SECOR

SECOR INTERNATIONAL INCORPORATED

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San Diego, CA 92108
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DATE: April 15, 2005

ARCO SEMI-ANNUAL GROUNDWATER MONITORING REPORT

Facility No.: 3037 Address:	915 Camino Del Rio South, San Diego, CA
ARCO Environmental Engineer:	Roy Thun
Consulting Co./Contact Person:	SECOR/Bradley Eisenberg
SECOR Project No.:	08BP.U3037.05
Primary Agency/Regulatory ID No.:	County of San Diego, Department of Environmental Health, Land and Water Quality Division, Site Assessment and Mitigation Program (SAM), (Danny Martinez) / Case #H05125-002

WORK PERFORMED THIS REPORTING PERIOD [Fourth - 2004 through First - 2005]:

1. Performed first 2005 semi-annual groundwater monitoring and sampling.
2. Conducted a sensitive receptor survey.

WORK PROPOSED FOR NEXT REPORTING PERIOD [Second through Third - 2005]:

1. Submit first 2005 semi-annual groundwater monitoring report.
2. Perform second 2005 semi-annual groundwater monitoring and reporting.
3. Submit sensitive receptor survey report.

Current Phase of Project:	Monitoring/Assessment	(Assmnt, Remed., etc.)
Frequency of Sampling:	Semi-Annual	(Quarterly, etc.)
Frequency of Monitoring:	Semi-Annual	(Monthly, etc.)
Are Liquid Phase Hydrocarbons Present On-site:	No	(Yes/No)
Cumulative LPH Recovered to Date:	None	(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 w/in a 2000 ft. Radius & Their Respective Directions:	San Diego River 1,500 feet to the north	(Distance and direction)
Current Remediation Techniques:	Passive Natural Attenuation	(SVES, LPH Removal)
Permits for Discharge:	N/A	(NPDES, POTW, etc.)

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

DATE: April 15, 2005

ARCO SEMI-ANNUAL GROUNDWATER MONITORING REPORT (Continued)
ARCO Facility #3037

Approximate Depth to Groundwater:	11.81 to 21.20	(Measured Feet)
	Northwest	(Direction)
Groundwater Gradient:	0.006	(Magnitude)
Groundwater Beneficial Use:	Yes	(Yes/No)

DISCUSSION: On March 2, 2005, SECOR personnel gauged four groundwater monitoring wells and five vadose zone/groundwater monitoring wells associated with the site (Figure 2). In addition, groundwater monitoring well City Well MW-2 owned by the City of San Diego, was gauged. SECOR purged and sampled eight of the ten wells mentioned above. Vadose zone well VW-1 was not sampled due to sheen observed while purging. Vadose zone well VW-2 was not sampled due to an obstruction in the well preventing sufficient purging. Field observations and data were documented on a monitoring well gauging log and well purging/sampling logs (attached). The depth to water ranged between 11.81 feet below ground surface (bgs) in City Well MW-2 to 21.20 feet bgs in well MW-1, as presented in Table 1. Groundwater elevations ranged from 23.94 to 27.25 feet above mean sea level (MSL). Estimated groundwater flow direction was to the northwest at an approximate gradient of 0.006 (Figure 3). Groundwater samples were collected from the wells in accordance with the attached purging and sampling procedures. The groundwater samples were collected and 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), tert-butyl alcohol (TBA), ethyl tert-butyl ether (ETBE), di-isopropyl ether (DIPE), tert-amyl methyl ether (TAME), and ethanol. Analytical results are summarized in Tables 2 and 3. GRO, benzene, and MTBE results are shown on Figure 4, and a benzene and MTBE isoconcentration map is presented in Figure 5. Hydrographs showing changes in groundwater elevation and benzene and MTBE concentrations with time are also attached.

CONCLUSIONS & RECOMMENDATIONS: In general, the March 2, 2005 groundwater elevations increased in wells approximately two feet or more, in comparison to the previous gauging event. Analytical results were similar to previous results, with dissolved MTBE decreasing by more than an order of magnitude in some wells. As with previous gauging events, the calculated groundwater elevation for well VW-2 was anomalous. SECOR recommends continued semi-annual groundwater monitoring and sampling, which includes the City-owned well in the groundwater monitoring program.

SUMMARY OF UNUSUAL ACTIVITY: VW-1 not sampled because of sheen in well; VW-2 not sampled due to well obstruction.

AGENCY DIRECTIVE REQUIREMENTS: Conduct semi-annual monitoring and reporting.

ATTACHED:

- Site Location Map (Figure 1)
- Site Plan (Figure 2)
- Groundwater Gradient Map, March 2, 2005 (Figure 3)
- GRO, Benzene, and MTBE Concentrations in Groundwater, March 2, 2005 (Figure 4)

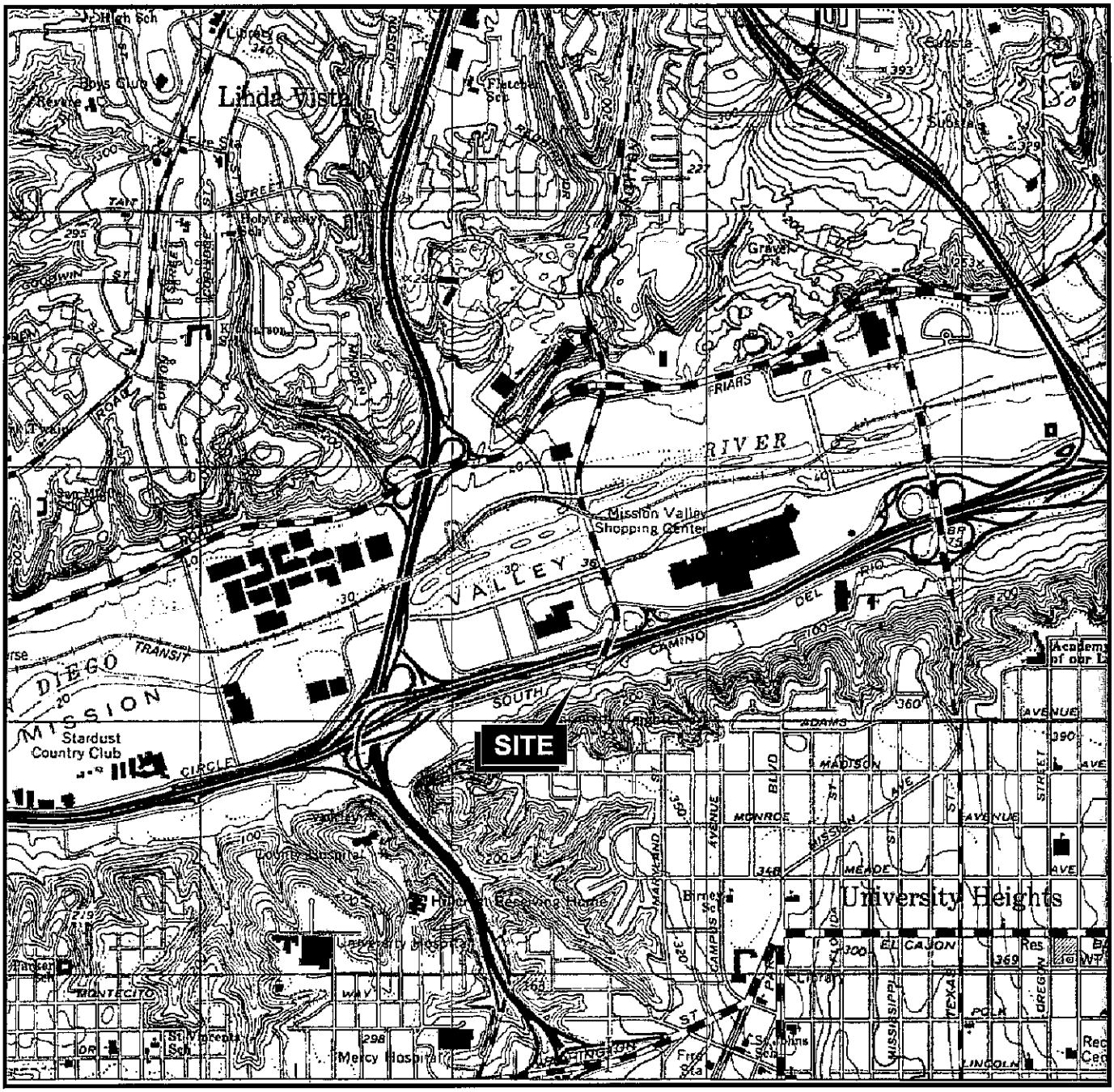
DATE: April 15, 2005

ARCO SEMI-ANNUAL GROUNDWATER MONITORING REPORT (Continued)
ARCO Facility #3037

ATTACHED:

- Benzene and MTBE Isoconcentration Map, March 2, 2005 (Figure 5)
- Summary of Groundwater Elevations, 2002 to Present (Table 1)
- Summary of Groundwater Analytical Results, 2002 to Present (Table 2)
- Summary of Additional Oxygenates Analytical Results 2002 to Present (Table 3)
- Well Hydrographs
- Monitoring Well Purging and Sampling Procedures
- Monitoring Well Gauging Log
- Well Purging/Sampling Logs
- Laboratory Report and Chain-of-Custody Documentation

cc: Roy Thun, Atlantic Richfield Company
Barbara J. and Thomas H. Handley Trust



QUADRANGLE LOCATION

N

0 1000 2000

1 INCH = 2000 FEET

Reference: U.S.G.S., 1996, La Jolla, California Quadrangle Topographic 7.5' Series.

SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: ARCO FACILITY #3037 915 Camino Del Rio South San Diego, California		SITE LOCATION MAP		FIGURE: 1
	JOB NUMBER: 08BP.U3037.05	DRAWN BY: RO	CHECKED BY: SM	APPROVED BY:	DATE: 03/29/05

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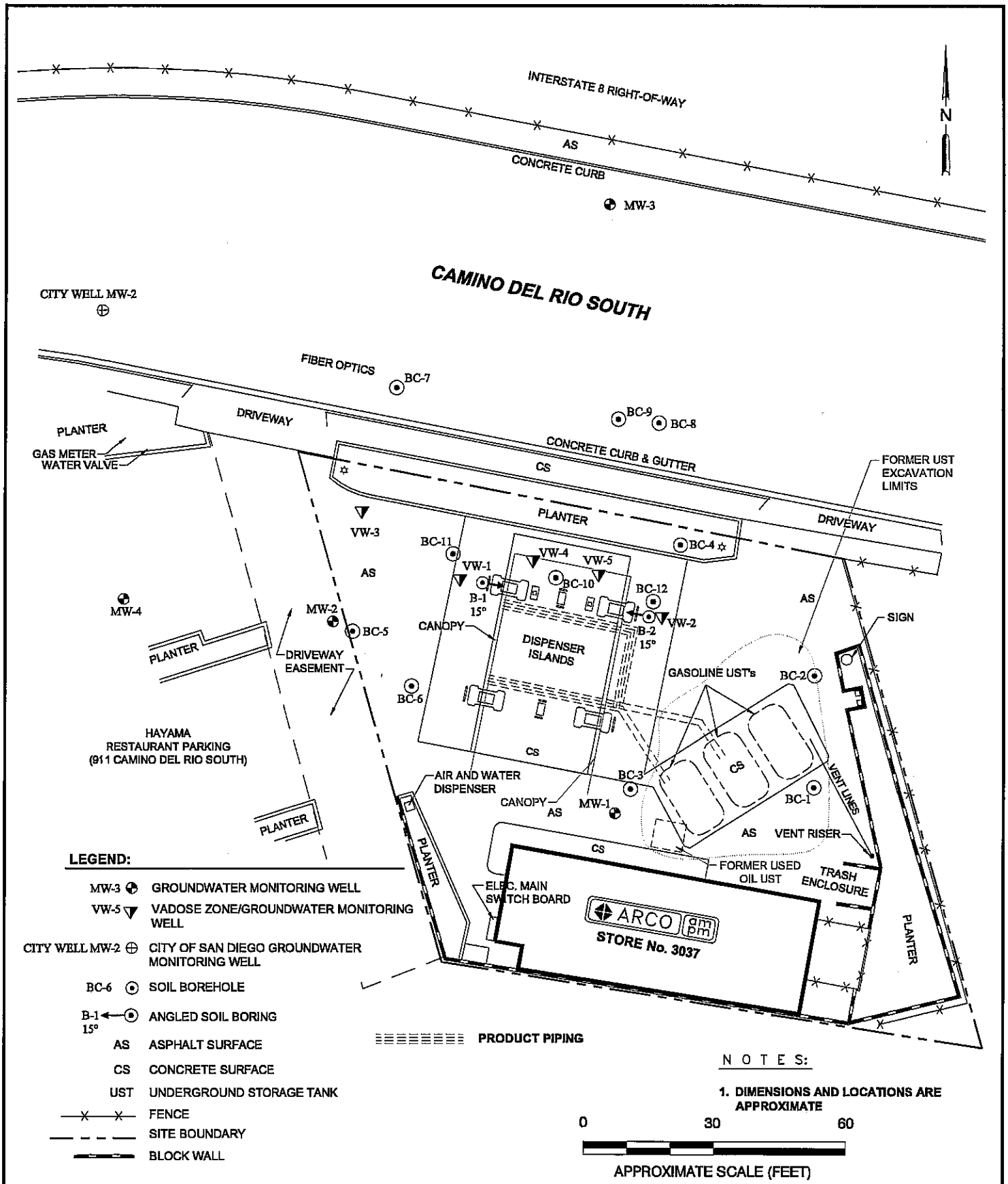
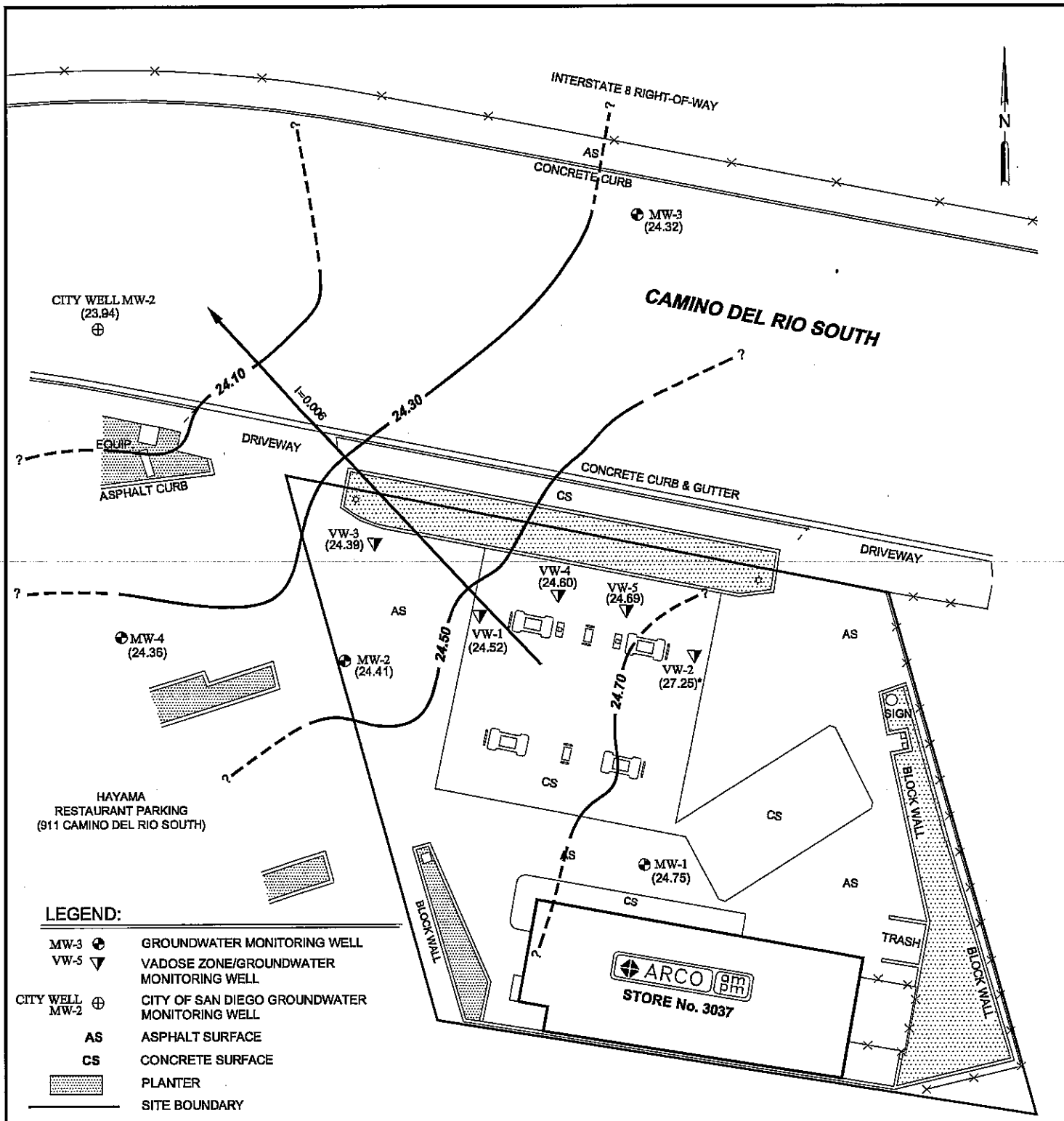
3037-USGS



SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: ARCO FACILITY #3037 915 Camino Del Rio South San Diego, California		SITE PLAN		FIGURE: 2
	JOB NUMBER: 08BP.U3037.05	DRAWN BY: RO	CHECKED BY: SM	APPROVED BY:	DATE: 03/29/05

FILEPATH:P:\CAD\ALLPROJECTS2005DWGS\ARCO 2005\3037-2K5\3037SP3-04.DWG|ROCAMPO|MAR 30, 2005 AT 14:53|LAYOUT: MODEL

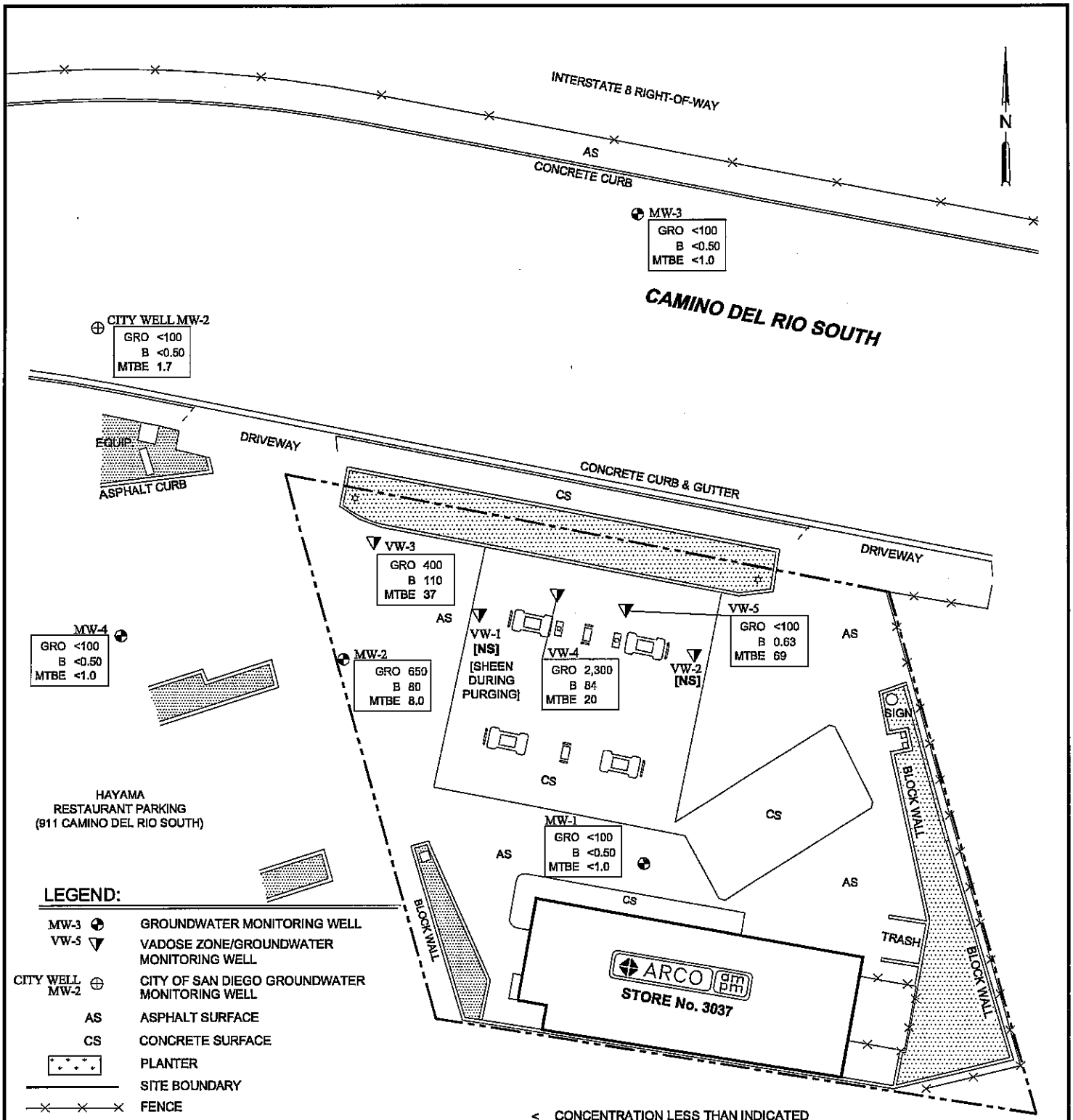
3037SP3-04



SECOR 2655 CAMINO DEL RIO NORTH, SUITE 302 SAN DIEGO, CALIFORNIA PHONE: (619) 296-6195/296-6199 (FAX)	FOR: ARCO FACILITY #3037 915 Camino Del Rio South San Diego, California		GROUNDWATER GRADIENT MAP MARCH 2, 2005		FIGURE: 3
	JOB NUMBER: 08BP.U3037.05	DRAWN BY: BDF	CHECKED BY: SM	APPROVED BY:	DATE: 03/29/05

FILEPATH:P:\CAD\ALLPROJECTS2005DWGS\ARCO 2005\3037-2K5\3037GW3-05.DWG|LHUNTER|APR 12, 2005 AT 9:55|LAYOUT: MODEL

3037GW3-05



LEGEND:

MW-3	GROUNDWATER MONITORING WELL
VW-5	VADOSE ZONE/GROUNDWATER MONITORING WELL
CITY WELL MW-2	CITY OF SAN DIEGO GROUNDWATER MONITORING WELL
AS	ASPHALT SURFACE
CS	CONCRETE SURFACE
	PLANTER
	SITE BOUNDARY
	FENCE
GRO <500 B <0.50 MTBE <1.0	GROUNDWATER SAMPLE ANALYTICAL CONCENTRATIONS IN MICROGRAMS PER LITER (mg/L)
GRO	GASOLINE - RANGE ORGANICS C_6 - C_{12}
B	BENZENE
MTBE	METHYL-TERT-BUTYL ETHER
<	CONCENTRATION LESS THAN INDICATED LABORATORY REPORTING LIMIT
[NS]	NOT SAMPLED
[SHEEN]	DISCONTIOUS, NON-MEASURABLE THICKNESS OF LPH

0 30 60

APPROXIMATE SCALE (FEET)

SECOR
2655 CAMINO DEL RIO NORTH, SUITE 302
SAN DIEGO, CALIFORNIA
PHONE: (619) 296-6195/296-6199 (FAX)

FOR:			FIGURE:
ARCO FACILITY #3037 915 Camino Del Rio South San Diego, California	GRO, BENZENE AND MTBE CONCENTRATIONS IN GROUNDWATER MARCH 2, 2005		4

JOB NUMBER:	DRAWN BY:	CHECKED BY:	APPROVED BY:	DATE:
08BP.U3037.05	BDF	SM		03/29/05

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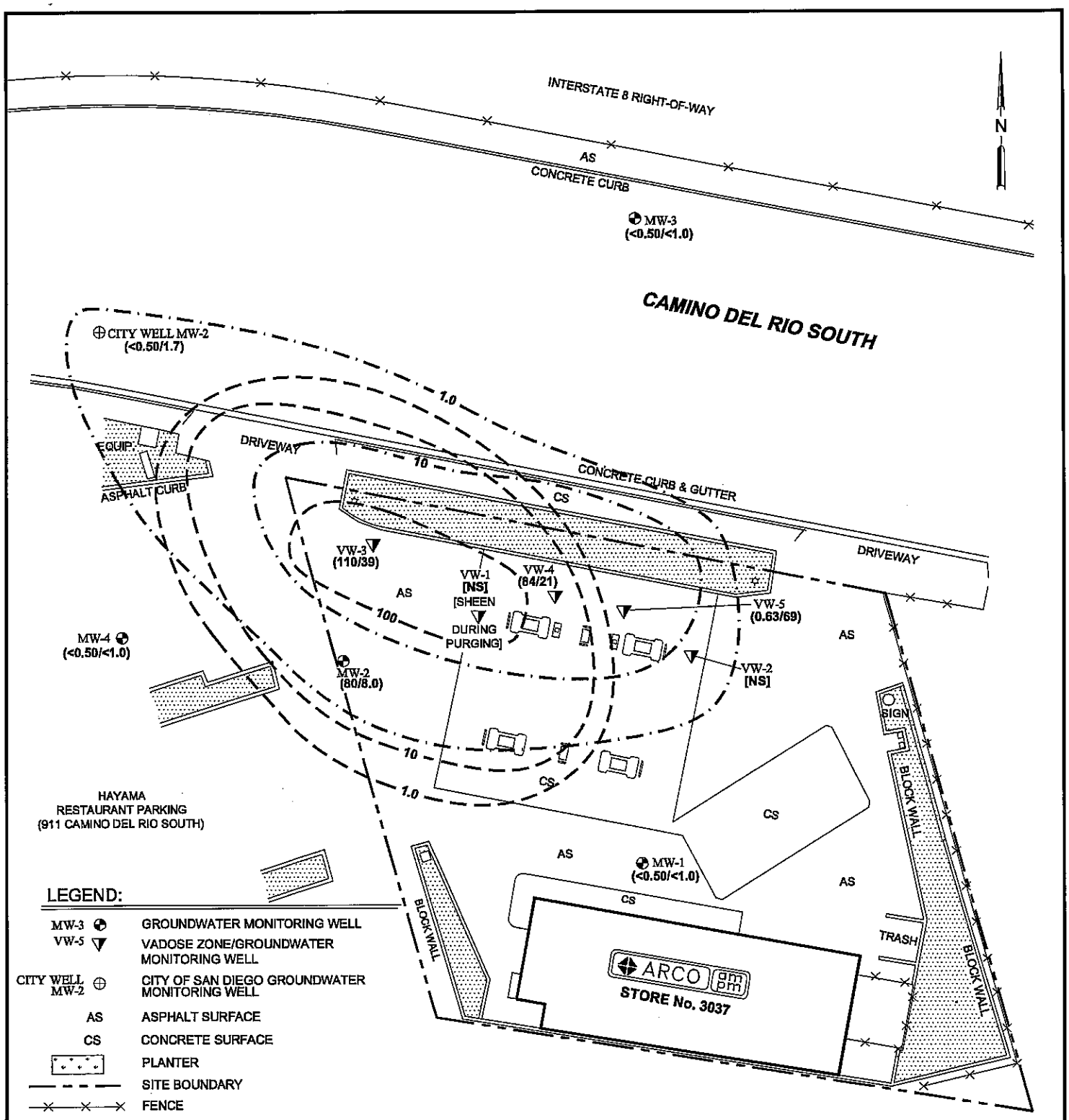
3037CON3-05



LEGEND:

MW-3	GROUNDWATER MONITORING WELL
VW-5	VADOSE ZONE/GROUNDWATER MONITORING WELL
CITY WELL MW-2	CITY OF SAN DIEGO GROUNDWATER MONITORING WELL
AS	ASPHALT SURFACE
CS	CONCRETE SURFACE
	PLANTER
	SITE BOUNDARY
	FENCE
(<0.50/<1.0)	POST PURGE GROUNDWATER SAMPLE ANALYTICAL CONCENTRATIONS IN MICROGRAMS PER LITER (μg/L)
?---10---	BENZENE ISOCONCENTRATION LINE (μg/L)
?—·—10—·—	MTBE ISOCONCENTRATION LINE (μg/L)
<	CONCENTRATION LESS THAN INDICATED LABORATORY REPORTING LIMIT
[SHEEN]	DISCONTINUOUS, NON-MEASURABLE THICKNESS OF LPH
[NS]	NOT SAMPLED

0 30 60

APPROXIMATE SCALE (FEET)

SECOR
2655 CAMINO DEL RIO NORTH, SUITE 302
SAN DIEGO, CALIFORNIA
PHONE: (619) 296-6195/296-6199 (FAX)

FOR:				FIGURE:
ARCO FACILITY #3037 915 Camino Del Rio South San Diego, California		BENZENE AND MTBE ISOCONCENTRATION MAP MARCH 2, 2005		5
JOB NUMBER: 08BP.U3037.05	DRAWN BY: BDF	CHECKED BY: SM	APPROVED BY:	DATE: 03/29/05

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3037ISO3-05

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #3037

Well ID/ Surveyed Well Elevation[1] (Feet MSL)	Date	Depth to Static Water (feet)	Apparent LPH Thickness (feet)	Groundwater Elevation[2] (feet MSL)
City Well MW-2[3]	02/18/03	Not Measured		
35.75	06/16/03	13.33	0.00	22.42
	09/03/03	Not Measured		
	11/26/03	13.47	0.00	22.28
	03/02/04	13.28	0.00	22.47
	06/17/04	13.48	0.00	22.27
	09/17/04	13.64	0.00	22.11
	03/02/05	11.81	0.00	23.94
MW-1	03/06/02	22.37	0.00	23.58
	04/16/02	23.33	0.00	22.62
	09/03/02	26.48	0.00	19.47
	11/07/02	23.69	0.00	22.26
45.95	02/18/03	23.16	0.00	22.79
	06/16/03	22.71	0.00	23.24
	09/30/03	22.96	0.00	22.99
	11/26/03	23.11	0.00	22.84
	03/02/04	22.94	0.00	23.01
	06/17/04	23.15	0.00	22.80
	09/17/04	23.39	0.00	22.56
	03/02/05	21.20	0.00	24.75
MW-2	03/06/02	20.02	0.00	22.37
	04/16/02	19.97	0.00	22.42
	09/03/02	20.35	0.00	22.04
	11/07/02	20.30	0.00	22.09
42.38	02/18/03	19.85	0.00	22.53
	06/16/03	19.31	0.00	23.07
	09/30/03	19.59	0.00	22.79
	11/26/03	19.76	0.00	22.62
	03/02/04	19.39	0.00	22.99
	06/17/04	19.71	0.00	22.67
	09/17/04	19.97	0.00	22.41
	03/02/05	17.97	0.00	24.41

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #3037

Well ID/ Surveyed Well Elevation[1] (Feet MSL)	Date	Depth to Static Water (feet)	Apparent LPH Thickness (feet)	Groundwater Elevation[2] (feet MSL)
MW-3	03/06/02	19.57	0.00	22.30
	04/16/02	19.51	0.00	22.36
	09/03/02	22.65	0.00	19.22
	11/07/02	19.85	0.00	22.02
41.86	02/18/03	19.40	0.00	22.46
	06/16/03	18.89	0.00	22.97
	09/30/03	19.13	0.00	22.73
	11/26/03	19.24	0.00	22.62
	03/02/04	19.17	0.00	22.69
	06/17/04	19.38	0.00	22.48
	09/17/04	19.54	0.00	22.32
	03/02/05	17.54	0.00	24.32
MW-4	02/18/03	Installed on 3/18/03		
41.24	06/16/03	18.23	0.00	23.01
	09/30/03	18.48	0.00	22.76
	11/26/03	Not Measured - Car Parked Over Well		
	03/03/04[4]	18.48	0.00	22.76
	06/17/04	18.74	0.00	22.50
	09/17/04	18.86	0.00	22.38
	03/02/05	16.88	0.00	24.36
VW-1	03/06/02	21.44	0.00	22.42
	04/16/02	21.39	0.00	22.47
	09/03/02	21.76	0.00	22.10
	11/07/02	21.74	0.00	22.12
44.44	02/18/03	21.79	0.00	22.65
	06/16/03	21.36	0.00	23.08
	09/30/03	21.65	0.00	22.79
	11/26/03	21.73	0.00	22.71
	03/02/04	21.61	0.00	22.83
	06/17/04	21.85	0.00	22.59
	09/17/04	22.03	0.00	22.41
	03/02/05	19.92	0.00	24.52
VW-2	03/06/02	25.34	0.00	19.74

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #3037

Well ID/ Surveyed Well Elevation[1] (Feet MSL)	Date	Depth to Static Water (feet)	Apparent LPH Thickness (feet)	Groundwater Elevation[2] (feet MSL)
VW-2	04/16/02	26.71	0.00	18.37
cont'd	09/03/02	26.67	0.00	18.41
	11/07/02	24.27	0.00	20.81
44.55	02/18/03	18.28	0.00	26.27
	06/16/03	19.12	0.00	25.43
	09/30/03	20.14	0.00	24.41
	11/26/03	20.08	0.00	24.47
	03/02/04	18.96	0.00	25.59
	06/17/04	20.81	0.00	23.74
	09/17/04	21.52	0.00	23.03
	03/02/05	17.30	0.00	27.25
VW-3	03/06/02	17.31	0.00	22.37
	04/16/02	17.27	0.00	22.41
	09/03/02	20.40	0.00	19.28
	11/07/02	17.59	0.00	22.09
41.16	02/18/03	18.58	0.00	22.58
	06/16/03	18.12	0.00	23.04
	09/30/03	18.37	0.00	22.79
	11/26/03	18.56	0.00	22.60
	03/02/04	18.40	0.00	22.76
	06/17/04	18.58	0.00	22.58
	09/17/04	18.76	0.00	22.40
	03/02/05	16.77	0.00	24.39
VW-4	03/06/02	21.76	0.00	22.45
	04/16/02	21.71	0.00	22.50
	09/03/02	22.07	0.00	22.14
	11/07/02	22.07	0.00	22.14
44.27	02/18/03	21.59	0.00	22.68
	06/16/03	21.17	0.00	23.10
	09/30/03	21.45	0.00	22.82
	11/26/03	21.55	0.00	22.72
	03/02/04	21.40	0.00	22.87
	06/17/04	21.67	0.00	22.60
	09/17/04	21.81	0.00	22.46

TABLE 1

SUMMARY OF GROUNDWATER ELEVATIONS, 2002 TO PRESENT
ARCO Facility #3037

Well ID/ Surveyed Well Elevation[1] (Feet MSL)	Date	Depth to Static Water (feet)	Apparent LPH Thickness (feet)	Groundwater Elevation[2] (feet MSL)
VW-4 cont'd	03/02/05	19.67	0.00	24.60
VW-5	03/06/02	21.91	0.00	22.48
	04/16/02	21.84	0.00	22.55
	09/03/02	22.24	0.00	22.15
	11/07/02	22.23	0.00	22.16
44.32	02/18/03	21.55	0.00	22.77
	06/16/03	21.17	0.00	23.15
	09/30/03	21.41	0.00	22.91
	11/26/03	21.55	0.00	22.77
	03/02/04	21.42	0.00	22.90
	06/17/04	21.69	0.00	22.63
	09/17/04	21.83	0.00	22.49
	03/02/05	19.63	0.00	24.69

Notes:

[1] = Elevations are measured in feet above mean sea level (MSL)
[2] = Groundwater elevation in feet MSL = Surveyed well elevation - depth to water
[3] =Third-Party Owned well (City of San Diego)
[4] = Well inaccessible on 3/2/04, gauged on 3/3/04
LPH = Liquid Phase Hydrocarbons

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #3037
All concentrations reported in micrograms per liter (µg/L)

Well Identification	Date	GRO	B	T	E	X	MTBE
City Well MW-2[a]	06/16/03	Well Not Sampled					
	11/26/03	<500	<0.50	<0.50	18	<2.5	1.8
	03/03/04 NP	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	03/03/04	<500	<0.50	<0.50	24.0	<1.5	1.3
	06/17/04	<500	<0.50	<0.50	<0.50	<1.5	2.0
	09/17/04	<500	<0.50	0.78	<0.50	<1.5	1.7
	03/02/05	<100	<0.50	<0.50	<0.50	<1.0	1.7
MW-1	03/06/02	<500	<0.50	<0.50	<0.50	<1.5	1.1
	04/16/02	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	09/03/02	<500	<0.50	<0.50	<0.50	<1.5	4.0
	11/07/02	<500	<0.50	<0.50	<0.50	<1.5	5.3
	02/18/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	06/16/03	<500	<0.50	<0.50	<0.50	<1.5	2.7
	09/30/03	<500	<0.50	<0.50	<0.50	<1.5	2.5
	11/26/03	<500	<0.50	<0.50	<0.50	<1.5	1.9
	03/02/04	<500	<0.50	<0.50	<0.50	<1.5	2.1
	06/17/04	<500	<0.50	<0.50	<0.50	<1.5	1.2
	09/17/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	03/02/05	<100	<0.50	<0.50	<0.50	<1.0	<1.0
MW-2	03/06/02	1,600	230	48	210	290	17
	04/16/02	<500	<0.50	<0.50	<0.50	<1.5	6.6
	09/03/02	1,700	220	39	180	220	28
	11/07/02	1,400	230	40	220	263	27
	02/18/03	1,600	200	55	200	310	27
	06/16/03	1,800	220	62	220	320	20
	09/30/03	1,500	180	51	210	280	15
	11/26/03	930	110	33	120	180	13
	03/02/04 NP	1,400	170	54	150	270	17
	03/02/04	1,200	140	46	140	240	16
	06/17/04	1,000	110	30	86	190	12
	09/17/04	770	88	26	56	150	11
	03/02/05	650	80	27	61	160	8.0

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #3037
All concentrations reported in micrograms per liter (µg/L)

Well Identification	Date	GRO	B	T	E	X	MTBE
MW-3	03/06/02	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	04/16/02	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	09/03/02	<500	<0.50	0.64	<0.50	<1.5	<1.0
	11/07/02	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	02/18/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	06/16/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	09/30/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/26/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	03/02/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	06/17/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	09/17/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	03/02/05	<100	<0.50	<0.50	<0.50	<1.0	<1.0
MW-4	02/18/03	Well installed 03/18/03					
	06/16/03	<500	<0.50	<0.50	<0.50	<1.5	1.0
	09/30/03	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	11/26/03	Well Not Sampled - Car Parked Over Well					
	03/03/04	<500	<0.50	<0.50	<0.50	<1.5	1.1
	06/17/04	<500	<0.50	<0.50	<0.50	<1.5	<1.0
	09/17/04	<500	<0.50	<0.50	<0.50	<1.5	1.0
	03/02/05	<100	<0.50	<0.50	<0.50	<1.0	<1.0
VW-1	03/06/02	22,000	4,500	1,400	1,400	3,200	1,000
	04/16/02	10,000	2,500	230	700	790	440
	09/03/02	31,000	4,200	300	2,300	2,900	420
	11/07/02	32,000	3,400	730	1,500	2,380	1,100
	02/18/03	11,000	1,800	660	600	950	240
	06/16/03	Not Sampled - LPH Sheen in well					
	09/30/03	Not Sampled - LPH Sheen in well					
	11/26/03	5,300	1,700	260	320	450	590
	03/02/04	Not Sampled - LPH Sheen in well during purging					
	06/17/04	Not Sampled - LPH Sheen in well during purging					
	09/17/04	Not Sampled - LPH Sheen in well during purging					
	03/02/05	Not Sampled - LPH Sheen in well during purging					

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #3037
All concentrations reported in micrograms per liter (µg/L)

Well Identification	Date	GRO	B	T	E	X	MTBE
VW-2	03/06/02	<500	1.9	0.97	15	57	32
	04/16/02	<500	<0.50	<0.50	<0.50	<1.5	17
	09/03/02	<500	<0.50	<0.50	0.52	<1.5	18
	11/07/02	<500	<0.50	<0.50	<0.50	<1.5	26
	02/18/03	<500	<0.50	<0.50	<0.50	<1.5	1.8
	06/16/03	<500	<0.50	<0.50	<0.50	<1.5	1.7
	09/30/03	<500	<0.50	<0.50	<0.50	<1.5	1.1
	11/26/03	Not Sampled - Insufficient Recharge					
	03/02/04	Not Sampled - Obstruction in well					
	06/17/04	Not Sampled - Obstruction in well					
	09/17/04	Not Sampled - Obstruction in well					
	03/02/05	Not Sampled - Obstruction in well					
VW-3	03/06/02	1,300	550	74	33	110	2,300
	04/16/02	<500	<0.50	<0.50	<0.50	<1.0	45
	09/03/02	<500	160	28	9.9	36	1,500
	11/07/02	<500	120	23	9.1	33	790
	02/18/03	770	150	48	22	82	210
	06/16/03	620	160	33	17	61	82
	09/30/03	570	190	32	18	58	97
	11/26/03	580	160	33	19	64	96
	03/02/04 NP	<500	51	14	7.5	27	47
	03/02/04	<500	75	21	12	42	50
	06/17/04	<500	95	27	16	54	44
	09/17/04	<500	83	21	13	43	32
	03/02/05	400	110	26	22	71	37
VW-4	03/06/02	910	63	150	62	230	730
	04/16/02	2,200	120	15	200	240	320
	09/03/02	610	43	96	40	140	940
	11/07/02	510	35	55	27	106	1,500
	02/18/03	2,100	79	170	77	560	1,200
	06/16/03	2,400	78	310	140	590	1,400
	09/30/03	1,300	67	170	95	350	2,400
	11/26/03	830	55	110	66	230	3,900
	03/02/04 NP	740	40	<5.0	<5.0	<15	1,100
	03/02/04	720	70	98	67	200	3,200

TABLE 2
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS, 2002 TO PRESENT
ARCO Facility #3037
All concentrations reported in micrograms per liter (µg/L)

Well Identification	Date	GRO	B	T	E	X	MTBE
VW-4 cont'd	06/17/04	500	43	56	40	120	1,100
	09/17/04	<500	32	42	31	98	130
	03/02/05	2,300	84	260	120	710	20
VW-5	03/06/02	<500	3.7	<2.5	6.0	<7.5	500
	04/16/02	<500	<0.50	<0.50	<0.50	<1.5	8.2
	09/03/02	<500	<2.5	<2.5	5.3	<7.5	540
	11/07/02	<500	<5.0	<5.0	6.6	<15.0	660
	02/18/03	<500	8.5	<5.0	14	<15	1,700
	06/16/03	<500	5.4	<5.0	13	<15	1,600
	09/30/03	<500	<10	<10	16	<30	1,700
	11/26/03	<500	5.7	<5.0	17	<15	1,700
	03/02/04	<500	<5.0	<5.0	12	<15	1,600
	06/17/04	<500	<5.0	<5.0	14	<15	1,400
	09/17/04	<500	<5.0	10	9.6	<15	1,100
	03/02/05	<100	0.63	<0.50	2.4	<1.0	69

Notes:

TPH = Total Petroleum Hydrocarbons (by EPA Method 8015M)
B = Benzene (by EPA Method 8260B)
T = Toluene (by EPA Method 8260B)
E = Ethylbenzene (by EPA Method 8260B)
X = Total Xylenes (by EPA Method 8260B)
MTBE = Methyl tert-butyl ether (by EPA Method 8260B)
< = Less than the indicated laboratory reporting limit
NP = Sample collected by no-purge sampling procedures
a = Third-Party owned well (City of San Diego)

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #3037

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

Well Identification	Date	TBA	DIPE	ETBE	TAME	ETHANOL
City Well MW-2[a]	11/26/03	<50	<5.0	<5.0	<5.0	<150
	03/03/04 NP	<50	<5.0	<5.0	<5.0	<150
	03/03/04	<50	<5.0	<5.0	<5.0	<150
	06/17/04	<50	<5.0	<5.0	<5.0	<150
	09/17/04	<50	<5.0	<5.0	<5.0	<150
	03/02/05	<25	<2.0	<2.0	<2.0	<500
MW-1	04/16/02	<25	<5.0	<5.0	<5.0	--
	09/03/02	<25	<5.0	<5.0	<5.0	--
	11/07/02	<50	<5.0	<5.0	<5.0	--
	02/18/03	<50	<5.0	<5.0	<5.0	<150
	06/16/03	<50	<5.0	<5.0	<5.0	<150
	09/30/03	<50	<5.0	<5.0	<5.0	<150
	11/26/03	<50	<5.0	<5.0	<5.0	<150
	03/02/04	<50	<5.0	<5.0	<5.0	<150
	06/17/04	<50	<5.0	<5.0	<5.0	<150
	09/17/04	<50	<5.0	<5.0	<5.0	<150
	03/02/05	<25	<2.0	<2.0	<2.0	<500
MW-2	04/16/02	<25	<5.0	<5.0	<5.0	--
	09/03/02	<25	<5.0	<5.0	<5.0	--
	11/07/02	<200	<20	<20	<20	--
	02/18/03	<200	<20	<20	<20	<600
	06/16/03	<200	<20	<20	<20	<600
	09/30/03	<200	<20	<20	<20	<600
	11/26/03	<50	<5.0	<5.0	<5.0	<150
	03/02/04 NP	<50	<5.0	<5.0	<5.0	<150
	03/02/04	<100	<10	<10	<10	<300
	06/17/04	<100	<10	<10	<10	<300
	09/17/04	<50	<5.0	<5.0	<5.0	<150
	03/02/05	<25	<2.0	<2.0	<2.0	<500
MW-3	04/16/02	<25	<5.0	<5.0	<5.0	--
	09/03/02	<25	<5.0	<5.0	<5.0	--
	11/07/02	<50	<5.0	<5.0	<5.0	--
	02/18/03	<50	<5.0	<5.0	<5.0	<150
	06/16/03	<50	<5.0	<5.0	<5.0	<150
	09/30/03	<50	<5.0	<5.0	<5.0	<150

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #3037

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

Well Identification	Date	TBA	DIPE	ETBE	TAME	ETHANOL
MW-3 cont'd	11/26/03	<50	<5.0	<5.0	<5.0	<1.0
	03/02/04	<50	<5.0	<5.0	<5.0	<150
	06/17/04	<50	<5.0	<5.0	<5.0	<150
	09/17/04	<50	<5.0	<5.0	<5.0	<150
	03/02/05	<25	<2.0	<2.0	<2.0	<500
MW-4	06/16/03	<50	<5.0	<5.0	<5.0	<150
	09/30/03	<50	<5.0	<5.0	<5.0	<150
	11/26/03	Not Sampled - Car Parked Over Well				
	03/03/04	<50	<5.0	<5.0	<5.0	<150
	06/17/04	<50	<5.0	<5.0	<5.0	<150
	09/17/04	<50	<5.0	<5.0	<5.0	<150
	03/02/05	<25	<2.0	<2.0	<2.0	<500
VW-1	04/16/02	<1,200	<250	<250	<250	--
	09/03/02	<1,200	<250	<250	<250	--
	11/07/02	<1,000	<100	<100	<100	--
	02/18/03	<1,000	<100	<100	<100	<3,000
	06/16/03	Not Sampled - Sheen in well				
	09/30/03	Not Sampled - Sheen in well				
	11/26/03	1,500	<120	<120	<120	<3,800
	03/02/04	Not Sampled - Sheen in well				
	06/17/04	Not Sampled - Sheen in well				
	09/17/04	Not Sampled - Sheen in well				
	03/02/05	Not Sampled - Sheen in well				
VW-2	04/16/02	<25	<5.0	<5.0	<5.0	--
	09/03/02	<25	<5.0	<5.0	<5.0	--
	11/07/02	<50	<5.0	<5.0	<5.0	--
	02/18/03	<50	<5.0	<5.0	<5.0	<150
	06/16/03	<50	<5.0	<5.0	<5.0	<150
	09/30/03	<50	<5.0	<5.0	<5.0	<150
	11/26/03	Not Sampled - Insufficient Recharge				
	03/02/04	Not Sampled - Obstruction in well				
	06/17/04	Not Sampled - Obstruction in well				
	09/17/04	Not Sampled - Obstruction in well				

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #3037

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

Well Identification	Date	TBA	DIPE	ETBE	TAME	ETHANOL
VW-2 cont'd	03/02/05	Not Sampled - Obstruction in well				
VW-3	04/16/02	<25	<5.0	<5.0	<5.0	--
	09/03/02	<250	<50	<50	<50	--
	11/07/02	560	<50	<50	<50	--
	02/18/03	470	<12	<12	<12	<380
	06/16/03	600	<10	<10	<10	<300
	09/30/03	480	<12	<12	<12	<380
	11/26/03	430	<10	<10	<10	<300
	03/02/04 NP	290	<5.0	<5.0	<5.0	<150
	03/02/04	290	<5.0	<5.0	<5.0	<150
	06/17/04	250	<5.0	<5.0	<5.0	<150
	09/17/04	180	<12	<12	<12	<380
	03/02/05	<50	<4.0	<4.0	<4.0	<1,000
VW-4	04/16/02	900	<50	<50	<50	--
	09/03/02	1,300	<50	<50	<50	--
	11/07/02	930	<50	<50	<50	--
	02/18/03	<500	<50	<50	<50	<1,500
	06/16/03	<500	<50	<50	<50	<1,500
	09/30/03	<1,000	<100	<100	<100	<3,000
	11/26/03	<1,200	<120	<120	<120	<3,800
	03/02/04 NP	<500	<50	<50	<50	<1,500
	03/02/04	1,600	<120	<120	<120	<3,800
	06/17/04	3,500	<50	<50	<50	<1,500
	09/17/04	4,700	<50	<50	<50	<1,500
	03/02/05	1,100	<10	<10	<10	<2,500
VW-5	04/16/02	<25	<5.0	<5.0	<5.0	--
	09/03/02	130	<25	<25	<25	--
	11/07/02	<500	<50	<50	<50	--
	02/18/03	<500	<50	<50	<50	<1,500
	06/16/03	<500	<50	<50	<50	<1,500
	09/30/03	<1,000	<100	<100	<100	<3,000
	11/26/03	<500	<50	<50	<50	<1,500
	03/02/04	<500	<50	<50	<50	<1,500
	06/17/04	<500	<50	<50	<50	<1,500

TABLE 3

SUMMARY OF ADDITIONAL OXYGENATES ANALYTICAL RESULTS, 2002 TO PRESENT

ARCO Facility #3037

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

Well Identification	Date	TBA	DIPE	ETBE	TAME	ETHANOL
VW-5	09/17/04	<500	<50	<50	<50	<1,500
cont'd	03/02/05	<25	<2.0	<2.0	<2.0	<500

Notes:

DIPE = Di-isopropyl ether

ETBE = Ethyl tert-butyl ether

TAME = tert-Amyl methyl ether

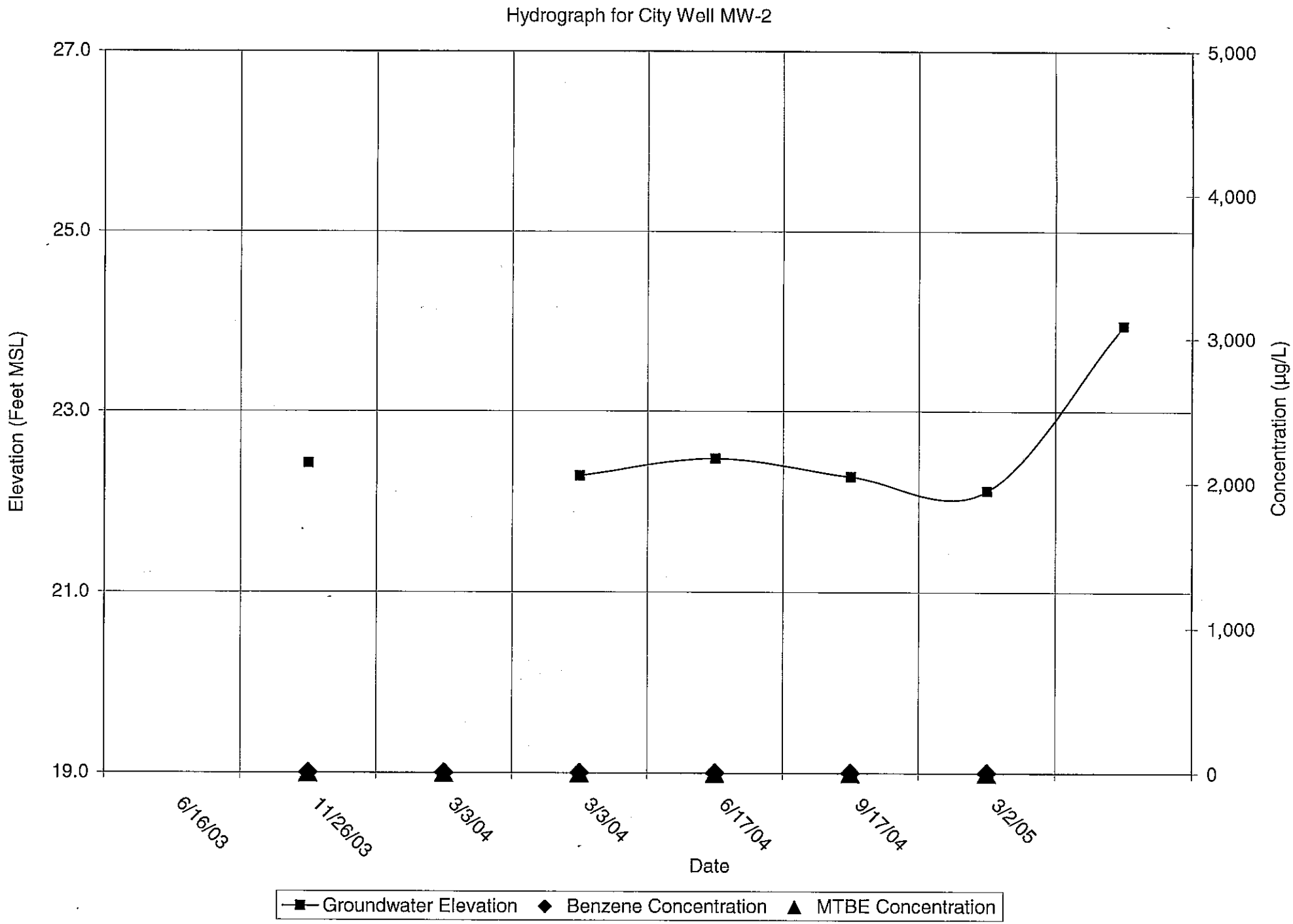
TBA = tert-Butanol

< = Less than the laboratory reporting limit shown.

Samples analyzed by EPA Method 8260B.

NP = Sample collected by no-purge sampling procedures

a =Third-Party owned well (City of San Diego)



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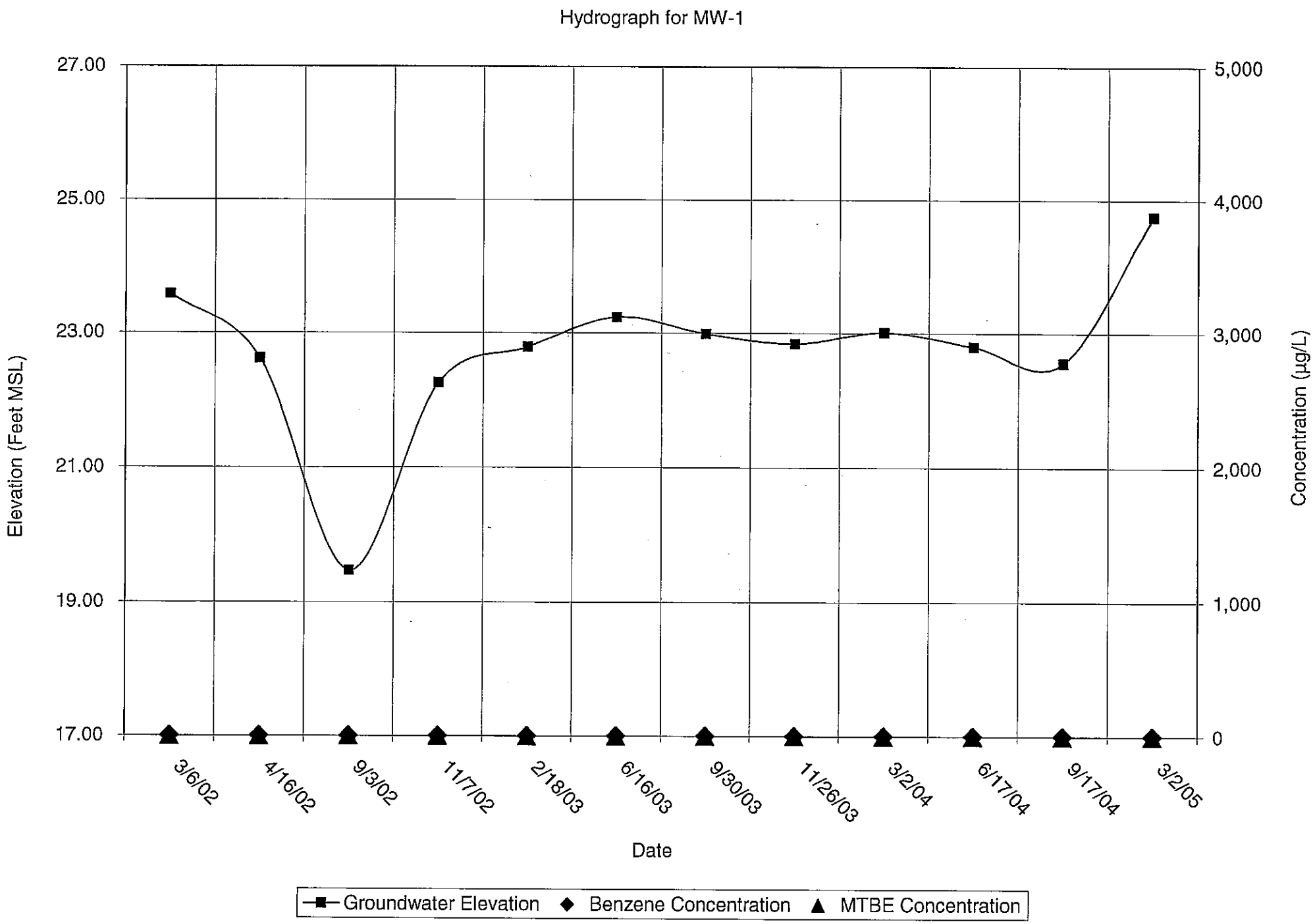

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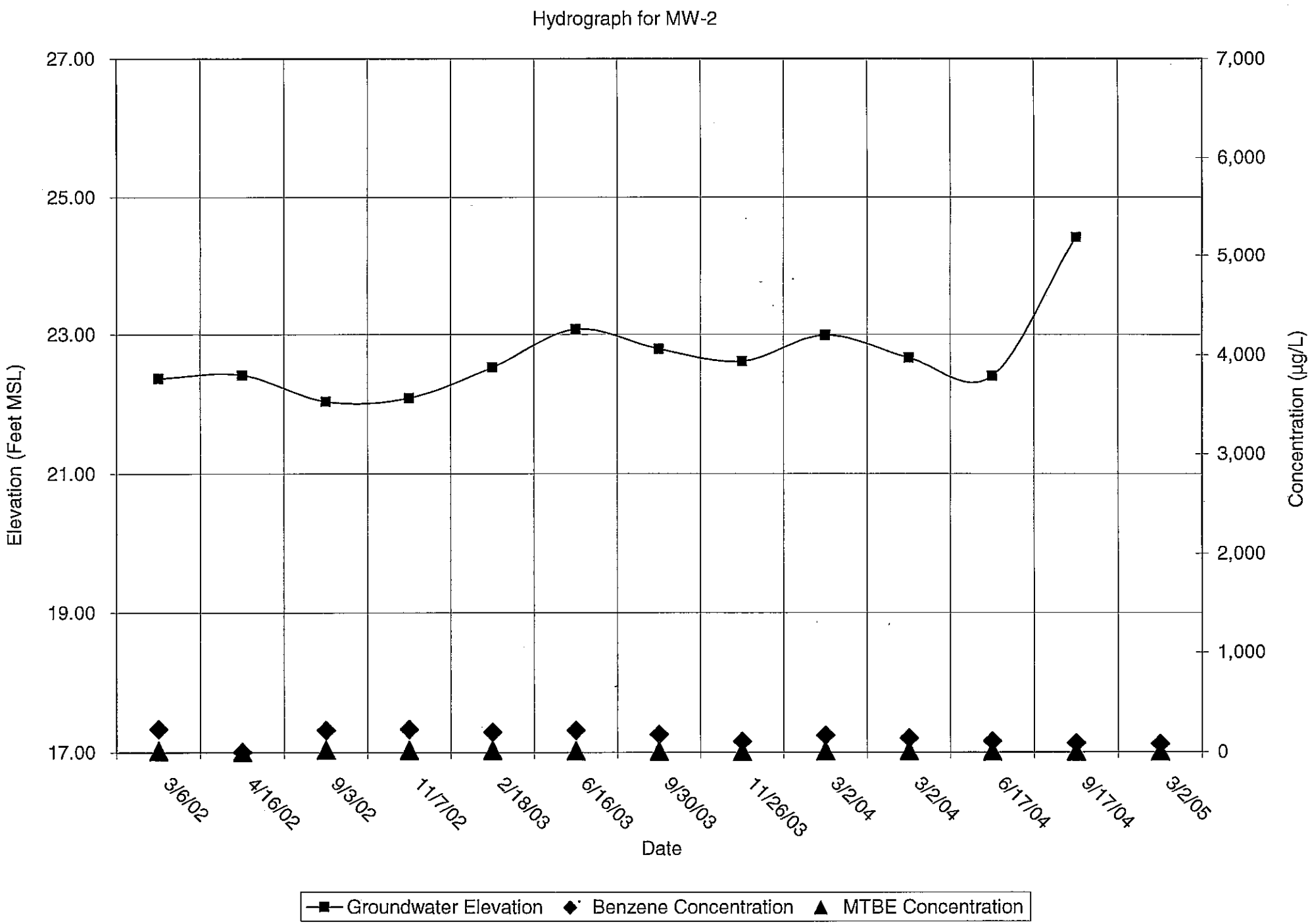

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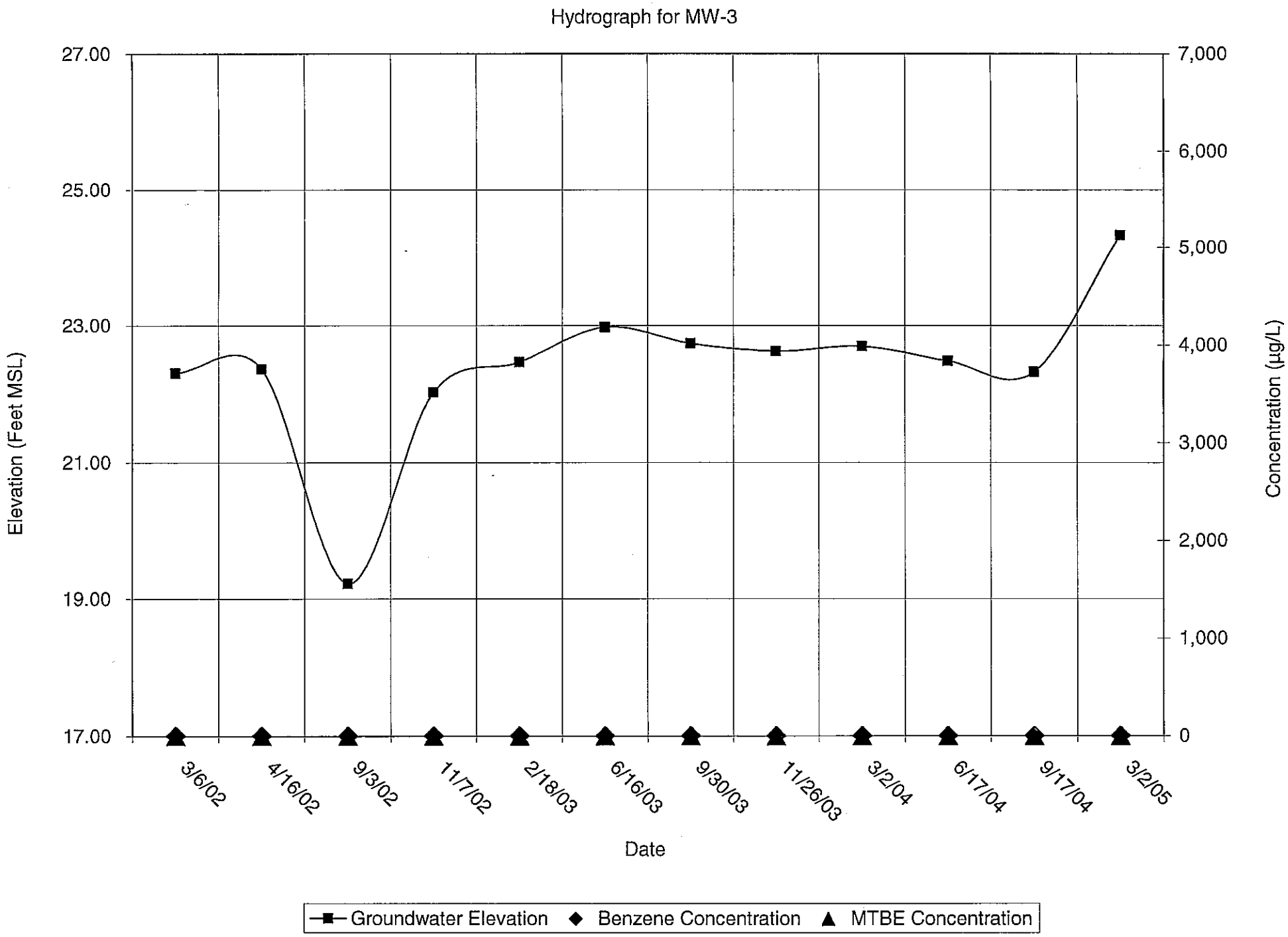

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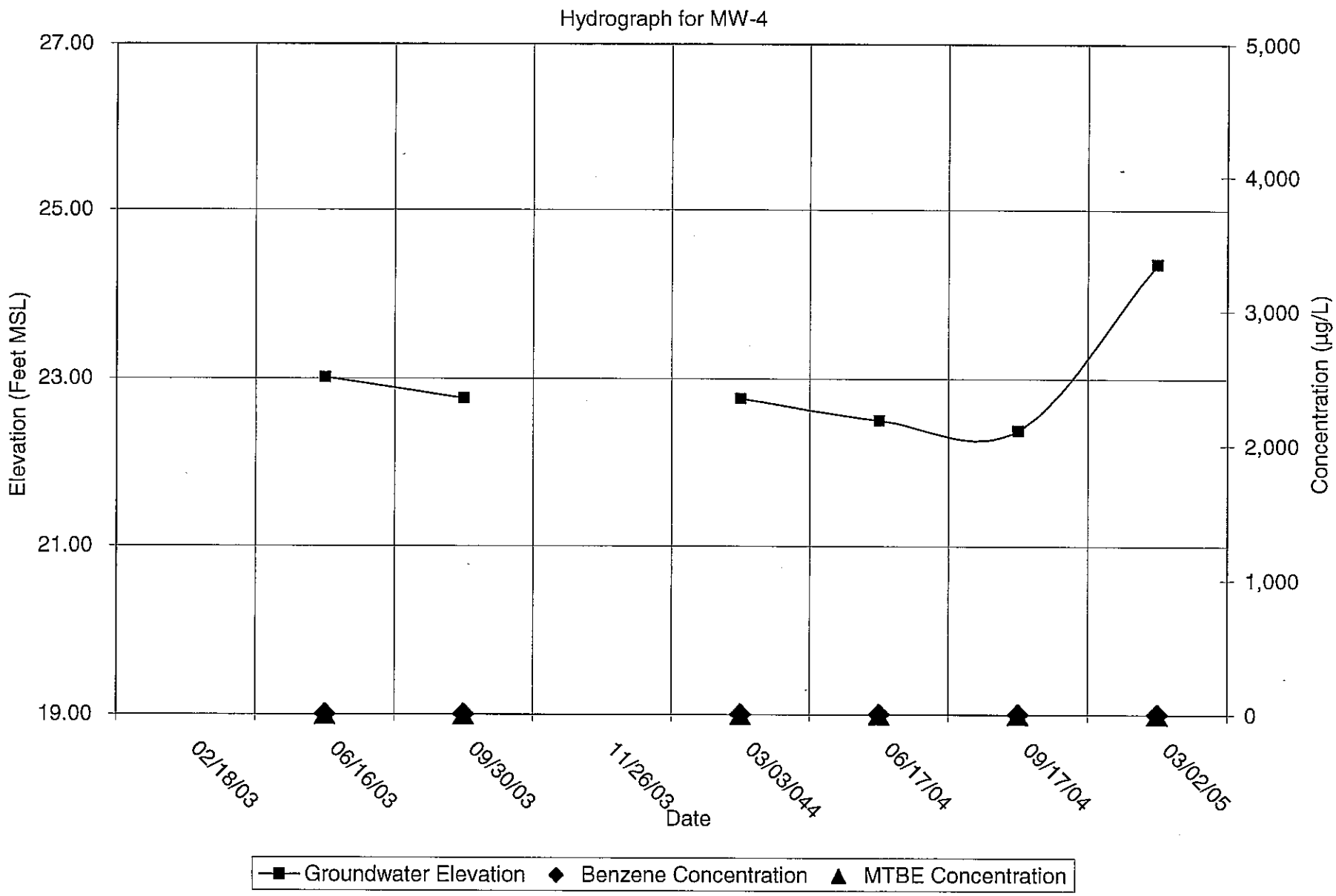

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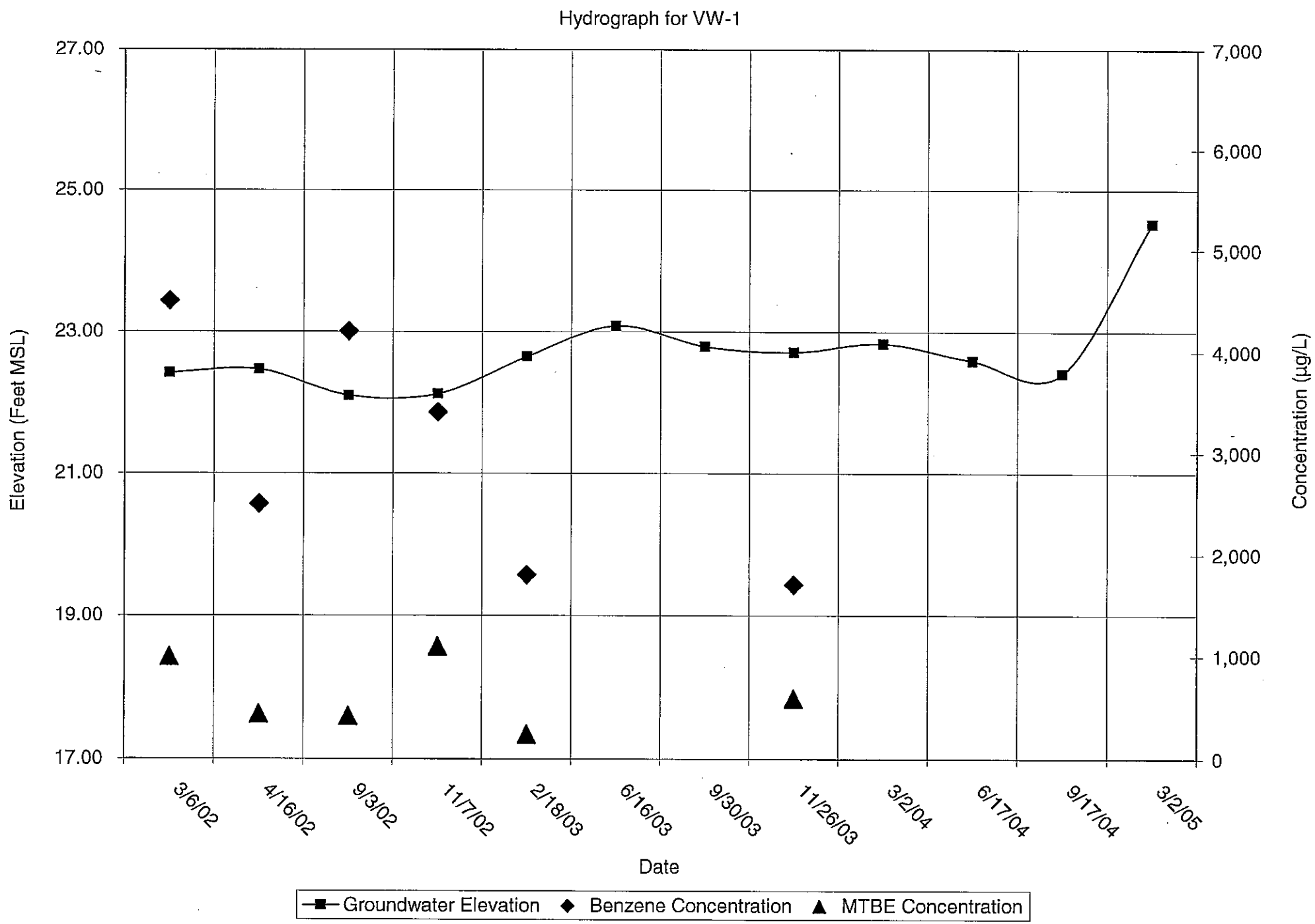

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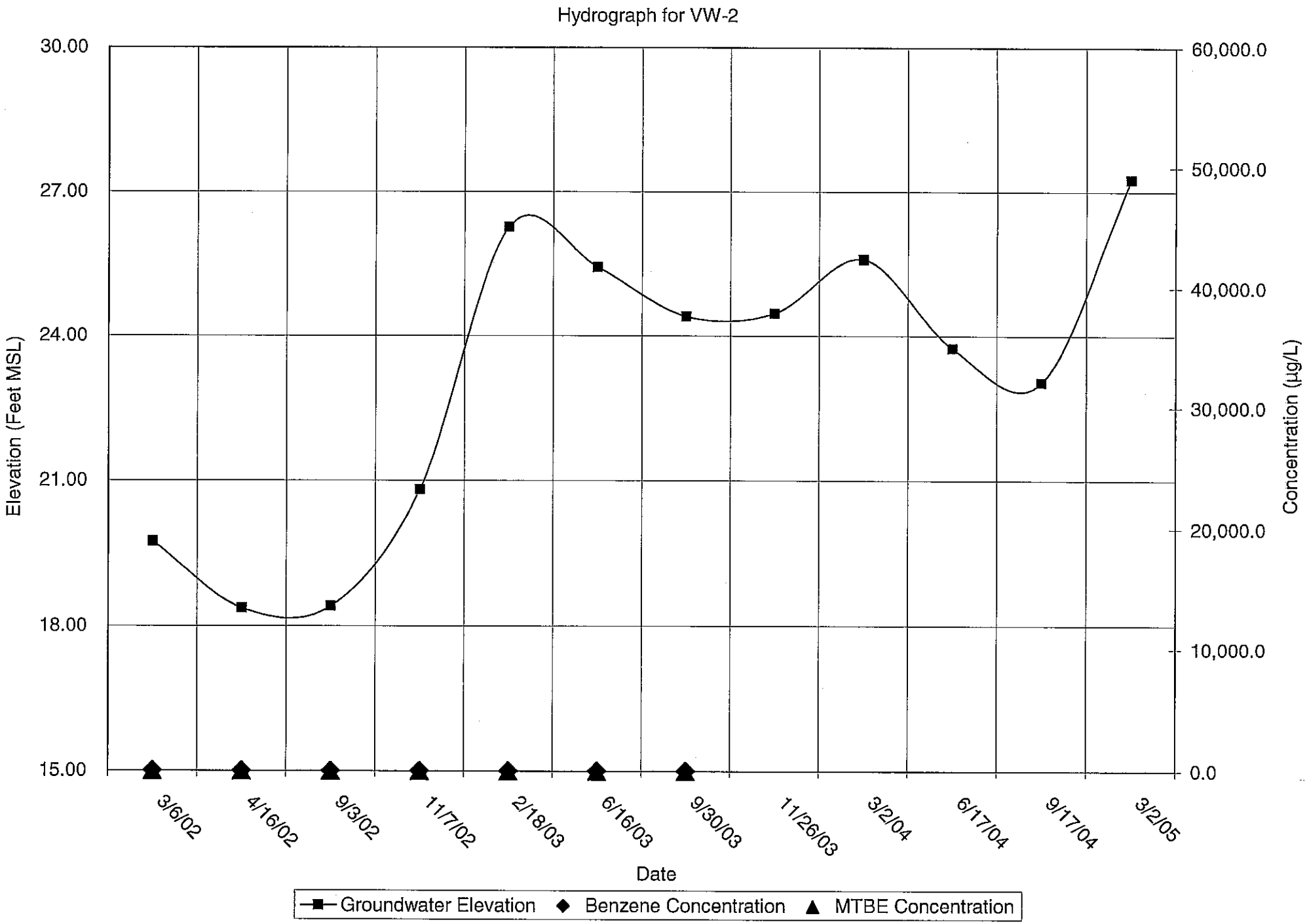

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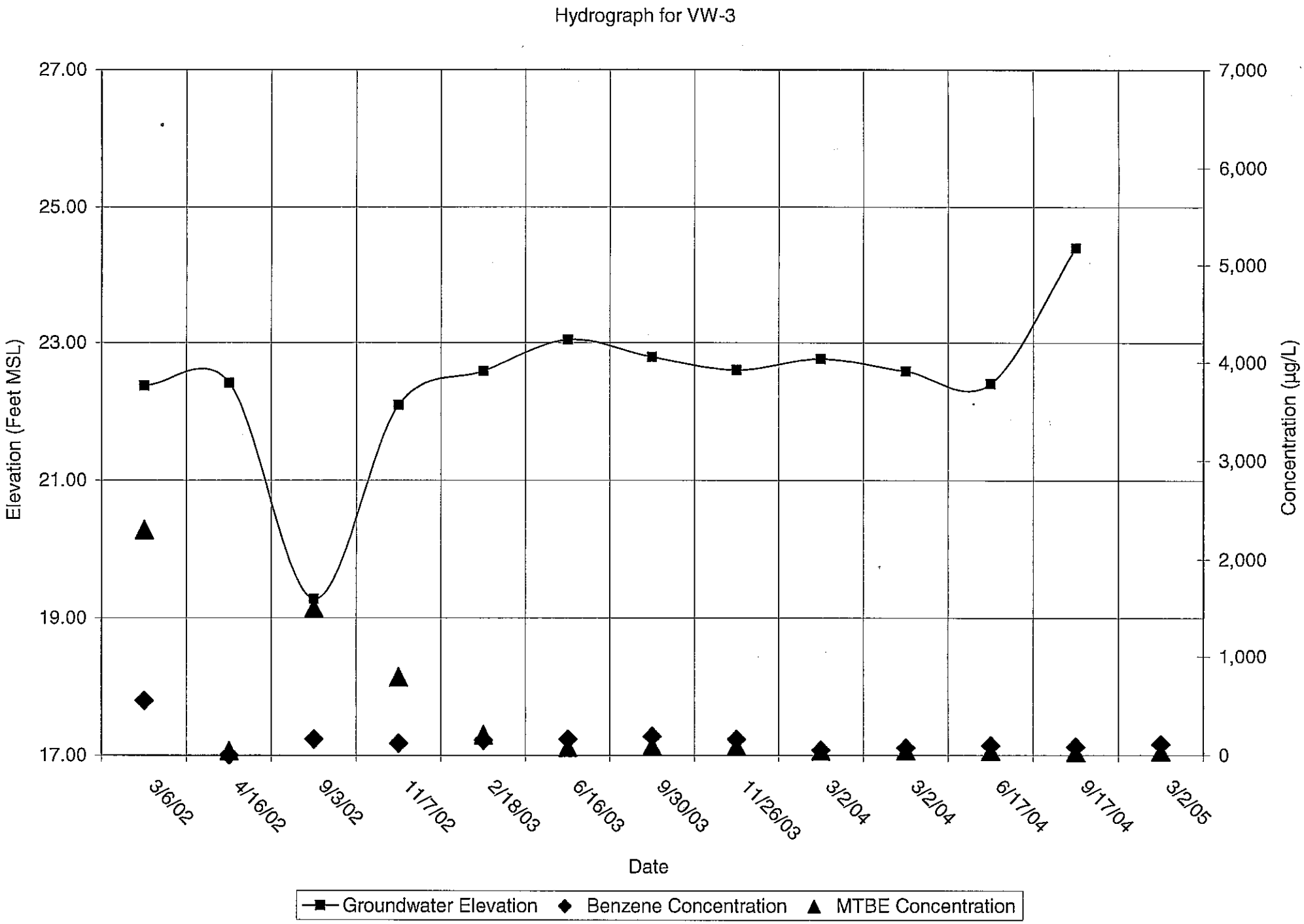

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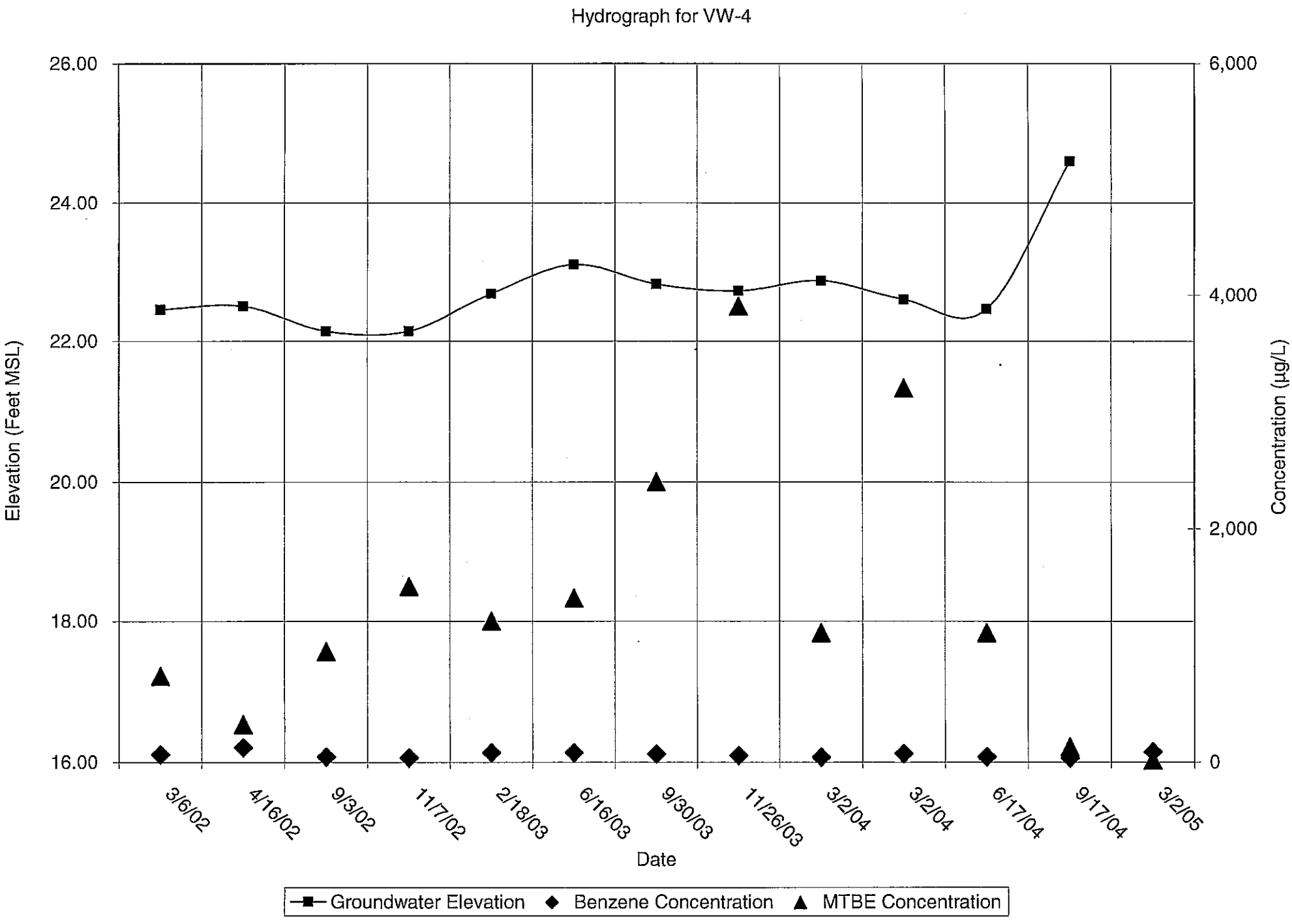

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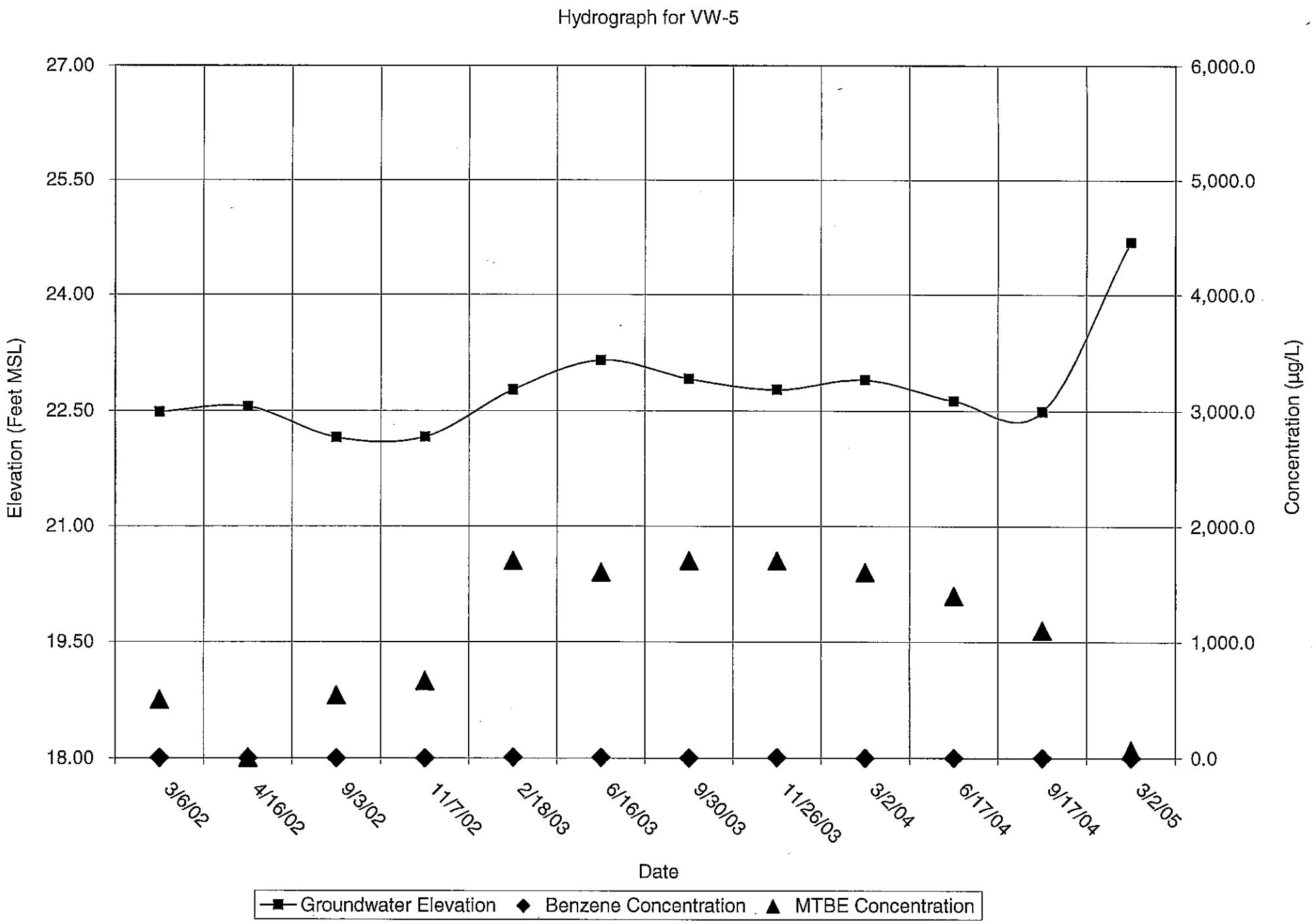

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MONITORING WELL PURGING AND SAMPLING PROCEDURES SAN DIEGO COUNTY

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 3037** Date: 3/2/05

Project Number: 08BP.U3037.05 / 4142 Field Representative(s): SM, JM

Checked by: SM

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-1	23.39	0933	–	21.20	–	34.87	45.95	24.75		
MW-2	19.97	0856	–	17.97	–	34.40	42.38	24.41		
MW-3	19.54	1030	–	17.54	–	34.49	41.86	24.32		
MW-4	18.86	0927	–	16.88	–	30.21	41.24	24.36		
VW-1	22.03	0941	–	19.92	–	23.86	44.44	24.52		
VW-2	21.52	0937	–	17.30	–	28.47	44.55	27.25		
VW-3	18.76	0901	–	16.77	–	24.19	41.16	24.39		
VW-4	21.81	0910	–	19.67	–	33.60	44.27	24.60		
VW-5	21.83	0951	–	19.63	–	27.70	44.32	24.69		
City Well (MW-2)	13.64	0915	–	11.81	–	18.81	35.75	23.94		

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	WELL PURGING / SAMPLING LOG		Well No: MW- 1
	Project Name: ARCO 3037		Date: 03/02/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time: 1340
	SECOR Rep: J. Morell	Checked by: JSM	Sample No: MW- 1

PURGING & SAMPLING EQUIPMENT / METHOD		WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID:	Solinist # 7	Borehole Diameter (in):	8 (10) 12
Purging Equipment / Method:	___ Vac Truck ✓ Bailer ___ Submersible Pump ___ Other	Casing Diameter (in):	2 (4)
pH Temp/Conductivity Meter Type / ID:	1 A	Depth to Water (DTW_1) (ft):	21.20
Sampling Method:	___ Teflon Bailer ✓ Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 34.87	Water Column: 13.67
Decontamination Method:	___ Steam / High Pressure Wash ✓ 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product:	Thickness (in):
		Borehole Volume (gal): 20.51	1.5 Borehole Volumes (gal): 30.76

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1115	Started Purging					
1125	Dry	21	6.97	22.2	1959	Brown, odorless, cloudy
1140	Dry	31	6.96	22.2	1955	"
1340	21.20					

Maximum Drawdown (DTW_2) (ft) = 21.20

H_2O Removal Rate (GPM) = 1.24

✓ Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1340

Depth to Water at time of sampling (DTW_3): 21.20

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.

Casing 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

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

$$\% \text{ of Recovery} = 1 - \frac{(21.20)-(21.20)}{(21.20)-(34.87)} = \frac{0}{13.67} = 100\ \%$$

80% Recharge = 23.93

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 2
	Project Name: ARCO 3037		Date: 3/2/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time: 1550
	SECOR Rep: S. Martin	Checked by: SM	Sample No: MW- 2

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 12	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: 1	Depth to Water (DTW_1) (ft): 17.94	
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 34.40	Water Column: 16.46
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product:	Thickness (in):
	Borehole Volume (gal): 24.69	1.5 Borehole Volumes (gal): 37.03

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1331	Started Purging					
1344	27.16	25	6.93	23.4	1343	None, cloudy, tan
1351	28.01	37.5	6.90	23.5	1370	" " gray
1550	18.00					

Maximum Drawdown (DTW_2) (ft) = 28.01

H_2O Removal Rate (GPM) = 1.88

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1550

Depth to Water at time of sampling (DTW_3): 18.00

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.

Casing 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

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

$$\% \text{ of Recovery} = 1 - \frac{(17.94) - (18.00)}{(17.94) - (\cancel{34.40})} = \frac{-0.06}{\cancel{-16.46}} = 99 \pm 0.07\%$$

28.01

80% Recharge = ~~21.23~~ 19.95 (SM)

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: CITYWELL (MW-2)
	Project Name: ARCO 3037		Date: 3/2/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time: 1458
	SECOR Rep: S. Martin	Checked by: SM	Sample No: CITYWELL (MW-2)

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # R12	Borehole Diameter (in): (8) (10) 12	
Purging Equipment / Method: ___ Vac Truck, X Bailer, ___ Submersible Pump, ___ Other	Casing Diameter (in): (2) (4)	
pH Temp/Conductivity Meter Type / ID:	Depth to Water (DTW_1) (ft): 11.81	
Sampling Method: ___ Teflon Bailer, X Disposable Bailer, ___ Other:	Total Well Depth (DTB) (ft): ~~27.70~~ 18.80	Water Column: 6.99
Decontamination Method: ___ Steam / High Pressure Wash, X 3 Stage (Alconox, Tap & DI rinse), ___ Other:	Floating Product:	Thickness (in):
	Borehole Volume (gal): 5.38	1.5 Borehole Volumes (gal): 8.07

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1220	Started Purging					
1254	dry	5.0	6.91	22.1	3220	none, very silty, brown
1258	dry	~~6.0~~ 5.5	6.97	21.9	3280	" " "
1458	16.35					

Maximum Drawdown (DTW_2) (ft) = 18.80

H_2O Removal Rate (GPM) = 0.13

___ Fast Recharging Well

X Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1458

Depth to Water at time of sampling (DTW_3):

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.

Casing 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: Historically slow difficult to purge, well silty perhaps screen is clogged

RECOVERY CALCULATIONS

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

$$\%\ of\ Recovery = 1 - \frac{(11.81)-(16.35)}{(11.81)-(18.80)} = \frac{4.54}{6.99} = 35\ \%$$

80% Recharge = 13.20

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 3
	Project Name: ARCO 3037		Date: 2/3/2/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time: 1136
	SECOR Rep: S. Martin	Checked by: SM	Sample No: MW- 3

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS
Water Level Meter Type & ID: Solinist # 12	Borehole Diameter (in): 8 (10) 12
Purging Equipment / Method: ___ Vac Truck ~~X~~ Bailer X Submersible Pump ___ Other	Casing Diameter (in): 2 (4)
pH Temp/Conductivity Meter Type / ID:	Depth to Water (DTW_1) (ft): 17.54
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 34.49 / Water Column: 16.95
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product: / Thickness (in):
	Borehole Volume (gal): 25.43 / 1.5 Borehole Volumes (gal): 38.14

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1035	Started Purging					
1047	30.41	26	6.44	22.2	3690	none, silty, brown
1059	DM	39	6.42	22.4	3710	
1136	19.73	Sample				

Maximum Drawdown (DTW_2) (ft) = 34.49

H_2O Removal Rate (GPM) = 1.63

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1136

Depth to Water at time of sampling (DTW_3): 19.73

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.

Casing 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

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

$$\% \text{ of Recovery} = 1 - \frac{(17.54) - (19.73)}{(17.54) - (34.49)} = \frac{2.19}{16.95} = 87\%$$

80% Recharge = +20.93

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: MW- 4
	Project Name: ARCO 3037		Date: 03/03/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time: 1255
	SECOR Rep: J. Morell	Checked by: SM	Sample No: MW- 4

PURGING & SAMPLING EQUIPMENT / METHOD		WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID:	Solinist # 7	Borehole Diameter (in):	8 (10) 12
Purging Equipment / Method:	___ Vac Truck X Bailer ___ Submersible Pump ___ Other	Casing Diameter (in):	2 (4)
pH Temp/Conductivity Meter Type / ID:	1A	Depth to Water (DTW_1) (ft):	16.88
Sampling Method:	___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 30.21	Water Column: 13.33
Decontamination Method:	___ Steam / High Pressure Wash ___ 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product:	Thickness (in):
		Borehole Volume (gal): 20.00	1.5 Borehole Volumes (gal): 30.00

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1034	Started Purging					
1043	27.09	20	6.88	22.4	1802	Brown, odorless, cloudy
1055	Dry	30	6.89	22.4	1795	"
1255	17.21	Sample				

Maximum Drawdown (DTW_2) (ft) = 30.21

H_2O Removal Rate (GPM) = 1.42

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1255

Depth to Water at time of sampling (DTW_3): 17.21

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.

Casing 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

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

$$\% \text{ of Recovery} = 1 - \frac{(16.88)-(17.21)}{(16.88)-(30.21)} = \frac{-.33}{-13.33} = 98\ \%$$

80% Recharge = 19.54

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VW- 1
	Project Name: ARCO 3037		Date: 03/03/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time:
	SECOR Rep: J. Morell	Checked by: SM	Sample No: VW- 1

PURGING & SAMPLING EQUIPMENT / METHOD		WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID:	Solinist # 7	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:	1A	Depth to Water (DTW_1) (ft):	20.02
Sampling Method:	___Teflon Bailer X Disposable Bailer ___Other:	Total Well Depth (DTB) (ft): 23.86	Water Column: 3.84
Decontamination Method:	___Steam / High Pressure Wash X 3-Stage (Alconox, Tap & DI rinse) ___Other:	Floating Product:	Thickness (in):
		Borehole Volume (gal): 5.76	1.5 Borehole Volumes (gal): 8.64

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1434	Started Purging					
1438	0.57	6				Black, odor, sheen
		9				
		SHEEN				

Maximum Drawdown (DTW_2) (ft) = 23.86	___Fast Recharging Well
H_2O Removal Rate (GPM) =	___Slow Recharging Well

SAMPLING INFORMATION

Time Sampled:	Depth to Water at time of sampling (DTW_3):

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.

Casing 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: Sheen Observed

RECOVERY CALCULATIONS

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

$$\%\ of\ Recovery = 1 - \frac{(20.02) - (\quad)}{(20.02) - (23.86)} = \frac{\quad}{3.84} = \quad \%$$

80% Recharge = 20.78

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VW- 2
	Project Name: ARCO 3037		Date:
	Project Number: 08BP.U3037.05 / 4142		Sample Time:
	SECOR Rep:	Checked by: SM	Sample No: VW- 2

PURGING & SAMPLING EQUIPMENT / METHOD		WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID:	Solinist #	Borehole Diameter (in):	8 (10) 12
Purging Equipment / Method:	___ Vac Truck ___ Bailer ___ Submersible Pump ___ Other	Casing Diameter (in):	2 (4)
pH Temp/Conductivity Meter Type / ID:		Depth to Water (DTW_1) (ft):	17.32
Sampling Method:	_____Teflon Bailer _____Disposable Bailer _____Other:_____	Total Well Depth (DTB) (ft): 28.47	Water Column: 11.15
		Floating Product:	Thickness (in):
Decontamination Method:	___Steam / High Pressure Wash ___3 Stage (Alconox, Tap & DI rinse) ___Other:	Borehole Volume (gal): 16.73	1.5 Borehole Volumes (gal): 25.09

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
	Started Purging					
	OBSTRUCTED				@	21.36 ft.

Maximum Drawdown (DTW_2) (ft) =	____Fast Recharging Well
H_2O Removal Rate (GPM) =	____Slow Recharging Well

SAMPLING INFORMATION

Time Sampled:	Depth to Water at time of sampling (DTW_3):

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.

Casing 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

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

$$\%\ of\ Recovery = 1 - \frac{(\quad)-(\quad)}{(\quad)-(\quad)} = ____$$

$$= ____\ \%$$

80% Recharge = _____

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VW- 3
	Project Name: ARCO 3037		Date: 03/02/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time: 1530
	SECOR Rep: S. Martin	Checked by: SM	Sample No: VW- 3

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 12	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:	Depth to Water (DTW_1) (ft): 16.77	
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 24.19	Water Column: 7.42
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product:	Thickness (in):
	Borehole Volume (gal): 11.13	1.5 Borehole Volumes (gal): 16.70

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1505	Started Purging					
1508	21.20	11.5	6.86	22.1	1383	mve, clo, dy, tm
1512	23.45	17	6.89	22.6	1350	
1530	16.88	Sample				

Maximum Drawdown (DTW_2) (ft) = 23.45

H_2O Removal Rate (GPM) = 2.42

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1530

Depth to Water at time of sampling (DTW_3): 16.88

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.

Casing 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

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

$$\% \text{ of Recovery} = 1 - \frac{(16.77) - (16.88)}{(16.77) - (23.45)} = \frac{-0.11}{-6.68} = 98\ \%$$

80% Recharge = 18.10

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG		Well No: VW- 4
	Project Name: ARCO 3037		Date: 03/02/05
	Project Number: 08BP.U3037.05 / 4142		Sample Time: 1558
	SECOR Rep: S. Martin	Checked by: SM	Sample No: VW- 4

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 12	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:	Depth to Water (DTW_1) (ft): 19.67	
Sampling Method: ___Teflon Bailer X Disposable Bailer ___Other:	Total Well Depth (DTB) (ft): 33.60	Water Column: 13.93
Decontamination Method: ___Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___Other:	Floating Product:	Thickness (in):
	Borehole Volume (gal): 20.89	1.5 Borehole Volumes (gal): 31.34

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1418	Started Purging					
1427	28.20	21	6.97	22.9	1970	none, silty, tan
1433	31.31	31.5	7.03	23.1	1960	" "
1558	20.06	Sample				

Maximum Drawdown (DTW_2) (ft) = 31.31

H_2O Removal Rate (GPM) = 2.10

X Fast Recharging Well

___Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1558

Depth to Water at time of sampling (DTW_3): 20.06

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.

Casing 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

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

$$\% \text{ of Recovery} = 1 - \frac{(19.67 - 20.06)}{(19.67 - 31.31)} = \frac{-0.39}{-11.64} = 97\ \%$$

80% Recharge = 21.99

SECOR INTERNATIONAL INCORPORATED	WELL PURGING / SAMPLING LOG	Well No: VW- 5
	Project Name: ARCO 3037	Date: 03/03/05
	Project Number: 08BP.U3037.05 / 4142	Sample Time: 1343
	SECOR Rep: J. Morcill Checked by: SM	Sample No: VW- 5

PURGING & SAMPLING EQUIPMENT / METHOD	WELL SPECIFICATIONS & MEASUREMENTS	
Water Level Meter Type & ID: Solinist # 7	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: 1A	Depth to Water (DTW_1) (ft): 19.63	
Sampling Method: ___ Teflon Bailer X Disposable Bailer ___ Other:	Total Well Depth (DTB) (ft): 27.70	Water Column: 8.07
Decontamination Method: ___ Steam / High Pressure Wash X 3 Stage (Alconox, Tap & DI rinse) ___ Other:	Floating Product:	Thickness (in):
	Borehole Volume (gal): 12.11	1.5 Borehole Volumes (gal): 18.16

PURGING INFORMATION

Time	DTW (ft)	Water Volume Purged (gal)	pH	Temp (°C)	Elect. Cond. (μ mhos)	Water Description (odor, turbidity, color)
1126	Started Purging					
1132	25.67	12.5	6.99	21.9	953	Brown, odorless, cloudy
1143	Dry	18.5	7.05	21.9	965	"
1343	20.65	Sample				

Maximum Drawdown (DTW_2) (ft) = 27.70

H_2O Removal Rate (GPM) = 1.08

X Fast Recharging Well

___ Slow Recharging Well

SAMPLING INFORMATION

Time Sampled: 1343

Depth to Water at time of sampling (DTW_3): 20.65

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.

Casing 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: Historically Slow

RECOVERY CALCULATIONS

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

$$\% \text{ of Recovery} = 1 - \frac{(19.63)-(20.65)}{(19.63)-(27.70)} = \frac{1.02}{8.07} = 88\ \%$$

80% Recharge = 21.24

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

March 16, 2005

STL LOT NUMBER: **E5C040440**
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 10 samples received under chain of custody by STL Los Angeles on March 4, 2005. These samples are associated with your ARCO #3037 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.

000027

This report contains _____ 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
Project Manager
CC: Project File

ARCO SITE #3037

E5C040440

bp

Chain of Custody Record

Page 1 of 1

Project Name: ARCO 3037 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.:	3037	Consultant Contractor:	SECOR
Address:	1721 Grand Ave.	BP/AR Facility Address:	915 Camino del Rio South	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.:	T0607300106	Consultant/Contractor Project No.:	08BP.03037.06.0427
Tele/Fax:	714.258.8610	Enfos Project No.:	G0BP4-0001	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	MW-1	1346	03/02		X			6				X		X	X	
2	MW-2	1558	03/02		X			6				X		X	X	
3	MW-3	1136	03/02		X			6				X		X	X	
4	City well (MW-2)	1458	03/02		X			6				X		X	X	
5	MW-4	1255	03/02		X			12				X		X	X	
6	VW-3	1530	03/02		X			6				X		X	X	
7	VW-4	1558	03/02		X			6				X		X	X	
8	VW-5	1343	03/02		X			6				X		X	X	
9	TB-3037-20050302		03/02		X			6				X				HOLD
10	EB-3037-20050302	1600	03/02		X			6				X				HOLD

	Relinquished By / Affiliation	Date	Time	Accepted By / Affiliation	Date	Time
Sampler's Name: Sean Martin	Sean Martin / Sampler	03/04	1615	[illegible]	03/04	1615
Sampler's Company: SECOR	[illegible]	03/04	1830	[illegible]	3-4	1830
Shipment Date:						
Shipment Method: Courier						
Shipment Tracking No:						

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

3

STL LOS ANGELES - PROJECT RECEIPT CHECKLIST Date: 3-4-05

LIMS Lot #: ESC040440 Quote #: 62428

Client Name: SECOR Project: Arco 3037

Received by: BB Date/Time Received: 3-4-05 / 18:30

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

	Initial / Date
Custody Seal Status Cooler: ☐ Intact ☐ Broken ☒ None	MG 3-4-05
Custody Seal Status Samples: ☐ Intact ☐ Broken ☒ None	
Custody Seal #(s): ☒ No Seal # ☐ N/A	
Sampler Signature on COC ☒ Yes ☐ No	
IR Gun # A Correction Factor -1 °C IR passed daily verification ☒ Yes ☐ No	MG 3-4-05
Temperature - BLANK 3.4 °C +/- 0.1 CF = 3.3 °C	GTB 3-4-05
Temperature – COOLER (___ °C ___ °C ___ °C ___ °C) = ___ avg °C +/- ___ CF = ___ °C	MG 3-4-05
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: MG 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	MG 3-4-05

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

Headspace Anomaly ☒ N/A MG 3-4-05

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 # E5C040440

PROJECT RECEIPT CHECKLIST Cont'd

Fraction	1-4	5	6-10											
VOAH/ *	3	1	3											

* 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

[X] N/A MG 3-4-05

- **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: MG 3-4-05

PM Review/Date: 3/7 SL

SECOR International Inc

Client Sample ID: MW-1

GC/MS Volatiles

Lot-Sample #...:	E5C040440-001	Work Order #...:	G5L3Q1AA	Matrix.....:	W
Date Sampled...:	03/02/05 13:40	Date Received..:	03/04/05 18:30	MS Run #.....:	5073292
Prep Date.....:	03/11/05	Analysis Date..:	03/12/05		
Prep Batch #...:	5073470	Analysis Time..:	00:17		
Dilution Factor:	1				
Analyst ID.....:	004648	Instrument ID..:	MSQ		
		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	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	100	(75 - 120)
1,2-Dichloroethane-d4	92	(65 - 130)
Toluene-d8	103	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: MW-1

GC Volatiles

Lot-Sample #...:	E5C040440-001	Work Order #...:	G5L3Q1AC	Matrix.....:	W
Date Sampled...:	03/02/05 13:40	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	16:09		
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)	95	(70 - 130)

SECOR International Inc

Client Sample ID: MW-2

GC/MS Volatiles

Lot-Sample #...:	E5C040440-002	Work Order #...:	G5L3R1AA	Matrix.....:	W
Date Sampled...:	03/02/05 15:50	Date Received..:	03/04/05 18:30	MS Run #.....:	5073292
Prep Date.....:	03/11/05	Analysis Date..:	03/12/05		
Prep Batch #...:	5073470	Analysis Time..:	04:26		
Dilution Factor:	1				
Analyst ID.....:	004648	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	80	0.50	ug/L
Ethanol	ND IO	500	ug/L
Ethylbenzene	61	0.50	ug/L
tert-Butyl alcohol	ND	25	ug/L
Toluene	27	0.50	ug/L
o-Xylene	53	1.0	ug/L
Xylenes (total)	160	1.0	ug/L
m-Xylene & p-Xylene	110	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	109	(75 - 120)
1,2-Dichloroethane-d4	113	(65 - 130)
Toluene-d8	101	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: MW-2

GC Volatiles

Lot-Sample #...:	E5C040440-002	Work Order #...:	G5L3R1AC	Matrix.....:	W
Date Sampled...:	03/02/05 15:50	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	16:37		
Dilution Factor:	1				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	650	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	105	(70 - 130)

SECOR International Inc

Client Sample ID: MW-3

GC/MS Volatiles

Lot-Sample #...:	E5C040440-003	Work Order #...:	G5L3T1AA	Matrix.....:	W
Date Sampled...:	03/02/05 11:36	Date Received..:	03/04/05 18:30	MS Run #.....:	5073292
Prep Date.....:	03/11/05	Analysis Date..:	03/12/05		
Prep Batch #...:	5073470	Analysis Time..:	00:40		
Dilution Factor:	1				
Analyst ID.....:	004648	Instrument ID..:	MSQ		
		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	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	104	(75 - 120)
1,2-Dichloroethane-d4	81	(65 - 130)
Toluene-d8	105	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: MW-3

GC Volatiles

Lot-Sample #...:	E5C040440-003	Work Order #...:	G5L3T1AC	Matrix.....:	W
Date Sampled...:	03/02/05 11:36	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	17:05		
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)	95	(70 - 130)

SECOR International Inc

Client Sample ID: CITY WELL (MW2)

GC/MS Volatiles

Lot-Sample #...: E5C040440-004 Work Order #...: G5L3V1AA Matrix.....: W
Date Sampled...: 03/02/05 14:58 Date Received..: 03/04/05 18:30 MS Run #.....: 5073292
Prep Date.....: 03/11/05 Analysis Date..: 03/12/05
Prep Batch #...: 5073470 Analysis Time..: 01:02
Dilution Factor: 1
Analyst ID.....: 004648 Instrument ID..: MSQ
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	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)	**1.7**	**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	92	(75 - 120)
1,2-Dichloroethane-d4	90	(65 - 130)
Toluene-d8	106	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: CITY WELL (MW2)

GC Volatiles

Lot-Sample #...:	E5C040440-004	Work Order #...:	G5L3V1AC	Matrix.....:	W
Date Sampled...:	03/02/05 14:58	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	17:33		
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)	93	(70 - 130)

SECOR International Inc

Client Sample ID: MW-4

GC/MS Volatiles

Lot-Sample #...: E5C040440-005 Work Order #...: G5L3W1AA Matrix.....: W
Date Sampled...: 03/02/05 12:55 Date Received..: 03/04/05 18:30 MS Run #.....: 5073292
Prep Date.....: 03/11/05 Analysis Date..: 03/12/05
Prep Batch #...: 5073470 Analysis Time..: 01:25
Dilution Factor: 1
Analyst ID.....: 004648 Instrument ID..: MSQ
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	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	96	(75 - 120)
1,2-Dichloroethane-d4	98	(65 - 130)
Toluene-d8	105	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: MW-4

GC Volatiles

Lot-Sample #...:	E5C040440-005	Work Order #...:	G5L3W1AC	Matrix.....:	W
Date Sampled...:	03/02/05 12:55	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	18:01		
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)	92	(70 - 130)

SECOR International Inc

Client Sample ID: VW-3

GC/MS Volatiles

Lot-Sample #...:	E5C040440-006	Work Order #...:	G5L3X1AA	Matrix.....:	W
Date Sampled...:	03/02/05 15:30	Date Received..:	03/04/05 18:30	MS Run #.....:	5073292
Prep Date.....:	03/11/05	Analysis Date..:	03/12/05		
Prep Batch #...:	5073470	Analysis Time..:	04:49		
Dilution Factor:	2				
Analyst ID.....:	004648	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	4.0	ug/L
Benzene	110	1.0	ug/L
Ethanol	ND IO	1000	ug/L
Ethylbenzene	22	1.0	ug/L
tert-Butyl alcohol	ND	50	ug/L
Toluene	26	1.0	ug/L
o-Xylene	25	2.0	ug/L
Xylenes (total)	71	2.0	ug/L
m-Xylene & p-Xylene	47	2.0	ug/L
Methyl tert-butyl ether (MTBE)	37	2.0	ug/L
Ethyl-t-Butyl Ether (ETBE)	ND	4.0	ug/L
Tert-amyl methyl ether (TAME)	ND	4.0	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	111	(75 - 120)
1,2-Dichloroethane-d4	120	(65 - 130)
Toluene-d8	100	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: VW-3

GC Volatiles

Lot-Sample #...:	E5C040440-006	Work Order #...:	G5L3X1AC	Matrix.....:	W
Date Sampled...:	03/02/05 15:30	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	18:29		
Dilution Factor:	1				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	400	100	ug/L

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

SECOR International Inc

Client Sample ID: VW-4

GC/MS Volatiles

Lot-Sample #...:	E5C040440-007	Work Order #...:	G5L301AA	Matrix.....:	W
Date Sampled...:	03/02/05 15:58	Date Received..:	03/04/05 18:30	MS Run #.....:	5073292
Prep Date.....:	03/11/05	Analysis Date..:	03/12/05		
Prep Batch #...:	5073470	Analysis Time..:	05:11		
Dilution Factor:	5				
Analyst ID.....:	004648	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	10	ug/L
Benzene	84	2.5	ug/L
Ethanol	ND IO	2500	ug/L
Ethylbenzene	120	2.5	ug/L
tert-Butyl alcohol	1100	120	ug/L
Toluene	260	2.5	ug/L
o-Xylene	300	5.0	ug/L
Xylenes (total)	710	5.0	ug/L
m-Xylene & p-Xylene	410	5.0	ug/L
Methyl tert-butyl ether (MTBE)	20	5.0	ug/L
Ethyl-t-Butyl Ether (ETBE)	ND	10	ug/L
Tert-amyl methyl ether (TAME)	ND	10	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	109	(75 - 120)
1,2-Dichloroethane-d4	122	(65 - 130)
Toluene-d8	102	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: VW-4

GC Volatiles

Lot-Sample #...:	E5C040440-007	Work Order #...:	G5L301AC	Matrix.....:	W
Date Sampled...:	03/02/05 15:58	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	18:57		
Dilution Factor:	1				
Analyst ID.....:	001464	Instrument ID..:	G13		
		Method.....:	SW846 8015B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
GRO (C6 - C12)	2300	100	ug/L

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	105	(70 - 130)

SECOR International Inc

Client Sample ID: VW-5

GC/MS Volatiles

Lot-Sample #...:	E5C040440-008	Work Order #...:	G5L311AA	Matrix.....:	W
Date Sampled...:	03/02/05 13:43	Date Received..:	03/04/05 18:30	MS Run #.....:	5073292
Prep Date.....:	03/11/05	Analysis Date..:	03/12/05		
Prep Batch #...:	5073470	Analysis Time..:	01:47		
Dilution Factor:	1				
Analyst ID.....:	004648	Instrument ID..:	MSQ		
		Method.....:	SW846 8260B		

PARAMETER	RESULT	REPORTING LIMIT	UNITS
Diisopropyl Ether (DIPE)	ND	2.0	ug/L
Benzene	**0.63**	**0.50**	**ug/L**
Ethanol	ND IO	500	ug/L
Ethylbenzene	**2.4**	**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)	**69**	**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	98	(75 - 120)
1,2-Dichloroethane-d4	87	(65 - 130)
Toluene-d8	107	(80 - 130)

NOTE(S):

IO Contract limits originate from BP-GCLN Technical Requirements

SECOR International Inc

Client Sample ID: VW-5

GC Volatiles

Lot-Sample #...:	E5C040440-008	Work Order #...:	G5L311AC	Matrix.....:	W
Date Sampled...:	03/02/05 13:43	Date Received..:	03/04/05 18:30	MS Run #.....:	5068280
Prep Date.....:	03/08/05	Analysis Date..:	03/08/05		
Prep Batch #...:	5068420	Analysis Time..:	19:25		
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)	92	(70 - 130)

METHOD BLANK REPORT

GC/MS Volatiles

Client Lot #...: E5C040440
MB Lot-Sample #: E5C140000-470

Analysis Date..: 03/11/05
Dilution Factor: 1

Work Order #...: G56841AA

Prep Date.....: 03/11/05
Prep Batch #...: 5073470

Analyst ID.....: 004648

Matrix.....: WATER

Analysis Time..: 21:51
Instrument ID..: MSQ

PARAMETER	RESULT	REPORTING LIMIT	UNITS	METHOD
Benzene	ND	0.50	ug/L	SW846 8260B
Ethanol	ND IO	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
Ethyl-t-Butyl Ether (ETBE	ND	2.0	ug/L	SW846 8260B
Tert-amyl methyl ether (T	ND	2.0	ug/L	SW846 8260B
Diisopropyl Ether (DIPE)	ND	2.0	ug/L	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	91	(75 - 120)
1,2-Dichloroethane-d4	82	(65 - 130)
Toluene-d8	103	(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

METHOD BLANK REPORT

GC Volatiles

Client Lot #...: E5C040440
MB Lot-Sample #: E5C090000-420

Analysis Date..: 03/08/05
Dilution Factor: 1

Work Order #...: G5V4F1AA

Prep Date.....: 03/08/05
Prep Batch #...: 5068420

Analyst ID.....: 001464

Matrix.....: WATER

Analysis Time..: 08:13
Instrument ID..: G13

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)	94	(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 #...: E5C040440 Work Order #...: G56841AC Matrix.....: WATER
LCS Lot-Sample#: E5C140000-470
Prep Date.....: 03/11/05 Analysis Date..: 03/11/05
Prep Batch #...: 5073470 Analysis Time..: 21:06
Dilution Factor: 1 Instrument ID..: MSQ
Analyst ID.....: 004648

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
Benzene	10.0	11.2	ug/L	112	SW846 8260B
tert-Butyl alcohol	50.0	54.4	ug/L	109	SW846 8260B
Ethanol	2000	1910 IO	ug/L	95	SW846 8260B
Tert-amyl methyl ether (T	10.0	10.3	ug/L	103	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	10.0	10.6	ug/L	106	SW846 8260B
Ethylbenzene	10.0	10.7	ug/L	107	SW846 8260B
Diisopropyl Ether (DIPE)	10.0	11.2	ug/L	112	SW846 8260B
Methyl tert-butyl ether (MTBE)	10.0	10.6	ug/L	106	SW846 8260B
Toluene	10.0	10.2	ug/L	102	SW846 8260B
m-Xylene & p-Xylene	20.0	21.0	ug/L	105	SW846 8260B
o-Xylene	10.0	10.3	ug/L	103	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	99	(75 - 120)
1,2-Dichloroethane-d4	94	(65 - 130)
Toluene-d8	99	(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

LABORATORY CONTROL SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: E5C040440 Work Order #...: G5V4F1AC Matrix.....: WATER
LCS Lot-Sample#: E5C090000-420
Prep Date.....: 03/08/05 Analysis Date..: 03/08/05
Prep Batch #...: 5068420 Analysis Time..: 07:45
Dilution Factor: 1 Instrument ID..: G13
Analyst ID.....: 001464

PARAMETER	SPIKE AMOUNT	MEASURED AMOUNT	UNITS	PERCENT RECOVERY	METHOD
GRO (C6 - C12)	1000	976	ug/L	98	SW846 8015B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	125	(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 #...: E5C040440 Work Order #...: G5L2H1AD-MS Matrix.....: WATER
MS Lot-Sample #: E5C040434-003 G5L2H1AE-MSD
Date Sampled...: 03/03/05 09:00 Date Received..: 03/04/05 18:30 MS Run #.....: 5073292
Prep Date.....: 03/11/05 Analysis Date..: 03/12/05
Prep Batch #...: 5073470 Analysis Time..: 06:19
Dilution Factor: 1 Analyst ID.....: 004648 Instrument ID..: MSQ

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
Benzene	ND	10.0	9.30	ug/L	93		SW846 8260B
	ND	10.0	9.36	ug/L	94	0.64	SW846 8260B
tert-Butyl alcohol	ND	50.0	97.7	ug/L	195 LM		SW846 8260B
	ND	50.0	121	ug/L	243 LM	22	SW846 8260B
Ethanol	ND	2000	2400	ug/L	120 IO		SW846 8260B
	ND	2000	2010	ug/L	101	17	SW846 8260B
Tert-amyl methyl ether (T	ND	10.0	10.0	ug/L	100		SW846 8260B
	ND	10.0	10.7	ug/L	107	7.0	SW846 8260B
Ethyl-t-Butyl Ether (ETBE	ND	10.0	8.94	ug/L	89		SW846 8260B
	ND	10.0	9.26	ug/L	93	3.5	SW846 8260B
Ethylbenzene	ND	10.0	10.1	ug/L	101		SW846 8260B
	ND	10.0	9.96	ug/L	100	1.8	SW846 8260B
Diisopropyl Ether (DIPE)	ND	10.0	7.15	ug/L	72		SW846 8260B
	ND	10.0	7.52	ug/L	75	5.0	SW846 8260B
Methyl tert-butyl ether (MTBE)	ND	10.0	9.23	ug/L	92		SW846 8260B
	ND	10.0	9.39	ug/L	94	1.7	SW846 8260B
Toluene	ND	10.0	9.17	ug/L	92		SW846 8260B
	ND	10.0	9.12	ug/L	91	0.54	SW846 8260B
m-Xylene & p-Xylene	ND	20.0	19.5	ug/L	97		SW846 8260B
	ND	20.0	19.5	ug/L	97	0.0	SW846 8260B
o-Xylene	ND	10.0	9.82	ug/L	98		SW846 8260B
	ND	10.0	9.68	ug/L	97	1.4	SW846 8260B

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
Bromofluorobenzene	113	(75 - 120)
	110	(75 - 120)
1,2-Dichloroethane-d4	136	(65 - 130)
	132	(65 - 130)
Toluene-d8	103	(80 - 130)
	99	(80 - 130)

NOTE(S):

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

Bold print denotes control parameters

Spiked analyte recovery is outside stated control limits.

LM MS and/or MSD above acceptance limits. See Blank Spike (LCS).

Surrogate recovery is outside stated control limits.

IO Contract limits originate from BP-GCLN Technical Requirements

MATRIX SPIKE SAMPLE DATA REPORT

GC Volatiles

Client Lot #...: E5C040440 Work Order #...: G5L2D1AD-MS Matrix.....: WATER
MS Lot-Sample #: E5C040432-001 G5L2D1AE-MSD
Date Sampled...: 03/04/05 08:00 Date Received..: 03/04/05 18:30 MS Run #.....: 5068280
Prep Date.....: 03/08/05 Analysis Date..: 03/08/05
Prep Batch #...: 5068420 Analysis Time..: 08:41
Dilution Factor: 1 Analyst ID.....: 001464 Instrument ID..: G13

PARAMETER	SAMPLE AMOUNT	SPIKE AMT	MEASRD AMOUNT	UNITS	PERCNT RECVRY	RPD	METHOD
GRO (C6 - C12)	**960**	**1000**	**1920**	**ug/L**	**96**		**SW846 8015B**
	960	**1000**	**1940**	**ug/L**	**98**	**1.1**	**SW846 8015B**

SURROGATE	PERCENT RECOVERY	RECOVERY LIMITS
a,a,a-Trifluorotoluene (TFT)	120	(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