

**MEMORANDUM**

**To:** Mr. Don Hwang  
Alameda County Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California 94502-6577

**From:** David Nanstad  
Harding ESE  
28 Second Street, Suite 700  
San Francisco, California 94105

JUN 20 2002

**Date:** June 7, 2002

**Subject:** First Quarter 2002 Quarterly Monitoring Report  
BPS Reprographic Services Facility  
1700 Jefferson Street  
Oakland, California

**Project Number:** 53087 Task 4

Dear Mr. Hwang,

This memo is to inform you that the attached report is being submitted past the typical due date because of delays associated with contract renewal between BPS Services and Harding ESE. I informed you that the report would be submitted after the typical due date during our April 12, 2002, telephone conversation. During our telephone conversation, you indicated that it was acceptable to submit the report past the due date and to include with the report the explanation I described during our telephone conversation.

The remaining quarterly reports for 2002 are back on schedule for delivery to you by their respective due dates. BPS Reprographic Services and Harding ESE appreciates your patience on this matter.

Please feel free to call me with any questions at (415) 278-2118.

DSN/1Q02-DSNanstad

**Attachment:** Quarterly Groundwater Remediation and Monitoring Report  
January 1 through April 23, 2002  
BPS Reprographic Services Facility  
1700 Jefferson Street  
Oakland, California



Engineering and Environmental Services  
90 Digital Drive  
Novato, CA 94949 - (415) 883-0112



**Harding ESE**

A MACTEC COMPANY

**Harding ESE, Inc.**  
28 Second Street  
Suite 700  
San Francisco, CA 94105  
Telephone: 415/543-8422  
Fax: 415/777-9706  
Home Page: www.mactec.com

June 7, 2002

Project 53087.4

Mr. Jeff Christoff  
Blue Print Service Company  
149 Second Street  
San Francisco, California 94105

JUN 20 2002

**Quarterly Groundwater Remediation and Monitoring Report  
January 1 through April 23, 2002  
BPS Reprographic Services Facility  
1700 Jefferson Street  
Oakland, California**

Dear Mr. Christoff:

Harding ESE, Inc, (Harding) presents this quarterly status letter-report on the groundwater monitoring and remedial activities at the BPS Reprographic Services (BPS) facility located at 1700 Jefferson Street in Oakland, California (Plate 1). This letter-report covers the period from January 1 through April 23, 2002, and was prepared to satisfy the quarterly groundwater monitoring requirements of the Alameda County Department of Environmental Health Services (County).

**BACKGROUND**

Three underground gasoline storage tanks were removed from the property in 1987 and a preliminary soil and groundwater investigation indicated that a release of fuel into the subsurface had occurred. Three groundwater-monitoring wells (MW-1, MW-2, and MW-3) were installed on the property to evaluate the distribution of petroleum hydrocarbons in the groundwater and to determine the direction of groundwater flow. Free phase hydrocarbon (FPH) was found in MW-1. Groundwater level measurements indicated that the local groundwater gradient was in a north to northwest direction.

In November 1987, monitoring well MW-2 was abandoned to facilitate the construction of the present BPS facility and, in January 1988, two additional wells, MW-1A and MW-4, were installed as groundwater extraction wells. Harding also installed one offsite monitoring well, MW-5, in August 1988 and a second offsite well, MW-6, in April 1996. The monitoring well locations are shown on Plate 1.

In 1992, a groundwater extraction system was constructed at the site to remove FPH from the groundwater surface. Groundwater was extracted from MW-1A and MW-4 and passed through an oil-water separator that removed the FPH. The water was then drawn into a 3,000-gallon bioreactor tank for treatment by hydrocarbon reducing microbes. Air and nutrients were supplied to the water within the bioreactor to facilitate microbial growth. The treated water from the bioreactor was pumped in batches of approximately 500 gallons through three granular activated carbon vessels before discharge under a wastewater discharge permit from the East Bay Utility District to the sanitary sewer. The treatment system processed approximately 1,385,490 gallons of groundwater and an estimated 5,062 pounds of FPH were recovered.

By 1999, the oil-water separator was no longer recovering FPH and FPH was no longer present in any of the groundwater monitoring wells. Dissolved hydrocarbon concentrations were decreasing and Harding requested approval from The County to terminate groundwater extraction and to modify the remediation technique to insitu-bioremediation using an oxygen-releasing compound (ORC™). ORC™ is manufactured and distributed by Regensis, Inc.; its purpose is to increase the concentration of dissolved oxygen (DO) in the groundwater and to augment the ability of naturally occurring microbial organisms in the groundwater to biodegrade the dissolved petroleum hydrocarbons. The County approved this plan in a letter dated September 28, 1999, following the submittal of an ORC™ calculation sheet and a Groundwater Monitoring Plan, dated September 23, 1999.

Harding implemented the *in situ* remediation technique by placing ORC™ in treatment wells: MW-1A, MW-3, MW-4, and MW-5 on September 29, 1999. The ORC™ is contained in fabric "socks" which release oxygen over time until the compound's oxygen releasing potential is depleted. Harding installed five socks in each treatment well at the approximate depth of the well's screened interval. The Groundwater Monitoring Plan outlined procedures for groundwater sampling using a non-purge method approved by the Regional Water Quality Control Board in a letter dated January 31, 1997. The first quarter that the new Groundwater Monitoring Plan was implemented, sampling included duplicate sampling using both the purge and non-purge methods (see Harding's quarterly report, dated October 25, 1999).

#### **FIRST QUARTER 2002 GROUNDWATER SAMPLING AND ANALYSIS**

In accordance with the Groundwater Monitoring Plan, Harding removed the ORC™ socks approximately two weeks before the scheduled sampling event from Wells MW-3 and MW-5 on April 10, 2002. The dissolved oxygen (DO) was measured in-situ in wells MW-3, MW-5, MW-1 and MW-6. The DO measurements are presented in Table 1.

On April 23, 2001, Harding conducted the quarterly groundwater sampling of wells MW-1, MW-3, MW-5, and MW-6 using the non-purge method outlined in the Groundwater Monitoring Plan. Prior to

sampling, Harding measured the depth to groundwater from the top of casing (TOC) of each well using an electronic water level indicator. These measurements are displayed on Plate 2 and tabulated in Table 2. To collect the groundwater samples, Harding raised dedicated Teflon tubing contained in each well until the submerged end of the tubing was 2 to 4 feet below the groundwater surface and connected the dry end of the tubing to a peristaltic pump with silicon tubing. New silicon tubing was used to sample each well. After removing the approximate volume of groundwater equal to the volume capacity of the Teflon tubing, Harding measured the groundwater's conductivity, pH, DO, and temperature and collected a sample in laboratory provided 40-milliliter vials. The groundwater parameter measurements are also presented in Table 1.

Immediately after sample collection, Harding labeled and stored the samples in a cooler with ice. The groundwater samples were kept chilled until submitted to Sequoia Analytical Laboratory (Sequoia), a California state-certified laboratory, under chain-of-custody protocol for the following analyses:

- Total petroleum hydrocarbons as gasoline (TPHg) in accordance with EPA Method 8015 modified;
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) in accordance with EPA Method 8020.
- Methyl tertiary butyl ether (MTBE) in accordance with EPA Method 8020 with confirmation of detections by EPA Method 8260.

The analytical results are displayed on Plates 3 and 4. The laboratory reports are presented in the Appendix.

Upon completion of the groundwater sampling, Harding installed 5 new ORC™ socks in well MW-3 and MW-5. Harding left the ORC™ socks in MW-1A and MW-4 undisturbed where they will remain until the next quarterly monitoring event. Presently, the ORC™ socks are replaced in the treatment wells on six-month intervals.

## DISCUSSION

As shown in Table 2 and on Plate 5, the groundwater surface elevation increased an average of 0.82 feet across the site as compared to last quarter's measurements. Using the groundwater elevations from MW-3, MW-5, and MW-6 as measured on April 23, 2001, groundwater contours were created and are shown on Plate 2. During the first quarter 2002 monitoring event no groundwater elevation data was collected from monitoring point MW-1, however, groundwater elevation data from MW-1 will continue to be collected next quarter. Based on the groundwater elevations, the groundwater gradient ranges from 0.005 to 0.007 ft/ft from the west to southwest. At the time MW-5 was constructed, the groundwater flow direction was reportedly north to northwest, and MW-5 was considered a downgradient well. However, presumably because of the construction of new buildings in the immediate vicinity, which

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Mr. Jeff Christoff  
BPS Reprographic Services  
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extend below the groundwater surface, recent groundwater monitoring has indicated the groundwater flow has been in a west to southwest direction.

Table 3 displays a summary of historical groundwater sample results through September 29, 1999, when the typical purge and sample protocol was terminated. Table 4 displays historical groundwater sample results since instituting *in situ* bioremediation and a non-purge sampling protocol. Plate 3 and Plate 4 present the sample results from this quarter's sampling event.

As shown on Table 4 and Plate 3, concentrations of TPH-g, BTEX and MTBE remained within the range of historical values for all the wells sampled. However, the groundwater sample collected from MW-3 contained the lowest concentration of Xylenes (total) monitored to date at 1.4 µg/L (detection limit 0.5 µg/L) since monitoring of this well began in August, 1991.

A laboratory provided trip blank consisting of organic free water was transported to and from the sampling site with the samples described above. The trip blank was analyzed for TPH-g, BTEX and MTBE with the groundwater samples using EPA Method 8015M/8020M. The trip blank was found to be free of contamination.

The DO content in the groundwater in wells MW-3 and MW-5 immediately following the removal of the ORC™ socks were 0.6 and 0.2 milligrams per liter (mg/l) respectively. The DO content in both wells remained approximately the same after two weeks (0.4 mg/L in well MW-3 and 0.9 mg/L in well MW-5). The low DO concentration upon removal of the ORC™ socks suggests that the ORC™ socks were depleted and ready to be replaced as discussed under the Recommendations section of this report.

## RECOMMENDATIONS

Harding recommends continued quarterly monitoring utilizing the procedures outlined in our Groundwater Monitoring Plan. ORC™ socks will continue to be replaced on six-month intervals to promote continued biodegradation of the residual petroleum hydrocarbons. Based on this interval, Harding will replace the ORC™ socks in MW-3 and MW-5 next quarter.

Harding recommends that Blue Print Services send a copy of this report to the following address:

Mr. Don Hwang  
Alameda County  
Environmental Health Services  
1131 Harbor Bay Parkway, Suite 250  
Alameda, California, 94502-6577

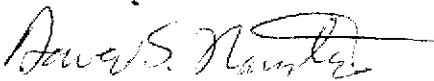
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BPS Reprographic Services  
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While under contract to BPS, Harding will continue to provide quarterly groundwater monitoring and reporting as required by The County.

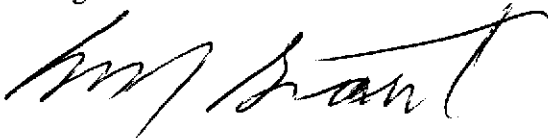
If you have any questions, please contact the undersigned at (415) 278-2118.

Sincerely,

**HARDING LAWSON ASSOCIATES**



David S. Nanstad  
Project Engineer





Miles Grant, R.G.  
Senior Geologist

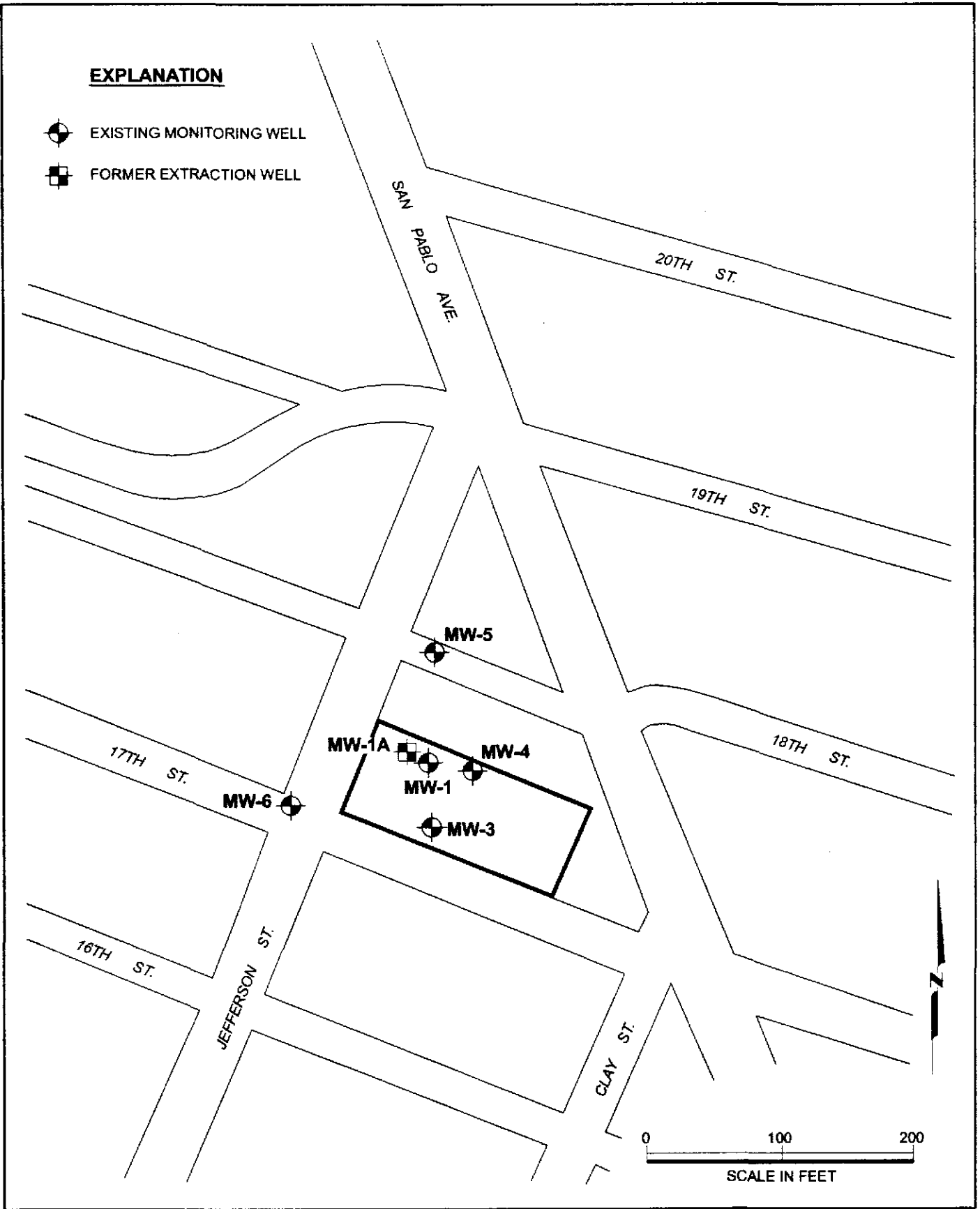
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Attachments: Table 1 – Groundwater Parameters  
Table 2 – Groundwater Elevation Data  
Table 3 – Historical Groundwater Monitoring Analytical Results - Using Purge Method  
Table 4 – Groundwater Monitoring Analytical Results – Non-Purge Method  
Plate 1 – Site Map  
Plate 2 – Groundwater Contours, December 26, 2001  
Plate 3 – TPH-g, BTEX and MTBE Concentrations in Groundwater, December 26, 2001  
Plate 4 – BTEX and DO Results  
Plate 5 – Groundwater Elevation Data  
Appendix A – Laboratory Reports  
Appendix B – Groundwater Sampling Forms  
Table B1. Sample Location/Sample Description Cross-Reference

**EXPLANATION**

-  EXISTING MONITORING WELL
-  FORMER EXTRACTION WELL



**Harding ESE**  
A MACTEC COMPANY

Site Map  
April 23, 2002  
1700 Jefferson Street  
BPS Reprographic Services Facility  
Oakland, California

PLATE

**1**

DRAWN  
CN

PROJECT NUMBER  
53087 004

APPROVED

DATE  
6/02

REVISED DATE

**EXPLANATION**



EXISTING MONITORING WELL



FORMER EXTRACTION WELL

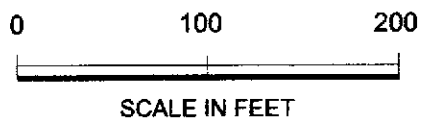
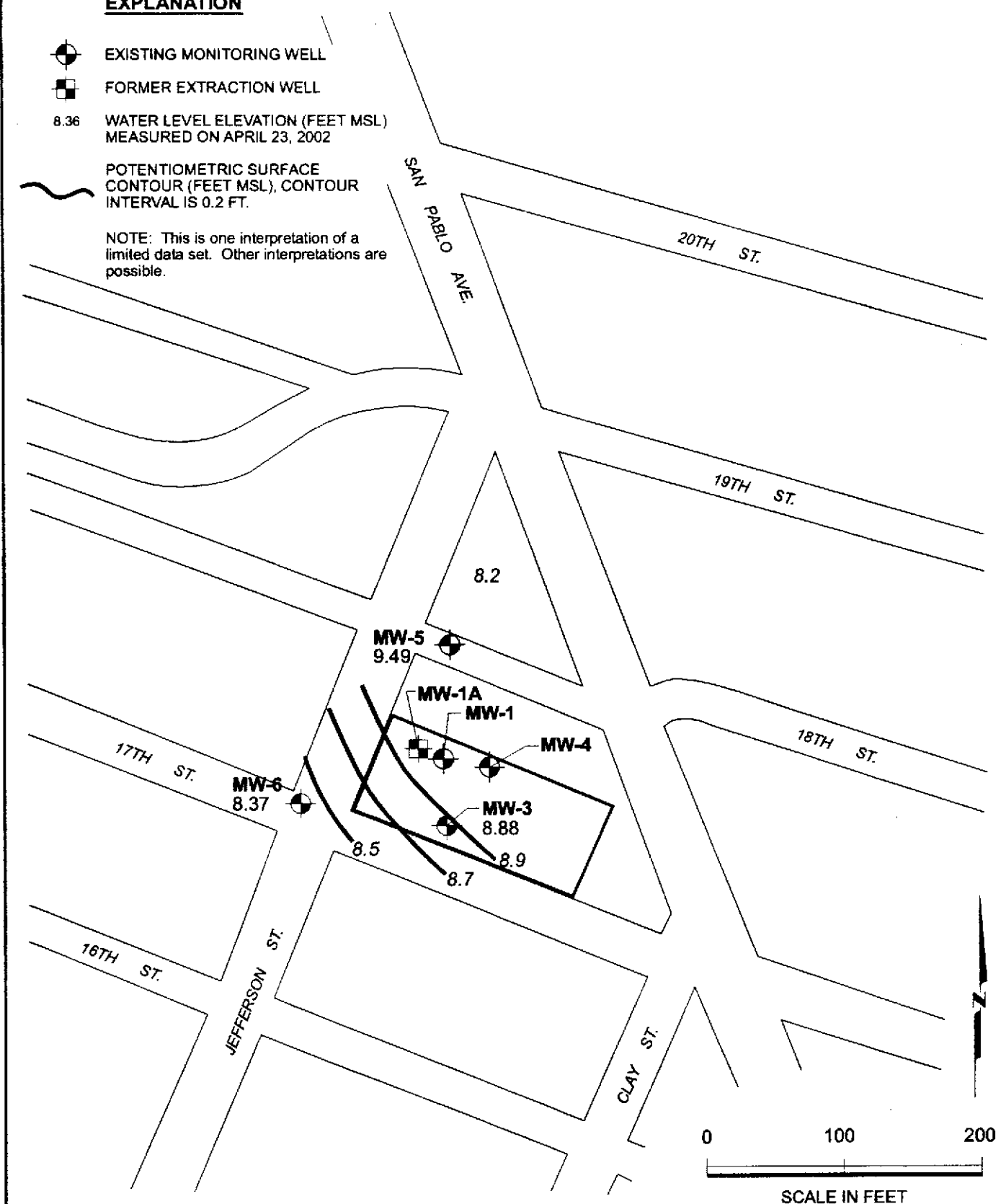
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WATER LEVEL ELEVATION (FEET MSL)  
MEASURED ON APRIL 23, 2002



POTENTIOMETRIC SURFACE  
CONTOUR (FEET MSL), CONTOUR  
INTERVAL IS 0.2 FT.

NOTE: This is one interpretation of a  
limited data set. Other interpretations are  
possible.



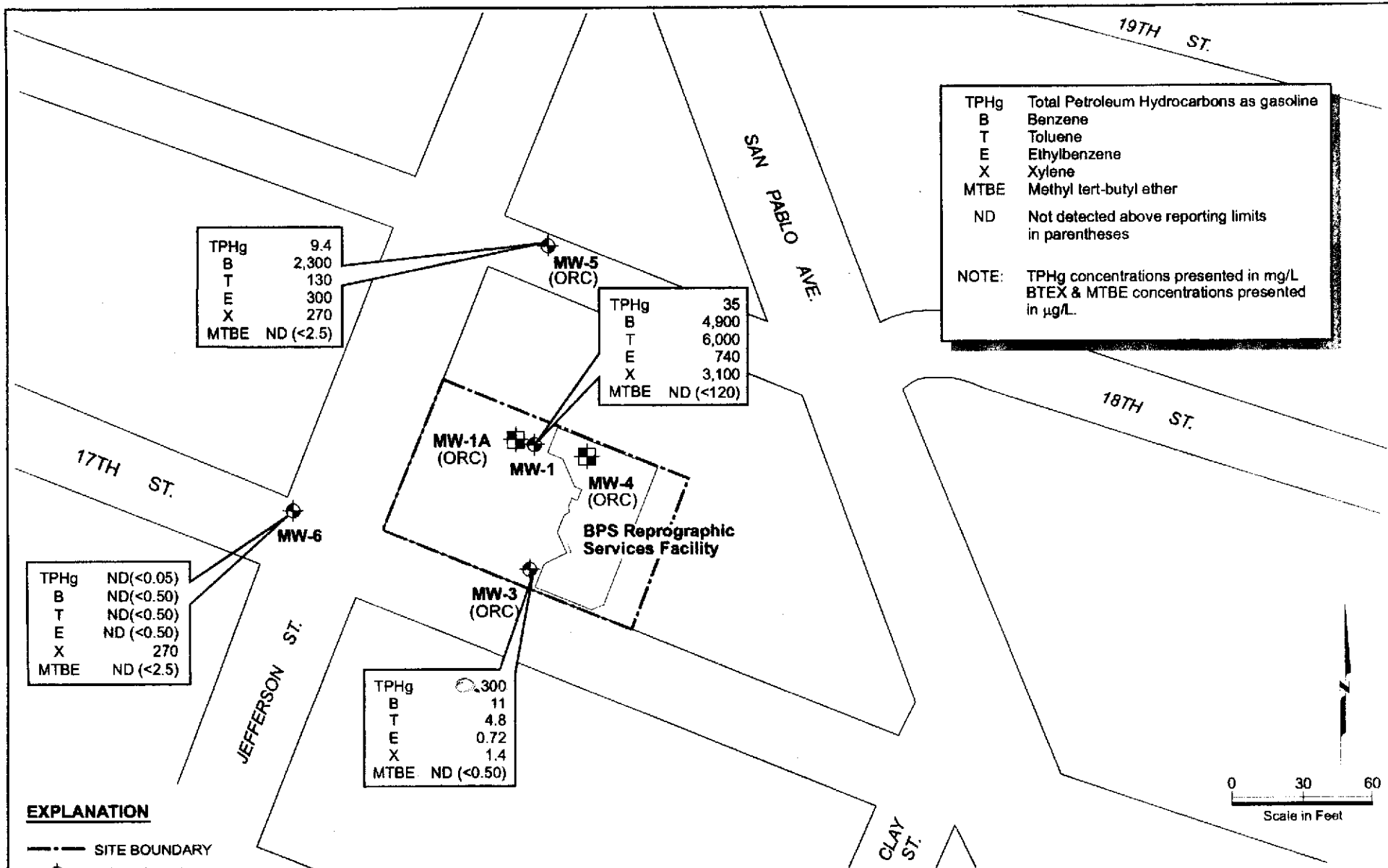
**Harding ESE**  
A MACTEC COMPANY

Groundwater Contours  
April 23, 2002  
1700 Jefferson Street  
BPS Reprographic Services Facility  
Oakland, California

PLATE  
**2**

DRAWN CN	PROJECT NUMBER 53087 004	APPROVED	DATE 6/02	REVISED DATE
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TPHg Total Petroleum Hydrocarbons as gasoline  
 B Benzene  
 T Toluene  
 E Ethylbenzene  
 X Xylene  
 MTBE Methyl tert-butyl ether  
 ND Not detected above reporting limits in parentheses

NOTE: TPHg concentrations presented in mg/L  
 BTEX & MTBE concentrations presented in µg/L.

TPHg	9.4
B	2,300
T	130
E	300
X	270
MTBE	ND (<2.5)

TPHg	35
B	4,900
T	6,000
E	740
X	3,100
MTBE	ND (<120)

TPHg	ND(<0.05)
B	ND(<0.50)
T	ND(<0.50)
E	ND (<0.50)
X	270
MTBE	ND (<2.5)

TPHg	300
B	11
T	4.8
E	0.72
X	1.4
MTBE	ND (<0.50)

**EXPLANATION**

- SITE BOUNDARY
- ⊕ MONITORING WELL
- ⊞ FORMER EXTRACTION WELL
- (ORC) OXYGEN RELEASING COMPOUND INSTALLATION WELL
- mg/L MILIGRAMS PER LITER
- µg/L MICROGRAMS PER LITER

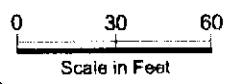


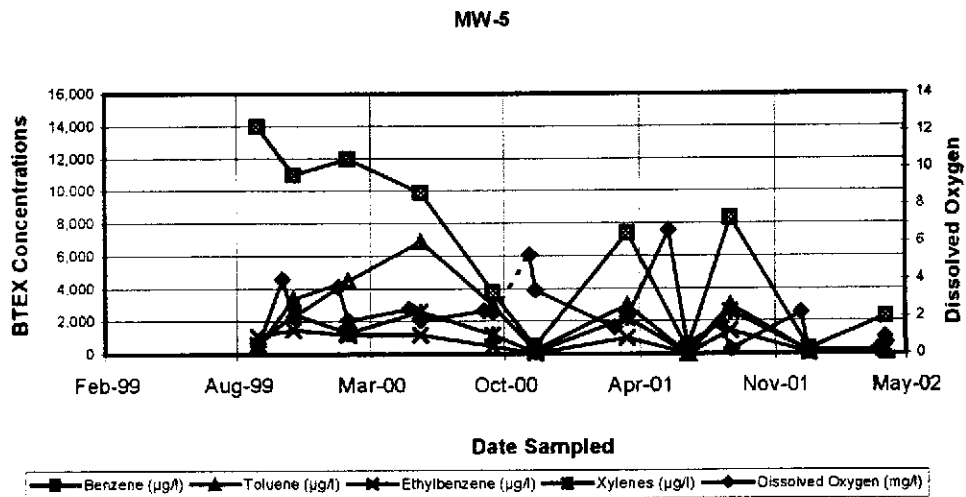
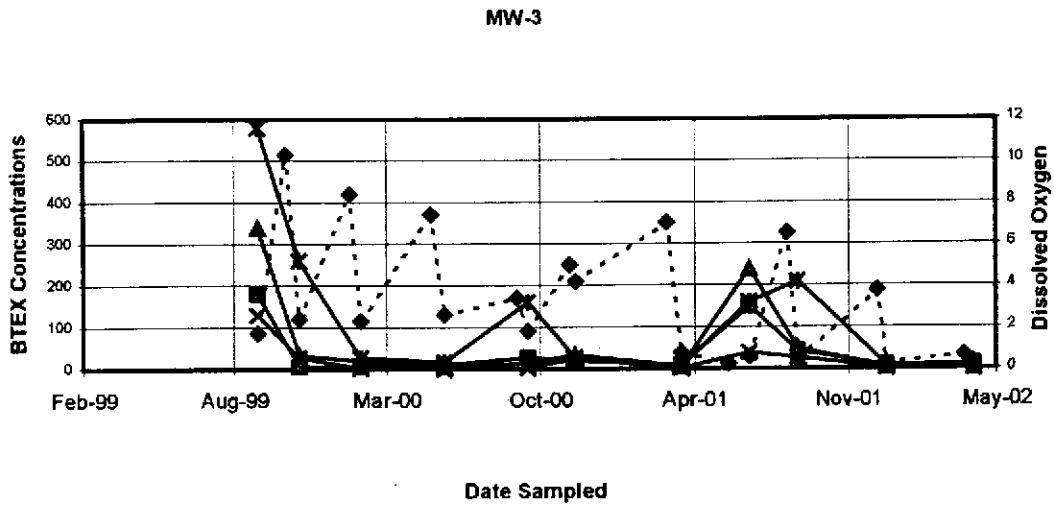
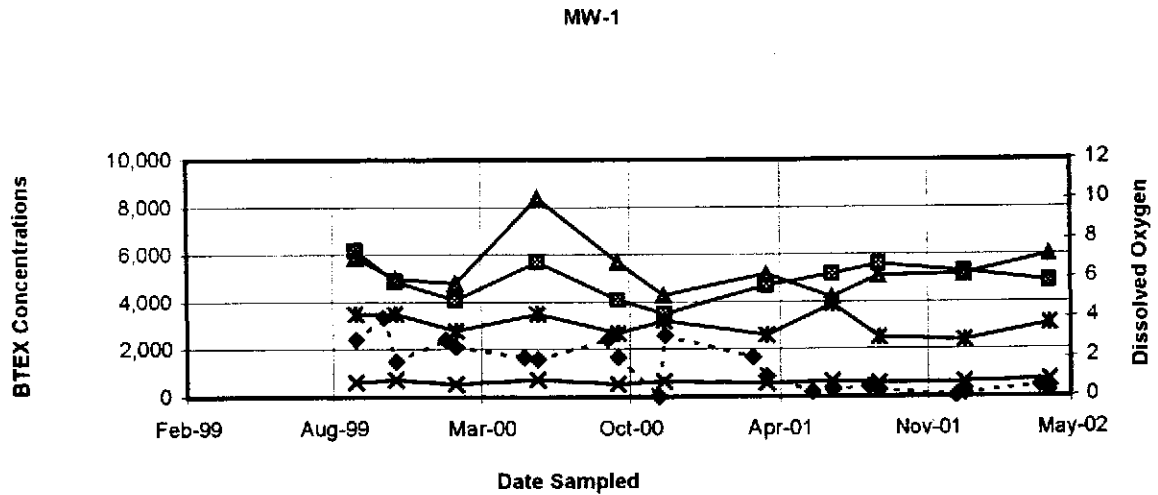
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TPHg, BTEX, and MTBE Concentrations in Groundwater  
 April 23, 2002  
 1700 Jefferson Street  
 BPS Reprographic Services Facility  
 Oakland, California

PLATE  
**3**

DRAWN CN	PROJECT NUMBER 53087 004	APPROVED	DATE 6/02	REVISED DATE
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**BTEX and DO Results**  
 Quarterly Groundwater Monitoring Report  
 BPS Reprographic Services Facility  
 1700 Jefferson Steet  
 Oakland, California

Plate

4

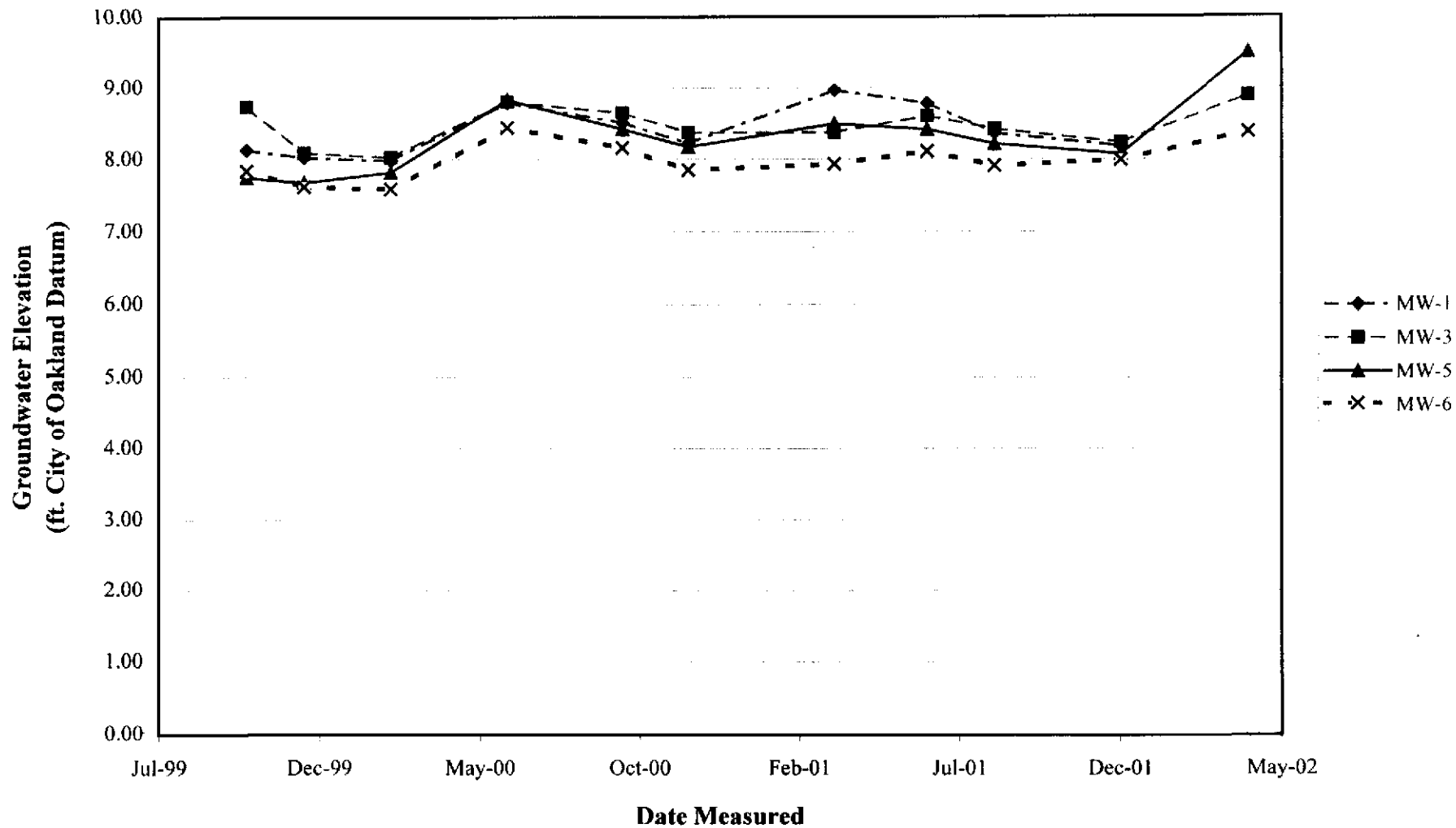
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DATE  
4/24/02

REVISED DATE



**Groundwater Elevation Data**  
 Quarterly Groundwater Monitoring Report  
 BPS Reprographic Services Facility  
 1700 Jefferson Steet  
 Oakland, California

Plate

**5**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED DATE
DSN	53087.004		4/24/02	

**Table 1. Groundwater Parameters  
BPS Reprographic Services Facility  
1700 Jefferson Street  
Oakland, California**

Dissolved Oxygen (mg/l)	MW-1	MW-3	MW-5	MW-6
9/29/99	2.9	1.7	0.4	1.8
11/5/99	4.0	10.3	4.0	2.8
11/22/99	1.8	2.4	2.0	3.2
1/28/00	2.9	8.4	3.6	2.2
2/11/00	2.5	2.3	1.8	3.5
5/12/00	2.0	7.4	2.4	1.7
5/30/00	1.9	2.6	1.8	3.2
9/1/00	2.9	3.4	2.3	2.7
9/15/00	2.0	1.8	2.2	3.8
11/9/00	--	5.0	5.3	--
11/17/00	3.1	4.2	3.4	6.0
3/15/01	2.0	7.0	1.4	2.1
4/2/01	1.0	0.8	2.0	1.0
6/1/01	0.2	0.2	6.6	0.3
6/28/01	0.3	0.6	0.5	0.7
8/16/01	0.5	6.5	1.6	0.8
8/30/01	0.3	0.4	0.2	0.5
12/14/01	0.03	3.8	2.2	0.2
12/26/01	0.16	0.3	0.2	0.2
4/10/02	0.55	0.6	0.2	0.4
4/23/02	0.30	0.4	0.9	0.5
<b>REDOX (mvols)</b>				
5/30/00	-322	197	-128	203
9/15/00	-269	3	-89	206
11/17/00	64	178	296	230
4/2/01	-194	26	-36	102
6/28/01	-310	-283	-360	107
8/30/01	NA	NA	NA	NA
12/26/01	12	11	11	11
4/23/02	3	62	-299	158
<b>Temperature (deg F)</b>				
9/29/99	67.0	72.6	67.7	73.8
11/22/99	66.4	62.9	65.0	69.8
2/11/00	61.3	63.2	62.0	68.5
5/30/00	77.7	74.8	76.3	76.2
9/15/00	64.4	64.3	64.7	67.0
11/17/00	54.5	58.1	68.1	65.9
4/2/01	63.5	64.9	66.2	66.4
6/28/01	73.0	71.2	74.7	74.3
8/30/01	74.8	77.6	78.3	78.7
12/26/01	65.7	65.8	65.8	65.1
4/23/02	64.4	69.8	37.1	71.6
<b>pH</b>				
9/29/99	8.39	8.53	8.43	8.44
11/22/99	6.86	8.42	6.84	6.79
2/11/00	6.80	6.94	6.83	6.72
5/30/00	7.02	7.35	7.54	7.56
9/15/00	7.06	7.54	6.76	6.62
11/17/00	7.37	7.69	7.12	7.34
4/2/01	6.98	6.61	7.07	6.96
6/28/01	6.90	6.74	6.78	6.83
8/30/01	7.85	7.91	7.9	8.41
12/26/01	6.23	6.91	7.11	6.72
4/23/02	6.90	6.95	6.94	6.86
<b>Specific Conductance (µS/cm)</b>				
9/29/99	976	880	1,577	966
11/22/99	1,004	1,500	1,352	1,038
2/11/00	992	1,327	1,275	1,149
5/30/00	845	1,020	758	924
9/15/00	800	917	989	1,009
11/17/00	785	970	742	886
4/2/01	725	365	839	821
6/28/01	1080	704	876	1021
8/30/01	924	1015	975	931
12/26/01	848	496	333	891
4/23/02	922	601	848	977

Note:

Baseline dissolved oxygen measurement taken on 09/29/99, prior to initial installation of oxygen releasing compound

mg/l = milligrams per liter

mvols = millivolts

deg F = degrees Fahrenheit

µS/cm = micro-ohms per centimeter

NA = Not Available

**Table 2. Groundwater Elevation Data  
BPS Reprographic Services Facility  
1700 Jefferson Street  
Oakland, California**

Date Sampled	MW-1		MW-3		MW-5		MW-6		Average Change Since Preceding Quarter
	TOC Elev.	32.36	TOC Elev.	31.77	TOC Elev.	30.56	TOC Elev.	31.26	
	Water Level	Water Elevation	Water Level	Water Elevation	Water Level	Water Elevation	Water Level	Water Elevation	
3/6/96	NM	--	24.79	6.98	23.53	7.03	NA	--	
6/11/96	FP	--	25.60	6.17	23.78	6.78	25.16	6.10	-0.53
9/19/96	FP	--	26.09	5.68	24.48	6.08	25.76	5.50	-0.60
12/23/96	FP	--	FP	--	24.83	5.73	25.88	5.38	-0.23
3/27/97	FP	--	FP	--	23.82	6.74	24.78	6.48	1.06
6/4/97	26.41	5.95	25.11	6.66	23.92	6.64	24.60	6.66	0.04
9/26/97	26.80	5.56	25.41	6.36	24.29	6.27	24.80	6.46	-0.32
12/22/97	26.00	6.36	24.91	6.86	24.02	6.54	24.71	6.55	0.42
3/31/98	26.06	6.30	24.05	7.72	22.78	7.78	23.75	7.51	0.75
6/18/98	25.60	6.76	23.71	8.06	22.51	8.05	23.22	8.04	0.40
8/28/98	25.45	6.91	23.70	8.07	22.74	7.82	22.23	9.03	0.23
12/2/98	24.92	7.44	23.60	8.17	23.16	7.40	23.72	7.54	-0.32
3/10/99	24.90	7.46	22.65	9.12	22.82	7.74	23.54	7.72	0.37
6/30/99	25.53	6.83	23.07	8.70	22.41	8.15	23.04	8.22	-0.04
9/29/99	24.23	8.13	23.03	8.74	22.81	7.75	23.42	7.84	0.14
11/22/99	24.33	8.03	23.68	8.09	22.88	7.68	23.64	7.62	-0.26
2/11/00	24.38	7.98	23.74	8.03	22.74	7.82	23.67	7.59	0.00
5/30/00	23.57	8.79	22.97	8.80	21.73	8.83	22.82	8.44	0.86
9/15/00	23.85	8.51	23.12	8.65	22.14	8.42	23.10	8.16	-0.28
11/16/00	24.14	8.22	23.40	8.37	22.39	8.17	23.41	7.85	-0.28
4/2/01	23.40	8.96	23.40	8.37	22.07	8.49	23.33	7.93	0.29
6/28/01	23.58	8.78	23.17	8.60	22.15	8.41	23.15	8.11	0.04
8/30/01	24.00	8.36	23.35	8.42	22.35	8.21	23.35	7.91	-0.25
12/26/01	24.18	8.18	23.54	8.23	22.49	8.07	23.27	7.99	-0.11
4/23/02	NM	NM	22.89	8.88	21.07	9.49	22.89	8.37	0.82

TOC Elev. = top of casing elevation  
 NM = not monitored  
 FP = free product  
 -- = no data collected  
 NA = not available (MW-6 had not been installed yet)

**Table 4. Groundwater Monitoring Analytical Results - Non-Purge Method**  
**BPS Reprographic Services Facility**  
**1700 Jefferson Street**  
**Oakland, California**

	9/29/99	11/22/99	2/11/00	5/30/00	9/15/00	11/16/00	4/2/01	6/28/01	8/30/01	12/26/01	4/24/02
<b>TPH (mg/l)</b>											
MW-1	14	24	19	19	20	18	19	39	31	34	35
MW-3	4.1	3.1	0.54	0.49	1.5	1.3	0.17	4.9	3.1	0.95	300
MW-5	10	30	23	19	24	1.8	15	3.6	34	1.9	9.4
MW-6	ND<0.5	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.05	ND<0.05	0.066	ND<0.05
<b>Benzene (µg/l)</b>											
MW-1	6,200	4,900	4,100	5,700	4,100	3,500	4,700	5,200	5,600	5,300	4,900
MW-3	180	6.5	8.3	11	28	20	9	150	42	8	11
MW-5	14,000	11,000	12,000	9,900	3,800	470	7,400	300	8,300	300	2,300
MW-6	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.30	ND<0.30	ND<0.50	ND<0.50	3.6	ND<0.50
<b>Toluene (µg/l)</b>											
MW-1	5,900	5,000	4,800	8,400	5,700	4,300	5,200	4,200	5,100	5,200	6,000
MW-3	340	33	20	5.6	14	34	6.2	240	48	5.2	4.8
MW-5	470	3,400	4,500	6,900	3,000	220	3,000	11	3,000	110	130
MW-6	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.30	ND<0.30	2.9	ND<0.50	3.6	ND<0.50
<b>Ethylbenzene (µg/l)</b>											
MW-1	620	730	530	730	540	640	570	660	560	630	740
MW-3	130	27	2.4	0.45	2.6	25	1.4	38	26	1.1	0.72
MW-5	1,100	1,500	1,200	1,200	460	39	1000	16	1,400	55	300
MW-6	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.3	ND<0.30	ND<0.30	ND<0.50	ND<0.50	ND<0.50	ND<0.50
<b>Xylenes (µg/l)</b>											
MW-1	3,500	3,500	2,800	3,500	2,700	3,200	2,600	3,900	2,500	2,400	3,100
MW-3	580	260	28	17	160	28	8.1	160	210	7	1.4
MW-5	600	2,500	1,300	2,600	1,200	100	2,200	15	2,600	120	270
MW-6	ND<0.6	ND<0.6	ND<0.6	ND<0.6	ND<0.6	ND<0.60	ND<0.30	2.7	ND<0.50	8.7	ND<0.50
<b>MTBE (µg/l) (EPA Method 8020)</b>											
MW-1	ND<250	ND<100	6.6	ND<5.0 <sup>1</sup>	ND<12 <sup>1,2</sup>	ND<40 <sup>1,2</sup>	50 <sup>1</sup>	8.5 <sup>1</sup>	ND<100 <sup>1,2</sup>	ND<120	ND<120
MW-3	14	ND<1.0	31	ND<5.0 <sup>1</sup>	ND<5 <sup>1</sup>	ND<5 <sup>1</sup>	77 <sup>1</sup>	ND<2 <sup>1</sup>	ND<1.2 <sup>1</sup>	ND<0.50 <sup>1</sup>	ND<0.50 <sup>1</sup>
MW-5	ND<100	ND<100	6.6	ND<200	ND<10 <sup>1,2</sup>	ND<5 <sup>1</sup>	ND<50 <sup>1</sup>	4.4 <sup>1</sup>	ND<50 <sup>1</sup>	ND<10 <sup>1</sup>	ND<50
MW-6	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	ND<1.0	5 <sup>1,3</sup>	17 <sup>1</sup>	ND<2.5	ND<2.5	ND<2.5

mg/l = milligrams per liter

µg/l = micrograms per liter

ND = Not detected above the reporting limit following the less than sign

MTBE = methyl t-butyl ether

<sup>1</sup> Result of MTBE confirmation by EPA Method 8260.

<sup>2</sup> Reporting limits have been elevated due to matrix interference.

<sup>3</sup> Detection limit = 5 µg/L. Backup sample analyzed after hold time had a result of ND<5 µg/l.

**Table 3. Historical Groundwater Monitoring Analytical Results - Using Purge Method**  
**BPS Reprographic Services Facility**  
**1700 Jefferson Street**  
**Oakland, California**

	Date Sampled																		Date Sampled																	
	8/1/91	9/30/92	3/30/93	1/13/94	4/13/94	6/29/95	12/8/94	4/3/95	6/27/95	9/19/95	12/13/95	3/6/96	6/11/96	9/19/96	12/23/96	3/27/97	6/4/97	9/26/97	12/23/97	3/31/98	6/18/98	8/28/98	12/2/98	5/10/99	6/30/99	9/29/99										
<b>TPH<sub>g</sub> (mg/l)</b>	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	68	59	41	44	32	26	26	26	18	21										
MW-1A	350	FP	FP	FP	FP	170	95	190	67	53	52	62	200	140	100	FP	66	54	73	66	51	50	15	41	10	18	NA									
MW-3	74	FP	FP	FP	FP	39	4,600	51	20	6.2	19	7	16	6	FP	FP	85	47	32	32	16	17	3.2	9.6	7.9	5.0										
MW-4	86	FP	FP	FP	FP	58	16	92	35	13	14	11	110	260	95	FP	37	24	41	48	NA	23	48	10	11	8.8	NA									
MW-5	120	51	74	80	64	61	59	51	41	50	45	51	48	48	45	44	35	36	39	48	17	16	15	23	7.7	11										
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)	ND(0.05)									
<b>Benzene (µg/l)</b>	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	2,200	6,000	6,800	8,300	1,100	8,600	9,200	8,200	7,900	9,200										
MW-1A	17,000	FP	FP	FP	FP	17,000	16,000	13,000	11,000	11,000	8,900	9,900	14,000	18,000	16,000	FP	12,000	11,000	10,000	10,000	9,100	11,000	1,100	8,500	2,300	6,400	NA									
MW-3	1,600	FP	FP	FP	FP	3,200	1,500	1,100	270	70	220	120	170	45	FP	FP	8,500	610	640	690	180	84	39	86	31	120										
MW-4	1,500	FP	FP	FP	FP	1,500	1,400	1,700	1,200	1,300	2,200	630	2,600	6,600	9,900	FP	2,600	2,600	2,900	6,000	NA	2,000	9,700	1,700	2,400	1,800	NA									
MW-5	20,000	13,000	16,000	19,000	14,000	29,000	13,000	15,000	12,000	1,600	13,000	15,000	12,000	12,000	12,000	11,000	8,900	7,900	13,000	10,000	9,500	5,400	8,400	14,000	5,200	9,600										
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)									
<b>Toluene (µg/l)</b>	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	14,000	4,500	3,000	3,000	3,700	3,800	2,300	4,900	5,900	5,800	10,000									
MW-1A	31,000	FP	FP	FP	FP	31,000	21,000	21,000	13,000	9,900	9,200	11,000	22,000	28,000	22,000	FP	15,000	12,000	16,000	16,000	11,000	15,000	830	11,900	1,900	7,800	NA									
MW-3	4,600	FP	FP	FP	FP	2,900	4,200	2,300	550	140	480	170	270	30	FP	FP	13,000	6,000	5,300	3,800	1,500	1,100	85	540	330	340										
MW-4	6,200	FP	FP	FP	FP	2,500	790	4,100	3,400	1,600	2,100	470	3,600	19,600	19,000	FP	6,900	3,200	5,000	11,000	NA	460	11,000	610	2,100	3,000	NA									
MW-5	14,000	5,900	5,000	8,200	3,500	5,400	3,800	2,200	2,100	2,700	2,100	2,800	2,900	4,500	2,200	1,100	560	270	500	400	310	160	120	300	270	710										
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)									
<b>Ethylbenzene (µg/l)</b>	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	1,500	1,600	1,400	1,100	550	730	820	870	930	1,200										
MW-1A	3,000	FP	FP	FP	FP	2,100	1,500	1,400	910	500	710	790	2,700	2,800	2,100	FP	1,400	1,000	1,400	1,400	1,100	870	41	720	1,500	660	NA									
MW-3	670	FP	FP	FP	FP	FP	590	6,000	580	190	68	140	49	68	15	FP	FP	2,400	930	800	870	490	430	25	250	200	240									
MW-4	1,000	FP	FP	FP	FP	520	51	310	280	77	110	14	780	3,700	2,000	FP	540	140	350	580	NA	ND(15)	890	ND(15)	88	150	NA									
MW-5	1,900	1,400	1,800	1,400	1,500	2,800	1,800	2,800	1,400	2,000	16,000	2,000	2,900	2,300	2,700	1,900	1,500	1,500	1,900	2,000	420	1,100	1,500	1,800	1,100	1,100										
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	ND(0.5)	0.5	ND(0.5)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)									
<b>Xylenes (µg/l)</b>	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA	FP	FP	FP	FP	11,000	8,600	6,600	4,300	3,000	2,100	2,800	3,500	2,500	5,500										
MW-1A	22,000	FP	FP	FP	FP	14,000	12,000	11,000	9,800	6,300	6,800	5,300	22,000	19,000	14,000	FP	100	7,200	8,500	12,000	6,800	5,800	3,000	6,700	2,400	4,100	NA									
MW-3	4,300	FP	FP	FP	FP	4,300	95,000	4,800	1,700	500	1,700	440	1,500	300	FP	FP	16,000	5,900	5,900	5,200	3,700	3,800	360	2,400	1,800	1,300										
MW-4	7,300	FP	FP	FP	FP	3,200	3,400	5,400	5,800	1,800	2,100	1,800	18,000	28,000	13,000	FP	5,500	3,500	4,800	8,200	NA	6,400	5,000	2,000	1,600	2,700	NA									
MW-5	4,900	2,600	2,700	2,700	2,100	4,500	2,900	4,500	1,600	2,100	1,900	2,400	2,700	4,000	6,500	2,800	1,700	1,300	1,700	2,200	850	960	830	1,100	690	1,100										
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(2)	ND(0.60)	ND(0.60)	ND(0.60)	ND(0.60)	ND(0.60)	ND(0.60)									
<b>MTBE (µg/l)</b>	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	FP	FP	ND(500)	ND(500)	300	420	ND(50)	ND(50)	ND(50)	ND(50)	ND(25)	ND(250)										
MW-1A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,800	ND(500)	ND(500)	1,900	300	ND(50)	ND(50)	ND(50)	ND(50)	ND(25)	NA										
MW-3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	FP	FP	ND(500)	ND(100)	ND(300)	350	ND(25)	ND(50)	ND(50)	ND(25)	ND(25)	10										
MW-4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,400	ND(300)	ND(500)	270	NA	ND(50)	ND(50)	ND(50)	ND(25)	ND(25)	NA										
MW-5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	600	300	ND(100)	ND(500)	ND(1000)	350	ND(10)	ND(50)	ND(50)	ND(50)	ND(25)	ND(100)										
MW-6	--	--	--	--	--	--	--	--	--	--	--	--	NA	NA	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(5)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)	ND(1.0)									

TPH<sub>g</sub> = total petroleum hydrocarbons as gasoline  
 MTBE = methyl t-butyl ether  
 (mg/l) milligrams per liter  
 (µg/l) micrograms per liter

ND = Not detected above the reporting limit in parentheses  
 NA = Not analyzed  
 FP = Free Product - well not sampled  
 -- = Well did not exist at date indicated

TPH<sub>g</sub> = total petroleum hydrocarbons as gasoline  
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1455 McDowell Blvd, North Ste D  
 Petaluma, CA 94954  
 (707) 792-1865  
 FAX (707) 792-0342  
 www.sequoialabs.com

Harding ESE - SF  
 28 2nd Street, Suite 700  
 San Francisco CA, 94105

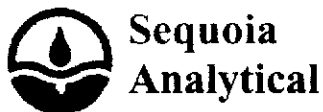
Project: BPS Services, Oakland, CA  
 Project Number: 53087.004  
 Project Manager: David Nanstad

Reported:  
 05/08/02 15:56

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>53087-4 (P204517-01) Water Sampled: 04/23/02 13:20 Received: 04/24/02 14:30</b>									
Gasoline (C6-C12)	ND	50	ug/l	1	2050038	05/02/02	05/02/02	EPA 8015M/8020M	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		109 %	65-135		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		104 %	65-135		"	"	"	"	
<b>53087-2 (P204517-02) Water Sampled: 04/23/02 14:42 Received: 04/24/02 14:30</b>									
Gasoline (C6-C12)	300	50	ug/l	1	2050038	05/02/02	05/02/02	EPA 8015M/8020M	
Benzene	11	0.50	"	"	"	"	"	"	
Toluene	4.8	0.50	"	"	"	"	"	"	
Ethylbenzene	0.72	0.50	"	"	"	"	"	"	
Xylenes (total)	1.4	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	2.9	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		110 %	65-135		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		106 %	65-135		"	"	"	"	
<b>53087-3 (P204517-03) Water Sampled: 04/23/02 16:36 Received: 04/24/02 14:30</b>									
Gasoline (C6-C12)	9400	1000	ug/l	20	2050038	05/02/02	05/02/02	EPA 8015M/8020M	
Benzene	2300	10	"	"	"	"	"	"	
Toluene	130	10	"	"	"	"	"	"	
Ethylbenzene	300	10	"	"	"	"	"	"	
Xylenes (total)	270	10	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	50	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		107 %	65-135		"	"	"	"	
Surrogate: 4-Bromofluorobenzene		103 %	65-135		"	"	"	"	





**Sequoia  
Analytical**

1455 McDowell Blvd, North Ste D  
Petaluma, CA 94954  
(707) 792-1865  
FAX (707) 792-0342  
www.sequoialabs.com

Harding ESE - SF  
28 2nd Street, Suite 700  
San Francisco CA, 94105

Project: BPS Services, Oakland, CA  
Project Number: 53087.004  
Project Manager: David Nanstad

Reported:  
05/08/02 15:56

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>53087-1 (P204517-04) Water Sampled: 04/23/02 17:35 Received: 04/24/02 14:30</b>									
Gasoline (C6-C12)	35000	2500	ug/l	50	2050038	05/02/02	05/02/02	EPA 8015M/8020M	
Benzene	4900	25	"	"	"	"	"	"	
Toluene	6000	25	"	"	"	"	"	"	
Ethylbenzene	740	25	"	"	"	"	"	"	
Xylenes (total)	3100	25	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	120	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		106 %		65-135	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		65-135	"	"	"	"	
<b>53087-5 (P204517-05) Water Sampled: 04/23/02 17:57 Received: 04/24/02 14:30</b>									
Gasoline (C6-C12)	ND	50	ug/l	1	2050079	05/03/02	05/03/02	EPA 8015M/8020M	
Benzene	ND	0.50	"	"	"	"	"	"	
Toluene	ND	0.50	"	"	"	"	"	"	
Ethylbenzene	ND	0.50	"	"	"	"	"	"	
Xylenes (total)	ND	0.50	"	"	"	"	"	"	
Methyl tert-butyl ether	ND	2.5	"	"	"	"	"	"	
Surrogate: a,a,a-Trifluorotoluene		103 %		65-135	"	"	"	"	
Surrogate: 4-Bromofluorobenzene		101 %		65-135	"	"	"	"	



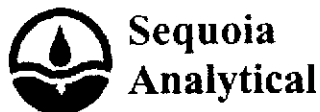
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San Francisco CA, 94105

Project: BPS Services, Oakland, CA  
Project Number: 53087.004  
Project Manager: David Nanstad

**Reported:**  
05/08/02 15:56

**Volatile Organic Compounds by EPA Method 8260B  
Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
<b>53087-2 (P204517-02) Water Sampled: 04/23/02 14:42 Received: 04/24/02 14:30</b>									
Methyl tert-butyl ether	ND	0.50	ug/l	1	2050115	05/05/02	05/05/02	EPA 8260B	
<i>Surrogate: Dibromofluoromethane</i>		101 %	84-122		"	"	"	"	



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 28 2nd Street, Suite 700  
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Reported:  
 05/08/02 15:56

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch 2050038 - EPA 5030, waters</b>										
<b>Blank (2050038-BLK1)</b> <span style="float:right">Prepared &amp; Analyzed: 05/02/02</span>										
Gasoline (C6-C12)	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
<i>Surrogate: a,a,a-Trifluorotoluene</i>	316		"	300		105	65-135			
<i>Surrogate: 4-Bromofluorobenzene</i>	311		"	300		104	65-135			
<b>LCS (2050038-BS1)</b> <span style="float:right">Prepared &amp; Analyzed: 05/02/02</span>										
Gasoline (C6-C12)	2670	50	ug/l	2750		97	65-135			
Benzene	41.2	0.50	"	34.0		121	65-135			
Toluene	195	0.50	"	206		95	65-135			
Ethylbenzene	45.6	0.50	"	48.5		94	65-135			
Xylenes (total)	226	0.50	"	244		93	65-135			
Methyl tert-butyl ether	72.2	2.5	"	54.5		132	65-135			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	364		"	300		121	65-135			
<i>Surrogate: 4-Bromofluorobenzene</i>	328		"	300		109	65-135			
<b>Matrix Spike (2050038-MS1)</b> <span style="float:right">Source: P204507-01 Prepared &amp; Analyzed: 05/02/02</span>										
Gasoline (C6-C12)	2700	50	ug/l	2750	ND	98	65-135			
Benzene	40.2	0.50	"	34.0	ND	118	65-135			
Toluene	191	0.50	"	206	ND	93	65-135			
Ethylbenzene	47.2	0.50	"	48.5	ND	97	65-135			
Xylenes (total)	223	0.50	"	244	ND	91	65-135			
Methyl tert-butyl ether	70.3	2.5	"	54.5	ND	129	65-135			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	354		"	300		118	65-135			
<i>Surrogate: 4-Bromofluorobenzene</i>	330		"	300		110	65-135			

Sequoia Analytical - Petaluma

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*



Harding ESE - SF  
 28 2nd Street, Suite 700  
 San Francisco CA, 94105

Project: BPS Services, Oakland, CA  
 Project Number: 53087.004  
 Project Manager: David Nanstad

**Reported:**  
 05/08/02 15:56

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 2050038 - EPA 5030, waters**

<b>Matrix Spike Dup (2050038-MSD1)</b>	<b>Source: P204507-01</b>			<b>Prepared &amp; Analyzed: 05/02/02</b>						
Gasoline (C6-C12)	2680	50	ug/l	2750	ND	97	65-135	0.7	20	
Benzene	38.4	0.50	"	34.0	ND	113	65-135	5	20	
Toluene	187	0.50	"	206	ND	91	65-135	2	20	
Ethylbenzene	45.4	0.50	"	48.5	ND	94	65-135	4	20	
Xylenes (total)	218	0.50	"	244	ND	89	65-135	2	20	
Methyl tert-butyl ether	61.6	2.5	"	54.5	ND	113	65-135	13	20	
<i>Surrogate: a,a,a-Trifluorotoluene</i>	339		"	300		113	65-135			
<i>Surrogate: 4-Bromofluorobenzene</i>	331		"	300		110	65-135			

**Batch 2050079 - EPA 5030, waters**

<b>Blank (2050079-BLK1)</b>	<b>Prepared &amp; Analyzed: 05/03/02</b>									
Gasoline (C6-C12)	ND	50	ug/l							
Benzene	ND	0.50	"							
Toluene	ND	0.50	"							
Ethylbenzene	ND	0.50	"							
Xylenes (total)	ND	0.50	"							
Methyl tert-butyl ether	ND	2.5	"							
<i>Surrogate: a,a,a-Trifluorotoluene</i>	312		"	300		104	65-135			
<i>Surrogate: 4-Bromofluorobenzene</i>	310		"	300		103	65-135			

**LCS (2050079-BS1)**

	<b>Prepared &amp; Analyzed: 05/03/02</b>									
Gasoline (C6-C12)	2430	50	ug/l	2750		88	65-135			
Benzene	41.4	0.50	"	34.0		122	65-135			
Toluene	209	0.50	"	206		101	65-135			
Ethylbenzene	44.5	0.50	"	48.5		92	65-135			
Xylenes (total)	224	0.50	"	244		92	65-135			
Methyl tert-butyl ether	58.2	2.5	"	54.5		107	65-135			
<i>Surrogate: a,a,a-Trifluorotoluene</i>	352		"	300		117	65-135			
<i>Surrogate: 4-Bromofluorobenzene</i>	323		"	300		108	65-135			



1455 McDowell Blvd, North Ste D  
 Petaluma, CA 94954  
 (707) 792-1865  
 FAX (707) 792-0342  
 www.sequoialabs.com

Harding ESE - SF  
 28 2nd Street, Suite 700  
 San Francisco CA, 94105

Project: BPS Services, Oakland, CA  
 Project Number: 53087.004  
 Project Manager: David Nanstad

**Reported:**  
 05/08/02 15:56

**Total Petroleum Hydrocarbons as Gasoline and BTEX by EPA 8015M/8020M - Quality Control**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch 2050079 - EPA 5030, waters**

**Matrix Spike (2050079-MS1)**

Source: P204517-05

Prepared & Analyzed: 05/03/02

Gasoline (C6-C12)	2440	50	ug/l	2750	ND	89	65-135			
Benzene	39.8	0.50	"	34.0	ND	117	65-135			
Toluene	209	0.50	"	206	ND	101	65-135			
Ethylbenzene	43.9	0.50	"	48.5	ND	91	65-135			
Xylenes (total)	220	0.50	"	244	ND	90	65-135			
Methyl tert-butyl ether	55.0	2.5	"	54.5	ND	99	65-135			

Surrogate: a,a,a-Trifluorotoluene	336		"	300		112	65-135			
Surrogate: 4-Bromofluorobenzene	315		"	300		105	65-135			

**Matrix Spike Dup (2050079-MSD1)**

Source: P204517-05

Prepared & Analyzed: 05/03/02

Gasoline (C6-C12)	2540	50	ug/l	2750	ND	92	65-135	4	20	
Benzene	41.5	0.50	"	34.0	ND	122	65-135	4	20	
Toluene	217	0.50	"	206	ND	105	65-135	4	20	
Ethylbenzene	45.4	0.50	"	48.5	ND	94	65-135	3	20	
Xylenes (total)	228	0.50	"	244	ND	93	65-135	4	20	
Methyl tert-butyl ether	57.9	2.5	"	54.5	ND	104	65-135	5	20	

Surrogate: a,a,a-Trifluorotoluene	334		"	300		111	65-135			
Surrogate: 4-Bromofluorobenzene	312		"	300		104	65-135			



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 28 2nd Street, Suite 700  
 San Francisco CA, 94105

Project: BPS Services, Oakland, CA  
 Project Number: 53087.004  
 Project Manager: David Nanstad

**Reported:**  
 05/08/02 15:56

**Volatile Organic Compounds by EPA Method 8260B - Quality Control**  
**Sequoia Analytical - Petaluma**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC %REC	Limits	RPD	RPD Limit	Notes
<b>Batch 2050115 - EPA 5030 waters</b>										
<b>Blank (2050115-BLK1)</b> Prepared & Analyzed: 05/05/02										
Methyl tert-butyl ether	ND	0.50	ug/l							
<i>Surrogate: Dibromofluoromethane</i>	5.99		"	5.50		109	84-122			
<b>LCS (2050115-BS1)</b> Prepared & Analyzed: 05/05/02										
Methyl tert-butyl ether	4.76	0.50	ug/l	5.00		95	79-118			
<i>Surrogate: Dibromofluoromethane</i>	5.84		"	5.50		106	84-122			
<b>Matrix Spike (2050115-MS1)</b> Source: P204507-12 Prepared & Analyzed: 05/05/02										
Methyl tert-butyl ether	5190	100	ug/l	1000	4200	99	79-118			
<i>Surrogate: Dibromofluoromethane</i>	5.78		"	5.50		105	84-122			
<b>Matrix Spike Dup (2050115-MSD1)</b> Source: P204507-12 Prepared & Analyzed: 05/05/02										
Methyl tert-butyl ether	4980	100	ug/l	1000	4200	78	79-118	4	20	QM-4X
<i>Surrogate: Dibromofluoromethane</i>	5.78		"	5.50		105	84-122			



Harding ESE - SF  
28 2nd Street, Suite 700  
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Project: BPS Services, Oakland, CA  
Project Number: 53087.004  
Project Manager: David Nanstad

**Reported:**  
05/08/02 15:56

### Notes and Definitions

- QM-4X The spike recovery was outside of control limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits.
- DET Analyte DETECTED
- ND Analyte NOT DETECTED at or above the reporting limit
- NR Not Reported
- dry Sample results reported on a dry weight basis
- RPD Relative Percent Difference



Harding ESE

A MACTEC COMPANY  
90 Digital Drive  
Novato, CA 94949  
(415) 883-0112

CHAIN OF CUSTODY FORM

Seq. No.: N<sup>o</sup> 10067

Lab: Sequia

Job Number: 53087.004

Name/Location: BPS Services, Oakland, CA

Project Manager: David Namstad

Samplers: Pamela Llewellyn  
MHUCKS

Recorder: Pamela Llewellyn  
(Signature Required)

MATRIX				#CONTAINERS & PRESERV.				SAMPLE NUMBER				DATE			
Water	Soil	Air	Uripres	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	HCL	YR	SEQ			YR	MO	DAY	TIME	
X						3		53087	-4		02	04	23	1320	
X						3		53087	-2		02	04	23	1442	
X						3		53087	-3		02	04	23	1636	
X						3		53087	-1		02	04	23	1735	
X						2		53087	-5		02	04	23	1757	

STATION DESCRIPTION		DEPTH
<u>P204517-01</u>		
		<u>2</u>
		<u>3</u>
		<u>4</u>
		<u>5</u>

ANALYSIS REQUESTED										
Gasoline Range Organics 8015B	Diesel Range Organics 8015B	BTEX plus MTBE	CCR Title 22 Metals (17)	EPA 8021B	EPA 8260B	EPA 8270C	EPA 8015-TPH-9	BTEX-EPA 8020	MTBE-EPA 8020	
							X	X	X	
							X	X	X	
							X	X	X	
							X	X	X	
							X	X	X	

ADDITIONAL INFORMATION													
SAMPLE NUMBER								TURNAROUND TIME/REMARKS					
YR	SEQ												
								<u>Confirm M+BE results with EPA Method 8260</u>					
								<b>COOLER CUSTODY SEALS INTACT</b> <input type="checkbox"/>					
								<b>NOT INTACT</b> <input type="checkbox"/>					
								<b>COOLER TEMPERATURE</b> <u>30</u> °C					

CHAIN OF CUSTODY RECORD			
Relinquished By: (signature)	<u>Pamela Llewellyn</u>	(Print Name)	<u>Pamela Llewellyn</u>
Received By: (signature)	<u>Milton Obregon</u>	(Print Name)	<u>MHUCKS HARDING ESE 4-23-02 1752</u>
Relinquished By: (signature)	<u>Susan Balleja</u>	(Print Name)	<u>Harding ESE 4/24/02 2:00</u>
Received By: (signature)	<u>Fred Garcia</u>	(Print Name)	<u>SEQ 4/24/02 11:00</u>
Relinquished By: (signature)		(Print Name)	
Received By: (signature)		(Print Name)	
Relinquished By: (signature)		(Print Name)	
Received By: (signature)		(Print Name)	
Method of Shipment:			





**APPENDIX B**

**GROUNDWATER SAMPLING FORMS**

**Table B1. Sample Location/Sample Description Cross-Reference  
BPS Reprographic Services Facility  
1700 Jefferson Street  
Oakland, California**

Well/Sample Number	Client Sample ID
MW-1	53087-1
MW-3	53087-2
MW-5	53087-3
MW-6	53087-4
Trip Blank	53087-5

Finish 1810

Project: BPS Services Job No.: \_\_\_\_\_  
 Subject: FIELD INVESTIGATION DAILY REPORT Date: 4/23/02  
 Equipment Rental: \_\_\_\_\_ Company: \_\_\_\_\_ To: \_\_\_\_\_  
 Equipment Hours: \_\_\_\_\_ F.E. Time from: \_\_\_\_\_ to: \_\_\_\_\_ By: \_\_\_\_\_

(outside service and expense record must be attached for any outside costs)

11:30 : Arrive on site. weather, sunny -  
Tail gate safety meeting

11:45 : Cal. meters  
YSI 55 D.O. meter # 700

12:00 : Redox meter

12:30 : D.O. test @ MW6 45 mg/l  
start ~ @ 12:40

12:40 : Redox meter @ MW6 158 mV  
@ 12:54

13:04 : Start pump (MW6)  
unable to sample through parasitic  
pump - line clogged with sediment.  
CCW Reverse flow cannot remove sediment

13:20 : Used Bailer to extract water from well

(MW6) 977  $\mu$ S conductivity  
 22.0°C temp  
 pH 6.86 pH

14:00 : (MW3) Depth = 22.89  
 Redox = -062 @ 1320 21°C  
 DO = .35 @ 1325

1442 i set-up pump for VOC samples  
 Conductivity = 601 @ 1500  
 pH = 6.95 @ 1500 Initial

Attachments:

Project: BPS Services Job No.: \_\_\_\_\_  
 Subject: FIELD INVESTIGATION DAILY REPORT Date: 4/23/02  
 Equipment Rental: \_\_\_\_\_ Company: \_\_\_\_\_ To: \_\_\_\_\_  
 Equipment Hours: \_\_\_\_\_ F.E. Time from: \_\_\_\_\_ to: \_\_\_\_\_ By: \_\_\_\_\_

(outside service and expense record must be attached for any outside costs)

1509: Set up for socks

3"  
16.38

1540: MWS  
 WL = 21.70  
 F.D. = 32.68

1552: DO = .90 mg/l  
 Redox = -299 @ 1605

1606: 848 us = Conductivity  
 20.6 = C°  
 6.94 = pH 1636 = HCL samples

1645: Set up for socks

1718: MWI  
 4" DO = 0.30  
 Redox = 008 mV  
 C° = 18

1737: pH = 6.9  
 Conductivity = 922

1745: Clean up, pack equipment

Attachments:

Initial

**APPENDIX A**

**LABORATORY REPORTS**



**Sequoia  
Analytical**

1455 McDowell Blvd, North Ste D  
Petaluma, CA 94954  
(707) 792-1865  
FAX (707) 792-0342  
www.sequoialabs.com

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8 May, 2002

David Nanstad  
Harding ESE - SF  
28 2nd Street, Suite 700  
San Francisco, CA 94105

RE: BPS Services, Oakland, CA  
Sequoia Work Order: P204517

Enclosed are the results of analyses for samples received by the laboratory on 04/24/02 14:30. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

*Angelee Cari*

Angelee Cari For Michelle M. Wiita  
Project Manager

CA ELAP Certificate #2374



Harding ESE - SF  
28 2nd Street, Suite 700  
San Francisco CA, 94105

Project: BPS Services, Oakland, CA  
Project Number: 53087.004  
Project Manager: David Nanstad

**Reported:**  
05/08/02 15:56

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
53087-4	P204517-01	Water	04/23/02 13:20	04/24/02 14:30
53087-2	P204517-02	Water	04/23/02 14:42	04/24/02 14:30
53087-3	P204517-03	Water	04/23/02 16:36	04/24/02 14:30
53087-1	P204517-04	Water	04/23/02 17:35	04/24/02 14:30
53087-5	P204517-05	Water	04/23/02 17:57	04/24/02 14:30

Sequoia Analytical - Petaluma

*The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.*

Angelee Cari For Michelle M. Wiita, Project Manager