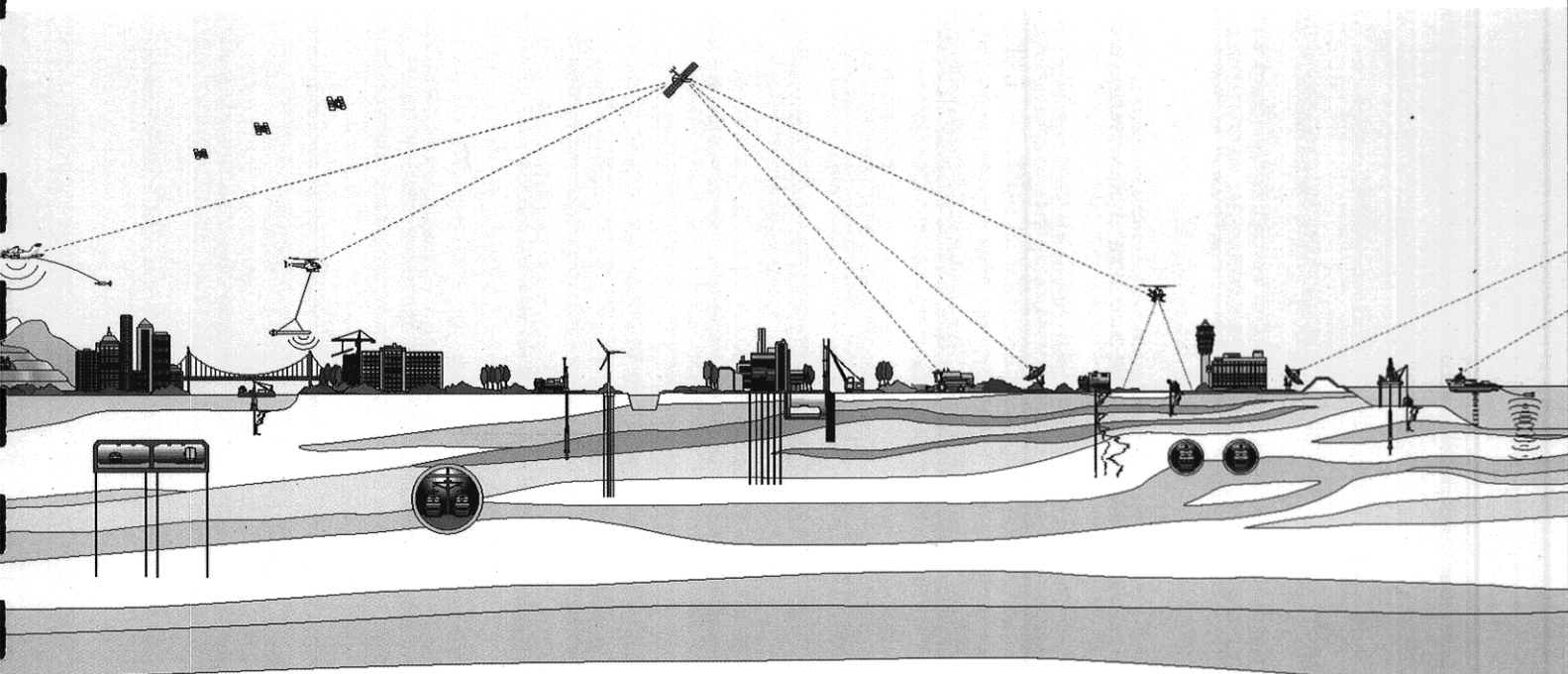
FUGRO WEST, INC.

EVALUATION OF SUBMERGED MONITORING WELL SCREENS 2801 MacARTHUR BOULEVARD OAKLAND, CALIFORNIA

Prepared for:
ALAMEDA COUNTY ENVIRONMENTAL HEALTH

DECEMBER 2005

Project No. 838.006



FUGRO WEST, INC.

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December 8, 2005
Project No. 838.006

Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Attention: Mr. Don Hwang, Hazardous Materials Specialist

Subject: Evaluation of Submerged Monitoring Well Screens
2801 MacArthur Boulevard, Oakland, California

Dear Mr. Hwang:

On behalf of the APA Fund, Fugro West, Inc., (Fugro) presents this response to concerns raised by the Alameda County Environmental Health (ACEH) in their letter dated July 28, 2005, regarding the effect of submerged well screens, on detected groundwater concentrations in monitoring wells located onsite.

Submerged Monitoring Well Screens for P-2, P-3, M-1, M-2, M-3, M-4, M-6

During a major portion of the sampling events, the depth to groundwater has been above the top of the monitoring well screens. Please evaluate the effects of groundwater elevations rising above well screens on hydrocarbon concentrations and propose recommendations to augment or validate the groundwater concentrations obtained. Include, with your analysis, hydrographs for each monitoring well with groundwater elevation vs time and plot TPH-g and benzene, and also indicate the top of screen elevations.

Response: Fugro prepared hydrographs of four existing monitoring wells (M-2, M-4, M-5 and M-6), and one piezometer (P-2) located onsite. Well schematics, historical static depths to water, historical groundwater sampling depths, and detected TPHg and benzene concentrations as a function of sampling date, are shown on the individual hydrographs. The historical groundwater sampling depths are those, which were obtained at the time of sampling, after the wells had been purged and allowed to recharge. These depths to water are not those, which were presented in the table of historical groundwater elevations, which accompany groundwater monitoring reports. Due to differences in scaling factors, separate hydrographs were prepared to show potential effects on TPHg and benzene concentrations. The hydrographs are presented in Appendix A. No hydrographs were created for the following wells and piezometers for the following reasons:

- Piezometer P-3, was decommissioned during Corrective Action Plan activities.
- Well M-1 has never been sampled.
- No chemicals of concern have been detected at M-3.

EVALUATION OF POTENTIAL EFFECTS

Fugro reviewed well sampling forms, hydrographs, screen intervals and detected TPHg and benzene concentrations in P-2, M-2, M-4, M-5 and M-6, to determine whether groundwater levels rising above the top of well screens appeared to have any effects on detected TPHg and benzene concentrations. Well sampling forms from March 1993, August 1994, April and October 1995, April, July and October/November 1996, June and December 1999, and March 2003 are presented in Appendix B. A compilation of groundwater Elevation Data are presented in Table 1. Our general observations, conclusions and recommendations of the referenced sampling points are summarized below:

- Groundwater depths presented in the historical groundwater elevation table presented in the groundwater monitoring reports (Table 1), reflects the static water level at each well, sampling point prior to purging activities. These depths are used to determine general flow direction and gradient information for each event.
- There is no indication that the concentrations were being diluted or adversely effected to result in lower concentrations.
- Prior to sample collection, all wells and piezometers to be sampled were purged of at least three well volumes. Due to the limited transmisivity of the formation, wells were often purged dry. Thus, although initial static water levels may have been above the top of screen interval, and in some cases the water level at the time of sampling may have risen above the top of the well screen, it is our opinion that groundwater samples were representative of groundwater conditions within the formation.
- Actual depths to groundwater prior to sample collection have been added to Table 1 and have also been plotted on respective hydrographs in Appendix A. Detected concentrations of benzene and TPHg in groundwater have fluctuated with time but have generally decreased following initial removal of impacted soil and source material from the former gasoline tank area, and implementation of the CAP, which included excavation and removal of impacted soil from the former waste oil tank area. Concentration decreases appear to occur over time independent of the depth to groundwater and level of groundwater column within or above the screen interval.
- Groundwater monitoring wells and piezometers onsite were screened to intercept the zone of potential groundwater impact at the time each well and piezometer was constructed. Contaminants of concern onsite (TPH and BTEX) are Light Non Aqueous Phase Liquids (LNAPLs), which float at the top of a water column as opposed to Dense Non Aqueous Phase Liquids (DNAPLs) that tend to sink below the top of a water column. Consequently the highest concentrations of LNAPLs would be expected to be located at the top of the impacted water column on a given sampling date.

PIEZOMETER P-2 - is screened between 30 and 40 feet below ground surface (bgs). Static groundwater levels generally were noted above the top of the respective well screen. However a review of well sampling forms and hydrographs for this piezometer indicate that this piezometer had relatively low transmisivity and was frequently purged dry. Samples were collected at least

24 hrs after purging. Groundwater depths prior to sampling were within the screen interval for about 70 percent of the sampling events recorded. Although detected concentrations have generally decreased historically, elevated levels of TPHg and benzene have been detected in this well regardless of where the groundwater level resided at the time of sampling. Since this piezometer was usually purged dry or nearly dry prior to sample collection, this ensured that groundwater representative of conditions within the target formation was infiltrating into the casing through the screen interval and was collected for testing. Consequently it is our opinion that detected groundwater concentrations are representative of conditions within the target formation and have not been adversely affected by water levels rising above the top of the screen.

WELL M-2 - is screened between 35 and 45 feet bgs. A review of well sampling forms and hydrographs for this monitoring well indicate that this well has low transmissivity and was frequently purged dry and allowed to recover at least 24 hours prior to sample collection. Although groundwater levels prior to sampling are above the top of the well screen for many sampling events, elevated levels of TPHg and benzene have been detected in this well regardless of what the groundwater level recorded at the time of sampling The fact that the well was purged dry or nearly dry, ensured that groundwater representative of conditions within the target formation entered the well casing and was collected for testing. Consequently it is our opinion that detected groundwater concentrations are representative of conditions within the target formation and have not been affected by water levels rising above the top of screen.

WELL M-4 - is screened between 30 and 45 feet bgs. Review of well sampling forms and our hydrographs for this monitoring well indicate that static groundwater levels as well as groundwater levels prior to sample collection have not risen above the top of the well screen. Elevated TPHg concentrations have historically been detected in this well. Consequently it is our opinion that detected groundwater concentrations are representative of conditions within the target formation and have not been affected by water levels rising above the top of screen.

WELL M-5 - is screened between 18 and 38 feet bgs. Review of well sampling forms and hydrographs for this well indicate that static groundwater levels as well as groundwater levels prior to sample collection have not historically risen above the top of the screen interval. No chemicals of concern have historically been detected in this well.

WELL M-6 – is screened between 28 and 47 feet bgs. Review of well sampling forms and hydrographs for this well indicate that with the exception of one event in 1996, groundwater levels prior to sample collection have not risen above the top of the well screen interval. Consequently, we believe detected groundwater concentrations are representative of conditions within the target formation.

CONCLUSION

Following our evaluation of well sampling forms, detected concentrations of chemicals of concern and hydrographs; it is our opinion that water levels which rise above the top the well screen in some piezometers and monitoring wells during some monitoring events, have not affected the detected concentrations of TPHg and benzene in groundwater onsite. It is our opinion that wells and piezometers are properly screened and when sampled according to proper protocol, concentrations detected will be representative of groundwater conditions onsite.

If you should have any questions or comments, please feel free to contact the undersigned at (510) 268-0461.

Sincerely,

FUGRO WEST, INC.

REGISTERED PROFESSIONAL ENGINEER
JERIANN N. ALEXANDER
No. C040469
Exp. 3/31/07
CIVIL
STATE OF CALIFORNIA

Obi Nzewi
Project Geologist

Jeriann Alexander, P.E., R.E.A.
Associate Engineer

ON/JNA:rp

Attachments: Hydrographs for Wells P-2, M-2, M-3, M-4, M-5 and M-6.
Historical Well Sampling Forms
Table 1

Copies Submitted: (1) Addressee
Aniko Molnar (APA Fund –2)

REGISTERED ENVIRONMENTAL ASSESSOR
JERIANN N. ALEXANDER
No. REA 03130
Expires 07/06
STATE OF CALIFORNIA

TABLE

Table 1
Summary of Groundwater Analytical Results
2801 MacArthur Boulevard
Oakland, California

Sample Location	Sample Date	Static Groundwater Depth (feet)	Groundwater Elevation (feet)	TVHg (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-benzene (ug/l)	Total Xylenes (ug/l)	MTBE (ug/l)	Actual Depth to Water Prior to Sampling (feet)
P-1	1/16/1992	--	963.0	6,700	500	4.4	80	40	--	
	3/9/1993	--	966.8	5,600	1,100	29	63	120	--	
P-2	11/6/1990	37	960.4	33,000	4,700	2,100	380	630	--	
	1/16/1992	33.7	964.1	99,000	6,500	12,000	2,000	16,000	--	
	3/9/1993	23.6	974.2	70,000	5,900	11,000	2,100	12,000	--	
	5/17/1993	23.7	974.1	87,000	6,600	13,000	2,200	13,000	--	36.42
	8/17/1993	28.3	969.5	80,000	5,800	12,000	2,000	12,000	--	NA
	12/13/1993	31	966.8	100,000	5,600	12,000	2,200	14,000	--	NA
	3/7/1994	25.4	972.4	77,000	5,100	11,000	2,000	12,000	--	NA
	8/23/1994	30.3	967.5	70,000	3,800	8,700	1,500	9,900	--	36.1
	4/27/1995	19.9	977.5	44,000	3,600	8,500	1,500	9,300	--	40
	10/30/1995	29.6	968.2	66,000	4,600	11,000	2,100	13,600	--	32.16
	4/17/1996	21.3	976.5	58,000	4,800	9,900	1,900	12,900	--	22.7
	6/23/1999	24.8	973.0	57,000	1,800	4,700	1,300	9,300	<25	27.65
	12/9/1999	31.2	966.6	32,000	1,500	3,200	700	5,100	<0.5	NA
	3/24/2003	25.8	972.0	54,000	750	3,000	1,200	7,100	<13	33.6
P-3	8/17/1993		970.6	900	180	65	10	93	--	NA
	10/30/1995		971.3	2000	650	45	31	156	--	NA
	6/23/1999		974.6	14,000	3,300	190	140	756	<10	NA
	12/9/1999		967.8	1,500	3,700	52	57	210	<0.5	NA
M-2	5/7/1991	31.3	968.3	16,000	1,300	950	170	890	--	NA
	1/16/1992	35.1	964.5	22,000	960	570	370	1,800	--	NA
	3/9/1993	33.6	966.0	27,000	1,100	970	490	1,400	--	NA
	5/17/1993	27.2	972.4	17,000	1,200	770	480	1,300	--	27.85
	8/17/1993	30.4	969.2	20,000	1,700	910	540	1,400	--	NA
	12/13/1993	34.0	965.6	51,000	2,200	1,400	700	2,600	--	NA
	3/7/1994	30.1	969.5	28,000	1,400	900	640	1,800	--	NA
	8/23/1994	32.3	967.3	21,000	1,600	540	520	1,100	--	38.64
	4/26/1995	24.4	975.2	14,000	1,200	510	490	870	--	34.7
	10/30/1995	31.4	968.2	16,000	1,700	830	470	1,120	--	31.62
	4/17/1996	25.6	974.0	10,000	1,300	610	380	810	--	25.57
	6/23/1999	27.3	972.4	1,900	150	19	32	24.8	410	29.2
	12/9/1999	34.14	965.9	11,000	560	130	240	265	<0.5	34.14
M-3	5/17/1993	22.2	970.6	<50	<0.5	<0.5	<0.5	<0.5	--	NA
	8/17/1993	25.0	967.8	<50	<0.5	<0.5	<0.5	<0.5	--	NA
	12/13/1993	25.8	967.0	<50	<0.5	<0.5	<0.5	<0.5	--	NA
	3/7/1994	23.1	969.7	<50	<0.5	<0.5	<0.5	<0.5	--	NA
	8/23/1994	25.8	967.0	<50	<0.5	<0.5	<0.5	<0.5	--	NA
	4/27/1995	19.6	973.2	<50	<0.5	<0.5	<0.5	<0.5	--	NA
	3/25/2003	23.9	975.7	<50	<0.5	<0.5	<0.5	<0.5	<0.5	NA
M-4	5/17/1993	33.8	965.8	7,500	1,200	230	11	350	--	38.75
	8/17/1993	--	--	13,000	3,000	330	130	700	--	NA
	12/13/1993	36.8	962.8	11,000	2,700	190	90	360	--	NA
	3/7/1994	33.0	966.6	3,800	980	33	49	140	--	NA
	8/23/1994	35.4	964.2	19,000	5,800	200	460	630	--	40.2
	4/27/1995	29.8	969.8	2,300	510	40	69	120	--	37.3

Table 1
Summary of Groundwater Analytical Results
2801 MacArthur Boulevard
Oakland, California

Sample Location	Sample Date	Static Groundwater Depth (feet)	Groundwater Elevation (feet)	TVHg (ug/l)	Benzene (ug/l)	Toluene (ug/l)	Ethyl-benzene (ug/l)	Total Xylenes (ug/l)	MTBE (ug/l)	Actual Depth to Water Prior to Sampling (feet)
M-4	11/1/1995	34.2	965.4	1,100	470	14	23	26	--	**36.38**
(cont.)	4/17/1996	30.1	969.5	550*	330	<2.5	5.9	16.1	--	**33.41**
	6/23/1999	31.8	967.8	4,000	<0.5	69	190	195	<0.5	**33.96**
	12/9/1999	35.4	964.3	1,500	2,500	32	140	88	<0.5	**36.23**
	3/24/2003	33.4	966.2	6,200	1,900	35	92	58	<7.1	**40.18**
M-5	8/23/1994	31.8	961.1	<50	<0.5	<0.5	<0.5	<0.5	--	**34.65**
	4/27/1995	20.5	972.4	<50	<0.5	<0.5	<0.5	<0.5	--	**21.75**
	11/1/1995	31.5	961.4	<50	<0.5	<0.5	<0.5	<0.5	--	**31.9**
	4/17/1996	21.7	971.2	<50	<0.5	<0.5	<0.5	<0.5	--	**24.96**
	6/23/1999	26.5	966.4	<50	<0.5	<0.5	<0.5	<0.5	<0.5	**28**
	12/9/1999	32.1	960.9	<50	<0.5	<0.5	<0.5	<0.5	<0.5	**32.1**
	3/24/2003	25.9	967.0	<50	<0.5	<0.5	<0.5	<0.5	<0.5	**26.43**
M-6	10/11/1994	38.2	959.5	3,600	340	27	65	240	--	
	4/26/1995	27.8	969.9	150	9.3	<0.5	5.6	1.7	--	**34.42**
	11/1/1995	34.9	962.8	170	0.6	<0.5	<0.5	0.6	--	**38.17**
	1/22/1996	22.0	975.7	<50	<0.5	<0.5	<0.5	<0.5	--	**27.52**
	4/17/1996	28.5	969.2	<50	<0.5	<0.5	<0.5	1	--	**33.1**
	7/12/1996	32.6	965.1	<50	<0.5	<0.5	<0.5	<0.5	--	**36.31**
	11/7/1996	35.6	--	<50	<0.5	<0.5	<0.5	<0.5	--	**38.07**
	6/23/1999	31.7	966.0	340	14	<0.5	19	<0.5	<0.5	**34.02**
	12/9/1999	36.3	961.4	120	3.7	<0.5	<0.5	<0.5	<0.5	**36.55**
	3/24/2003	32.9	964.8	<50	<0.5	<0.5	<0.5	<0.5	<0.5	**43.1**

TVH = Total volatile hydrocarbons in the gasoline range.
ug/l = Micrograms per liter = parts per billion.
<50 = Analyte not present at a concentration above the stated detection limit.
* = Sample exhibits a fuel pattern which does not resemble the standard.
-- = Sample not analyzed for analyte.
36.1 = Actual groundwater depth prior to sample collection
NA = Not Available

APPENDIX A
HYDROGRAPHS SHOWING SCREEN INTERVALS

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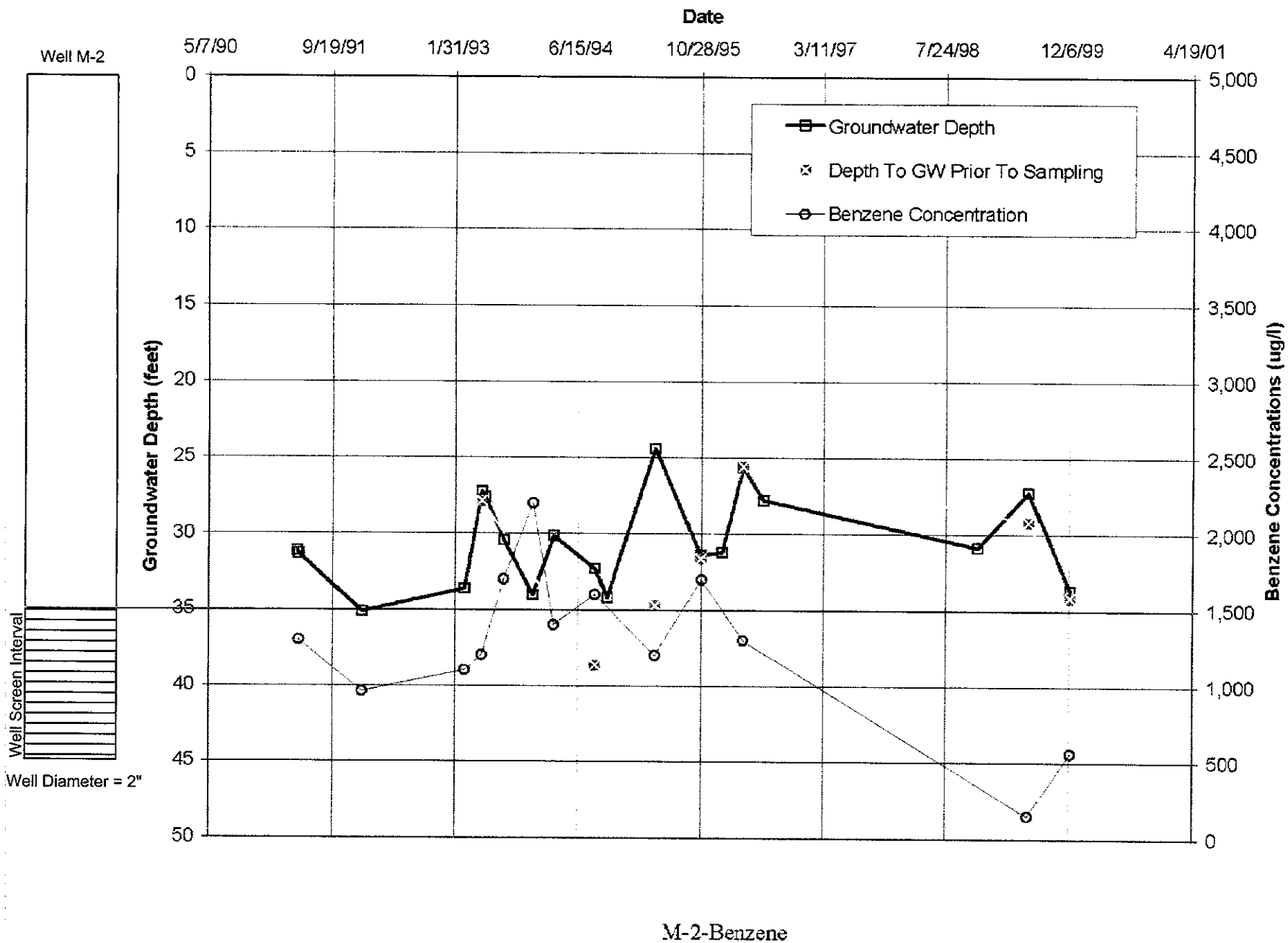

M-2-Benzene

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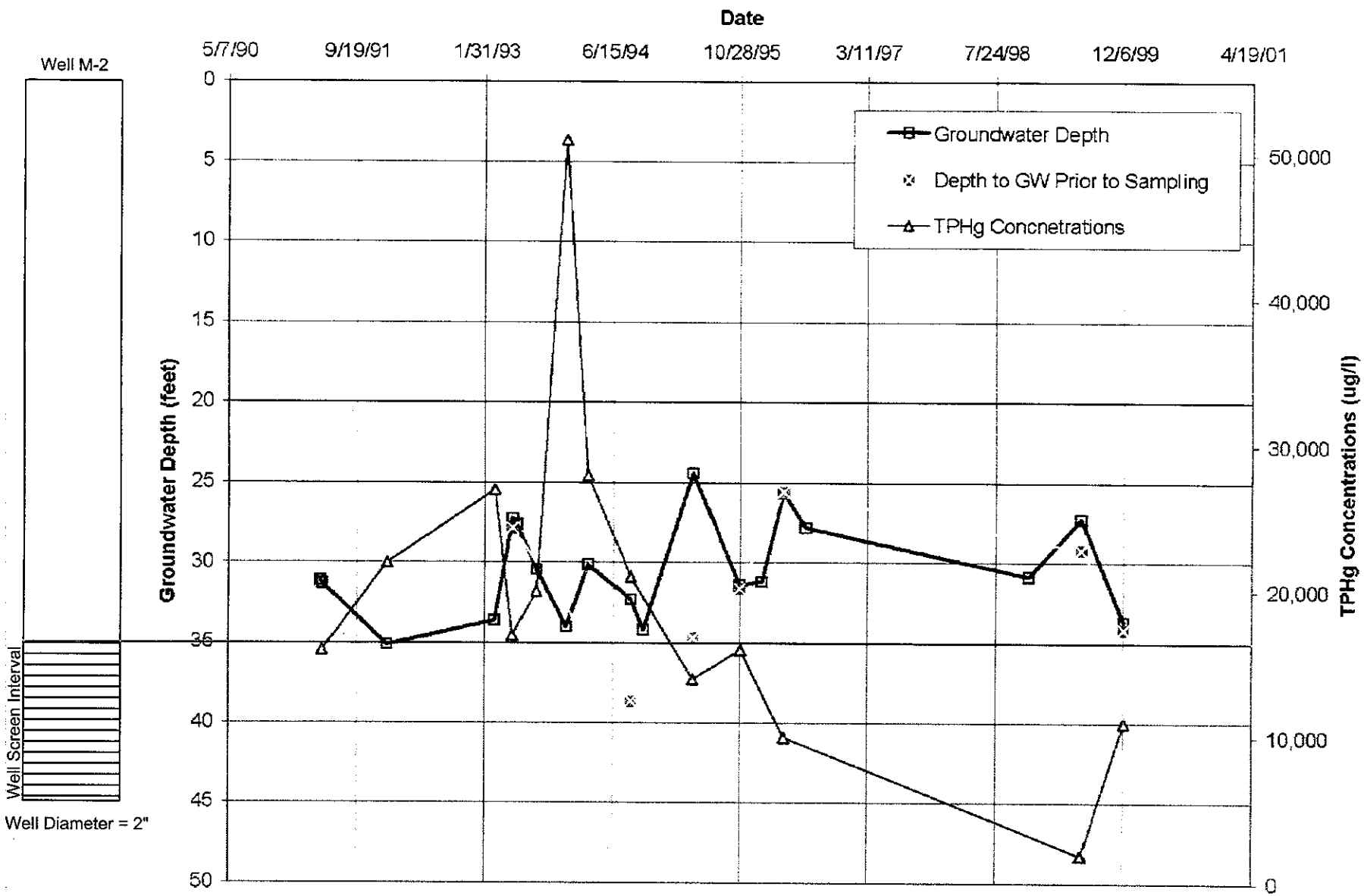

M-2-TPHg

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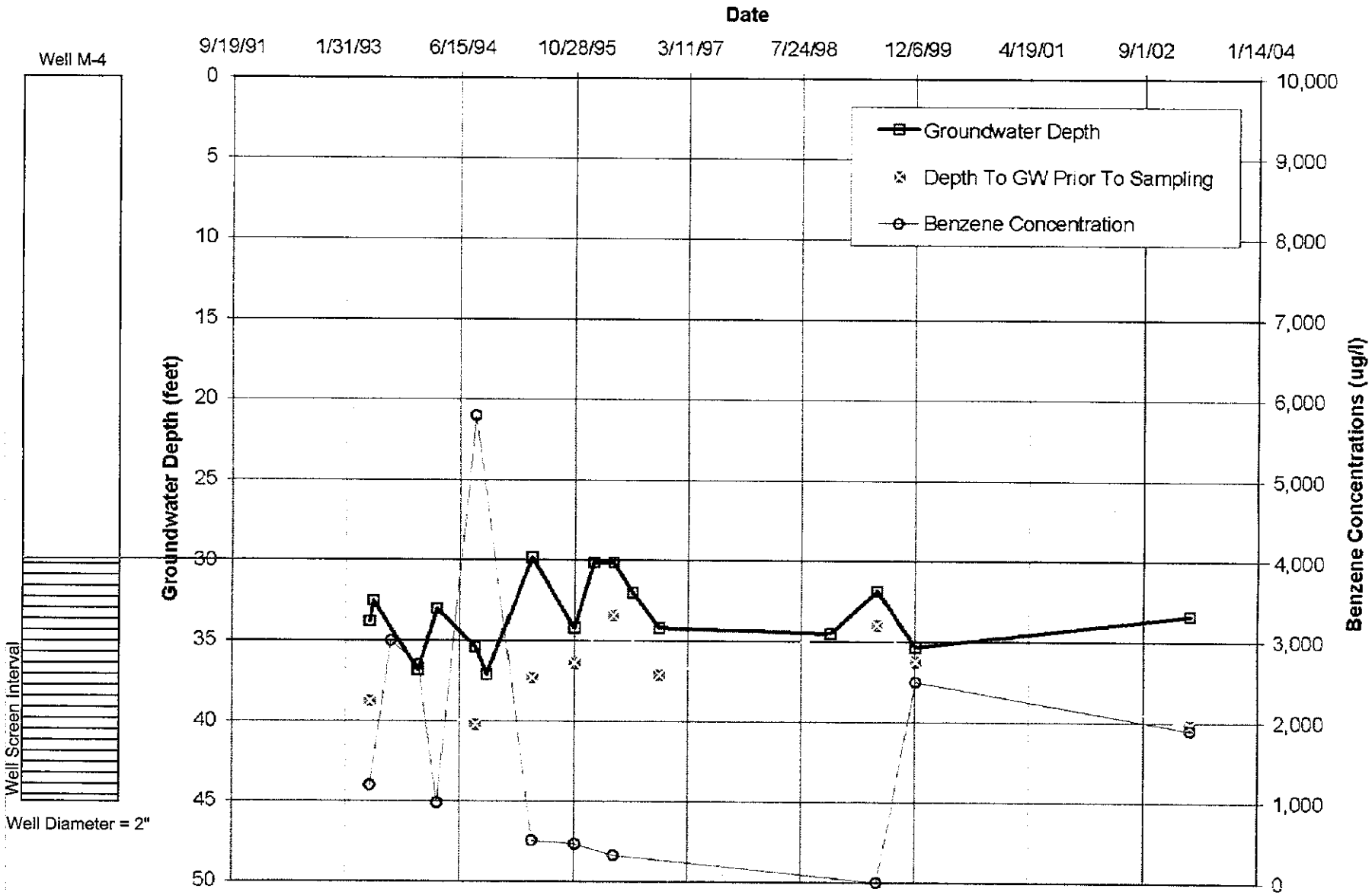

M-4-Benzene

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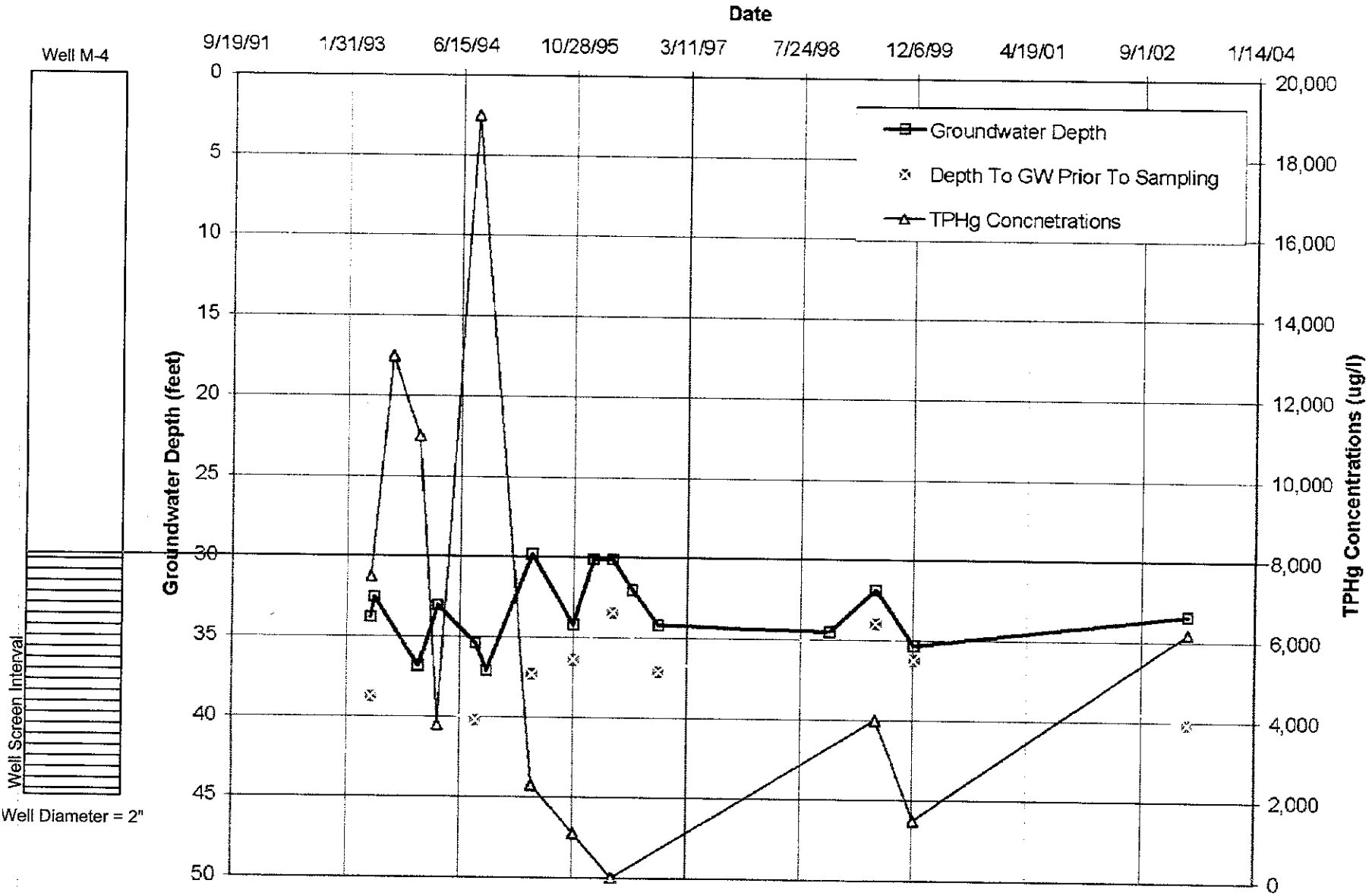

M-4-TPHg

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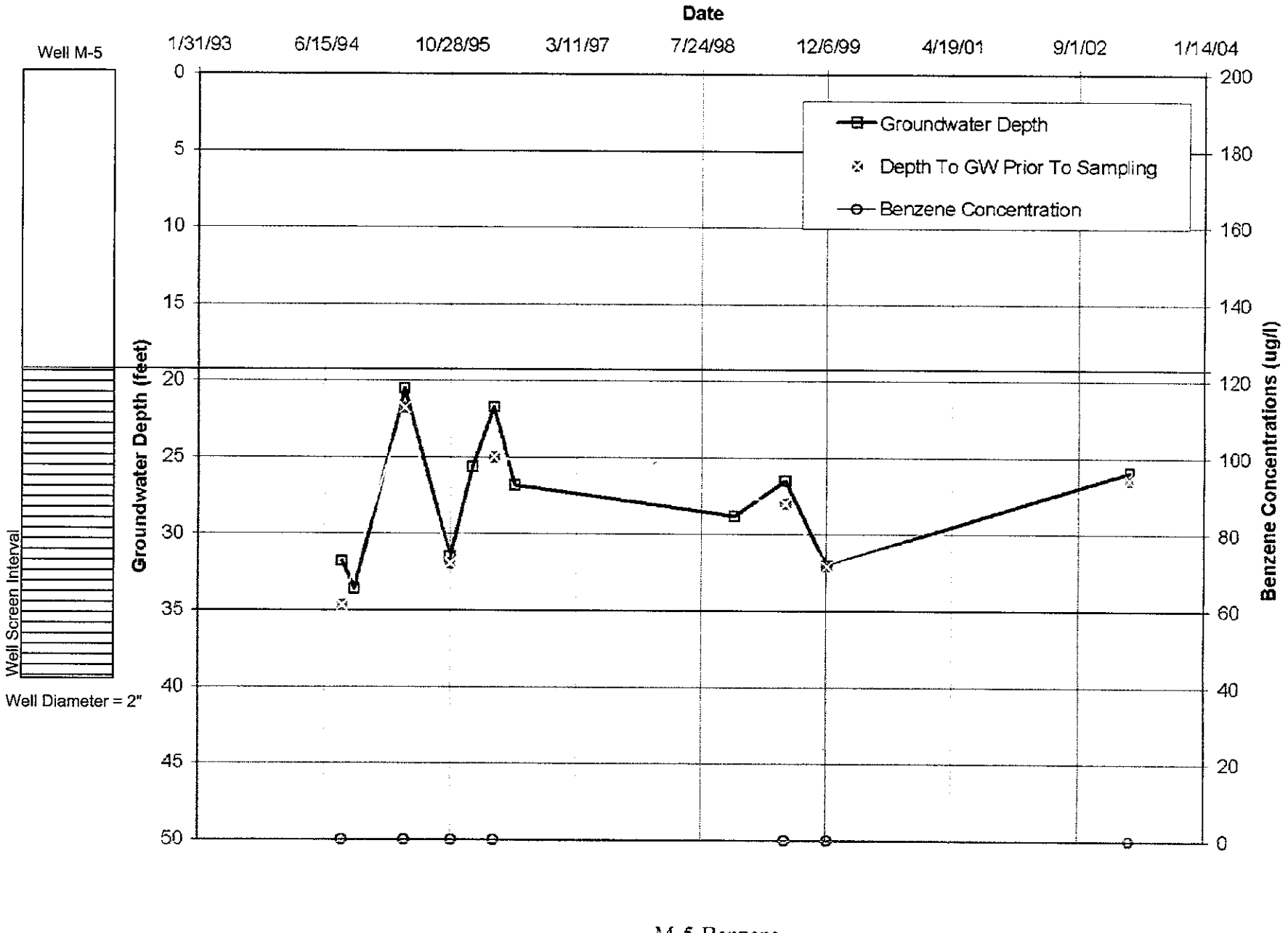

M-5-Benzene

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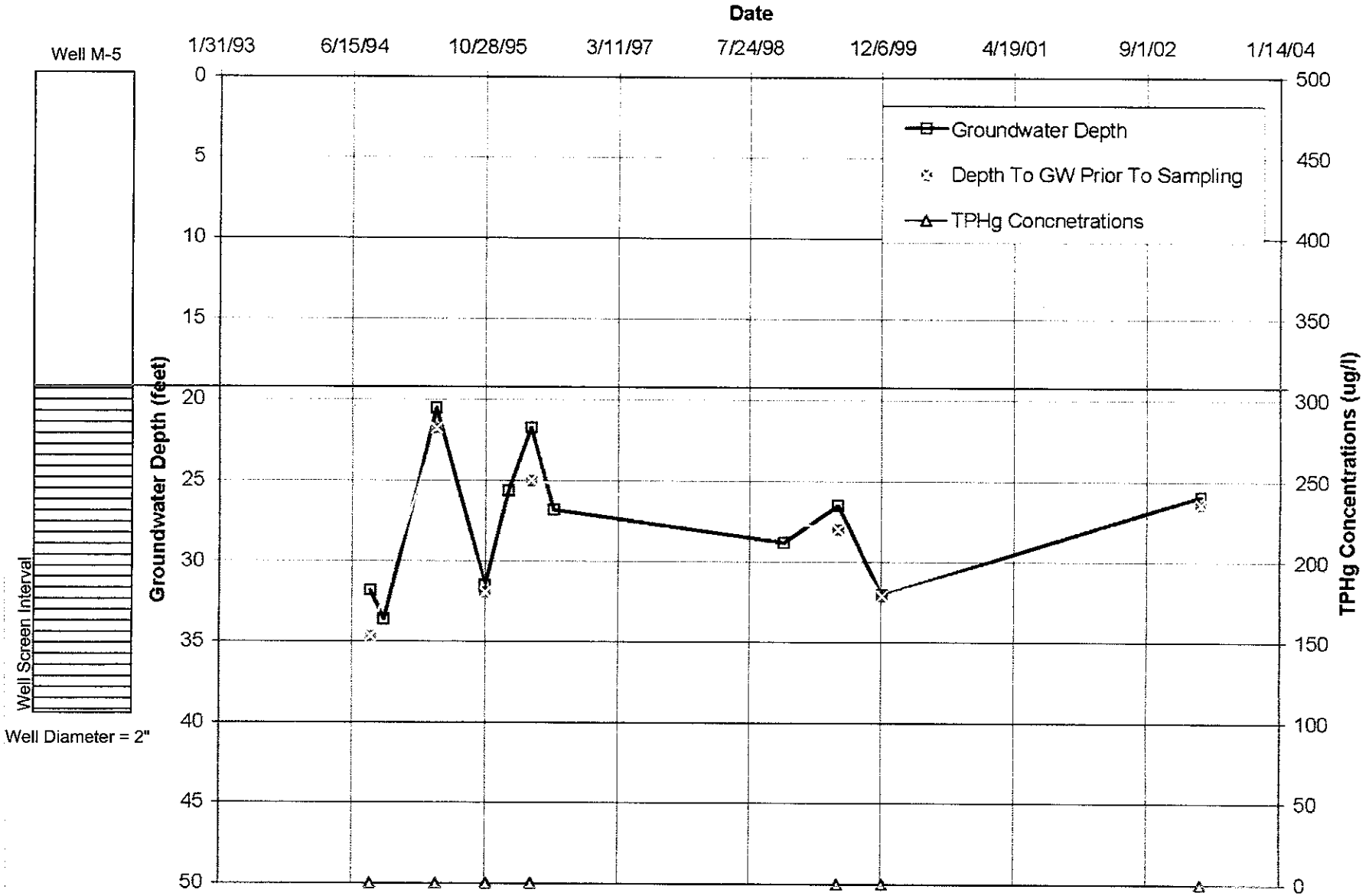

M-5-TPHg

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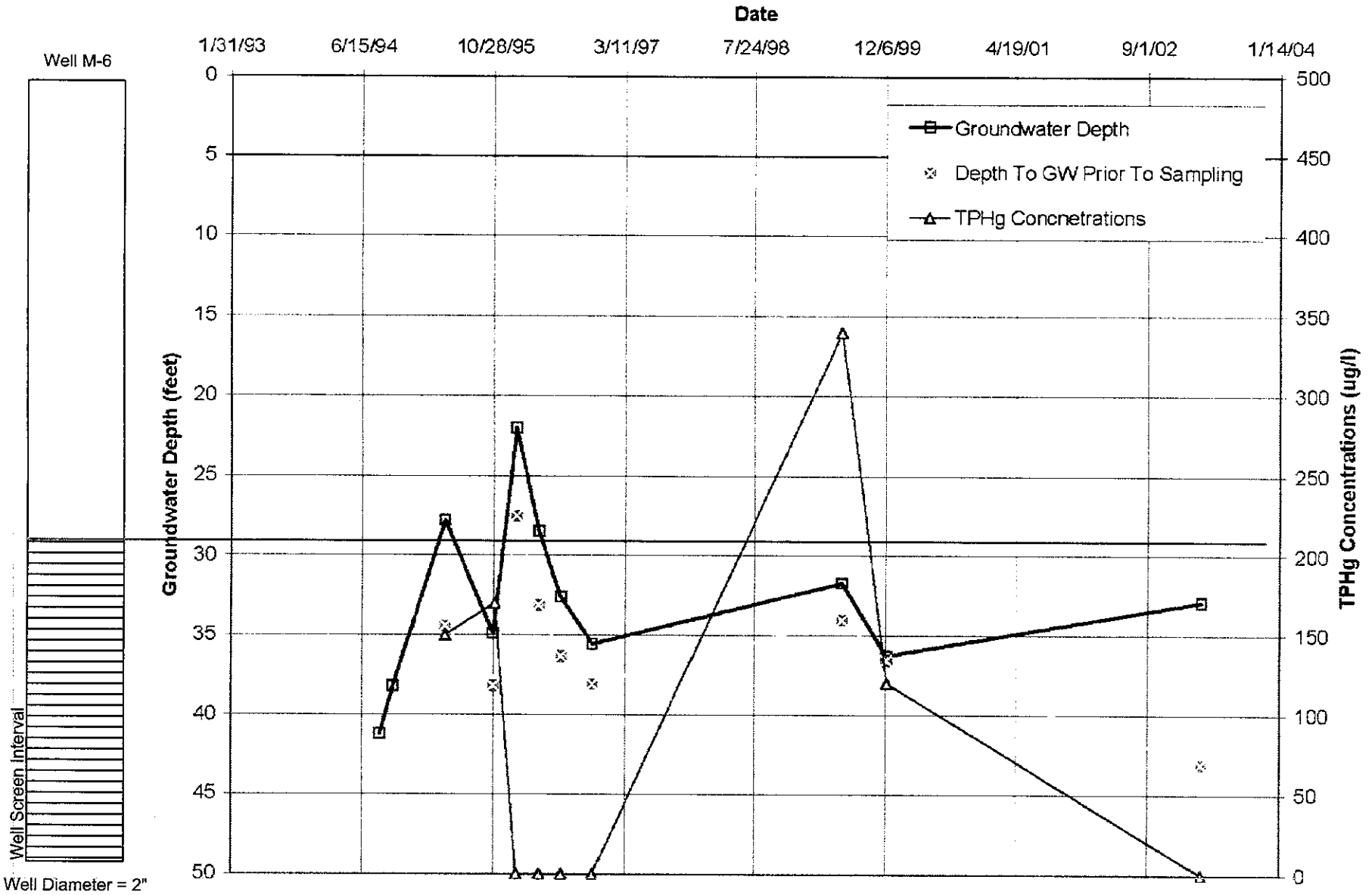

M-6-TPHg

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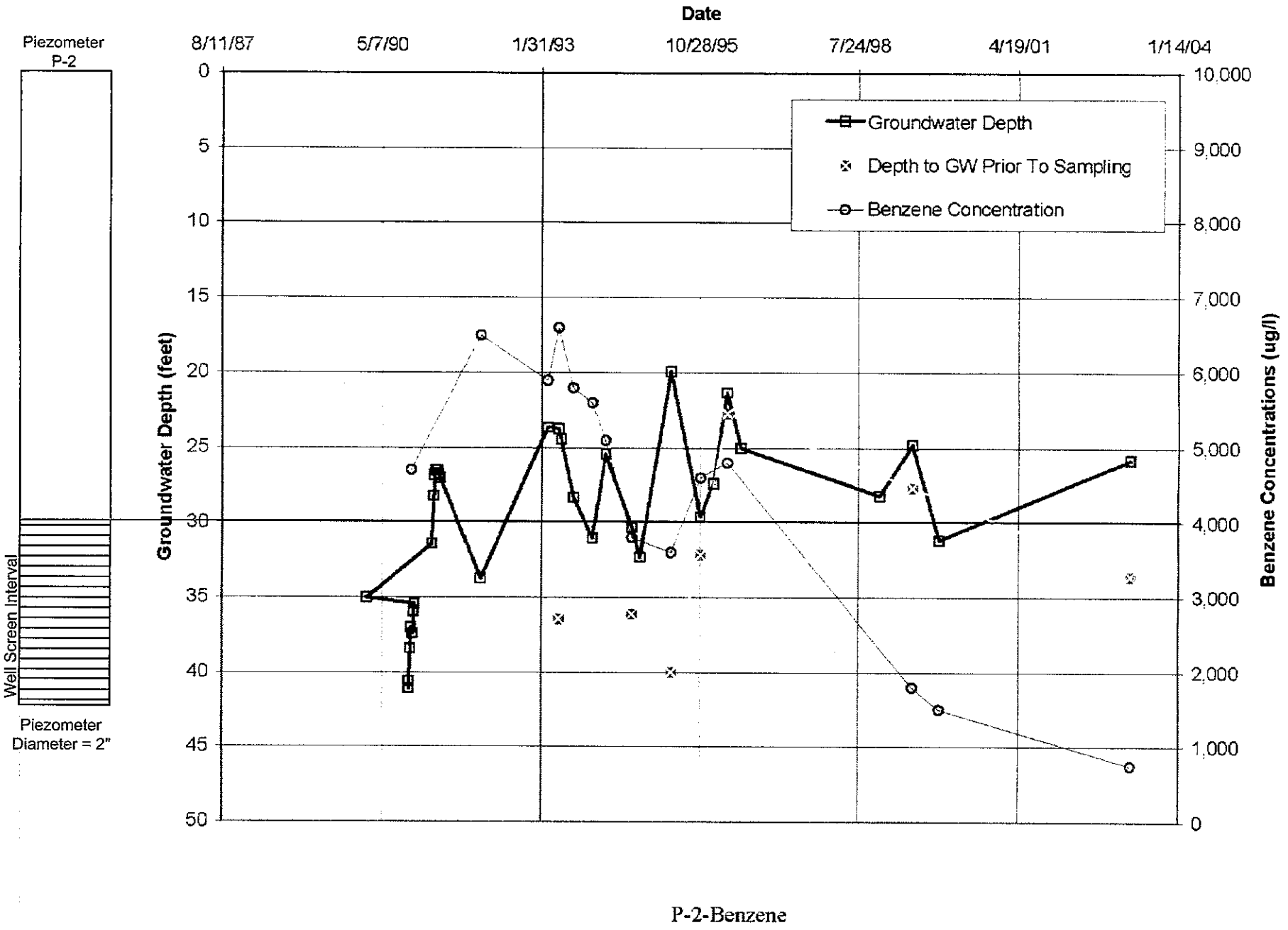

P-2-Benzene

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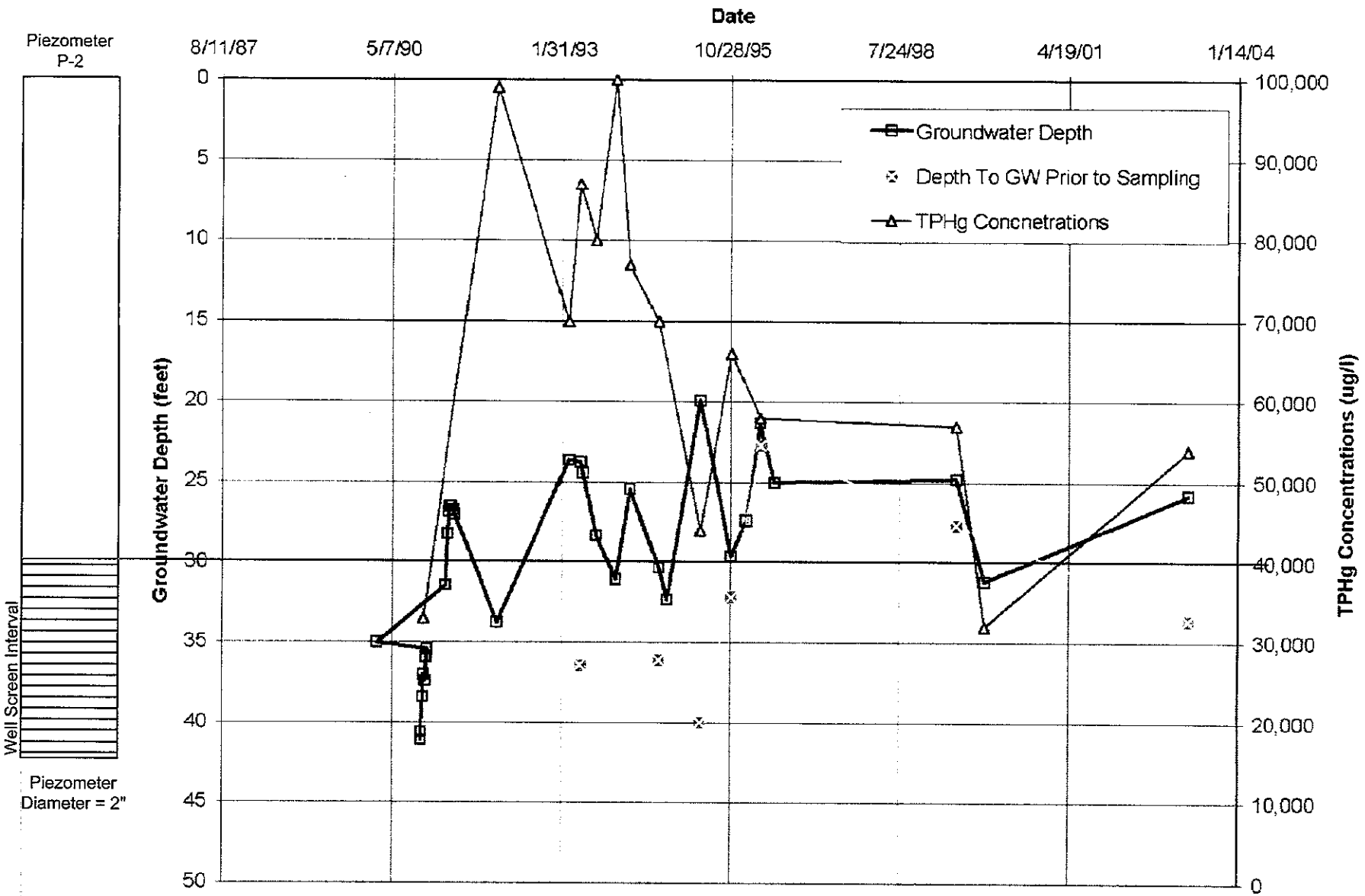

P-2-TPHg

APPENDIX B
HISTORICAL WELL SAMPLING FORMS

Sampling

WELL DEVELOPMENT FORM

Project Name: 2801 MACARTHUR BLVD

Well Number: MW-2

Job No.: 838.002

Well Casing Diameter: 2 inches

Developed By: DWA

Date: ~~8/24/94~~ 8/23/94

TOC Elevation: 999.6

Weather: Sunny

Depth to Casing Bottom (below TOC) 45.00 feet

Depth to Groundwater (below TOC) ~~31.55~~ 32.32 (38.66 @ 50%) feet

Feet of Water in Well ~~13.5~~ 12.68 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.1 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Development Method disposable bailer

Recharge rate:
~6" every 5-7 min.

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	7.14	24.0	875		clear/slight odor/she
3	7.09	23.5	925		
5	7.08	24.5	925		semi-clear
7	7.07	24.0	950		murky/stronger odor

Total Gallons Removed 7 gallons

Depth to Groundwater After Development (below TOC) 38.64' feet

Subsurface Consultants	2801 MacArthur Boulevard			PLATE
	JOB NUMBER	DATE	APPROVED	
	838.002			

WELL SAMPLING FORM

Project Name: 2801 MacArthur Blvd
Well Number: MW-3

Job No.: 838.001
Well Casing Diameter: 2 inch

Sampled By: DWA
Date: 8/23/94

TOC Elevation: 992.8
Weather: Foggy / Sunny

Depth to Casing Bottom (below TOC) ~~39.~~ 40.00 feet

Depth to Groundwater (below TOC) 25.78 feet

Feet of Water in Well 14.22 feet

Depth to Groundwater When 80% Recovered 28.62 (32.89 @ 50%) feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.3 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other

Free Product none

Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	7.35	24.5	240		lt. turbidity/no odor
4	7.23	24.0	230		
6	7.14	24.0	235		increasing turbidity
8	7.14	25.0	230		

Total Gallons Purged 8 gallons

Depth to Groundwater Before Sampling (below TOC) 30.68' feet

Sampling Method teflon bailer

Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants	2801 MacArthur Blvd., Oakland, California	PLATE
	JOB NUMBER 838.001 / DATE / APPROVED	

WELL SAMPLING FORM

Project Name: 2801 MacArthur Blvd
Well Number: MW-4
Job No.: 838.001
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: ~~8/24~~ 8/22/94
TOC Elevation: 999.6
Weather: foggy/sunny

Depth to Casing Bottom (below TOC) 45.00 feet
Depth to Groundwater (below TOC) ~~35.43~~ 35.43 feet
Feet of Water in Well ~~9.43~~ 9.57 feet
Depth to Groundwater When 80% Recovered 37.34 (40.21 @ 50%) feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.56 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

Recharge rate: ~ 1" every 5 min.

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	7.53	~~8~~ 23.0	~~5~~ 550		clear/mod. odor
1	7.43	23.0	600		
3	7.38	23.0	700		
5	7.39	23.0	700		~~Decreasing~~ odor

Total Gallons Purged 5 gallons
Depth to Groundwater Before Sampling (below TOC) 40.20' feet
Sampling Method teflon bailer
Containers Used 3 (40 ml) ____ liter ____ pint

Subsurface Consultants

2801 MacArthur Blvd., Oakland, California

JOB NUMBER	DATE	APPROVED
838.001		

PLATE

WELL SAMPLING FORM — Development

Project Name: 2801 MacArthur Blvd
Well Number: MW-5
Job No.: 838.001
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: ~~8/1/94~~ 8/23/94
TOC Elevation: 992.9
Weather: Sunny

Depth to Casing Bottom (below TOC) 37.50 feet
Depth to Groundwater (below TOC) ~~30.87~~ 31.80 feet
Feet of Water in Well ~~6.63~~ 5.70 feet
Depth to Groundwater When 80% Recovered 32.94 (34.65 @ 50%) feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) .93 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

recharge rate: 2-3" per 5 min.

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	7.56	24.5	950		clear/no odor
3	7.56	24.0	950		Lt. turbidity
5	7.48	24.0	900		went dry @ 5 gals.

Total Gallons Purged 5 gallons
Depth to Groundwater Before Sampling (below TOC) 34.65' feet
Sampling Method teflon bailer
Containers Used 3 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

2801 MacArthur Blvd., Oakland, California

JOB NUMBER	DATE	APPROVED	PLATE
838.001			

WELL SAMPLING FORM

Project Name: 2801 MACARTHUR BOULEVARD

Well Number: ~~P-1~~ P-2

Job No.: 838.002

Well Casing Diameter: 2 inch

Sampled By: DWA

Date: ~~8/11/94~~ ~~8/22~~ 8/23/94

TOC Elevation: _____

Weather: foggy

Depth to Casing Bottom (below TOC) 42.00 feet

Depth to Groundwater (below TOC) ~~29.52~~ 30.34 feet

Feet of Water in Well 11.66 feet

Depth to Groundwater When 80% Recovered 32.67 (36.17' @ 50%) feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.9 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product None

Purge Method BAILER

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	10.17	21.0	320		clear/strong odor/sl
2	9.96	21.0	400		
4	10.24	21.0	~~430~~ 435		
6	10.41	21.0	460		

Total Gallons Purged 6 gallons

Depth to Groundwater Before Sampling (below TOC) 36.10' feet

Sampling Method BAILER

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

2801 MACARTHUR BLVD - OAKLAND, CA

JOB NUMBER 838.002 | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: 2801 MacArthur blvd Well Number: M2

Job No.: 838.001 Well Casing Diameter: 2 inch

Sampled By: FV Date: 5/17/93

TOC Elevation: _____ Weather: CLEAR

Depth to Casing Bottom (below TOC) 44.90 feet

Depth to Groundwater (below TOC) 27.15 feet

Feet of Water in Well 17.75 feet

Depth to Groundwater When 80% Recovered 30.70 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.90 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) Other

Free Product _____

Purge Method DISPOSIBLE BAILER

FIELD MEASUREMENTS

Gallons Removed	pH	Temp °F	Conductivity (micromhos/cm)	Salinity S%	Comments
1	6.30	69.0	12.59 x 100		clear; gas odor
3	6.10	66.6	12.94 x 100		"
5	6.38	69.9	14.84 x 100		"
7	6.37	68.5	14.21 x 100		"
9	6.44	68.3	14.41 x 100		"
11	6.38	68.9	14.58 x 100		"

Total Gallons Purged 11 gallons

Depth to Groundwater Before Sampling (below TOC) 27.85 feet

Sampling Method DISPOSIBLE BAILER

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED PLATE

WELL SAMPLING FORM

Project Name: 2801 MacArthur bldg Well Number: M3

Job No.: 838.001 Well Casing Diameter: 2 inch

Sampled By: FV Date: 5/17/93

TOC Elevation: _____ Weather: CLEAR

Depth to Casing Bottom (below TOC) 39.86 feet

Depth to Groundwater (below TOC) 22.15 feet

Feet of Water in Well 17.71 feet

Depth to Groundwater When 80% Recovered 25.69 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 2.89 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other

Free Product _____

Purge Method DISPOSIBLE BAILER

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	9.25	68.7	290 X 100		Semi clear; no odor
4	7.83	67.2	3.15 X 100		"
6	7.74	67.6	3.07 X 100		"
8	7.61	67.0	3.13 X 100		"
10	7.69	66.3	3.11 X 100		"

Total Gallons Purged 10 gallons

Depth to Groundwater Before Sampling (below TOC) 25.45 feet

Sampling Method DISPOSIBLE BAILER

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED PLATE

WELL SAMPLING FORM

Project Name: 2801 MacArthur blvd Well Number: M4

Job No.: 838.001 Well Casing Diameter: 2 inch

Sampled By: FV Date: 5/17/93

TOC Elevation: _____ Weather: CLEAR

Depth to Casing Bottom (below TOC) 45.20 feet

Depth to Groundwater (below TOC) 33.81 feet

Feet of Water in Well 11.39 feet

Depth to Groundwater When 80% Recovered 36.09 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.86 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other

Free Product _____

Purge Method DISPOSIBLE BAILER

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	6.82	72.8	19.57 X 100		Clear, good odor
3	6.59	70.2	2.11 X 1000		"
5	6.70	69.0	2.07 X 1000		"
6	6.69	70.1	1.92 X 1000		"
DRY					slow recharge

Total Gallons Purged 6 + 6 more gallons and sample gallons

Depth to Groundwater Before Sampling (below TOC) 38.75 feet

Sampling Method DISPOSIBLE BAILER

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED PLATE

WELL SAMPLING FORM

Project Name: 2801 MacArthur blvd Well Number: P2

Job No.: 838.001 Well Casing Diameter: 2 inch

Sampled By: FV Date: 5/17/93

TOC Elevation: _____ Weather: CLEAR

Depth to Casing Bottom (below TOC) 42.20 feet

Depth to Groundwater (below TOC) 23.66 feet

Feet of Water in Well 18.54 feet

Depth to Groundwater When 80% Recovered 27.37 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 3.03 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other

Free Product _____

Purge Method DISPOSIBLE BAILER

FIELD MEASUREMENTS

Gallons Removed	pH	Temp °F (°C)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	9.64	72.2	7.15 X 100		sheen - gas odor
4	9.93	68.0	5.54 X 100		clear gas odor
6	10.24	67.7	5.33 X 100		"
8	9.99	67.6	5.48 X 100		"
10	11.23	68.9	8.64 X 100		"
12 DRY	11.23	68.3	8.48 X 100		"

Total Gallons Purged 12 +3 more gallon gallons

Depth to Groundwater Before Sampling (below TOC) 36.42 slow recharge feet

Sampling Method DISPOSIBLE BAILER

Containers Used _____ 40 ml _____ liter _____ pint

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: P-2
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/27/95
TOC Elevation: _____
Weather: cloudy

Depth to Casing Bottom (below TOC) 42.50 feet
Depth to Groundwater (below TOC) 19.90 feet
Feet of Water in Well 22.60 feet
Depth to Groundwater When 50 ~~80~~% Recovered 31.20 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 3.7 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

recharge rate 1" per 2 min.

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
3	11.13	20.0	750		clear/strong odor/sl
6	10.34	20.0	700		semi-clear
9	11.26	20.0	875		murky increasing turbidity
12	11.67	20.0	1400		
13	12.14	20.5	2825		Dry @ 13 gallons purged dry twice

Total Gallons Purged ~~12~~ gallons
Depth to Groundwater Before Sampling (below TOC) 40.00' feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-2
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/26/95
TOC Elevation: _____
Weather: Sunny

Depth to Casing Bottom (below TOC) ~~44.50~~ 45.00 feet
Depth to Groundwater (below TOC) ~~24.35~~ 24.44 feet
Feet of Water in Well ~~20.75~~ 20.56 feet
Depth to Groundwater When 50 ~~80~~% Recovered 34.72 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 3.3 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	6.79	22.5	1625		clear / strong odor
4	6.77	22.0	1700		slight turbidity & sheen
6	6.76	22.0	1775		increasing turbidity
8	6.74	22.0	1775		slightly murky
10	6.75	22.0	1725		murky / strong odor

Total Gallons Purged 10 gallons
Depth to Groundwater Before Sampling (below TOC) 34.70' feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-3
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/27/95
TOC Elevation: _____
Weather: cloudy

Depth to Casing Bottom (below TOC) 39.50 feet
Depth to Groundwater (below TOC) 19.62 feet
Feet of Water in Well 19.88 feet
Depth to Groundwater When 50% Recovered 29.56 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 3.3 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	6.77	19.0	350		clear/no odor
4	6.76	18.5	355		murky
6	6.79	18.5	360		
8	6.74	18.5	360		
10	6.73	18.5	370		

Total Gallons Purged 10 gallons
Depth to Groundwater Before Sampling (below TOC) 27.00' feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA Fund Well Number: M-4

Job No.: 838.002 Well Casing Diameter: 2 inch

Sampled By: DWA Date: 4/26/95

TOC Elevation: _____ Weather: Sunny

Depth to Casing Bottom (below TOC) 45.00 feet

Depth to Groundwater (below TOC) 29.76 feet

Feet of Water in Well 15.24 feet

Depth to Groundwater When 50% Recovered 37.38 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 2.5 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product none

Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	8.79	22.0	285		murky/moderate odor
3	7.51	22.0	300		Decreasing turbidity
5	7.27	22.0	325		↓
7	7.19	22.0	370		clear
9	7.15	22.0	360		

Total Gallons Purged ~~disposable bailer~~ 9 gallons

Depth to Groundwater Before Sampling (below TOC) 37.30' @ 7:25 a.m. on 4/27/95 feet

Sampling Method disposable bailer

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants	JOB NUMBER	DATE	APPROVED	PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-5
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/26/95
TOC Elevation:
Weather: sunny

Depth to Casing Bottom (below TOC) 37.50 feet
Depth to Groundwater (below TOC) 20.53 feet
Feet of Water in Well 16.97 feet
Depth to Groundwater When 50% Recovered 29.02 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.8 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	6.75	22.5	1200		clear/no odor
4	6.96	22.0	1350		
6	6.99	22.0	1425		
8	7.01	22.0	1475		
10	6.99	22.0	1500		semi-clear/no odor

Total Gallons Purged 10 gallons
Depth to Groundwater Before Sampling (below TOC) ~~29.02~~ 21.75 @ 7:00 a.m. 4/27/95 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA Fund Well Number: M-6

Job No.: 838.002 Well Casing Diameter: 2 inch

Sampled By: DWA Date: 4/26/95

TOC Elevation: _____ Weather: Sunny

Depth to Casing Bottom (below TOC) 46.50 feet

Depth to Groundwater (below TOC) 27.79 feet

Feet of Water in Well 18.71 feet

Depth to Groundwater When ~~80~~ 50 % Recovered 37.15 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 3.1 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other

Free Product none

Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	7.68	20.0	400		clear/no odor
1	7.70	19.5	425		semi-clear
2	7.73	19.5	445		murky
3	7.	19.5	470		

Total Gallons Purged 3.5 gallons

Depth to Groundwater Before Sampling (below TOC) 34.42 feet

Sampling Method disposable bailer

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: P-2
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 10/30/95
TOC Elevation:
Weather: foggy

Depth to Casing Bottom (below TOC) 42.50 feet
Depth to Groundwater (below TOC) 29.57 feet
Feet of Water in Well 12.93 feet
Depth to Groundwater When 80% Recovered 32.16 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 2.1 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer
slow recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Dissolved oxygen ~~Salinity S‰~~	Comments
0	10.60	20.0	455	8.2 ppm	clear / strong odor sheen
2	10.48	20.0	725		
4	9.87	20.0	850		
6	10.85	20.0	900	8.4 ppm	

Total Gallons Purged 6 gallons
Depth to Groundwater Before Sampling (below TOC) 32.16 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA Fund Well Number: P-3

Job No.: 838.002 Well Casing Diameter: 2 inch

Sampled By: DWA Date: 10/27/95

TOC Elevation: _____ Weather: sunny

Depth to Casing Bottom (below TOC) 45.80 feet

Depth to Groundwater (below TOC) 27.76 feet

Feet of Water in Well 17.24 feet

Depth to Groundwater When 80% Recovered 31.21 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.8 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other

Free Product none

Purge Method disposable bailer

FIELD MEASUREMENTS

very slow recharge (overnight)

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Dissolved OXYGEN 3.1 ppm / ~~Salinity %~~	Comments
1	7.19	21.0	1325		clear/mod. odor
3	6.85	20.5	1350		semi-clear
5	6.81	20.0	1400		murky
7	6.81	20.0	1350		
9	6.85	20.0	1300		

Total Gallons Purged 9 gallons

Depth to Groundwater Before Sampling (below TOC) 30.35 on 10/30/95 @ 0750 feet

Sampling Method disposable bailer

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-2
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 10/27/95
TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 45.00 feet
Depth to Groundwater (below TOC) 31.45 feet
Feet of Water in Well 13.55 feet
Depth to Groundwater When 80% Recovered 34.16 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.2 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

Very slow Recharge (overnight)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Dissolved Oxygen 2.7 ppm / ~~Salinity S%~~	Comments
1	6.62	22.0	1600		clear/mod. odor spotty sheen
3	6.67	21.5	1750		
5	6.64	22.0	1700		semi-clear
7	6.71	22.0	1700		murky

Total Gallons Purged 7 gallons
Depth to Groundwater Before Sampling (below TOC) 31.62 on 10/30/95 @ 0730 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-4
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 10/30/95
TOC Elevation:
Weather: foggy

Depth to Casing Bottom (below TOC) 45.00 feet
Depth to Groundwater (below TOC) 34.22 feet
Feet of Water in Well 10.78 feet
Depth to Groundwater When 80% Recovered 36.38 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.8 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer
very slow recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Dissolved Oxygen ~~Salinity S%~~	Comments
0	6.83	20.0	600	3.0 ppm	clear/slight odor
2	6.92	20.0	625		
4	6.97	20.0	650		
6	7.09	20.0	750	4.0 ppm	

Total Gallons Purged 6 gallons
Depth to Groundwater Before Sampling (below TOC) 36.38' on 11/1/95 @ 10:00 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) 1 (liter) (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-5
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 10/30/95
TOC Elevation:
Weather: foggy

Depth to Casing Bottom (below TOC) 37.50 feet
Depth to Groundwater (below TOC) 31.53 feet
Feet of Water in Well 5.97 feet
Depth to Groundwater When 80% Recovered 32.72 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 1.0 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

very slow recharge (overnight)

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Dissolved oxygen 2.3ppm ~~Salinity S%~~	Comments
0	7.13	20.0	1200		clear/no odor
1	7.14	20.0	1225		semi-clear
2	7.14	19.5	1225		↓
3	7.14	19.5	1225		murky

Total Gallons Purged 3 gallons
Depth to Groundwater Before Sampling (below TOC) 31.90 on 10/1/95 @ 10:15 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APH Fund
Well Number: M-6
Job No.: 838.002
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 10/30/95
TOC Elevation:
Weather: foggy

Depth to Casing Bottom (below TOC) 46.50 feet
Depth to Groundwater (below TOC) 34.86 feet
Feet of Water in Well 11.64 feet
Depth to Groundwater When 80% Recovered 37.19 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 2.0 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

very slow recharge (overnight)

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	Dissolved oxygen 6.3 ppm / ~~Salinity S%~~	Comments
2	7.23	19.5	800		semi-clear/slight odor
4	7.23	19.5	850		
6	7.35	19.5	900		dry @ 7 gals.

Total Gallons Purged 7 gallons
Depth to Groundwater Before Sampling (below TOC) 38.17' on 11/1/95 @ 11:00 a.m. feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: P-2
Job No.: 838.003
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/15/96
TOC Elevation:
Weather: partly cloudy

Depth to Casing Bottom (below TOC) 42.00 feet
Depth to Groundwater (below TOC) 21.33 feet
Feet of Water in Well 20.67 feet
Depth to Groundwater When 80% Recovered 25.44 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 3.4 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	10.80	65.4	537		clear/strong odor
4	10.86	65.6	518		spotty sheen
6	10.41	65.3	469		
8	10.07	65.7	438		
10	10.32	66.4	511		

Total Gallons Purged 10 gallons
Depth to Groundwater Before Sampling (below TOC) 22.70 on 4/17/96 @ 0730 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-2
Job No.: 838.003
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/15/96
TOC Elevation:
Weather: partly cloudy

Depth to Casing Bottom (below TOC) 45.00 feet
Depth to Groundwater (below TOC) 25.57 feet
Feet of Water in Well 19.43 feet
Depth to Groundwater When 80% Recovered 29.46 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 3.2 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer

moderate/slow recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	7.70	66.4	802		clear/strong odor spotty sheen
4	7.60	66.2	806		
6	7.61	65.8	786		
8	7.37	66.5	784		
10	7.34	66.5	794		murky

Total Gallons Purged 10 gallons
Depth to Groundwater Before Sampling (below TOC) 25.57 on 4/17/96 @ 0745 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-4
Job No.: 838.003
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/15/96
TOC Elevation:
Weather: partly cloudy

Depth to Casing Bottom (below TOC) 45.00 feet
Depth to Groundwater (below TOC) 30.09 feet
Feet of Water in Well 14.91 feet
Depth to Groundwater When 80% Recovered 33.07 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.5 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

slow recharge

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	8.69	68.2	305		semi-clear/slight odor
4	8.52	67.9	260		clear
6	8.32	66.2	250		↓ increasing odor
8	7.93	66.0	447		

Total Gallons Purged 8 gallons
Depth to Groundwater Before Sampling (below TOC) 33.41 on 4/17/96 @ 0830 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA Fund
Well Number: M-5
Job No.: 838.003
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/15/96
TOC Elevation:
Weather: partly cloudy

Depth to Casing Bottom (below TOC) 37.50 feet
Depth to Groundwater (below TOC) 21.72 feet
Feet of Water in Well 15.78 feet
Depth to Groundwater When 80% Recovered 24.88 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 2.6 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

slow recharge overnight

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	8.20	65.9	524		clear/no odor
4	7.87	66.1	517		
6	7.48	65.5	545		
8	7.47	64.7	591		

Total Gallons Purged 8 gallons
Depth to Groundwater Before Sampling (below TOC) 24.96 on 4/17/96 @ 0815 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) ____ (liter) ____ (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA FUND
Well Number: M-6
Job No.: 838.003
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 4/15/96
TOC Elevation: _____
Weather: partly cloudy

Depth to Casing Bottom (below TOC) 47.00 feet
Depth to Groundwater (below TOC) 28.50 feet
Feet of Water in Well 18.50 feet
Depth to Groundwater When 80% Recovered 32.20 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 3.0 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer

very slow recharge (overnight)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
2	8.73	68.5	1030		clear/no odor/ orange tint
4	8.38	68.3	506		
6	8.24	67.3	440		decreasing tint faint odor
8	8.09	66.9	467		↓
10	8.03	67.4	512		

Total Gallons Purged 10 gallons
Depth to Groundwater Before Sampling (below TOC) 33.10' on 4/17/96 @ 0800 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA FUND Well Number: M-6

Job No.: 838.003 Well Casing Diameter: 2 inch

Sampled By: DWA Date: 7/10/96

TOC Elevation: _____ Weather: foggy

Depth to Casing Bottom (below TOC) 46.50 feet

Depth to Groundwater (below TOC) 32.56 feet

Feet of Water in Well 13.94 feet

Depth to Groundwater When 80% Recovered 35.35 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 2.3 gallons

Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other

Free Product none

Purge Method disposable bailer

very slow recharge (overnight)

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
1	9.24	62.8	925		clear/no odor
3	8.55	64.3	545		↓
5	8.33	64.3	521		↓
7	8.21	64.2	520		semi-clear

Total Gallons Purged 7 gallons

Depth to Groundwater Before Sampling (below TOC) 36.31 @ 11:45 a.m. on 7/12/96 feet

Sampling Method disposable bailer

Containers Used 3 (40 ml) _____ (liter) _____ (pint)

Subsurface Consultants

JOB NUMBER DATE APPROVED

PLATE

WELL SAMPLING FORM

Project Name: APA FUND
Well Number: M-4
Job No.: 838.003
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: ~~10/5/96~~ 11/5/96
TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 45.00 feet
Depth to Groundwater (below TOC) 34.19 feet
Feet of Water in Well 10.81 feet
Depth to Groundwater When 80% Recovered 36.35 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.8 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product none
Purge Method disposable bailer
very slow recharge

FIELD MEASUREMENTS

DO. = 3.4 ppm

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	Salinity S%	Comments
0	8.14	67.4	278		clear/strong odor
2	8.04	66.6	348		
4	8.05	66.8	383		
6	8.12	66.8	391		

Total Gallons Purged 6 gallons
Depth to Groundwater Before Sampling (below TOC) 37.11 on 11/7/96 @ 1330 feet
Sampling Method disposable bailer
Containers Used ____ 40 ml / 1 liter / ____ pint

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA FUND
Well Number: M-6
Job No.: 838.003
Well Casing Diameter: 2 inch
Sampled By: DWA
Date: 10/25/96
TOC Elevation:
Weather: Sunny

Depth to Casing Bottom (below TOC) 46.50 feet
Depth to Groundwater (below TOC) 35.55 feet
Feet of Water in Well 10.95 feet
Depth to Groundwater When 80% Recovered 37.74 feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 1.8 gallons
Depth Measurement Method Tape & Paste / (Electronic Sounder) / Other
Free Product none
Purge Method disposable bailer
very slow recharge

FIELD MEASUREMENTS

D.O. = 6.31 mg

Gallons Removed	pH	Temp (°F)	Conductivity (micromhos/cm)	~~Salinity S‰~~	Comments
0	8.30	59.4	817		clear/no odor
2	7.65	62.5	509		" slight odor
4	7.37	62.7	482		" increasing odor
6	7.93	63.0	453		murky

Total Gallons Purged 6 gallons
Depth to Groundwater Before Sampling (below TOC) 38.07' on 11/1/96 @ 1300 feet
Sampling Method disposable bailer
Containers Used 3 (40 ml) / 1 (liter) / (pint)

Subsurface Consultants

JOB NUMBER | DATE | APPROVED | PLATE

Subsurface Consultants, Inc.

WELL SAMPLING FORM

P-2

PROJECT NAME: APA Fund
PROJ. NO. 838.006 TASK 1
SAMPLED BY: STEWART DALZE
DATE: 6/23/99
WEATHER: cool clear winds

WELL NO.: [redacted]
CASING DIAMETER: 2
WELL MATERIAL: —
TOC ELEVATION: —

TOTAL DEPTH OF CASING (BTOC) 42.02 FEET

DEPTH TO GROUNDWATER (BTOC) 24.79 FEET

HEIGHT OF WATER IN WELL 17.23 FEET

CALCULATED PURGE VOLUME 8.43 gallons
(feet of water * casing dia² * .0408 * # of Volumes)

FREE PRODUCT N/A - Very Strong odor elsewhere

PURGE METHOD disposable bailer

MEASUREMENT METHOD (TAPE & PASTE) (ELECTRONIC SOUNDER) OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	Sal/‰	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...) Sheen on H2O
0	12:30	10.94	20.69	570.00	0.27	90.6	5.16	Strong hydrocarbon odor
2	12:40	10.71	19.91	513.00	0.25	101.1	7.25	" " Sheen/Slight tan
4	12:50	10.41	19.60	492.00	0.24	111.6	7.10	" Very strong odor
6	13:00	10.14	19.10	473.00	0.23	84.21	8.62	grey - Turbid
8	13:10	10.14	19.71	455.00	0.22	69.01	5.30	" "
10	13:20	10.06	19.62	525.00	0.25	61.24	6.45	" "
								Still very strong odor

DEPTH TO GROUNDWATER WHEN 80% RECOVERED 28.32 Ft.

ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 27.65 Ft. (overnight) 6/24

SAMPLING METHOD disposable bailer

CONTAINERS / PRESERVATIVE 4 / VOA w/ HCL. / LITER
40 ML

/ OTHER / OTHER

ANALYSES:
BTEX 5030/8020
MTBE 5030/8260 - mass spec } 4 VOA's for all analysis
TVH 5030/8015 - modified -

MISC FIELD OBSERVATION: crew on property in front of garage / very Strong odor
Well locked / very Strong odor, Sheen, grey-turbid

Subsurface Consultants, Inc.

WELL SAMPLING FORM

ECT NAME: APA Fund
O. 838.006 TASK 1
LED BY: STEWART DALEE
E: 6/23/99
THER: Warm Clear windy

WELL NO.: P-3
CASING DIAMETER: 2 in
WELL MATERIAL: —
TOC ELEVATION: —

L DEPTH OF CASING (BTOC) 45.6 FEET

H TO GROUNDWATER (BTOC) 24.5 FEET

OF WATER IN WELL 21.1 FEET

CALCULATED PURGE VOLUME 10.33 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes) x 3

FREE PRODUCT N/A

PURGE METHOD disposable bailer

SUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

LONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	Sal‰	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	13:30	8.58	18.02	1199.0	0.59	40.7	7.24	Very Strong odor / clear (hydrocarbon)
2	13:40	7.24	19.34	1102.0	0.55	-23.7	4.80	" " slight sheen
4	13:50	7.19	19.33	1111.0	0.55	-23.9	4.99	
6	14:05	7.10	19.45	1115.0	0.51	-30.5	5.62	Sheen / Strong odor
8	14:15	7.11	19.56	1132.0	0.56	-30.2	5.55	grey-turbid.
10	14:25	7.09	19.55	1167.00	0.57	-35.6	6.45	

TH TO GROUNDWATER WHEN 80% RECOVERED 28.72 Ft.

CTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 26.95 Ft. (overnight) 6/24

PLING METHOD disposable bailer

TAINERS / PRESERVATIVE 4 / VOA w/ HCL. / LITER
40 ML

/ OTHER / OTHER

NALYSES:
BTEX 5030/8020
MTBE 5030/8260 - mass spec } 4 VOA's for all analysis
TVH 5030/8015 - modified -

MISC FIELD OBSERVATION: Open, no manhole odor / Very Strong hydrocarbon odor
Over purged, next to pump island on property

Subsurface Consultants, Inc.

WELL SAMPLING FORM

PROJECT NAME: APA Fund

JOB NO.: 838.006 TASK 1

SAMPLED BY: STEWART DALIE

DATE: 6/23/99

WEATHER: Cool windy

WELL NO.: M2

CASING DIAMETER: 2 IN

WELL MATERIAL: –

TOC ELEVATION: –

TOTAL DEPTH OF CASING (BTOC) 45.00 FEET

DEPTH TO GROUNDWATER (BTOC) 27.25 FEET

FEET OF WATER IN WELL 17.75 FEET

CALCULATED PURGE VOLUME 8.69 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)

FREE PRODUCT N/A

PURGE METHOD disposable bailer

MEASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

GALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	Sal/Sg	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	14:30	11.64	20.81	817.00	0.40	-61.6	9.30	clear hydrocarbon odor
1	14:40	11.65	20.88	828.00	0.44	-60.6	9.01	grey odor sheen
3	14:55	11.65	19.95	801.00	0.37	-48.9	9.00	
5	15:00	11.65	19.75	790.00	0.35	-40.4	8.95	stronger grey-turbid
7	15:10	11.66	19.95	798.00	0.33	-38.9	8.99	odor
9	1520	11.66	19.92	768.00	0.38	-36.1	8.95	- Slight Sheen
								on H2O turbid grey

DEPTH TO GROUNDWATER WHEN 80% RECOVERED 30.8 Ft.

ACTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 29.2 Ft. (Overnight) 6/24

SAMPLING METHOD disposable bailer

CONTAINERS / PRESERVATIVE 4 / VOA w/ HCL. (40 ML) / (LITER)

/ (OTHER) / (OTHER)

ANALYSES:
BTEX 5030/8020
MTBE 5030/8260 - mass spec } 4 VOA's for all analysis
TVH 5030/8015 - modified -

MISC FIELD OBSERVATION: on prop / odor, sheen head car moved for access

Subsurface Consultants, Inc.

WELL SAMPLING FORM

ECT NAME: APA Fund
NO. 938.006 TASK 1
PLED BY: STEWART DALIE
E: 6/23/99
THER: clear warm

WELL NO.: M-4
CASING DIAMETER: 2 in
WELL MATERIAL: —
TOC ELEVATION: —

AL DEPTH OF CASING (BTOC) 45.00 FEET

TH TO GROUNDWATER (BTOC) 31.84 FEET

T OF WATER IN WELL 13.16 FEET

CALCULATED PURGE VOLUME 6.44 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes) x 3

FREE PRODUCT N/A

PURGE METHOD disposable bailer

SUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER OTHER

FIELD MEASUREMENTS

ALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	Sal ‰	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	09:45	6.56	21.55	904.00	0.45	-0.6	4.18	Slight Hydrocarbon odor / clear
1	09:50	6.72	20.73	525.00	0.25	-8.7	5.54	stronger odor / clear
3	09:59	6.71	20.65	1050.00	0.52	-18.3	4.91	same odor slightly grey
5	10:10	6.88	20.51	1044.00	0.54	-48.8	7.60	↓ 3 ↓
7	10:20	6.79	20.37	1091.00	0.54	-45.7	4.57	

PTH TO GROUNDWATER WHEN 80% RECOVERED 34.18 Ft.

TUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 33.96 Ft. (overnight) 6/24

AMPLING METHOD disposable bailer

ONTAINERS PRESERVATIVE 4 / VOA w/ HCL. / LITER
40 ML

/ OTHER / OTHER

ANALYSES:
BTEX 5030/8020
MTBE 5030/8260 - mass spec } 4 VOA's for all analysis
TVH 5030/8015 - modified -

MISC FIELD OBSERVATION: needs covering well cover / opened, no odor, no leak
- grey / Turbid to 7 gal purged

Subsurface Consultants, Inc.

WELL SAMPLING FORM

ECT NAME: APA Fund
NO. 838.006 TASK 1
PLED BY: STEWART DALIE
E: 6/23/99
THER: Clear warm

WELL NO.: M-5
CASING DIAMETER: 2 in
WELL MATERIAL: —
TOC ELEVATION: —

AL DEPTH OF CASING (BTOC) ~~[illegible]~~ 38.00 FEET

TH TO GROUNDWATER (BTOC) 26.49 FEET

T OF WATER IN WELL 11.51 FEET

CALCULATED PURGE VOLUME 5.63 gallons
(feet of water * casing dia² * .0408 * # of Volumes)

FREE PRODUCT N/A

PURGE METHOD disposable bailer

ASUREMENT METHOD TAPE & PASTE ELECTRONIC SOUNDER (circled) OTHER

FIELD MEASUREMENTS

ALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (μMHOS/CM)	Sal/S%	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	11:50	7.80	20.83	594.00	0.29	157.6	6.92	Clear no odor
2	12:00	6.88	20.08	573.00	0.28	203.6	6.73	" "
4	12:10	7.20	19.98	586.00	0.28	205.6	7.35	" "
6	12:20	6.91	19.97	601.00	0.29	237.8	6.95	↓

PTH TO GROUNDWATER WHEN 80% RECOVERED 28.8 Ft.

CTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 28.0 Ft. (Overnight) 6/24

MPLING METHOD disposable bailer

NTAINERS / PRESERVATIVE 4 / VOA w/ HCL.
40 ML

/ LITER

/ OTHER

/ OTHER

NALYSES:
BTEX 5030/8020
MTBE 5030/8260 - mass spec
TVH 5030/8015 - modified -
} 4 VOA's for all analysis

MISC FIELD OBSERVATION: instant open / no odor / Clear clear no odor

Subsurface Consultants, Inc.

WELL SAMPLING FORM

ECT NAME: APA Fund
NO. 838.006 TASK 1
PLED BY: STEWART DALIE
E: 6/23/99
ATHER: clear - warm - windy

WELL NO.: M-6
CASING DIAMETER: 2 in
WELL MATERIAL: —
TOC ELEVATION: —

AL DEPTH OF CASING (BTOC) 47.00 FEET

TH TO GROUNDWATER (BTOC) 31.70 FEET

T OF WATER IN WELL 15.3 FEET

CALCULATED PURGE VOLUME 7.49 gallons
(feet of water * casing dia^2 * .0408 * # of Volumes)

FREE PRODUCT N/A

PURGE METHOD disposable bailer

EASUREMENT METHOD (TAPE & PASTE) (ELECTRONIC SOUNDER) OTHER

FIELD MEASUREMENTS

ALLONS REMOVED	TIME	pH	TEMP	CONDUCTIVITY (µMHOS/CM)	Sal/Sg	ORP (mV)	DO (mg/l)	COMMENTS (odor, color, ...)
0	10:50	7.80	20.32	448.00	0.22	118.12	4.64	no odor Turbid greenish-b
2	11:00	7.30	19.78	437.00	0.21	153.00	4.76	greenish brown - no odor
4	11:10	7.45	19.72	440.00	0.21	174.40	8.95	very faint hydrocarb odor
6	11:20	7.42	19.79	473.00	0.23	191.00	5.59	same as above
8	11:30	7.33	19.69	491.00	0.24	179.09	6.17	

PTH TO GROUNDWATER WHEN 80% RECOVERED 34.76 Ft.

CTUAL DEPTH TO GROUNDWATER BEFORE SAMPLING (BTOC) 34.02 Ft. (overnight) 6/24

MPLING METHOD disposable bailer

NTAINERS / PRESERVATIVE 4 / VOA w/ HCL. / LITER
40 ML

/ OTHER / OTHER

NALYSES:
BTEX 5030/8020
MTBE 5030/8260 - mass spec } 4 VOA's for all analysis
TVH 5030/8015 - modified -

MISC FIELD OBSERVATION: N Street, covered no odor / Turbid greenish brown no odor
down to ~~36.81~~ after purge

WELL SAMPLING FORM

Project Name: A&A fuel

Job No.: 838.006

Sampled By: Stw

TOC Elevation: —

Well Number: P-2

Well Casing Diameter: 2 inch

Date: 12/8/99

Weather: Clear cool

Depth to Casing Bottom (below TOC) 42.02 feet

Depth to Groundwater (below TOC) 31.17 feet

Feet of Water in Well 10.85 feet

Depth to Groundwater When 80% Recovered 35.34 feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 5.3 gallons

Depth Measurement Method Tape & Paste / Electronic Sounder / Other

Free Product N/A

Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	DO/TDS/ORP ~~Salinity S%~~	Comments
Ø downhole	9.87	19.15	411	/6.64/.304/89.3	Very Strong Hydrocarbon odor
1	10.29	19.55	448	/5.01/.324/70.8/	clear. strong HC odor
3	10.31	19.84	452	5.68/.325/55.3/	Same
5	! 10.38	19.90	454.0/	4.28/.327/36.4/	slightly cloudy very strong odor, note pH e (10+)
			/	/ /	/

Total Gallons Purged 5' gallons

12/8 40.05 - almost Dry overnight recharge

Depth to Groundwater Before Sampling (below TOC) 12/9 @ 33.35' bgs feet

Sampling Method disposable bailer

Containers Used 5 VOA HCl 40 ml ___ liter ___ pint

BTEX 8021
MTBE 8260
TVHg 8015M

Subsurface Consultants

JOB NUMBER 838.006 DATE 12/8/99 APPROVED PLATE

WELL SAMPLING FORM

Project Name: APA Fuels
Well Number: P-3
Job No.: 638.006
Well Casing Diameter: 2 inch
Sampled By: SW
Date: 12/8/99
TOC Elevation: —
Weather: Clear Cool

Depth to Casing Bottom (below TOC) 45.60' feet
Depth to Groundwater (below TOC) 31.34 feet
Feet of Water in Well 14.26 feet
Depth to Groundwater When 80% Recovered 34.2' feet
Casing Volume (feet of water x Casing DIA ² x 0.0408) 6.9 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
(not deep enough!)
Free Product —
Purge Method disposable bailer

FIELD MEASUREMENTS

DO/TDS/ORP

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	Salinity-Sal%	Comments
0 dewater	6.46	19.23	1,037.0/6.34	.765/5.0	Moderate odor
1	6.67	19.75	1,086.0/5.56	.785/-12.1	Strong odor, sheen, cloudy, turbid
3	6.72	19.69	1,096.0/4.37	.796/-16.2	Strong sheen, turbid, H. odor
5	6.74	19.80	1,105.0/4.09	.797/-17.1	same
7	6.73	19.86	1,109.0/3.93	.800/-19.5	Strong sheen, very strong odor, turbid, cream

Total Gallons Purged 7' gallons
Depth to Groundwater Before Sampling (below TOC) 12/8 44.4 - 1/4 bailer-dry overnight recharge feet
12/9 @ 33.33'
Sampling Method disposable bailer
Containers Used 5 VOA w/HCl — —
40 ml liter pint

BTEX 8021
MTBE 8260
TVHg 8021

Subsurface Consultants

APPROVED
DATE 12/8/99
JOB NUMBER 638.006

PLATE

WELL SAMPLING FORM

Project Name: ApA fwd

Job No.: 838.006

Sampled By: STO

TOC Elevation: /

Well Number: MZ

Well Casing Diameter: 2 in inch

Date: 12/8/99

Weather: Clear cool

Depth to Casing Bottom (below TOC) 45.00 feet

Depth to Groundwater (below TOC) 33.68 feet

Feet of Water in Well 11.32 feet

Depth to Groundwater When 80% Recovered 36.0' feet

Casing Volume (feet of water x Casing DIA ² x 0.0408) 5.54' gallons

Depth Measurement Method: (Tape & Paste) / (Electronic Sounder) / Other

Free Product ~~[illegible]~~ – beads – yes!

Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm) / DO	~~Salinity~~ S% / TDS	ORP	Comments
Ø downhole	6.41	19.39	819.0 / 4.35	.598	44.7	No odor
			1,156.0 / 3.08	.832	19.5	wild Hydrocarbon odor cloudy, slight sheen
1	6.49	19.96	1,120.0 / 3.48	.813	31.2	beads Free product encountered
3	6.67	19.64	1123.0 / 3.14	.814	29.1	strong hydrocarbon odor
5	6.67	19.59	1,123.0 / 3.14	.814	32.2	same, cloudy ~~odor sheen~~ beads
5.5	6.67	19.59				

Total Gallons Purged 5.5 gallons

Depth to Groundwater Before Sampling (below TOC) 12/8 @ 42.2' overnight recharge ~~12/9 @ 34.14'~~ feet

Sampling Method disposable bailer?

Containers Used 5 VOA w/ HCl 40 ml liter pint

BTEX 8020
MTBE 8260
TVHg 8015m

Subsurface Consultants

JOB NUMBER 838.006 | DATE 12/8/99 | APPROVED | PLATE

WELL SAMPLING FORM

Project Name: APA fwd
Well Number: M-4
Job No.: 838.006
Well Casing Diameter: 2" inch
Sampled By: STU
Date: 12/8/99
TOC Elevation: —
Weather: clear cool

Depth to Casing Bottom (below TOC) 45.00 feet
Depth to Groundwater (below TOC) 35.35 feet
Feet of Water in Well 9.65 feet
Depth to Groundwater When 80% Recovered 37.28 feet
Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) x3 4.7 gallons
Depth Measurement Method Tape & Paste / Electronic Sounder / Other
Free Product N/A
Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°C)	Conductivity (micromhos/cm)	DO/TDS/ORP ~~Salinity~~ %	Comments
⊘ dewtole	5.93	19.91	454.0	4.73/.326/12.3	no odor
1	6.24	20.00	484.0	4.07/.348/-2.7	strong hydrocarbon odor clear
3	6.68	19.36	502.0	5.19/.361/-3.9	odor, clear
.5	6.41	19.85	521.0	4.35/.417/-11.6	Hydrocarbon odor clear
			/	/ /	/

Total Gallons Purged 5 gallons
Depth to Groundwater Before Sampling (below TOC) 12/8 @ 49.6' - baled dry 12/9 overnight recharge @ 36.23 feet
Sampling Method disposable bailer
Containers Used 5 - 40 ml VOA w/ HCl — liter — pint

TVHg 8015
BTEX 8021
MTBE 8260

1/2 bailer

Subsurface Consultants

JOB NUMBER
DATE
APPROVED 12/8/99
PLATE

WELL SAMPLING FORM

Project Name: A&A Fuel

Job No.: 838.006

Sampled By: Stu

TOC Elevation: —

Well Number: M-~~[illegible]~~ M-5

Well Casing Diameter: 2 inch

Date: 12/8/99

Weather: Clear Cool

Depth to Casing Bottom (below TOC) 38.00 feet

Depth to Groundwater (below TOC) 32.05 feet

Feet of Water in Well 5.95 feet

Depth to Groundwater When 80% Recovered 33.24 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) x3 2.9 gal gallons

Depth Measurement Method (Tape & Paste) / (Electronic Sounder) / Other

Free Product N/A

Purge Method disposable bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm)	DO / TDS / ~~Salinity S%~~ ORP	Comments
Ø discharle	6.19	19.21	578.0	5.24 / .423 / 175.3	clear, no odor
1	6.41	19.45	577.0	5.99 / .419 / 213.3	" "
3	6.45	19.51	578.0	6.01 / .420 / 257.0	" "
					cloudy no odor last bailer full

cile[illegible] 1/2 full

Total Gallons Purged 3 gallons

Depth to Groundwater Before Sampling (below TOC) 12/8 37.25 - bailed dry! overnight, 12/9 @ 32.10 feet

Sampling Method disposable bailer

Containers Used 5 VOA w/ HCl 40 ml ______ liter ______ pint

BTEX 8021

MTBE 8260

TPHg 8015m

Subsurface Consultants

JOB NUMBER	DATE	APPROVED	PLATE
838.006	12/8		

WELL SAMPLING FORM

Project Name: APA fund

Job No.: 838.006

Sampled By: Stu

TOC Elevation: /

Well Number: M-6

Well Casing Diameter: 2 inch

Date: 12/8/99

Weather: Clear cool

Depth to Casing Bottom (below TOC) 47.00 feet

Depth to Groundwater (below TOC) 36.29 feet

Feet of Water in Well 10.71 feet

Depth to Groundwater When 80% Recovered 38.5 feet

Casing Volume (feet of water x Casing DIA ^{2} x 0.0408) 5.21 gallons

Depth Measurement Method Tape & Paste / ~~Electronic Sounder~~ (circled) / Other

Free Product N/A

Purge Method d. bailer

FIELD MEASUREMENTS

Gallons Removed	pH	Temp (°c)	Conductivity (micromhos/cm) / DO / ORP / TDS (~~Salinity S%~~)	Comments
0 dewtitle	7.15	18.74	558.0 / 5.75 / -57.9 / .415	no odor
1	7.03	18.65	517.0 / 4.81 / -27.9 / .390	~~slight odor~~ clear suspended particles
3	7.11	19.03	545.0 / 4.65 / -16.7 / .401	grey turbid, cloudy, slight odor
5	7.11	19.09	554.0 / 5.04 / -12.9 / .406	same
			/ / / /	same mild to moderate odor

Total Gallons Purged overnight recharge gallons

Depth to Groundwater Before Sampling (below TOC) 12/8 43.4' / 12/9 @ 36.55' bgs feet

Sampling Method d. bailer

Containers Used 5 VOA HCl 40 ml ___ liter ___ pint

BTEX 8021
MTBE 8260
TPH 8015 M

PLATE

APPROVED

DATE

Consultants

WELL MONITORING DATA SHEET

Project #: 030324-SS1	Client: ~~[illegible]~~ APA Fund LTD.
Sampler: GOOCH SUNG	Start Date: 3/24/03
Well I.D.: M-6	Well Diameter: (2) 3 4 6 8 ____
Total Well Depth: 46.70	Depth to Water: 32.89
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

80%

Purge Method:
- Bailer
- (Disposable Bailer)
- Middleburg
- Electric Submersible
- Waterra
- Peristaltic
- Extraction Pump
- Other____________

Sampling Method:
- Bailer
- (Disposable Bailer)
- Extraction Port
- Dedicated Tubing
- Other: ______________

2.2 (Gals.) X 5 = 11.0 Gals.

Well Diameter	Multiplier	Well Diameter	Mu…
1"	0.04	4"	0.…
2"	0.16	6"	1.…
3"	0.37	Other	ra…

Time	Temp. ((°F) or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Obse…
1007	65.1	6.8	588	127	2.2	TURBID
1010	65.5	6.9	664	75	4.4	LESS TURBID
WELL DEWATERED @ 6 gal.						DTW = 44.20
0959	66.5	7.4	710	56	—	DTW=43.10

Did well dewater? (Yes) No — Gallons actually evacuated: 6

Sampling Time: 1004 — Sampling Date: 3/24/03

Sample I.D.: M-6 — Laboratory: C+T

Analyzed for: (TPH-G BTEX MTBE 8260A) TPH-D — Other:

Equipment Blank I.D.: @ Time — Duplicate I.D.:

Analyzed for: TPH-G BTEX MTBE TPH-D — Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 030324-SS1	Client: [redacted]. Arta Funds Ltd.
Sampler: GOOCH SUNG	Start Date: 3/24/03
Well I.D.: M-5	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 37.50	Depth to Water: 25.85
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI

Purge Method: Bailer, (Disposable Bailer), Middleburg, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other___

Sampling Method: Bailer, (Disposable Bailer), Extraction Port, Dedicated Tubing, Other: ___

2 (Gals.) X 5 = 10 Gals.

Well Diameter	Multiplier	Well Diameter
1"	0.04	4"
2"	0.16	6"
3"	0.37	Other

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Ot
948	66.3	6.3	907	64	2	CLEAR
951	66.8	6.4	852	58	4	"
954	66.7	6.4	856	174	6	TURBID
WELL	DEWATERED @ 6	gal.				DTW = 35.85
850	67.5	6.4	852	29	—	DTW = ~~26~~43'

5.1... ½...

Did well dewater? (Yes) No	Gallons actually evacuated: 6
Sampling Time: 856	Sampling Date: ~~3/24/03~~ 3/25/03
Sample I.D.: M-5	Laboratory: C+T
Analyzed for: (TPH-G BTEX MTBE [8260A]) TPH-D	Other:
~~Equipment Blank I.D.:~~ FIELD BLANK: FB032503@ ~~FB032403~~ Time: 905 ~~1115~~	Duplicate I.D.:
Analyzed for: (TPH-G BTEX MTBE [8260A]) TPH-D	Other:
D.O. (if req'd): Pre-purge: mg/L	Post-purge: mg/L
ORP (if req'd): Pre-purge: mV	Post-purge: mV

WELL MONITORING DATA SHEET

Project #: 030324-SS1	Client: [redacted] APP Fund LTD.
Sampler: SCOTT SUNG	Start Date: 3/24/03
Well I.D.: M-4	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 45.05	Depth to Water: 33.35
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI

Purge Method:

- Bailer
- (Disposable Bailer)
- Middleburg
- Electric Submersible
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: Bailer

- (Disposable Bailer)
- Extraction Port
- Dedicated Tubing
- Other: _____

80

Well Diameter	Multiplier	Well Diameter	M
1"	0.04	4"	
2"	0.16	6"	
3"	0.37	Other	

2 (Gals.) X 5 = 10 Gals.

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Ob:
1050	69.2	6.6	1206	>200	2	GAS ODOR
1053	69.1	6.6	1278	111	4	
1056	69.4	6.7	1396	>200	6	
WELL DEWATERED @ 6 gal.						DTW = 42.75
1013	68.1	7.0	1347	>200	—	DTW = 40.18'

Did well dewater? (Yes) No Gallons actually evacuated: 6

Sampling Time: 1017 Sampling Date: 3/24/03

Sample I.D.: M-4 Laboratory: CAT

Analyzed for: TPH-G BTEX MTBE 8260A TPH-D Other:

Equipment Blank I.D.: @ Time Duplicate I.D.:

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 030324-SS1	Client: ~~[redacted]~~ ARA Funds LLC.
Sampler: SOOCH SUNG	Start Date: 3/24/03
Well I.D.: ~~MW~~ MW-3	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 39.65	Depth to Water: 23.88
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

80% 27.03

Purge Method:

- Bailer
- (Disposable Bailer)
- Middleburg
- Electric Submersible
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: Bailer

- (Disposable Bailer)
- Extraction Port
- Dedicated Tubing
- Other: _____

2.5 (Gals.) X 5 = 12.5 Gals.

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
1025	65.0	7.1	334	>200	2.5	TURBID
1030	65.4	6.7	288	>200	5.0	"
1035	65.6	6.7	297	>200	7.5	BROWN
1039	66.1	6.7	299	>200	10.0	"
~~1045~~	DEWATERED @		11 gal.	~~DTW=23.92~~		DTW=36.75
947	66.3	7.1	335	>200	—	DTW=23.92

Did well dewater? (Yes) No — Gallons actually evacuated: ~~10.0~~ 11 BS

Sampling Time: 950 — Sampling Date: ~~3/24/03~~ 3/25/03

Sample I.D.: MW-3 — Laboratory: CTT

Analyzed for: (TPH-G BTEX MTBE) TPH-D — Other: $8260B

Equipment Blank I.D.: @ Time — Duplicate I.D.:

Analyzed for: TPH-G BTEX MTBE TPH-D — Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
ORP (if req'd):	Pre-purge:	mV	Post-purge:	mV

WELL MONITORING DATA SHEET

Project #: 030324-SS1	Client: ~~Dominion Univ.~~ AAA Fund LTD
Sampler: Scott Sung	Start Date: 3/24/03
Well I.D.: P-2	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 41.80	Depth to Water: 25.80
Before: After:	Before: After:
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

80% = 29.00

Purge Method: Bailer, (Disposable Bailer), Middleburg, Electric Submersible, Waterra, Peristaltic, Extraction Pump, Other___

Sampling Method: Bailer, (Disposable Bailer), Extraction Port, Dedicated Tubing, Other: ___

2.5 (Gals.) X 5 = 12.5 Gals.

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius^2 * 0.163

Time	Temp. (°F or °C)	pH	Conductivity (mS or µS)	Turbidity (NTU)	Gals. Removed	Observations
1150	67.2	9.6	566	167	2.5	sheen/gas odor
1155	66.7	9.5	574	>200	5.0	
well	dewatered @	5.5 gal.				DTW=38.75
1030	67.1	9.3	693	49	—	DTW=33.60'

Did well dewater? (Yes) No	Gallons actually evacuated: 5.5
Sampling Time: 1035	Sampling Date: 3/24/03
Sample I.D.: P-2	Laboratory: CHT
Analyzed for: (TPH-G BTEX MTBE [8260A]) TPH-D	Other:
Equipment Blank I.D.: @ Time	Duplicate I.D.:
Analyzed for: TPH-G BTEX MTBE TPH-D	Other:
D.O. (if req'd): Pre-purge: mg/L	Post-purge: mg/L
Pre-purge: mV	Post-purge: mV