BP OIL

BP Oil Company
16400 Southcenter Parkway, Suite 301
Tukwila, Washington 98188
(206) 575-4077

April 5, 1993

3870

Mr. Ron Owcarz
Alameda County Health Care Services Agency
80 Swan Way
Oakland, Ca 94621

RE: BP OIL Facility #11132
3201 35th Avenue
Oakland, California 94619

Dear Mr. Owcarz:

Attached please find our **GROUNDWATER MONITORING AND SAMPLING REPORT** for the above referenced facility.

Please call me at (206) 394-5243 with questions regarding this submission.

Respectfully,

Scott T. Hooton
Environmental Resources Management

STH:jc ERM11132

cc: Mr. Tom Callaghan, California Regional Water Quality Control Board, San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland, CA 94612

Mr. Markus B. Niebanck, Hydro Environmental Technologies, Inc., 2363 Mariner Square Drive, Suite 243, Alameda, CA 94501

David Baker, Mobil Oil Corp, 3225 Gallows Road, Fairfax, VA 22037

Mr. Al Sveilla, Alisto Engineering, 1777 Oakland Blvd., Suite 200, Walnut Creek, CA 94596

Site file

GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11132
3201 35th Street
Oakland, California

Project No. 10-024

Prepared for:

BP Oil Company
Environmental Resource Management
16400 Southcenter Parkway, Suite 301
Tukwila, Washington

Prepared by:

Alisto Engineering Group
1777 Oakland Boulevard, Suite 200
Walnut Creek, California

March 19, 1993

Brady Nagle
Project Manager

Al Sevilla, P.E.
Principal

GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11132
3201 35th Street
Oakland, California

Project No. 10-024

March 19, 1993

INTRODUCTION

This report presents the results and findings of the January 13, 1993 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11132, 3201 35th Street, Oakland, California. A site vicinity map is shown in Figure 1.

FIELD PROCEDURES

Field activities were performed in accordance with the procedures and guidelines of the Alameda County Health Care Services Agency, and the California Regional Water Quality Control Board, San Francisco Bay Region.

Before purging and sampling, the groundwater level in each well was measured from a permanent mark on the top of the casing to the nearest 0.01 foot using an electronic sounder. The depth to groundwater and top of casing elevation data were used to calculate the groundwater elevation in each well in reference to mean sea level. The survey data and groundwater elevation measurements collected to date are presented in Table 1.

Before sample collection, each well was purged of 3 casing volumes, while recording field readings of pH, temperature, and electrical conductivity. Groundwater samples were collected for laboratory analysis by lowering a bottom-fill, disposable bailer to just below the water level in the well. The samples were transferred from the bailer into laboratory-supplied containers. The water sampling field survey forms are presented in Appendix A.

SAMPLING AND ANALYTICAL RESULTS

The results of monitoring and laboratory analysis of the groundwater samples for this and previous quarters are summarized in Table 1. The potentiometric groundwater elevations as interpreted from the results of this quarterly monitoring event are shown in Figure 2. Concentrations of petroleum hydrocarbons detected in the groundwater samples are shown in Figure 3. The laboratory report and chain of custody record are presented in Appendix B.

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11132
3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
RW-1	07/09/90	168.01	—	1.21	—	FP	FP	FP	FP	FP	—
RW-1	12/21/90	168.01	—	0.01	—	FP	FP	FP	FP	FP	—
RW-1	03/07/91	168.01	17.62	SHEEN	150.39	FP	FP	FP	FP	FP	—
RW-1	06/27/91	168.01	—	0.04	—	FP	FP	FP	FP	FP	—
RW-1	09/27/91	168.01	—	0.02	—	FP	FP	FP	FP	FP	—
RW-1	12/18/91	168.01	—	0.02	—	FP	FP	FP	FP	FP	—
RW-1	04/01/91	168.01	14.40	0.11	153.69	FP	FP	FP	FP	FP	—
RW-1	07/03/92	168.01	20.66	SHEEN	147.35	FP	FP	FP	FP	FP	—
RW-1	10/05/92	168.01	23.34	0.08	144.73	FP	FP	FP	FP	FP	—
RW-1	01/13/93	168.01	16.59	0.05	151.46	FP	FP	FP	FP	FP	—
MW-1	07/09/90	169.75	—	0.22	—	FP	FP	FP	FP	FP	—
MW-1	12/21/90	169.75	—	0.58	—	FP	FP	FP	FP	FP	—
MW-1	03/07/91	169.75	20.59	—	—	FP	FP	FP	FP	FP	—
MW-1	06/27/91	169.75	—	0.18	—	FP	FP	FP	FP	FP	—
MW-1	09/27/91	169.75	—	0.27	—	FP	FP	FP	FP	FP	—
MW-1	12/18/91	169.75	—	0.28	—	FP	FP	FP	FP	FP	—
MW-1	04/01/91	169.75	16.51	0.15	153.35	FP	FP	FP	FP	FP	—
MW-1	07/03/92	169.75	22.30	0.27	147.65	FP	FP	FP	FP	FP	—
MW-1	10/05/92	169.75	23.98	0.24	145.95	FP	FP	FP	FP	FP	—
MW-1	01/13/93	169.75	17.03	0.24	152.90	FP	FP	FP	FP	FP	—
MW-2	07/09/90	168.14	—	0.10	—	FP	FP	FP	FP	FP	—
MW-2	12/21/90	168.14	—	0.48	—	FP	FP	FP	FP	FP	—
MW-2	03/07/91	168.14	19.18	—	—	FP	FP	FP	FP	FP	—
MW-2	06/27/91	168.14	—	0.19	—	FP	FP	FP	FP	FP	—
MW-2	09/27/91	168.14	—	0.15	—	FP	FP	FP	FP	FP	—
MW-2	12/18/91	168.14	—	0.36	—	FP	FP	FP	FP	FP	—
MW-2	04/01/91	168.14	15.21	0.10	153.00	FP	FP	FP	FP	FP	—
MW-2	07/03/92	168.14	20.93	0.03	147.23	FP	FP	FP	FP	FP	—
MW-2	10/05/92	168.14	22.74	0.21	145.56	FP	FP	FP	FP	FP	—
MW-2	01/13/93	168.14	15.55	0.02	152.60	FP	FP	FP	FP	FP	—

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BP OIL COMPANY SERVICE STATION NO. 11132
3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-3	07/09/90	167.17	—	0.00	—	140	5.3	4.6	2.0	3.8	—
MW-3	12/21/90	167.17	—	0.00	—	0.19	100	6.0	0 9	27	—
MW-3	03/07/91	167.17	17.40	0.00	149.77	0.4	69	22	6.1	57	—
MW-3	06/27/91	167.17	—	0.00	—	380	28	26	13	46	—
MW-3	09/27/91	167.17	—	0.00	—	0.07	7.9	ND	0.4	1 1	—
MW-3	12/18/91	167.17	—	0.00	—	0.26	34	24	0.8	28	—
MW-3	04/01/91	167.17	13.69	0.00	153.48	ND	ND	ND	ND	ND	—
MW-3	07/03/92	167.17	19.59	0.00	147.58	71	9.4	0.9	5.0	13	ANA
MW-3	10/05/92	167.17	21.22	0.00	145.95	67	5.1	1.1	6.1	8.1	ANA
QC-1 (c)	10/05/92	167.17	21.22	0.00	145.95	ND<50	2.2	ND<0.5	1.5	2.8	ANA
MW-3	01/13/93	167.17	13.63	0.00	153.54	830	50	34	42	89	PACE
MW-4	07/09/90	170.36	—	0.00	—	ND	ND	ND	ND	ND	—
MW-4	12/21/90	170.36	—	0.00	—	ND	ND	ND	ND	0.8	—
MW-4	03/07/91	170.36	20.72	0.00	149.64	ND	2.2	3.8	1.5	2.8	—
MW-4	06/27/91	170.36	—	0.00	—	ND	6.3	1.8	0.4	1.0	—
MW-4	09/27/91	170.36	—	0.00	—	ND	ND	ND	ND	ND	—
MW-4	12/18/91	170.36	—	0.00	—	ND	ND	ND	ND	ND	—
MW-4	04/01/91	170.36	17.49	0.00	152.87	ND	ND	ND	ND	ND	—
MW-4	07/03/92	170 36	22.16	0.00	148.20	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-4	10/05/92	170 36	23.38	0.00	146.98	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-4	01/13/93	170.36	17 58	0.00	152.78	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-5	07/09/90	165.14	—	0.00	—	280	200	210	46	290	—
MW-5	12/21/90	165.14	—	0.00	—	0.69	300	34	8.4	39	—
MW-5	03/07/91	165.14	16.60	0.00	148.54	ND	17	0.9	0.7	1.6	—
MW-5	06/27/91	165.14	—	0.00	—	330	120	10	12	8	—
MW-5	09/27/91	165.14	—	0.00	—	0.73	230	16	20	22	—
MW-5	12/18/91	165.14	—	0.00	—	ND	ND	ND	ND	ND	—
MW-5	04/01/91	165.14	11.99	0.00	153.15	800	250	54	11	60	—
MW-5	07/03/92	165.14	18.65	0.00	146.49	150	36	ND<0 5	ND<0.5	1.1	ANA
MW-5	10/05/92	165.14	20.32	0.00	144.82	270	79	4	1.7	2.9	ANA
MW-5	01/13/93	165.14	13.03	0.00	152.11	180	59	6.0	1.8	7 6	PACE

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11132
3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-6	07/09/90	165.40	—	0.00	—	ND	ND	ND	ND	ND	—
MW-6	12/21/90	165.40	—	0.00	—	0.17	2.6	7.0	4.9	26	—
MW-6 (d)	03/07/91	165.40	—	0.00	—	—	—	—	—	—	—
~~MW-6 (d)~~	~~06/27/91~~	~~165.40~~	—	~~0.00~~	—	—	—	—	—	—	—
MW-6 (d)	09/27/91	165.40	—	0.00	—	—	—	—	—	—	—
MW-6	12/18/91	165.40	—	0.00	—	ND	1.3	22	ND	2.7	—
MW-6	04/01/91	165.40	11.79	0.00	153.61	ND	ND	ND	ND	ND	—
MW-6	07/03/92	165.40	17.77	0.00	147.63	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0 5	ANA
MW-6	10/05/92	165.40	19.46	0.00	145 94	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0 5	ANA
MW-6	01/13/93	165.40	11.34	0.00	154.06	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-7	07/09/90	167.61	—	0.00	—	ND	ND	ND	ND	ND	—
MW-7	12/21/90	167.61	—	0.00	—	ND	ND	ND	ND	ND	—
MW-7	03/07/91	167.61	19 04	0.00	148.57	ND	ND	0.4	0.3	2.4	—
MW-7	06/27/91	167.61	—	0.00	—	70	17	4	0.8	2.2	—
MW-7	09/27/91	167.61	—	0.00	—	ND	0.4	ND	ND	0.4	—
MW-7	12/18/91	167.61	—	0.00	—	ND	0.7	2.9	0.8	3.3	—
MW-7	04/01/91	167.61	15.18	0.00	152.43	ND	ND	ND	ND	ND	—
MW-7	07/03/92	167.61	20.28	0.00	147.33	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
MW-7	10/05/92	167.61	21.56	0.00	146.05	ND<50	ND<0 5	ND<0.5	ND<0.5	1.5	ANA
MW-7	01/13/93	167.61	15.41	0.00	152.20	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE
MW-8	03/07/91	165.74	16.72	0.00	149.02	2.7	780	450	64	310	—
MW-8	06/27/91	165.74	—	0.00	—	12000	3400	1100	240	750	—
MW-8	09/27/91	165.74	—	0.00	—	41	5700	5200	1100	4300	—
MW-8	12/18/91	165.74	—	0.00	—	3.2	990	150	120	250	—
MW-8	04/01/91	165.74	12.54	0.00	153.20	15000	3600	2600	410	1900	—
MW-8	07/03/92	165.74	18.78	0.00	146.96	72000	19000	32000	3000	15000	ANA
MW-8	10/05/92	165.74	20.48	0.01	145.27	FP	FP	FP	FP	FP	—
MW-8	01/13/93	165.74	12.87	0.01	152.88	FP	FP	FP	FP	FP	—

TABLE 1 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
BP OIL COMPANY SERVICE STATION NO. 11132
3201 35TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (a)	DEPTH TO WATER	PRODUCT THICKNESS	GROUNDWATER ELEVATION (b)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	LAB
MW-9	03/07/91	166.20	16.79	0.00	149.41	7.1	220	4	2.4	2400	—
MW-9	06/27/91	166.20	—	0.00	—	3600	520	400	85	310	—
MW-9	09/27/91	166.20	—	0.00	—	3.2	720	150	50	180	—
~~MW-9~~	~~12/18/91~~	~~166.20~~	—	0.00	—	ND	2.5	1.1	0.3	5.8	—
MW-9	04/01/91	166.20	12.89	0.00	153.31	12000	2000	2600	360	1600	—
MW-9	07/03/92	166.20	18.89	0.00	147.31	5700	17000	840	230	800	ANA
MW-9	10/05/92	166.20	20.52	0.00	145.68	1400	440	17	14	100	ANA
MW-9	01/13/93	166.20	12.92	0.00	153.28	11000	1200	1700	340	1400	PACE
QC-1 (c)	01/13/93	166.20	12.92	0.00	153.28	11000	1200	1600	330	1300	PACE
MW-10	03/07/91	167.01	18.09	0.00	148.92	1.6	120	190	32	230	—
MW-10	06/27/91	167.01	—	0.00	—	12000	7300	500	150	300	—
MW-10	09/27/91	167.01	—	0.00	—	57	12000	7200	1400	4600	—
MW-10	12/18/91	167.01	—	0.00	—	5.3	2500	120	36	79	—
MW-10	04/01/91	167.01	13.92	0.00	153.09	ND	ND	ND	ND	ND	—
MW-10	07/03/92	167.01	19.92	0.00	147.09	8600	5100	1300	180	690	ANA
MW-10	10/05/92	167.01	21.92	0.19	145.09	FP	FP	FP	FP	FP	—
MW-10	01/13/93	167.01	14.43	0.03	152.60	FP	FP	FP	FP	FP	—
QC-2 (e)	10/05/92	—	—	—	—	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ANA
QC-2 (e)	01/13/93	—	—	—	—	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	PACE

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
ND	Not detected above reported detection limits
(ppb)	Parts per billion
—	Not analyzed/available
ANA	Anametrix, Inc.

NOTES:

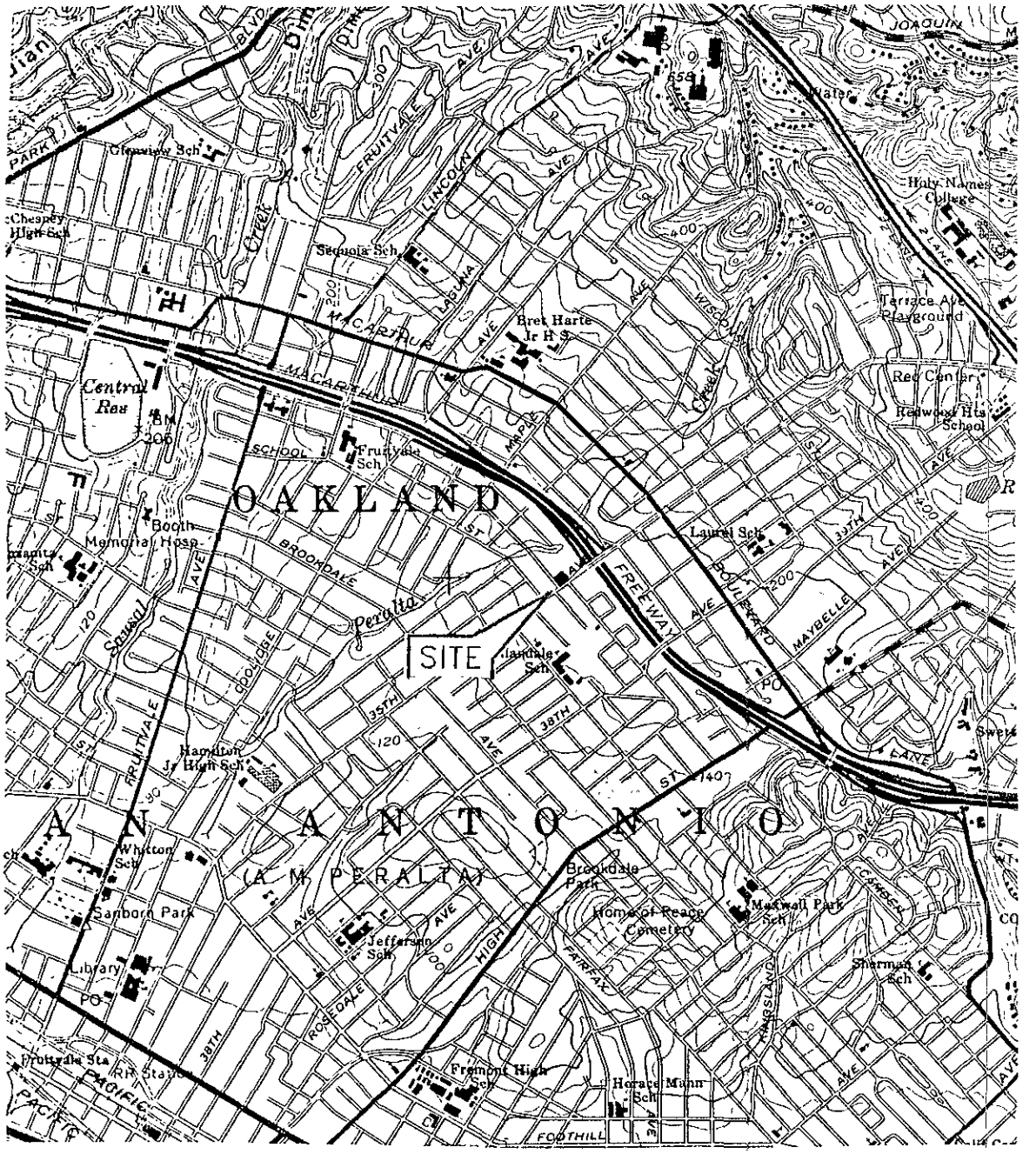
(a) Casing elevation were surveyed to the nearest 0.01 foot relative to mean sea level.

(b) Groundwater elevations adjusted assuming a specific gravity of 0.75 for free product.

(c) Blind duplicate.

(d) MW-6 not accessed due to an abandoned vehicle parked over the well.

(e) Travel blank.



SOURCE:
USGS MAP, OAKLAND EAST QUADRANGLE, CALIFORNIA.
7.5 MINUTE SERIES. 1959. PHOTOREVERSED 1980.

N

0 1000 2000
SCALE IN FEET

FIGURE 1

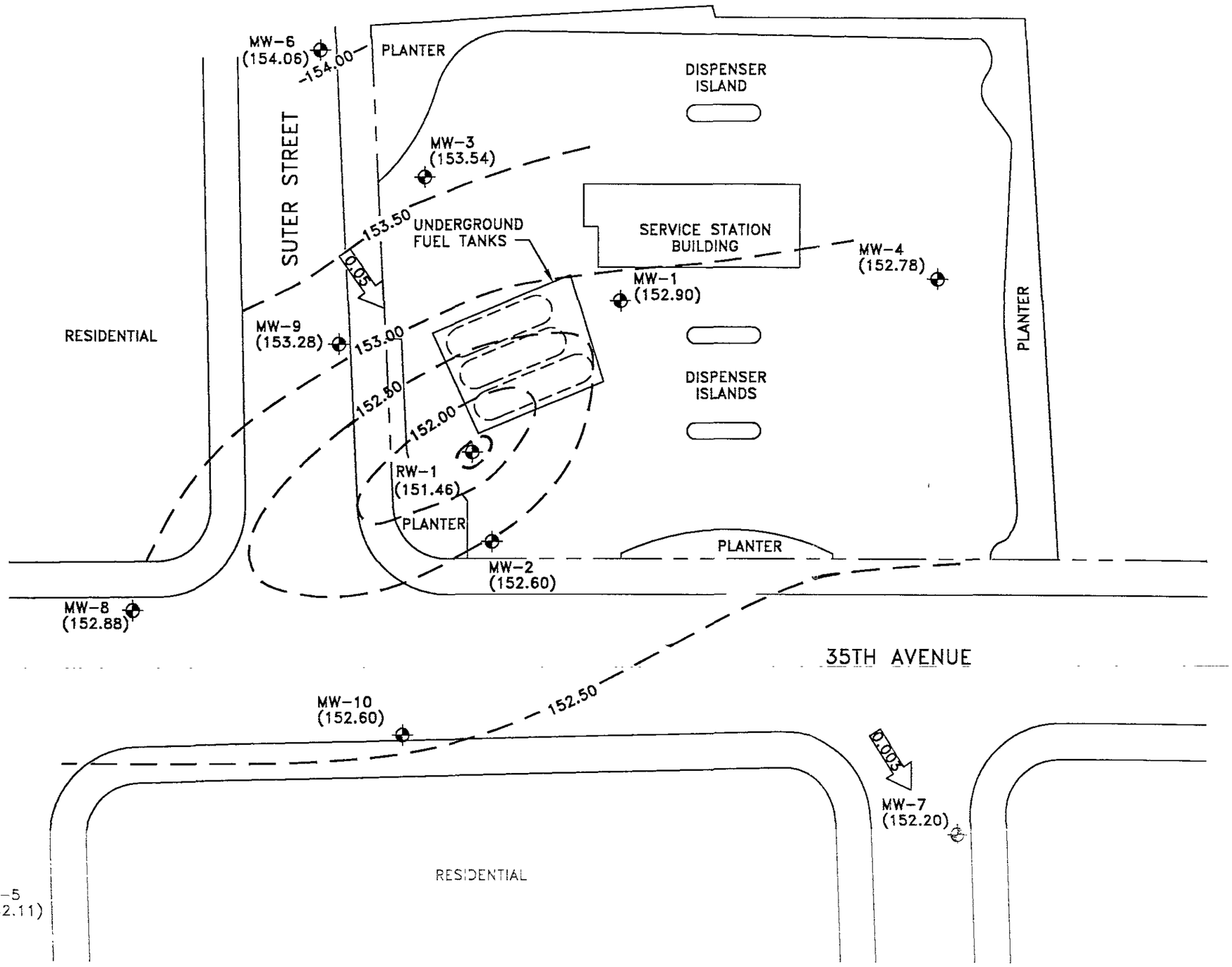
SITE VICINITY MAP

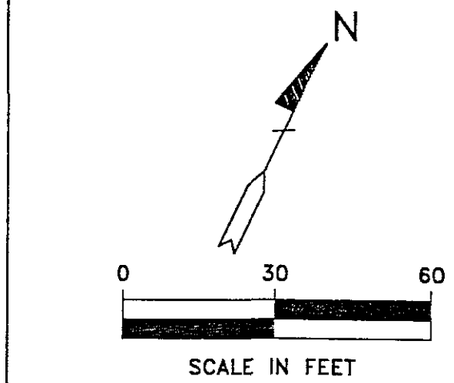
BP OIL SERVICE STATION NO. 11132
3201 35TH AVENUE
OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-024

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

11132-2.DWG 7-28-92 JMG 1=1





LEGEND:

- GROUNDWATER MONITORING WELL
- (152.78) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 153.00 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL – 0.50 FOOT)
- 0.05 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE

FIGURE 2

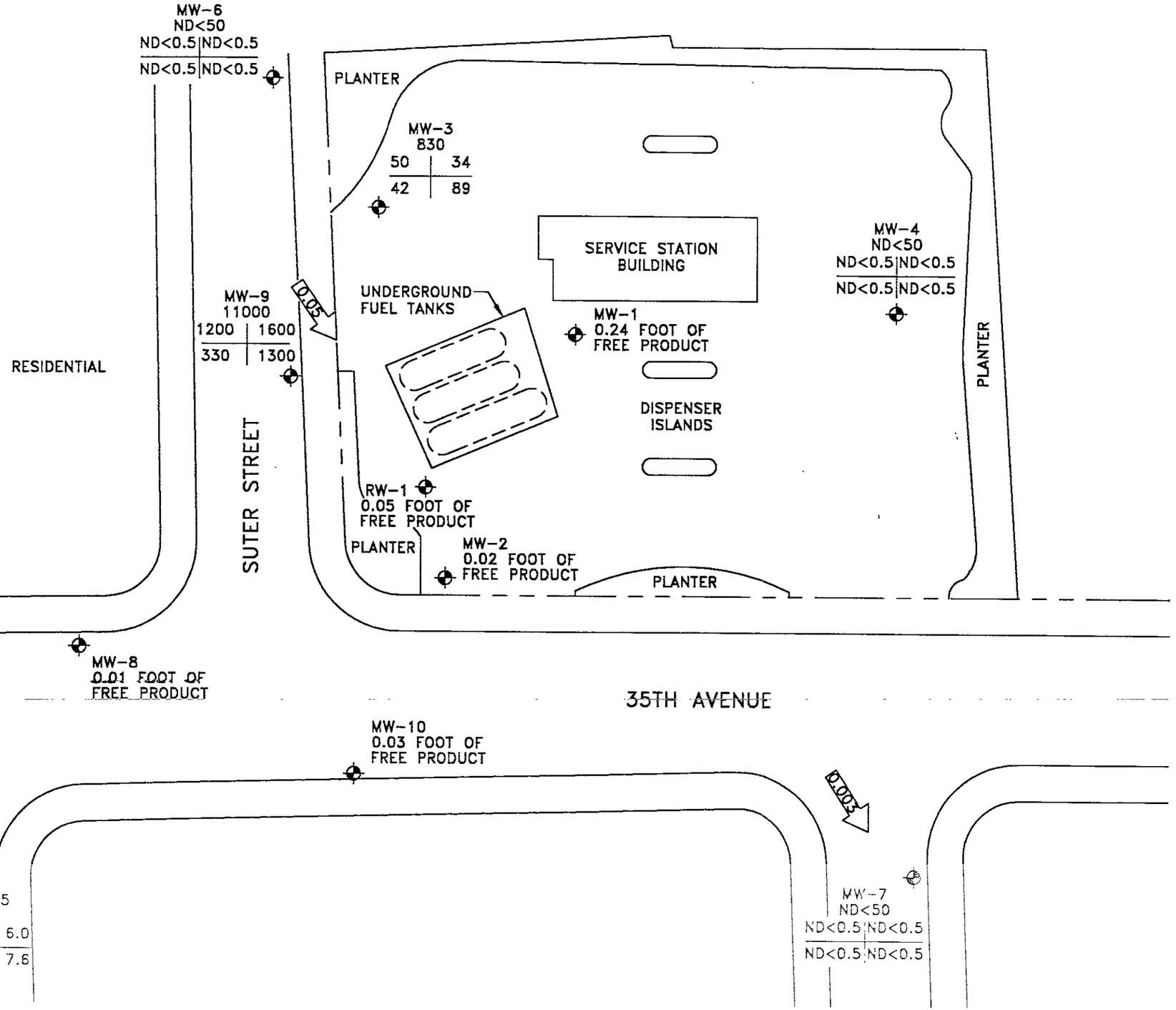
POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP
(JANUARY 13, 1993)

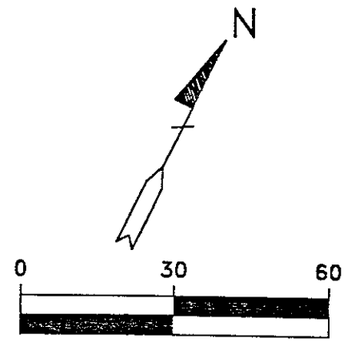
BP OIL SERVICE STATION NO. 11132
3201 35TH STREET
OAKLAND, CALIFORNIA

PROJECT NO. 10-024

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10024022.DWG 2-25-93 RKS 1=60





LEGEND:

⊕	GROUNDWATER MONITORING WELL
TPH-G / B | T / E | X	CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION (PPB)
TPH-G	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
ND	NOT DETECTED ABOVE REPORTED DETECTION LIMIT
0.05 →	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER (JANUARY 13, 1993)

BP OIL SERVICE STATION NO. 11132
3201 35TH STREET
OAKLAND, CALIFORNIA

PROJECT NO. 10-024

ALISTO ENGINEERING GROUP
CONCORD, CALIFORNIA

10024028.DWG 2-25-93 RKY 1=50

APPENDIX A

WATER SAMPLING FIELD SURVEY FORMS

ALISTO ENGINEERING GROUP
GROUNDWATER MONITORING

Client: BP
Alisto Project No: 10-024-01
Service Station No: 11132

Date: 1/13/93
Field Personnel: LCB
Site Address: Oakland, Ca

FIELD ACTIVITY:

___ Groundwater Monitoring
X Groundwater Sampling
___ Well Development

QUALITY CONTROL SAMPLES:

MW-9 ___ QC-1 Sample Duplicate (Well ID)
X QC-2 Trip Blank
___ QC-3 Rinsate Blank

Well ID	Well Diam	Order Measured/ Sampled	Total Depth	Depth to Water	Depth to Product	Product Thick-ness	Comments
MW-1	2"	9	44.08	17.03	16.79	.24	FP
MW-2		10	34.31	15.55	15.53	.02	FP (Black & sticky)
MW-3		4	34.58	13.63	Ø	Ø	
MW-4		3	38.74	17.58			
MW-5		5	30.88	13.03			
MW-6		2	34.56	11.34			
MW-7		1	34.49	15.41	↓	↓	
MW-8		7	38.72	12.87	—	—	small trace of sheen
MW-9	↓	6	29.49	12.92	Ø	Ø	
RW-1	6"	8	38.41	16.59	16.54	.05	FP (Black & sticky)
MW-10	2"	11	34.00	14.43	14.40	.03	FP (Black & sticky)

Notes:
all wells had water runoff inside Monument around the Casing. Also traces of Sheen on runoff water.

FORM: FS2/121592

ALISTO ENGINEERING GROUP
Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 0-024-01
Service Station No: 11132

Date: 1/13/93
Field Personnel: LCB
Address: Oakland, Ca

Well ID: MW-3 Field Activity: ___Well Development X Well Sampling ___Product Bailing

Casing Diameter:

X 2 Inch (0.16 Gal/foot)
___3 Inch (0.37 Gal/foot)
___4 Inch (0.65 Gal/Foot)
___4.5 Inch (0.83 Gal/foot)
___6 Inch (1.47 Gal/foot)

Purge Method:

X Pump (dispos. Poly Tubing)
___Disposable Bailers
___Other
___1.66 PVC Standard Bailer
___3.50 PVC Standard Bailer

Well Data:

0 Depth to Product
0 Product Thickness
13.63 Depth to Water

Sampling Method:

X Disposable Bailer
___Pump

Decontamination Method:

X Triple Rinse (Liquinox)
___ Steam Cleaned

Calculated Purge Volume

34.58 (Total Depth of Well) - 13.63 (Depth to Water) = 20.95 ft (Water Column) X .16 Gal/Ft (Conversion Factor) = 3.35 Gal (Casing Vol) X 3 (Vols to Purge) = 10.05 (Total Volume)

Well Development/Sampling Parameters

Time	Temp °F	pH	Condt (umhos /cm)	Purge Vol (Gal)	Comments/ Turbidity
	65.6	8.20	X1000 .59	2	Clear
	67.8	8.20	.60	4	
	68.8	8.15	.66	6	
	68.3	8.10	.67	8	
	67.9	8.06	.72	10.25	

Analysis Required		Container Type	Preserv.
X	TPH-G/BTEX	VOA	HCL
	TPH-Diesel	Amber Liter	Solvent Rinsed
	EPA 601	VOA	
	TOG 5520BF	Amber Liter	H_2SO_4

Begin 1359 Stop 1404 Sampled 1408

FORM: FS3/121592

ALISTO ENGINEERING GROUP
Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-034-01
Service Station No: 11132

Date: 1/13/93
Field Personnel: LCB
Address: Oakland, CA

Well ID: MW-5 Field Activity: ___Well Development X Well Sampling ___Product Bailing

Casing Diameter:

X 2 Inch (0.16 Gal/foot)
___3 Inch (0.37 Gal/foot)
___4 Inch (0.65 Gal/Foot)
___4.5 Inch (0.83 Gal/foot)
___6 Inch (1.47 Gal/foot)

Purge Method:

X Pump (dispos. Poly Tubing)
___Disposable Bailers
___Other
___1.66 PVC Standard Bailer
___3.50 PVC Standard Bailer

Well Data:

Ø Depth to Product
Ø Product Thickness
13.03 Depth to Water

Sampling Method:

X Disposable Bailer
___Pump

Decontamination Method:

X Triple Rinse (Liquinox)
___Steam Cleaned

Calculated Purge Volume
30.88 (Total Depth of Well) - 13.03 (Depth to Water) = 17.85 ft (Water Column) X .16 Gal/Ft (Conversion Factor) = 2.86 Gal (Casing Vol) X 3 (Vols to Purge) = 8.58 (Total Volume)

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm)	Purge Vol (Gal)	Comments/ Turbidity
			X 1000		
1431	65.2	770	.84	1.75	Clear
1432	65.9	7.68	.85	3.50	
1433	66.2	7.62	.85	5.25	
1434	66.3	7.60	.87	7.00	
1435	66.6	7.59	.88	8.75	

Analysis Required	Container Type	Preserv.
X TPH-G/BTEX	VOA	HCL
TPH-Diesel	Amber Liter	Solvent Rinsed
EPA 601	VOA	
TOG 5520BF	Amber Liter	H_2SO_4

Begin 1430 Stop 1435 Sampled 1447

FORM: 153/121592

ALISTO ENGINEERING GROUP
Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-024-01
Service Station No: 11132

Date: 1/13/93
Field Personnel: LB
Address: Oakland, Ca

Well ID: MW-6 Field Activity: ___Well Development X Well Sampling ___Product Bailing

Casing Diameter:
- X 2 Inch (0.16 Gal/foot)
- ___3 Inch (0.37 Gal/foot)
- ___4 Inch (0.65 Gal/Foot)
- ___4.5 Inch (0.83 Gal/foot)
- ___6 Inch (1.47 Gal/foot)

Purge Method:
- X Pump (dispos. Poly Tubing)
- ___Disposable Bailers
- ___Other
- ___1.66 PVC Standard Bailer
- ___3.50 PVC Standard Bailer

Well Data:
- 0 Depth to Product
- 0 Product Thickness
- 11.34 Depth to Water

Sampling Method:
- X Disposable Bailer
- ___Pump

Decontamination Method:
- X Triple Rinse (Liquinox)
- ___ Steam Cleaned

Calculated Purge Volume: 34.56 (Total Depth of Well) - 11.34 (Depth to Water) = 23.22 ft (Water Column) X .16 (Conversion Factor) Gal/Ft = 3.72 (Casing Vol) Gal X 3 (Vols to Purge) = 11.16 (Total Volume)

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos/cm)	Purge Vol (Gal)	Comments/ Turbidity
			X1000		
1333	65.0	9.12	.51	2.25	clear
1334	65.5	8.90	.38	4.50	
1335	66.6	8.82	.36	6.75	
1336	66.7	8.78	.35	9.00	
1337	66.9	8.72	.32	11.25	

Analysis Required		Container Type	Preserv.
X	TPH-G/BTEX	VOA	HCL
	TPH-Diesel	Amber Liter	Solvent Rinsed
	EPA 601	VOA	
	TOG 5520BF	Amber Liter	H_2SO_4

Begin 1331 Stop 1337 Sampled 1341

FORM: FS3/121592

ALISTO ENGINEERING GROUP
Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-024-01
Service Station No: 11132

Date: 1/13/93
Field Personnel: LCS
Address: Oakland, CA

Well ID: MW-7 Field Activity: ___Well Development X Well Sampling ___Product Bailing

Casing Diameter:

X 2 Inch (0.16 Gal/foot)
___3 Inch (0.37 Gal/foot)
___4 Inch (0.65 Gal/Foot)
___4.5 Inch (0.83 Gal/foot)
___6 Inch (1.47 Gal/foot)

Purge Method:

X Pump (dispos. Poly Tubing)
___Disposable Bailers
___Other
___1.66 PVC Standard Bailer
___3.50 PVC Standard Bailer

Well Data:

0 Depth to Product
0 Product Thickness
15.41 Depth to Water

Sampling Method:

X Disposable Bailer
___Pump

Decontamination Method:

X Triple Rinse (Liquinox)
___Steam Cleaned

Calculated Purge Volume

34.49 (Total Depth of Well) - 15.41 (Depth to Water) = 19.08 ft (Water Column) X .16 (Conversion Factor) Gal/Ft = 3.05 Gal (Casing Vol) X 3 (Vols to Purge) = 9.15 (Total Volume)

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos /cm)	Purge Vol (Gal)	Comments/ Turbidity
			X1000		
1321	65.0	10.10	.51	1.75	Clear
1323	64.9	9.79	.62	3.50	
1324	65.1	9.50	.54	5.50	
1325	65.4	9.25	.63	7.25	
1326	65.9	9.15	.66	9.25	

Analysis Required		Container Type	Preserv.
X	TPH-G/BTEX	VOA	HCL
	TPH-Diesel	Amber Liter	Solvent Rinsed
	EPA 601	VOA	
	TOG 5520BF	Amber Liter	H_2SO_4

Begin 1318 Stop 1326 Sampled 1330

FORM: FS3/121592

ALISTO ENGINEERING GROUP
Groundwater Development and Sampling Form

Client: BP
Alisto Project No: 10-024-01
Service Station No: 11132

Date: 1/13/93
Field Personnel: LB
Address: Oakland, CA

Well ID: MW-9 Field Activity: ___Well Development X Well Sampling ___Product Bailing

Casing Diameter:

X 2 Inch (0.16 Gal/foot)
___3 Inch (0.37 Gal/foot)
___4 Inch (0.65 Gal/Foot)
___4.5 Inch (0.83 Gal/foot)
___6 Inch (1.47 Gal/foot)

Purge Method:

X Pump (dispos. Poly Tubing)
___Disposable Bailers
___Other
___1.66 PVC Standard Bailer
___3.50 PVC Standard Bailer

Well Data:

0 Depth to Product
0 Product Thickness
12.92 Depth to Water

Sampling Method:

X Disposable Bailer
___Pump

Decontamination Method:

X Triple Rinse (Liquinox)
___Steam Cleaned

Calculated Purge Volume

29.47 (Total Depth of Well) - 12.92 (Depth to Water) = 16.57 ft (Water Column) X .16 Gal/Ft (Conversion Factor) = 2.65 Gal (Casing Vol) X 3 (Vols to Purge) = 7.95 (Total Volume)

Well Development/Sampling Parameters

Time	Temp °F	pH	Cond. (umhos /cm)	Purge Vol (Gal)	Comments/ Turbidity
1412	66.2	7.66	X1000 .90	1.75	Clear
1413	67.8	7.44	1.23	3.50	
1414	68.1	7.40	1.26	5.50	
1415	68.5	7.35	1.31	7.25	
1416	68.3	7.29	1.33	8.00	

Analysis Required	Container Type	Preserv.
TPH-G/BTEX	VOA	HCL
TPH-Diesel	Amber Liter	Solvent Rinsed
EPA 601	VOA	
TOG 5520BF	Amber Liter	H_2SO_4

Begin 1412 Stop 1416 Sampled 1421

QC-1 Dup. 9156 taken from this well

FORM: FS3/121592

APPENDIX B

LABORATORY REPORT AND CHAIN OF CUSTODY RECORD

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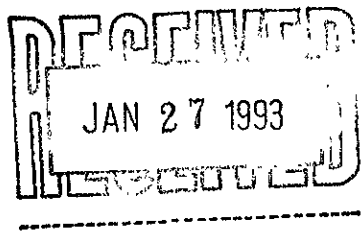
REPORT OF LABORATORY ANALYSIS

January 25, 1993



Mr. Brady Nagle
Alisto Engineering Group
1000 Burnett Ave., Ste. 420
Concord, CA 94520

RE: PACE Project No. 430115.506
Client Reference: BP Station # 11132

Dear Mr. Nagle:

Enclosed is the report of laboratory analyses for samples received January 15, 1993.

Footnotes are given at the end of the report.

If you have any questions concerning this report, please feel free to contact us.

Sincerely,

Stephanie Matzo

Stephanie Matzo
Project Manager

Enclosures

11 Digital Drive
Novato, CA 94949
TEL: 415 883 6100
FAX 415 883 2673

pace INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

Alisto Engineering Group
1000 Burnett Ave., Ste. 420
Concord, CA 94520

January 25, 1993
PACE Project Number: 430115506

Attn: Mr. Brady Nagle

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277523	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			QC-2	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	0.5	ND	01/19/93
Toluene	ug/L	0.5	ND	01/19/93
Ethylbenzene	ug/L	0.5	ND	01/19/93
Xylenes, Total	ug/L	0.5	ND	01/19/93

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FAX. 415 883 2673

Mr. Brady Nagle
Page 2

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277531	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			MW-7	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	0.5	ND	01/19/93
Toluene	ug/L	0.5	ND	01/19/93
Ethylbenzene	ug/L	0.5	ND	01/19/93
Xylenes, Total	ug/L	0.5	ND	01/19/93

PACE INCORPORATED
THE ASSURANCE OF QUALITY

REPORT OF LABORATORY ANALYSIS

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277540	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			MW-6	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	0.5	ND	01/19/93
Toluene	ug/L	0.5	ND	01/19/93
Ethylbenzene	ug/L	0.5	ND	01/19/93
Xylenes, Total	ug/L	0.5	ND	01/19/93

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REPORT OF LABORATORY ANALYSIS

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277558	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			MW-4	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	ND	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	0.5	ND	01/19/93
Toluene	ug/L	0.5	ND	01/19/93
Ethylbenzene	ug/L	0.5	ND	01/19/93
Xylenes, Total	ug/L	0.5	ND	01/19/93

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REPORT OF LABORATORY ANALYSIS

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277566	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			MW-3	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	830	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	0.5	50	01/19/93
Toluene	ug/L	0.5	34	01/19/93
Ethylbenzene	ug/L	0.5	42	01/19/93
Xylenes, Total	ug/L	0.5	89	01/19/93

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REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
Page 6

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277574	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			MW-5	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	50	180	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	0.5	59	01/19/93
Toluene	ug/L	0.5	6.0	01/19/93
Ethylbenzene	ug/L	0.5	1.8	01/19/93
Xylenes, Total	ug/L	0.5	7.6	01/19/93

REPORT OF LABORATORY ANALYSIS

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277582	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			MW-9	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	1000	11000	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	10	1200	01/19/93
Toluene	ug/L	10	1700	01/19/93
Ethylbenzene	ug/L	10	340	01/19/93
Xylenes, Total	ug/L	10	1400	01/19/93

REPORT OF LABORATORY ANALYSIS

Mr. Brady Nagle
Page 8

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PACE Sample Number:			70 0277590	
Date Collected:			01/13/93	
Date Received:			01/15/93	
Client Sample ID:			Qc-1	
Parameter	Units	MDL		DATE ANALYZED
ORGANIC ANALYSIS				
PURGEABLE FUELS AND AROMATICS				
TOTAL FUEL HYDROCARBONS, (LIGHT):			-	01/19/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/L	1000	11000	01/19/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	01/19/93
Benzene	ug/L	10	1200	01/19/93
Toluene	ug/L	10	1600	01/19/93
Ethylbenzene	ug/L	10	330	01/19/93
Xylenes, Total	ug/L	10	1300	01/19/93

These data have been reviewed and are approved for release.

Darrell C. Cain
Regional Director

11 Digital Drive
Novato, CA 94949
TEL: 415-883-6100
FAX 415 883 2673

Client Reference: BP Station # 11132

MDL Method Detection Limit
ND Not detected at or above the MDL.

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Mr. Brady Nagle
Page 10

QUALITY CONTROL DATA

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PURGEABLE FUELS AND AROMATICS
Batch: 70 18221
Samples: 70 0277574, 70 0277582, 70 0277590

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	1000	96%	99%	3%
Benzene	ug/L	0.5	40.0	99%	98%	1%
Toluene	ug/L	0.5	40.0	98%	96%	2%
Ethylbenzene	ug/L	0.5	40.0	101%	98%	3%
Xylenes, Total	ug/L	0.5	120	103%	100%	2%

Mr. Brady Nagle
Page 11

QUALITY CONTROL DATA

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

PURGEABLE FUELS AND AROMATICS
Batch: 70 18246
Samples: 70 0277523, 70 0277531, 70 0277540, 70 0277558, 70 0277566

METHOD BLANK:

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/L	0.5	ND
Toluene	ug/L	0.5	ND
Ethylbenzene	ug/L	0.5	ND
Xylenes, Total	ug/L	0.5	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M	ug/L	50	1000	98%	93%	5%
Benzene	ug/L	0.5	40.0	93%	93%	0%
Toluene	ug/L	0.5	40.0	93%	93%	0%
Ethylbenzene	ug/L	0.5	40.0	98%	98%	0%
Xylenes, Total	ug/L	0.5	120	99%	98%	1%

Mr. Brady Nagle
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FOOTNOTES
for pages 10 through 11

January 25, 1993
PACE Project Number: 430115506

Client Reference: BP Station # 11132

MDL Method Detection Limit
ND Not detected at or above the MDL.
RPD Relative Percent Difference

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B.P. OIL MARKETING COMPANY

33305 First Way South, Federal Way, WA 98003

CHAIN OF CUSTODY

Novato, CA, 11 Digital Drive, 94949
Phone: (415) 883-6100 Fax: (415) 883-2673

130115-105

Consultant's Name: Alisto Engineering Group — Page 1 of 1

Address: 1000 Burnett Ave #420, Concord, Ca 94520

Project Contact: Brady Nagle — Consultant Project #: 10-024-01 — Phone #: (510)798-4070 Fax #: 798-4099

Sampled by (print): Larry Buenvenida — Sampler's Signature: Larry Buenvenida

Shipment Method: Courier — B.P. Site Location #: 11132 — B.P. Site Location: Oakland

TAT: ☐ 24 hr ☐ 48 hr ☐ 72 hr ☒ Standard (10 day)

Sample Condition as Received
Temperature ° C: _____
Cooler #: _____
Inbound Seal Yes No
Outbound Seal Yes No

Sample Description	Collection Date/Time	Matrix Soil/Water	Prsv	# of Cont	PACE Sample #	TPH/GAS/BTEX EPA 8015/8020	TPH/Diesel EPA 8015	Oil & Grease SM 5520	HVOC 8010	COMMENTS
QC-2	1/13/93 1328	W	HCl	2	27752.9	X				
MW-7	1330			3	53.1					
MW-6	1341				54.0					
MW-4	1357				55.8					
MW-3	1408				56.8					
MW-5	1447				57.4					
MW-9	1421				58.2					
QC-1	1423				59.0					

Relinquished by/Affiliation	Date	Time	Accepted by/Affiliation	Date	Time	Additional Comments:
Larry Buenvenida	1/13/93	1425	Ed Hatty - Pace	1/15	1425	
Ed Hatty - Pace	1/15	1710	Lia Stone PACE	1/15/93	1710	

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GROUNDWATER MONITORING AND SAMPLING REPORT

BP Oil Company Service Station No. 11132
3201 35th Street
Oakland, California

Project No. 10-024-02-001

September 9, 1993

INTRODUCTION

This report presents the results and findings of the July 12, 1993 groundwater monitoring and sampling conducted by Alisto Engineering Group at BP Oil Company Service Station No. 11132, 3201 35th Street, Oakland, California. A site vicinity map is shown in Figure 1.

FIELD PROCEDURES

Field activities were performed in accordance with the procedures and guidelines of the Alameda County Health Care Services Agency and the California Regional Water Quality Control Board, San Francisco Bay Region.

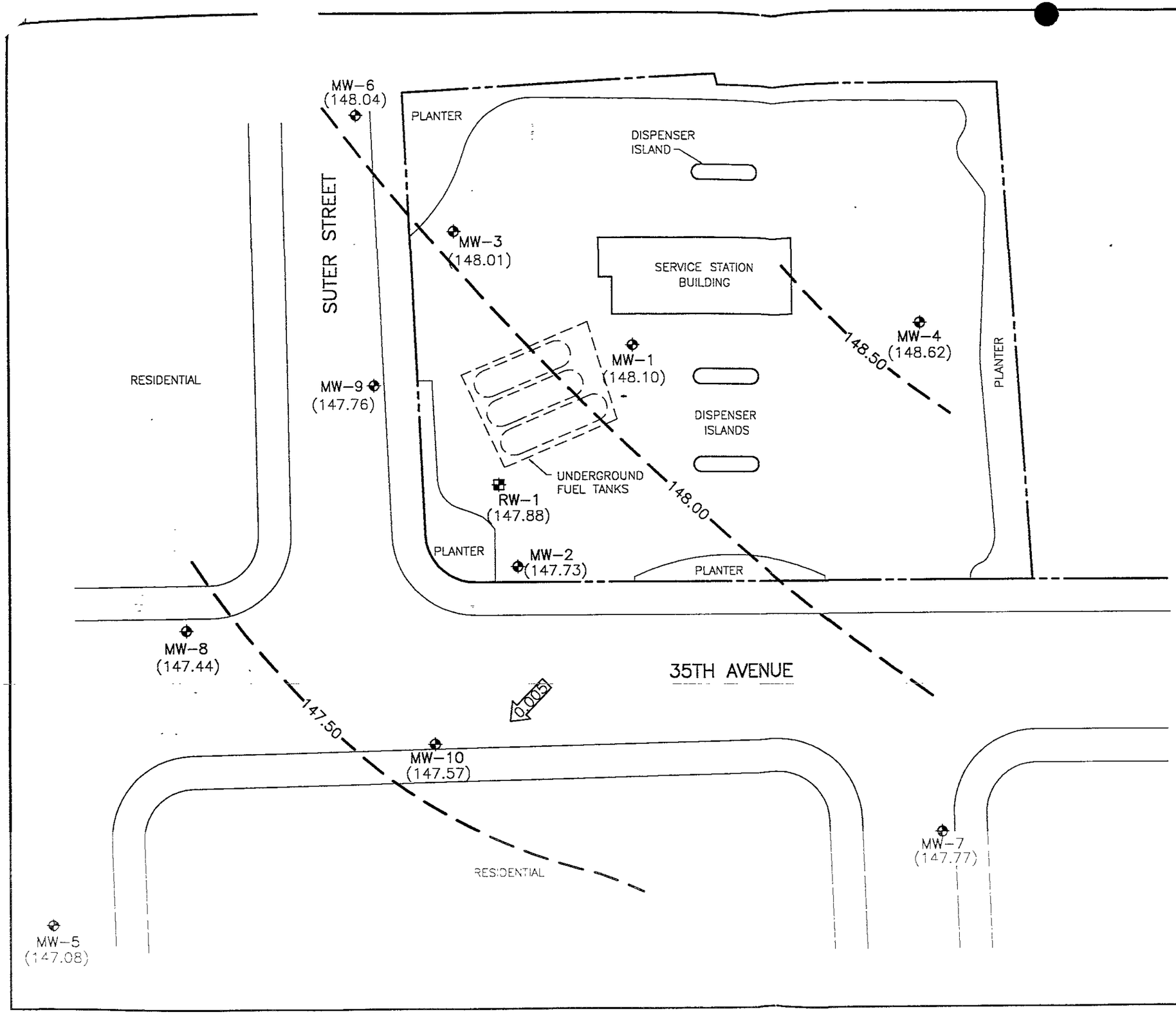
Before purging and sampling, the groundwater level in each well was measured from a permanent mark on the top of the casing to the nearest 0.01 foot using an electronic sounder. The depth to groundwater and top of casing elevation data were used to calculate the groundwater elevation in each well relative to mean sea level. The survey data and groundwater elevation measurements collected to date are presented in Table 1.

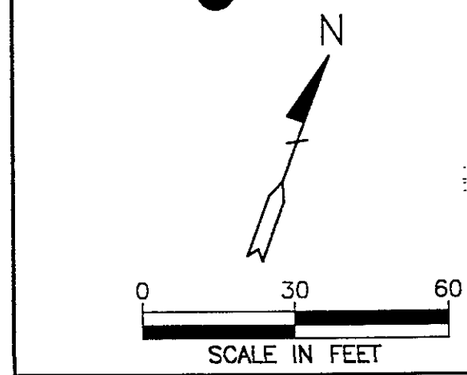
Before sample collection, each well was purged of 3 casing volumes, while recording field readings of pH, temperature, and electrical conductivity. Groundwater samples were collected for laboratory analysis by lowering a bottom-fill, disposable bailer to just below the water level in the well. The samples were transferred from the bailer into laboratory-supplied containers. The water sampling field survey forms are presented in Appendix A.

SAMPLING AND ANALYTICAL RESULTS

The results of monitoring and laboratory analysis of the groundwater samples for this and previous quarters are summarized in Table 1. The potentiometric groundwater elevations as interpreted from the results of this monitoring event are shown in Figure 2. Concentrations of petroleum hydrocarbons detected in the groundwater samples are shown in Figure 3. The laboratory report and chain of custody record are presented in Appendix B.

Separate-phase product has been removed from MW-2, MW-10, and RW-1 using a passive product recovery system (PPRS) and manual bailing. During this quarter, less than one gallon of viscous, weathered product was removed from the wells. A remediation system is currently being installed at the site. The PPRS was removed from RW-1 in July 1993 to accommodate a product removal pump.





LEGEND

- GROUNDWATER MONITORING WELL
- GROUNDWATER RECOVERY WELL
- (148.62) GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL
- 148.50 GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MEAN SEA LEVEL (CONTOUR INTERVAL–0.50 FOOT)
- 0.005 CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 2

POTENTIOMETRIC GROUNDWATER ELEVATION CONTOUR MAP

JULY 12, 1993

BP OIL SERVICE STATION NO. 11132
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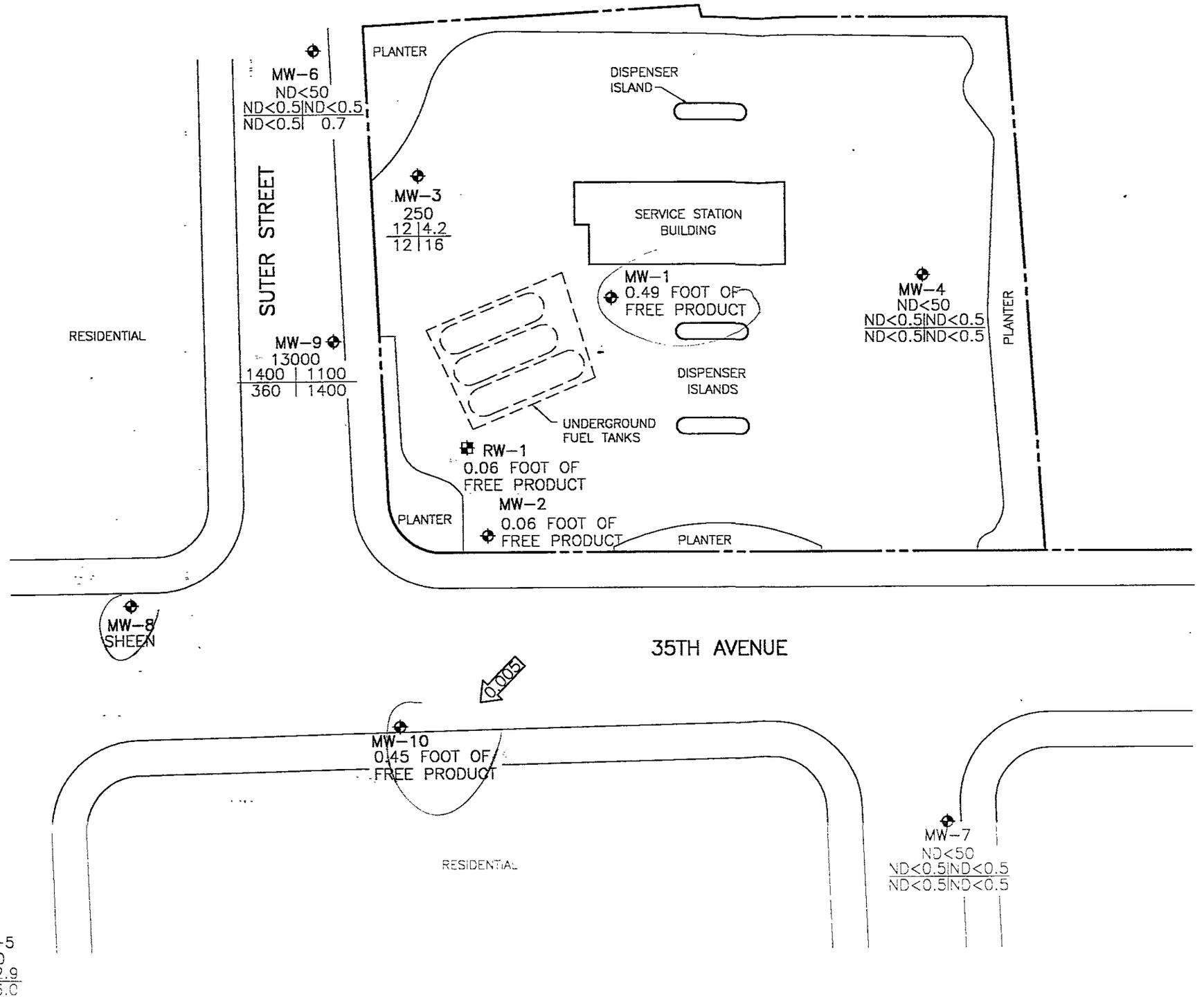
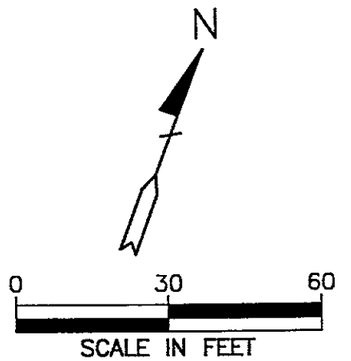
OAKLAND, CALIFORNIA

PROJECT NO. 10–024

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10024(1) G.DWG 8-11-93 ROW 1=30





LEGEND

⊕	GROUNDWATER MONITORING WELL
⊞	GROUNDWATER RECOVERY WELL
TPH–G / B | T / E | X	CONCENTRATION OF CONSTITUENTS IN PARTS PER BILLION
TPH–G	TOTAL PETROLEUM HYDROCARBONS AS GASOLINE
B	BENZENE
T	TOLUENE
E	ETHYLBENZENE
X	TOTAL XYLENES
ND	NOT DETECTED ABOVE REPORTED DETECTION LIMIT
⇦ 0.005	CALCULATED GROUNDWATER GRADIENT DIRECTION AND MAGNITUDE IN FOOT PER FOOT

FIGURE 3

CONCENTRATIONS OF PETROLEUM HYDROCARBONS IN GROUNDWATER

JULY 12, 1993

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