

Harding ESE, Inc.

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Project 53087.1

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

Quarterly Groundwater Remediation and Monitoring Report April 5 through June 30, 2001 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 (see Plate 1). This letter-report covers the period from April 5 through June 30, 2001, 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 gasoline 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 free phase product from the groundwater surface. Groundwater was extracted from MW-1A and MW-4 and passed through an oil-water separator that removed the free phase gasoline. 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 free-phase gasoline were recovered.

By 1999, the oil-water separator was no longer recovering product and free phase product 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 (ORCTM). ORCTM is manufactured and distributed by Regenesis, 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 ORCTM calculation sheet and a Groundwater Monitoring Plan, dated September 23, 1999.

Harding implemented the *in situ* remediation technique by placing ORC<sup>TM</sup> in treatment wells: MW-1A, MW-3, MW-4, and MW-5 on September 29, 1999. The ORC<sup>TM</sup> 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).

#### SECOND QUARTER OF 2001 GROUNDWATER SAMPLING AND ANALYSIS

In accordance with the Groundwater Monitoring Plan, Harding removed the ORC<sup>TM</sup> socks two weeks before the scheduled sampling event from Wells MW-3 and MW-5 on June 1, 2001. The dissolved oxygen was measured in-situ in wells MW-3, MW-5, MW-1 and MW-6. The DO measurements are presented in Table 1.

On June 28, 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 distance from the top of each well's casing to the groundwater using an electric 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 end of the tubing was 2 to 4 feet below the groundwater surface and connected 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, oxidation reduction potential, 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<sup>TM</sup> socks in wells MW-1A and MW-4. Harding returned the ORC<sup>TM</sup> socks to treatment wells MW-3 and MW-5 where they will remain until the next quarterly monitoring event. Presently, the ORC<sup>TM</sup> socks are replaced in the treatment wells on six-month intervals.

#### DISCUSSION

As shown in Table 2 and Plate 5, the groundwater surface elevation increased an average of 0.04 feet across the site as compared to last quarter's measurements. Using the groundwater elevations from MW-1, MW-3, MW-5, and MW-6 as measured on June 28, 2001, groundwater contours were created and are shown on Plate 2. Based on these contours, the groundwater gradient was at 0.005 ft/ft to the 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 extend below the groundwater surface, recent groundwater monitoring has indicated the groundwater flow has been in a west to southwest direction.



Table 3 contains the compilation of historical groundwater sample results using the purge method of sampling and Table 4 provides the historical groundwater sample results since instituting *in situ* bioremediation using the non-purge sampling method. Plate 3 and Plate 4 present the sample results from this quarter's sampling event.

As shown on Plate 3, concentrations of TPH-g, BTEX constituents and MTBE remained within the range of historical values for well MW-1 and MW-3. Second quarter sample results indicated that concentrations of BTEX constituents in well MW-5 were the lowest monitored to date. Second quarter TPH-g, MTBE concentrations from well MW-5 remained within the range of historical values. The groundwater sample from MW-6 did not contain any detectable concentrations of TPH-g, benzene or ethylbenzene.

The groundwater sample from MW-6 did contain detectable concentrations of MTBE, toluene and total xylenes at the following concentrations: 17, 2.9 and 2.7 micrograms per liter ( $\mu$ g/L) respectively. Harding will continue to sample well MW-6 during the third quarter 2001 groundwater monitoring event. If the presence of these or any of the constituents of concern are indicated, Harding will provide an evaluation of the laboratory analytical result in the third quarter 2001 report. It should be noted that fingerprint analyses of a product sample from the site in 1998 indicated the product recovered by the treatment system did not contain MTBE.

The DO content in well MW-3 immediately following the removal of the ORC<sup>TM</sup> socks was 0.24 mg/L indicating that the ORC<sup>TM</sup> socks had been depleted and were ready to be replaced. The DO content in MW-5 significantly declined in the two week period following removal of the ORC<sup>TM</sup> socks (from 6.62 to 0.5 mg/L), which would be expected if a healthy population of hydrocarbon reducing microbes were present.

#### RECOMMENDATIONS

Harding recommends continued quarterly monitoring utilizing the procedures outlined in our Groundwater Monitoring Plan. ORC<sup>TM</sup> 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<sup>TM</sup> 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

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) 884-3199.

Sincerely,

HARDING LAWSON ASSOCIATES

David S. Nanstad Project Engineer

Luis A. Fraticelli, R.G.

David & Nansta

Associate Geologist

DSN Novmain:/Cityblue/1q01

4 copies submitted

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, June 28, 2001

Plate 3 – TPHg, BTEX and MTBE Concentrations in Groundwater, June 28, 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



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
REDOX (mvolts)				
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
Temperature (deg F)			202	
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
•	, 3.0	,	, 4.,	74.5
pH	0.20	0.53	0.42	0.44
9/29/99 11/22/99	8.39 6.86	8.53	8.43	8.44
2/11/00	6.80	8.42 6.04	6.84	6.79
5/30/00	7.02	6.94 7.35	6.83	6.72
9/15/00	7.06	7.35 7.54	7.54	7.56 6.62
9/15/00 11/17/00	7.00 7.37	7.54 7.69	6.76 7.12	5.62 7.34
4/2/01	6.98	7.69 6.61	7.12 7.07	7.3 <del>4</del> 6.96
6/28/01	6.90	6.74		6.83
	0.50	0.74	6.78	0.63
Specific Conductance (µS/cm)	001	000		0.5.5
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

Note:

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

mg/l = milligrams per liter

mvolts = millivolts

deg F = degrees Fahrenheit

 $\mu S/cm = micro-ohms$  per centimeter

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

	MW		MV	<b>/-</b> 3	ММ		MV	<b>/</b> -6	Average
	TOC Elev.	32.36	TOC Elev.	31.77	TOC Elev.	30.56	TOC Elev.	31.26	Change
Date	Water	Water	Water	Water	Water	Water	Water	Water	Since
Sampled	Level	Elevation	Level	Elevation	Level	Elevation	Lev <u>el</u>	Elevation	Preceding
3/6/96	NM	•	24.79	6.98	23.53	7.03	NA	••	Quarter
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. <b>6</b> 8	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. <del>9</del> 1	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

TOC Elev. = top of well casing elevation based on City of Oakland Datum

NM = not measured

FP = free product

-- = no data

NA = not applicable ( MW-6 was installed in April 1996)

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

Oakland, California

						I	Date Sample	d												Data Pamel						
TPHg (mg/l)	8/1/91	9/30/92	3/30/93	1/13/94	4/13/94	6/29/94	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	Date Sampl 3/31/98	6/18/98	8/28/98	10000	7 4 0 600	< 0.000	
MW-1	FP	FP	ΕP	FP	FP	FР	FP	NA	NΑ	NA	NA	NA	FP	FP	FP	FP	68	59					12/2/98	3/10/99	6/30/99	9/29/99
MW-1A	350	FP	FP	FP	170	95	190	67	53	52	62	200	140	100	FP	66	54	73	41	44	32	26	26	26	18	21
MW-3	74	44	FP	FP	FP	39	4,600	51	20	6.2	19	7	16	6	FP	FP	85	47	66	5L	50	15	41	10	18	NA
MW-4	86	FP	FP	FΡ	58	16	92	35	13	14	ii	110	260	95	FP	37	24	41	32 48	32 NA	16	17	3.2	9.6	7.9	5.0
MW-5	120	51	74	80	63	64	59	51	41	50	45	51	48	48	45	44	35	36	4a 39	NA 48	25	48	10	11	8.8	NA
MW-6						-	-	-		_	-		ND(0.05)								17	16	15	23	7.7	. 11
Benzene (µg/I)													112(0.05)	212(0.03)	(U.U.)	ND(V.VJ)	HEI(VAVS)	(כט,טוריו	ND(0.05)	MD(0.05)	MTD(0102)	ND(0.02)	ND(0.05)	NIX(0.05)	ND(0.05)	ND(0.05)
MW-1	FP	FP	FP	EP	₽P	J-P	FP	NA	NA	NA	NA	ÑĀ	FP	FP	FP	FP	2,200	4.000	4 000	0.000						
MW-1A	17.000	FP	FP	ľΡ	17.000	16,000	13,000	11,000	11,000	8,900	9,900	14,000	18,000	16,000	FP			6,000	6,800	8,300	1,100	8,600	9,200	8,200	7,000	9,200
MW-3	1,600	FP	FP	FP	FP	3,200	1,500	1.100	270	70	220	120	170	45		12,000	11,000	10,000	10,000	9,100	11,000	1,100	8,500	2,300	6,400	NΑ
MW-4	1,500	FP	FP	FP	1,500	1.300	1,700	1,200	1,300	2,200	630	2,600	6,600	9.900	FP	FP	8,500	610	640	690	180	84	39	86	31	120
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		FP.	2,600	2,600	2,900	6,000	NA	2,000	9,700	1,700	2,300	1,800	NA
MW-6					- 1,000		15.000	13,000	12,000	1,000	13,000	15,000		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
Toluene (µg/l)								-	-		_		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(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
MW-I	ΓP	FP	FP	1515	FP	FP	FP	NA	MA	NA	MA	N.				66-		4.44								
MW-IA	31.000	FP	FP	FP	31,000	21.000	21,000	13,000	NA 9,900	9,200	NA 11,000	NA 22,000	FP	FP	FP	14,000	4,500	3.000	3,000	3,700	3,800	2,300	4,300	5,900	5,800	10,000
MW-3	4,600	FP	FP	FP	PP P	2,900	4,200	2,300		140	480		28,000	22,000	HP.	£5,000	12,000	16,000	16,000	11,000	15,000	830	11,000	1,900	7,800	NA
MW-4	6,200	FP	FP	FP	2.500	790	4,100	3 400	550			170	270	30	FP	FP	13,000	6,000	5,300	3,800	1,500	1,100	85	540	330	340
MW-5	14,000	5.900	5,000	8.200	3.500	5,400	3,800	2,200	1,600	2,100 2,700	470	3,600	19,000	19,000	FP	6,900	3,200	5,000	11,000	NA	460	11,000	610	2,100	3,000	NA
MW-6	1-7,000	5,500	5,000	0,200	3.300	3,400	3,600		2,100		2,100	2,800	2,900	4,500	2,200	1,100	560	270	500	400	310	160	120	300	270	710
Ethylbenzene (µ						-	-	-	-	-	-	-	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(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)	ND(0.30)
MW-1	FP	FP	FP	FP	FP	FP	FP	NA	NA	NA	NA	NA			-											
MW-LA	3.000	FP	FP	FP	2,100	1,500	1,400	910	500	710			FP	FP	FP	FP	1.500	1,600	1,400	1,100	550	730	820	870	950	1,200
MW-3	670	FP	FP	FP	FP	580	6,000	580	190	68	790 140	2,700 49	2,800	2,100	FP	1,400	1,000	1,400	1,400	1,100	870	31	720	1,600	660	NA
MW-4	1,000	FP	[-]>	FP	520	51	310	280	77	110	140		68	15	FP	FP	2.400	930	800	870	490	430	25	250	200	230
MW-5	1,900	1.400	1,800	1,400	1,500	2,800	1,800	2,800	1.400	2,000	16,000	780 2,000	3,700	2,000	FP	540	140	350	580	NA	ND(15)	890	ND(15)	88	150	NA
MW-6		1,100		.,	1	2,000	1,000	2,300	1,400	2,000	10,000	2,000	2,000	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
Xylenes (µg/l)							_			-	-		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)
MW-1	FP	FP	퍈	FP	FP	FP	FP	ÑΑ	MA	MA	17.4	314														
MW-IA	22,000	FP	FP	FP	14,000	12.000	11,000	9,800	NA 6,300	NA 6.800	NA 5 200	NA 22 AAA	FP	FP	FP	FP	.,	8,600	6,600	4,300	3,000	2,100	2.800	3,500	2,500	5,500
MW-3	4,300	FP	172	FP	FP	4,300	95,000	4,800	1.700	500	5,300 1,700	22,000 440	19,000	14,000	FP	100	7,200	8,500	12,000	6,800	5,800	3,000	6.700	2,300	4,100	NA
MW-4	7,300	FP	172	FP	3,200	3,400	5.400	5,800	1,800	2,100	1,300		1,500	300	FP	FP	16,000	5,900	5,900	5,200	3,700	3,800	360	2,300	1,800	1,300
	4,900	2,600	2,700	2,700	2,100	4,500	2,900	4,500	1,600	2,100	1,900	10,000	28,000	13,000	FP	5,500	3,500	4,800	8,200	NA	6,400	5,000	2,300	1,600	2,700	NA
MW-5	-1,700	-,000		2,100	2,100	4,,100	2,900	4,500	1,000	2,100		2,400	2,700	4,000	6,500	2,800	1,700	1,300	1,700	2,200	850	900	840	1,100	690	1,100
MW-6								-	-	-	-	-	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)
				NΛ	NA	NA.	N'A	NIA	N/A	MA																
MW-6 MTBE (μg/l)	NA.	NΑ	NA.			LAV.	NA	NA NA	NA	NA	NA	NA	NA	NA	FP		ND(500)	ND(500)	300	420	ND(50)	ND(50)	ND(50)	ND(50)	ND(25)	ND(250)
MW-6 MTBE (µg/l) MW-1	NA NA	NA NA	NA NA		MΔ	NI A				NA	NA	NA	NA	NA.	NA	1,800	ND(500)	ND(500)	1,900	300	ND(50)	ND(50)	****	h		314
MW-6 MTBE (µg/l) MW-1 MW-1A	NΛ	NA	NA	NA	NA NA	NA	NΑ		NA													1117 (20)	ND(50)	ND(50)	ND(25)	NA
MW-6 MTBE (µg/l) MW-1 MW-1A MW-3	NA NA	NA NA	NA NA	NA NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	FP		ND(500)		ND(300)	350	ND(25)	ND(50)	ND(50) ND(50)	ND(50) ND(25)	ND(25) ND(25)	10
MW-6 MTBE (µg/l) MW-1 MW-1A MW-3 MW-4	NA NA NA	NA NA NA	NA NA NA	NA NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA NA	NA	NA	NA	NA	NA	1,400	ND(300)	ND(500)	270	350 NA						10
MW-6 MTBE (µg/t) MW-1 MW-1A MW-3	NA NA	NA NA	NA NA	NA NA	NA	NA	NA	NA	NA	NA							ND(300)		270		ND(25)	ND(50)	ND(50)	ND(25)	ND(25) ND(25)	

TPHg = total petroleum hydroxarbons as gosoline MTBH = methyl t-huryl other (mg/t) milligrams per liter

(µg/l) inicrograms per liter

ND  $\Rightarrow$  Not detected above the reporting limit in parenthesis

NA = Not analyzed

I'P = Prec Product - well not sampled

-- = Well did not exist at date indicated

TPHg = total petroleum hydrocarbons as gasoline MTBE = methyl t-butyl other

(µg/l) micrograms per liter

(mg/l) milligrams per liter

 $ND \cong Not$  detected above the reporting limit in parenthesis  $NA \cong Not$  analyzed  $PP = Free \ Product + well not sampled$ 

-- = Well did not exist at date indicated

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

TPHg (mg/l)	9/29/99	11/22/99	2/11/00	5/30/00	9/15/00	11/16/00	4/2/01	6/28/01
MW-1	14	24	19	19	20	18	19	39
MW-3	4.1	3.1	0.54	0.49	1.5	1.3	0.17	4.9
MW-5	10	30	. 23	19	24	1.8	15	3.6
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
Benzene (µg/l)								
MW-1	6,200	4,900	4,100	5,700	4,100	3,500	4,700	5,200
MW-3	180	6.5	8.3	11	28	20	9	150
MW-5	14,000	11,000	12,000	9,900	3,800	470	7,400	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
Toluene (μg/l)								
MW-1	5,900	5,000	4,800	8,400	5,700	4,300	5,200	4,200
MW-3	340	33	20	5.6	14	34	6,2	240
MW-5	470	3,400	4,500	6,900	3,000	220	3,000	11
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
Ethylbenzene (µg/l)								
MW-1	620	730	530	730	540	640	570	660
MW-3	130	27	2.4	0.45	2.6	25	1.4	38
MW-5	1,100	1,500	1,200	1,200	460	39	1000	16
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
Xylenes (μg/l)								
MW-1	3,500	3,500	2,800	3,500	2,700	3,200	2,600	3900
MW-3	580	260	28	17	160	28	8.1	160
MW-5	600	2,500	1,300	2,600	1,200	100	2,200	15
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
MTBE (µg/l) (EPA Met	hod 8020)				_			
MW-1	ND<250	ND<100	6.6	ND<5.0 <sup>1</sup>	ND<12 1,2	ND<40 <sup>1,2</sup>	50 <sup>1</sup>	8.5 1
MW-3	14	ND<1.0	31	ND<5.0 <sup>1</sup>	ND<5 1	ND<5 1	77 <sup>1</sup>	ND<2 1
MW-5	ND<100	ND<100	6.6	ND<200	ND<10 1,2	ND<5 1	ND<501	4.4 <sup>1</sup>
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>

mg/l = milligrams per liter

μg/l = micrograms per liter

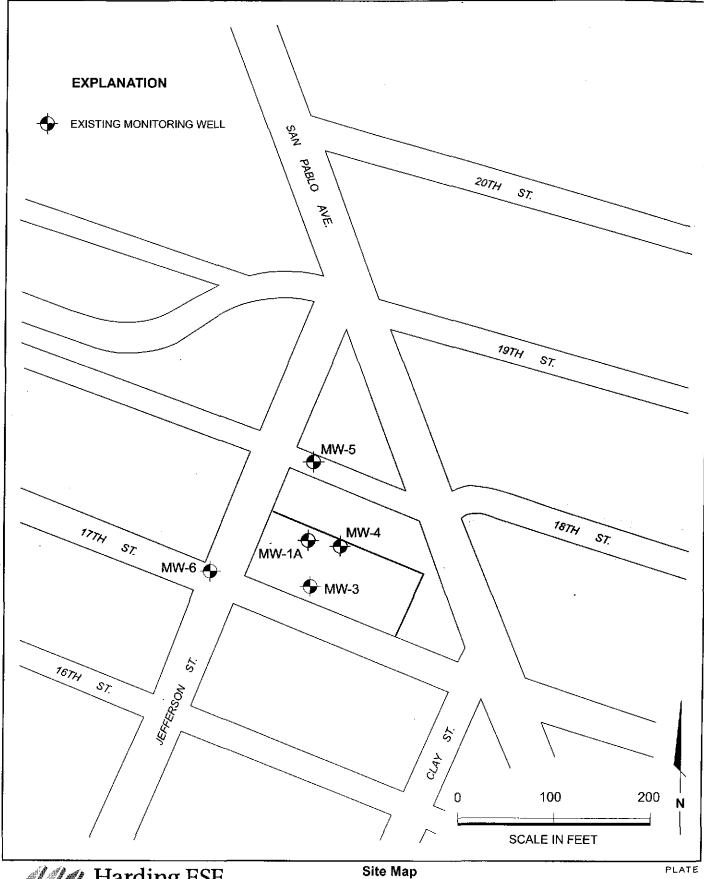
ND = Not detected above the reporting limit following the less than sign

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 ug/L, Backup sample analyzed after hold time had a result of ND<5 µg/l.





Harding ESE A MACTEC COMPANY

1700 Jefferson Street

**BPS Reprographic Services Facility** Oakland, California

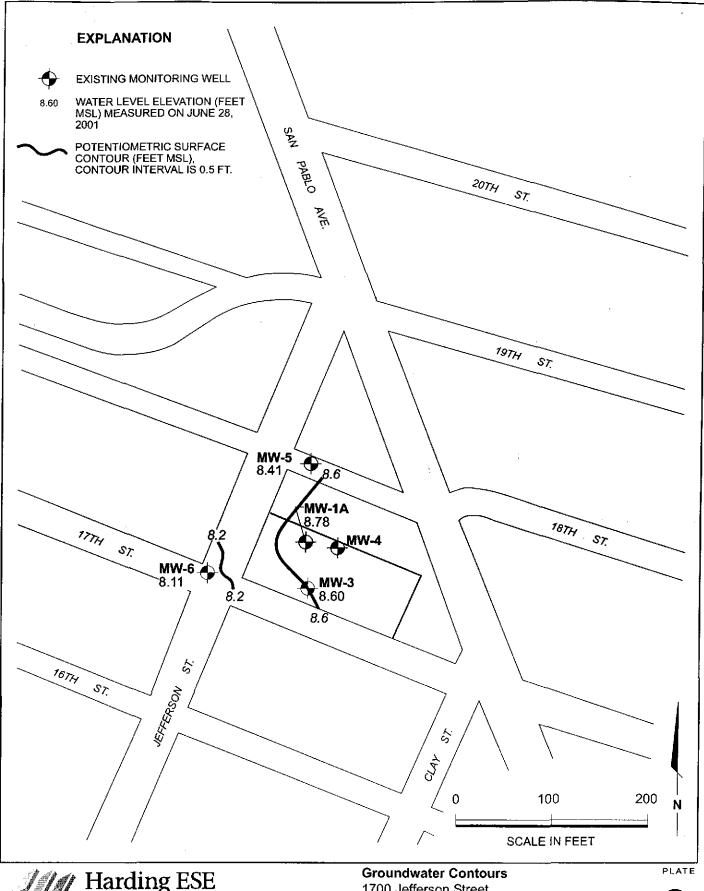
DRAWN CN

PROJECT NUMBER 53087 001

APPROVED

DATE 7/01

REVISED DATE





Harding ESE

1700 Jefferson Street

**BPS Reprographic Services Facility** Oakland, California

APPROVED

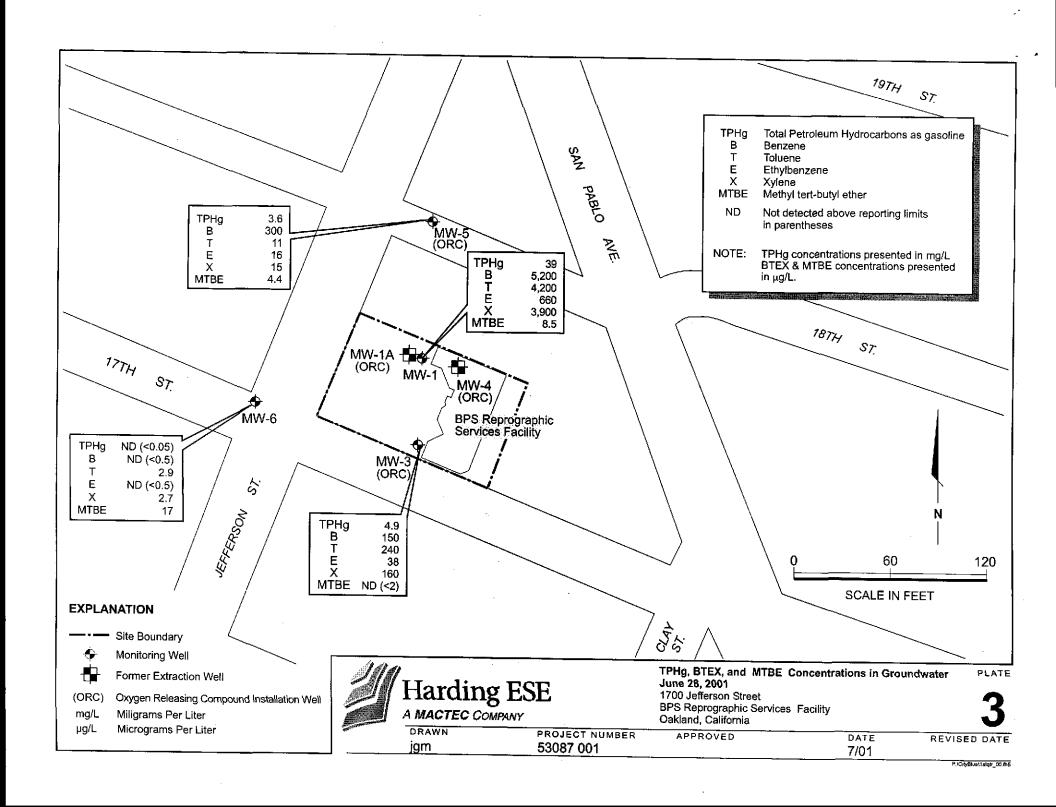
7/01

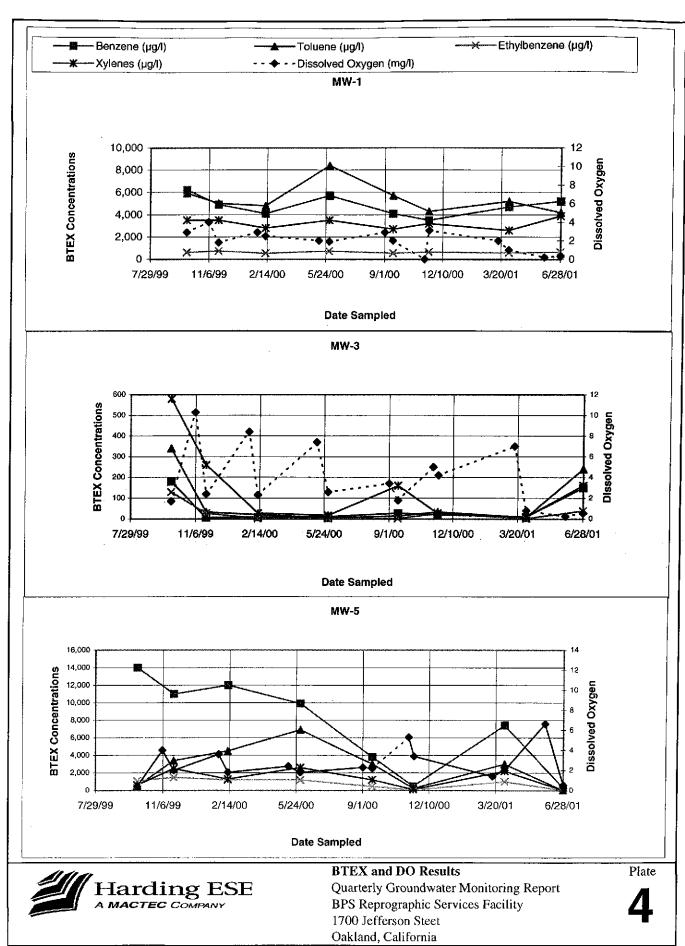
REVISED DATE

DRAWN CN

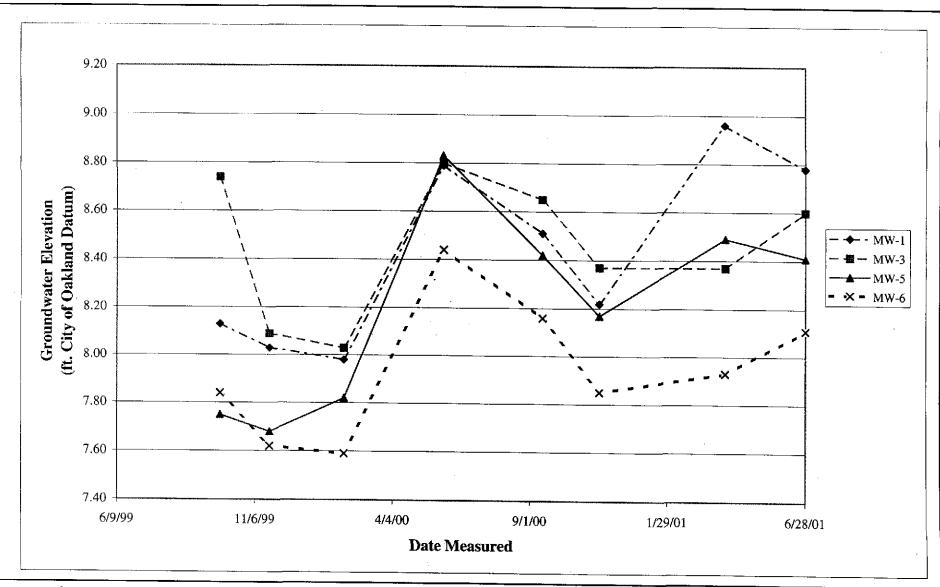
PROJECT NUMBER 53087 001

DATE





Drawn by JOB NUMBER APPROVED DATE REVISED DATE dsn 53087.001 7/11/01





**Groundwater Elevation Data** 

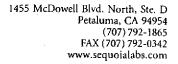
Quarterly Groundwater Monitoring Report BPS Reprographic Services Facility 1700 Jefferson Steet Oakland, California

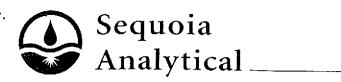
5

FIGURE

DRAWN JOB NUMBER APPROVED DATE REVISED DATE dsn 53087.001 7/11/01

# APPENDIX A LABORATORY REPORTS





July 11, 2001

David Nanstad Harding ESE 90 Digital Drive Novato, CA 94948

RE: General Commercial / P106542

Enclosed are the results of analyses for samples received by the laboratory on 06/28/01. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Michelle M. Portis Project Manager

CA ELAP Certificate Number 2374





Project: General Commercial

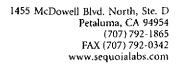
Project Number: City Blue- Oakland-53087.001

Project Manager: David Nanstad

Reported: 07/11/01 12:23

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
53087-6	P106542-01	Water	06/28/01 09:40	06/28/01 18:15
53087-3	P106542-02	Water	06/28/01 11:15	06/28/01 18:15
53087-5	P106542-03	Water	06/28/01 12:20	06/28/01 18:15
53087-1	P106542-04	Water	06/28/01 13:10	06/28/01 18:15





Project: General Commercial

Project Number: City Blue- Oakland-53087.001

Project Manager: David Nanstad

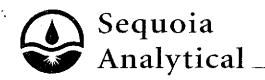
Reported:

07/11/01 12:23

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

		Reporting		1 1 1 1 1 1 1	•				
Analyte	Result	Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
53087-6 (P106542-01) Water	Sampled: 06/28/01 09:40	Received:	06/28/01	18:15					
Gasoline	ND	50	ug/l	1	1070063	07/03/01	07/03/01	EPA 8015M/8020M	
Benzene	ND	0.50			**	#	"	ш	
Toluene	2.9	0.50	"	н	H	n	*	н	
Ethylbenzene	ND	0.50	•	**	**	#	**	19	
Xylenes (total)	2.7	0.50			. **	π.	**	11	
Methyl tert-butyl ether	14	2.5	н	#	"	#	*	"	
Surrogate: a,a,a-Trifluorotolue	ne	106 %	65-	135	11	Ħ	"	,,	
Surrogate: 4-Bromofluorobenze		99.7 %		135	H	tt .	**	,,	
53087-3 (P106542-02) Water	Sampled: 06/28/01 11:15	Received:	06/28/01	18:15					
Gasoline	4900	250	ug/i	5	1070063	07/03/01	07/03/01	EPA 8015M/8020M	
Benzene	150	2.5	n,	-	n	*	•	н	
Toluene	240	2.5	n	*	H			#	
Ethylbenzene	38	2.5	H		н	Ħ		н	
Xylenes (total)	160	2.5	*	. •	n	•	₩ 1	•	
Methyl tert-butyl ether	27	12	. *		н			н	QR-04
Surrogate: a,a,a-Trifluorotolue	ne	104 %	65-	135	н	7		*	
Surrogate: 4-Bromofluorobenze		97.3 %		135	*	tt	<b>n</b> .	"	
53087-5 (P106542-03) Water	Sampled: 06/28/01 12:20	Received:	06/28/01	18:15					
Gasoline	3600	100	ug/l	2	1070063	07/03/01	07/03/01	EPA 8015M/8020M	
Benzene	300	1.0	**	"	n	Ħ	**	π	
Toluene	11	1.0	"	**	11	н	"	**	
Ethylbenzene	16	1.0	19	IF.	н	н	**	*	
Xylenes (total)	15	1.0	11	н	#	Ħ	**	n	
Methyl tert-butyl ether	19	5.0	**	"	**		"	19	QR-04
Surrogate: a,a,a-Trifluorotolue	ne	97.3 %	65-	135	"	н	и	"	
Surrogate: 4-Bromofluorobenze		97.0 %		135	"	,,	IJ	11	
G		· - · <del>-</del>							





Project: General Commercial

Project Number: City Blue- Oakland-53087.001

Reported: .

Project Manager: David Nanstad

07/11/01 12:23

## 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
53087-1 (P106542-04) Water	Sampled: 06/28/01 13:10	Received:	06/28/01	18:15					
Gasoline	39000	1000	ug/l	20	1070063	07/03/01	07/03/01	EPA 8015M/8020M	
Benzene	5200	10	"	D	••	**	"	#1	
Toluene	4200	10	H	н	•	"	**	**	
Ethylbenzene	660	. 10	**	н				44	
Xylenes (total)	3900	10	**	11	**			"	
Methyl tert-butyl ether	99	50		"	n	**	*	11	QR-04
Surrogate: a,a,a-Trifluorotolue	 ne	108 %	65-	135	н	12	r r	"	
Surrogate: 4-Bromofluorobenze		95.7 %	65-	135	n	n	Ħ	*	





Project: General Commercial

Project Number: City Blue- Oakland-53087.001

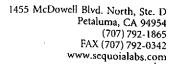
Reported:

Project Manager: David Nanstad

07/11/01 12:23

# 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
Batch 1070063 - EPA 5030, waters										
Blank (1070063-BLK1)				Prepared	& Analyz	ed: 07/03/				
Gasoline	ND	50	ug/I	<u> </u>						
Benzene	ND	0.50								
Toluene	ND	0.50	••							
Ethylbenzene	ND	0.50								
Xylenes (total)	ND	0.50	,,							
Methyl tert-butyl ether	ND	2.5	Ħ	•			•			
Surrogate: a,a,a-Trifluorotoluene	327		"	300		109	65-135			
Surrogate: 4-Bromofluorobenzene	287		#	300		95.7	65-135			
LCS (1070063-BS1)	·			Prepared	& Analyz	ed: 07/03/	01			
Gasoline	2650	50	ug/l	2750		96.4	65-135			
Benzene	42.8	0.50	**	32.0		134	65-135			
Toluene	190	0.50	н	193		98.4	65-135			
Ethylbenzene	49.3	0.50	*	46.0		107	65-135			
Xylenes (total)	234	0.50		231		101	65-135			
Methyl tert-butyl ether	63.2	2.5	•.	52.0		122	65-135			
Surrogate: a,a,a-Trifluorotoluene	356	·	*	300	·····	119	65-135			
Surrogate: 4-Bromofluorobenzene	308		"	300		103	65-135			
Matrix Spike (1070063-MS1)	Sou	ırce: P10652	8-01	Prepared	& Analyzo	ed: 07/03/	01			
Gasoline	2810	50	ug/l	2750	ND	102	65-135			
Benzene	39.3	0.50	н	32.0	ND	123	65-135			
Toluene	193	0.50	н	193	ND	100	65-135			
Ethylbenzene	52.5	0.50	**	46.0	ND	114	65-135			
Xylenes (total)	245	0.50	**	231	ND	106	65-135			
Methyl tert-butyl ether	68.9	2.5	"	52.0	ND	128	65-135			
Surrogate: a,a,a-Trifluorotoluene	360		"	300		120	65-135			
Surrogate: 4-Bromofluorobenzene	315		**	300		105	65-135			





Harding ESE

90 Digital Drive

Novato CA, 94948

Project: General Commercial

Project Number: City Blue- Oakland-53087.001

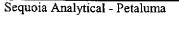
Project Manager: David Nanstad

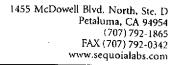
Reported:

07/11/01 12:23

# 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
Batch 1070063 - EPA 5030, waters										
Matrix Spike Dup (1070063-MSD1)	Sou	ırce: P10652	8-01	Prepared	& Analyze	ed: 07/03/	01			
Gasoline	2810	50	ug/l	2750	ND	102	65-135	0.00	20	
Benzene	38.6	0.50	**	32.0	NĐ	121	65-135	1.80	20	
Toluene	196	0.50	**	193	ND	102	65-135	1.54	20	
Ethylbenzene	53.3	0.50	n	46.0	ND	116	65-135	1.51	20	•
Xylenes (total)	249	0.50	**	231	ND	108	65-135	1.62	20	
Methyl tert-butyl ether	67.6	2.5	н	52.0	ND	125	65-135	1.90	20	
Surrogate: a,a,a-Trifluorotoluene	368		"	300		123	65-135	-		
Surrogate: 4-Bromofluorobenzene	317		N	300	-	106	65-135			







Harding ESE

Project: General Commercial

90 Digital Drive Novato CA, 94948 Project Number: City Blue- Oakland-53087.001

Project Manager: David Nanstad

Reported:

07/11/01 12:23

#### Notes and Definitions

QR-04 The results between the primary and confirmation columns varied by greater than 40% RPD. The results may still be useful for

their intended purpose.

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

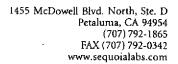
RPD Relative Percent Difference

Sequoia Analytical - Petaluma



### CHAIN OF CUSTODY FORM

Job Number:	53087	. 00 1		David Browne		SIS REQUESTED	
Name/Location: —	City 5	zwe ou	cland		887	] \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Project Manager: —	Daniel	Nanstacl	Cleuch Recorder: —	David Scome (Signature Required)	Range Organics 8015B ange Organics 8015B see MTBE (80 80 80 80 80 80 80 80 80 80 80 80 80 8	(801	
MATRIX #CONTAINERS & PRESERV.		E NUMBER	DATE	STATION DESCRIPTION	Gasoline Range Organics 8015 Diesel Range Organics 8015B BTEX plus MTBE (8020 CCR Title 22 Metals (17) EPA 8021B EPA 8260B	TPH (2002)	
Water Soil Air HrSO4 HRO5 HCL	YR	SEQ	YR MO DAY TIME	DEb.	Gate Die BTE EP/	7 P	
X 3 3 3	53087 53087	- G	0106280940	P166542-1 -2		X	
X 3	53087	- 5	0106281220	<del>-3</del>		X	
				· ·			
	ADDITIONA	L INFORMATION			CHAIN OF CUSTODY R	ECORD	
SAMPLE NUMBER				7 1 A	D-11.1.2	14.1 500	0ate/Time
YR SEQ		TURNAROUND	TIME/REMARKS	Relinguished By: Isignature)	Print Name (Print Name) (Print Name)	(Company)	Cate/Time
		STANDIARD	TAT	Jaceived By: (signature)	(Print Name)	(Company)	6/28/9 /8/5 Date/Time
				Relinquished By: (signature)	(Print Name)	(Company)	Date/Time
				Descript Bu (signature)	/Print Mamal		
	000	LER CUSTODY	SEALS INTACT	Received By: (signature)	(Print Name)	(Company)	Date/Time ·
				Relinquished By: (signature)	(Print Name)	(Company)	Date/Time
			NOT INTACT	Received By: (signature)	(Print Name)	(Company)	Date/Time
	coc	DLER TEMPERA	TURE°C	Received By: (signature)	(Print Name)	(Company)	Oate/Time
				Method of Shipment:			
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		Laboratory Cop White	Yellow	Field or Office Copy Pink			00291 1





July 16, 2001

**David Nanstad** Harding ESE 90 Digital Drive Novato, CA 94949

RE: General Commercial / P106542

**Dear David Nanstad** 

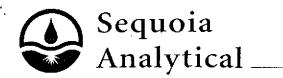
Enclosed are the results of MTBE confirmation by EPA 8260B for sample(s) received by the laboratory on June 28, 2001. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Project Manager

CA ELAP Certificate Number 2374





Project: General Commercial

Project Number: City Blue-Oakland-53087.001

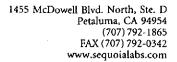
Project Manager: David Nanstad

Reported:

07/16/01 15:59

#### ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
53087-6	P106542-01	Water	06/28/01 09:40	06/28/01 18:15
53087-3	P106542-02	Water	06/28/01 11:15	06/28/01 18:15
53087-5	P106542-03	Water	06/28/01 12:20	06/28/01 18:15
53087-1	P106542-04	Water	06/28/01 13:10	06/28/01 18:15





Harding ESE

Project: General Commercial

90 Digital Drive Novato CA, 94949

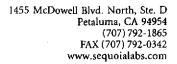
Project Number: City Blue- Oakland-53087.001

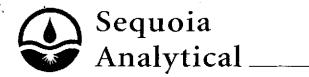
Project Manager: David Nanstad

Reported: 07/16/01 15:59

### MTBE by EPA Method 8260B Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
53087-6 (P106542-01) Water	Sampled: 06/28/01 09:40	Received:	06/28/01	18:15					
Methyl tert-butyl ether	17	2.0	ug/l	1	1070051	07/12/01	07/12/01	EPA 8260B	
Surrogate: 1,2-Dichloroethane-	d4	97.6 %	76-	-114	"	"	"	<b>"</b>	
53087-3 (P106542-02) Water	Sampled: 06/28/01 11:15	Received:	06/28/01	18:15					
Methyl tert-butyl ether	ND	2.0	ug/l	1	1070051	07/12/01	07/12/01	EPA 8260B	·
Surrogate: 1,2-Dichloroethane-	d4	96.2 %	76-	-114	<b>"</b>	*	"	"	
53087-5 (P106542-03) Water	Sampled: 06/28/01 12:20	Received:	06/28/01	18:15					
Methyl tert-butyl ether	4.4	2.0	ug/l	1	1070051	07/12/01	07/12/01	EPA 8260B	A-01
Surrogate: 1,2-Dichloroethane-	d4	95.8 %	76-	-114	н	п	"	m	
53087-1 (P106542-04) Water	Sampled: 06/28/01 13:10	Received:	06/28/01	18:15					
Methyl tert-butyl ether	8.5	2.0	ug/l	1	1070051	07/12/01	07/12/01	EPA 8260B	A-01
Surrogate: 1,2-Dichloroethane-	d4	111 %	76-	114	#	"	"	"	· ·





Project: General Commercial

Project Number: City Blue- Oakland-53087.001

Project Manager: David Nanstad

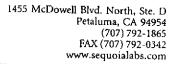
Reported:

07/16/01 15:59

# MTBE by EPA Method 8260B - Quality Control

#### Sequoia Analytical - San Carlos

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch 1070051 - EPA 5030B [P/T]										
Blank (1070051-BLK3)				Prepared -	& Analyz	ed: 07/12/	01			
Methyl tert-butyl ether	ND	2.0	ug/l							
Surrogate: 1,2-Dichloroethane-d4	52.6		"	50.0		105	76-114		,	
Blank (1070051-BLK4)				Prepared	& Analyz	ed: 07/13/	01			
Methyl tert-butyl ether	ND	2.0	ug/l							
Surrogate: 1,2-Dichloroethane-d4	46.1		"	50.0		92.2	76-114			
LCS (1070051-BS3)				Prepared	& Analyz	ed: 07/12/	01			
Methyl tert-butyl ether	53.5	2.0	ug/l	50.0		107	70-130			
Surrogate: 1,2-Dichloroethane-d4	51.4		"	50.0		103	76-I14			
LCS (1070051-BS4)				Prepared	& Analyz	ed: 07/13/	01			
Methyl tert-butyl ether	48.3	2.0	ug/l	50.0		96.6	70-130		_	
Surrogate: 1,2-Dichloroethane-d4	45.4		. н	50.0		90.8	76-114			
Matrix Spike (1070051-MS1)	Source: L107104-01			Prepared & Analyzed: 07/13/01						
Methyl tert-butyl ether	45.4	2.0	ug/l	50.0	ND	90.8	60-140			
Surrogate: 1,2-Dichloroethane-d4	46.9		17	50.0		93.8	76-114			
Matrix Spike Dup (1070051-MSD1)	Source: L107104-01		4-01	Prepared	& Analyz	ed: 07/13/	01			
Methyl tert-butyl ether	46.0	2.0	ug/l	50.0	ND	92.0	60-140	1.31	25	٠
Surrogate: 1,2-Dichloroethane-d4	47.0		"	50.0	-	94.0	76-114			





Harding ESE

90 Digital Drive Novato CA, 94949 Project: General Commercial

Project Number: City Blue- Oakland-53087.001

Project Manager: David Nanstad

Reported:

07/16/01 15:59

#### Notes and Definitions

A-01 MTBE has 3-methyl pentane coelution.

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

# APPENDIX B GROUNDWATER SAMPLING FORMS



	A MACTER	TITIE	ئالاننا		Well Number: Well Type:	Monitor	Extraction	Other
Job Name:		City Blue	e		Asen (Aber (	PVC	St. Steel	Other
Job Numbe	 er:		 37.001		Date:	6/28/01		
Recorded E	Ву:	avid 3	ignature)		Sampled By:		(initials)	
L.W.G.L.F				WELL PU	RGING	18 (1 <u>1</u> 2 )		
	PURG	E VOLUME		Residence (2012)		PURGE	METHOD	President de la Sue
Total Depth Water Leve	meter (D in in of Casing ( el Depth (WL Volumes to 1	TO in ft BTOG in ft BTOC):			Bailer - Type: Submersible - Type Other - Type:	Mu	cro pur	
		<b>F</b> 9 (*	<u>- /</u>				rabbalt (Esetting	
	PURGE VOLU	ME GAL CULATI	ON 🛬 :	respondent of the	Near Bottom		Near Top	900 T T T T T T T T T T T T T T T T T T
·	x		08 =		Other Depth in feet (8TOC):			
TD (feet)	WL (Feet)	D (inches) #V	С	alculated Purge Volu	me Screen Interval in feet	t (BTOC):	from	to
To May Table	- Fjeld Parame	ter Measuremer	ite					
Gallons		Conductivity	. ==	Turbidity	BURGETIMES (#2		RURSERAVI	
or Minutes	pH	(μS)	Temp. ☐ °F		Purge Start:		_ GPM:	<del></del>
Initial	6.78	876-45	23.7	695	Purge Stop:		_ GPM:	<del></del>
			<u></u>		Elapsed: PURGIE VOLUMENCE		-	
					Volume:	···	gations	
					Observations During F	Puraina (Well (	•	Odor):
					1			ocenhan od
<del>:</del>					D.O. Initial 0.53		Redov initial	
					D.O. final & 19		Redox final	340 MV
Meter S/N	DB02	DO953	DO953	9092	Discharge Water Dispo	osal:	700000	
	UBUZ	DO999	DO953		Storm Sewer	L	Other	
				WELL SAM	PLING - L			
Bailer - Type	:				Sample Time:	1220		
<del></del>	le No.	Volume/Cont.		sis Requested	Preservatives	Lab	Соп	ments
5 3087	7-5	340As	TPH & ,	BTEX, M	TBB HCI	SEQUION		
		<u> </u>						
				<del></del>				<u> </u>
			···					
			····		· · · · · · · · · · · · · · · · · · ·		-	
						1		
			van gerinden de zwe			I STREET	50.20 Su-Linuxus un confinent	
	uplicate Sample	energies en se comp			SAMPLES			CONTRACTOR AND ADDRESS OF THE PARTY OF THE P
Driginal Sample	•	s ol. Sample No.	Турє		Samples Sample No.	Туре	Other Samp Samp	les le No.
	. 1							
			<u> </u>			<u> </u>		



	Harding ESE				Well Number:	Mw-6			
	AT ANTAILM: PAGE				Well Type:	Monitor	Extraction	Other_	
ob Name:		City Blue	<u> </u>		4 no. 1	PVC	St. Steel	Other	
ob Numbe			7.001		Date:	6/28/01			
ecorded B	y: <u>D</u>	avd Gu	gnature)		Sampled By:		DS B		
				WELL PUR	GING				
	PURG	SE VOLUME		i se sagid Aprie)	Table is report of	PÚRGI	METHOD	THE PROPERTY OF THE PROPERTY O	
	meter (D in i				Bailer - Type:				
		TD in ft-BTOC in ft BTOC):			Submersible - Type:				
		be purged (#			Xotrier - Type.	Pa	rashilt	444	
						PUMPINTA	KESETTING		
	PURGE VOLU	IME CALCULATIO	NC		Near Bottom		Near Top	-	
		/			Other			·	
	) X		08 =	<del></del> -	Depth in feet (BTOC) Screen Interval in Jee	,	from		
TD (feet)	WL (Feet)	D (inches) #V	C:	alculated Purge Volume	a Screen Interval in Jee	et (BTOC).	from	to	
on. Continues (file)	Field Parame	eter Measuremen	ıt						
Gallons		Conductivity	<b>√</b> °C	Turbidity	PURGETIME		PURGE RATE		
r Minutes	рН	(μS)	Temp. □ °F	(NTU)	Purge Start:	,	GPM-		
Initial	6.83	1021-45	23.5	13.3	Purge Stop:		GPM: '	<del></del>	
-	<del>                                     </del>				Elapsed:		_	•	
	<u> </u>				PURGE VOLUME*				
	<u> </u>				Volume: ———	· · · · · · · · · · · · · · · · · · ·	gallons		
			<u>-</u>		Observations During	Purging (Well	Condition, Color, (	Odor):	
					D.O. Initial 6.7	e 27.2°C	Redox initial	106.6	
					D.O. final	milet	Redox final		
					Discharge Water Dist	posal:			
eter S/N	DB02	DO953	DQ953	9092	Storm Sewer		Other		
in die 1984 o Grandspanischen 1984 o		niigi). Držiu i maji		WELLSAMP	NING	anague <u>i en e</u>	State (Article) - 1921 B	Amerikaning de l	
Bailer - Typ	e: <u>G</u> v	a 6		WELLSAMP	PLING Sample Time:	0940		ering and the control of the control	
Bailer - Typ Sam	e: <b></b>	Volume/Cont.	Analy	and the second s	Sample Time:	0940		ments	
Sam	ple No.			WELL SAMP /sis Requested 、。 BTEx   M	Sample Time:		Com	ments	
Sam	ple No.	Volume/Cont.		vsis Requested	Sample Time:	Lab	Com	ments	
Sam	ple No.	Volume/Cont.		vsis Requested	Sample Time:	Lab	Com	ments	
Sam	ple No.	Volume/Cont.		vsis Requested	Sample Time:	Lab	Com	ments	
Sam	ple No.	Volume/Cont.		vsis Requested	Sample Time:	Lab	Com	ments	
Sam	ple No.	Volume/Cont.		vsis Requested	Sample Time:	Lab	Com	ments	
Sam	ple No.	Volume/Cont.		vsis Requested	Sample Time:	Lab	Com	ments	
Sam	ple No.	Volume/Cont.		vsis Requested	Sample Time:	Lab	Com	ments	
Sam 5.308	ple No.	Volume/Cont.	TPHGos	vsis Requested	Sample Time:  Preservatives  1168 HC1	Lab	Com	ments	
Sam 5.308	ple No.	Volume/Cont.	TPHGos	AUTY CONTROL	Sample Time:  Preservatives  1168 HC1	Lab	Com		



Job Name:   City Blue   Johnston   Extraction   Other     Job Number:   S3087,001   Date:   67,88001     Recorded By:   Darwing   Sampled By:   D3 1/2     Recorded By:   Darwing   Sampled By:   D3 1/2     Recorded By:   Darwing   Sampled By:   D3 1/2     Recorded By:   D4 1/2		ame non	Well Number:	MW-3
Date: 6/28/01   Date: 6/28/01   Sampled By:   Date: 6/28/01   Sample By:   Date: 6/28/01	A MAJULE	C COMPANY	Well Type:	Monitor Extraction Other
Sampled By:   Double   Doubl	Job Name:	City Blue	[	St. Steel Other
Casing Diameter (D in inches):   Bailer - Type:   Submersible - Type:   YOther - Type:	Job Number:	53087.001	Date:	6/28/01
PURGE VOLUME  Casing Diameter (D in inches): Total Depth of Casing (TD in ABTOC): Water Level Depth (Mat in ft BTOC): No. of Well Volumes to be purged (# V):  PURGE VOLUME CALCULATION  Purge Store Depth in feet (BTOC): Screen Interval in feet (BTOC):  FIRST PARTING  PURGE METHOD  Bailer - Type:  With routing Purger Micro Purger  Submersible - Type:  PURGE METHOD  Bailer - Type:  Submersible - Type:  Submersible - Type:  PURGE METHOD  Bailer - Type:  Submersible - Type:  Submersible - Type:  PURGE METHOD  Bailer - Type:  Submersible - Type:  Submersible - Type:  Submersible - Type:  PURGE METHOD  Bailer - Type:  Submersible - Type:	Recorded By:	<u> </u>	Sampled By:	Doy (initials)
Casing Diameter (D in inches): Total Depth of Casing (TD in Bet OC): Water Level Depth (W-L in ft BTOC): No. of Well Volumes to be purged (# V):  PURGE VOLUME CALCULATION  Purge Bottom  Other  Depth in feet (BTOC): From to  Screen Interval in feet (BTOC):  Form in feet (BTOC):  Purge Start:  GPM:  Purge Start:  GPM:  Purge Stop:  GPM:  Elapsed:  Baller - Type:  Volume:  Observations During Purging (Well Condition, Color, Odor):  Observations During Purging (Well Condition, Color, Odor):  Observations During Purging (Well Condition, Color, Odor):  Start Advances of the Color of the Co			ELL PURGING	
Total Depth of Casing (TD in 8-BTOC):  Water Level Depth (MU in ft BTOC):  No. of Well Volumes to be purged (# V):  PURGE VOLUME CALCULATION  PURGE VOLUME CALCULATION  Near Bottom Other  Depth in feet (BTOC):  TD (feet)  W. (fpen)  Calculated Purge Volume  Gallons or Minutes pH  Conductivity (µS)  Temp.  FEIGURE TUE  Purge Stop: Elapsed:  Elapsed:  Elapsed:  Elapsed:  Do. Initial  Do. final  D	PURG	<b>EVOLUME</b> COMMENT OF THE PROPERTY OF THE PROPE		PURGE METHOD
Water Level Depth (WATIN ft BTOC): No. of Well Volumes to be purged (# V):  PURGE.VOLUME CALCULATION  PURGE.VOLUME CALCULATION  PURGE.VOLUME CALCULATION  Near Bottom Other Depth in feet (BTOC): Screen Interval in feet (BTOC): From to  Screen Interval in feet (BTOC): From to  PURGE.VOLUME CALCULATION  Now Bottom Other Depth in feet (BTOC): From to  Screen Interval in feet (BTOC): From to  Screen Interval in feet (BTOC): From to  Purge Start: GPM: Purge Start: GPM: Purge Start: GPM: Purge Start: GPM: Discharge Vield Condition, Color, Odor):  Start Advance of the feet (BTOC): From to  Now Bottom Depth in feet (BTOC): From to  Screen Interval in feet (BTOC): From to  Depth in feet (BTOC): From to  Screen Interval in feet (BTOC): From to  Depth in feet (BTOC): From to  Purge Start: From to  Depth in feet (BTOC): From to  Purge Start: From to  Depth in feet (BTOC): From to  Depth in feet (BTO			Bailer - Type:	
No. of Well Volumes to be purged (# V):    PURGE-VOLUME CALGULATION	Total Depth of Casing ( Water Level Depth (WH:	ID in #BTOC):	H	
PURGE VOLUME CALCULATION    Near Bottom			<u> </u>	Τιτο ραγγ
Other   Depth in feet (BTOC):   Screen Interval in feet (BTOC):   Screen	<u> </u>			PUMP INTAKE SETTING
Depth in feet (BTOC):  TD (feet)  WL (Feet)  D (inches) # V  Calculated Purge Volume  Screen Interval in feet (BTOC):  Field Parameter, Measurement  Gallons or Minutes pH  (µS) Temp.	PURGEVOLU	ME CALCULATION	Near Bottom	· Near Top
TO (feet) WILES D (inches) # V Calculated Purge Volume   Screen Interval in feet (BTOC):   from	/	2 Y 2 Y 0 0409 = 004		
Gallons or Minutes pH (μS) Temp. of Turbidity (NTU) Purge Start: GPM:  Initial (ε·7-5 704-45 71.8 42.8 Purge Start: GPM: GPM: GPM: GPM: GPM: GPM: GPM: GPM	TD (feet) WL (F941)			<del> </del>
Gallons or Minutes pH (μS) Temp. of Turbidity (NTU) Purge Start: GPM:  Initial (ε·7-5 704-45 71.8 42.8 Purge Start: GPM: GPM: GPM: GPM: GPM: GPM: GPM: GPM				
or Minutes				
Initial   6.75   704.45   71.8   42.8   Purge Stop: GPM: GPM: GPM:		1 1 6 1		
Elapsed:    PRGFVBLUME				•
Volume: gallons  Observations During Purging (Well Condition, Color, Odor):  Class Consulty a vay - 0  D.O. Initial 6.56 @ PR.B C Redox initial  D.O. final MSUT Redox final 7282-9 must  Discharge Water Disposal:  Meter S/N DB02 D0953 D0953 9092 Storm Sewer Other  WELL: SAMPBING  Sample Time:  Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments				
Observations During Purging (Well Condition, Color, Odor):    Consulty gray = 0 down			(RURGIE VOITUME IV)	
D.O. Initial   D.O. Initial   D.O. final   Preservatives   Documents   D.O. Initial   D.O. Initial   D.O. final   D.O. final   Preservatives   Discharge   Disch			Volume: ———	gallons
D.O. Initial D. S & C PA B C Redox initial D.O. final MOUT Redox final ZBZ-9 MV Discharge Water Disposal:  Meter S/N DB02 DO953 DO953 9092 Storm Sewer Other  WEIL SAMPLING  Sample Time: Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments				
D.O. final WOLF Redox final 7282-9 www Discharge Water Disposal:  Meter S/N DB02 DO953 DO953 9092 Storm Sewer Other  WELL SAMPLING  Baller - Type: Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments				Cloudy avery - Door
Meter S/N DB02 DO953 DO953 9092 Storm Sewer Other			-4.4	Ver Redox initial -282.9 mg
Bailer - Type: Sample Time: 115  Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments				
Bailer - Type: Sample Time: 115  Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments	Meter S/N DB02	DO953 DO953	Storm Sewer	Other
Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments		de la companya de la	LLSAMPHING	
	Bailer - Type:		Sample Time:	1115
53087-3 3vons ton 6, BTEX, MTBR Inc. RES			uested Preservatives	
	53087-3	3 yours tay of BTP	X MTBR HCI	SEZ VICA
QUALITY CONTROL SAMPLES		March 1986 of the Strougher	CONTROLSAMPLES	
Duplicate Samples Blank Samples Other Samples	Duplicate Sample			Other Samples
		,		**************************************
Original Sample No. Dupl. Sample No. Type Sample No. Type Sample No.		pl. Sample No. Type	Sample No.	· ·



Date: 6/28/01  Recorded By: Sampled By: D56  RESERVED COLUMN  RESERVED COL	**CHARLES SACRE 1		4111 <b>2</b>	LUL		Well Number:		Mw-i	·
Date: \$128/01  Sampled By: Do Grand State Purching  WELL PURGING  WELL PURGING  WELL PURGING  WELL PURGING  Sampled By: Do Grand State Purching State Purching State Purching State Purching Park State State Purching State State Purching State Stat		A MAGTEC	COMMINY			Well Type:	UMonitor [	Extraction	Other
Recorded By: DSD (Symints)    PURCE VOLUME	Job Name:		City Blu	е			V VC	St. Steel	Other
Comment   Comm	Job Number:		530	87.001		Date:	6/28/01	_	
PURCEVOLUME  Casing Diameter (D in inches)  otal Depth of Casing (TD-rft BTOC):  Valer Level Depth QM: Int BTOC):  Jo. of Well Volume's to be purged (# V):  PURGE VOLUME STATUMENTON  Near Top  Other  TO (MH)  Volume:  Quality  Qu	Recorded By:	<b>→</b>	urd3-	Signature)		Sampled By:	D56		-
Bailer - Type:  State Level Depth of Casing (TD-irft BTOC):  Jone of Well Volumes to be purged (# V):  PURGE VOLUME CALCULATION  TO MANUE CONDUCTORY  PURGE VOLUME CALCULATION  Purge Stort  GPM:  Bajesd:  Doublind Calculation  Purge Stort  GPM:  Bajesd:  Doublind Calculation  Purge Stort  GPM:  Bajesd:  Doublind Calculation  Purger Stort  Conduct Calculation  Purger Stort  Conduct Calculation  Purger Stort  Purge Stort  GPM:  Bajesd:  Doublind Calculation  Purger Stort  Purge Stort  GPM:  Bajesd:  Doublind Calculation  Purger Stort  Purger Stort  Conduct Calculation  Purger Stort  Redox ritinal 209, gr wv.  Redox ritinal 209, gr vv.  Redox ritinal 209, gr	Tighte the form				WELL PURG	sing :			
Other - Type:    Summerable - Type:   Summerable - Type:   Other - Type:   Oth		PURG	E VOLUME	jangan sa			PURGE	METHOD	
Other Type:   Micropack   Parastalia   Pumpinak	_		1,000			Bailer - Type;			
PURGE VOLUME CATOLISM   PURP   Near Bottom   Near Top   Other									
PURGE VOLUME CALCULATION   Near Bottom						X Jotner - Type:	MICEO D	urge, to	castaltic
Other   Depth in feet (BTOC):   From   Io	_					的。"我们有 <sub>是</sub> ""。	PUMP INTAK	ESETTING	
Depth in feet (BTOC):   Screen Interval in feet (BTOC):   Screen Interva	PL	URGE VOLUI	NE CALCULATI	lon	(1090 St. 100 St.) (1095	Near Bottom	7	Near Top	
TD (944) W. (Feb. D (942) BV Caucasted Purge Volume Screen Interval in feet (BTOC): from to						Other	<i></i>	<b></b> -	
Gallons  Ordinductivity  Temp. For (NTU)  Initial (g.9.0 10.80 22.8 1(g.3 Purps Stop:  Elapsed:  Elapsed:  Observations During Purging (Well Condition, Color, Odor):  Observations During									
Gallons pH (u.S) Temp. strong to Turbidity purge Start GPM:  Initial (a.90 1080 72.6 16.9 Purge Store GPM:  Elapsad:  Elapsad:  Buscestiffs GPM:	TD (feet) V	ML (Feet) I	D (inches) #V		Calculated Purge Volume	Screen Interval in feet	(BTOC):	from	to
Gallons pH (u.S) Temp. strong to Turbidity purge Start GPM:  Initial (a.90 1080 72.6 16.9 Purge Store GPM:  Elapsad:  Elapsad:  Buscestiffs GPM:	cardi <del>ere</del> nai F	ield Parame	ter Measureme	NG PASSON AND					
Initial   G   Q   D   D   D   D   D   D   D   D   D			T	1	C Turbidity	PURGETIME SALE		PURGE RAT	
Baller - Type:   Sample No.   Volume/Cont.   Analysis Requested   Preservatives   Lab   Comments	or Minutes	рН	(μS)	1 —	F (NTU)			and the second second	
Baller - Type:   Sample No.   Volume/Cont.   Analysis Requested   Preservatives   Lab   Comments	Initial (	6.90	1080	22.8	16,9	Purge Stop:		GPM:	*****
Volume: gallons Observations During Purging (Well Condition, Color, Odor): Cloudy Lott grow Stight hydro Coulment Do. Initial 2.32 e17.8 2 Redox Initial 329.8 mv/s Redox final Discharge Water Disposal: Sterr S/N DB02 D0953 D0953 9092 Storm Sewer Other  Baller - Type: Sample Time: 1310  Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments  53087-1 3 YON'S TP Hg BTEX, MT6 & HC1 SETUMH  GUALITY CONTROL SAMPLES  Duplicate Samples  Duplicate Samples  Duplicate Samples  Other Samples					****	Elapsed:			•
Observations During Purging (Well Condition, Color, Odor):  Clast Latter 31 Left hydro Coulons D.O. Initial 2.57.217-8 2. Redox Initial 29.8 mvs D.O. Initial 2.57.217-8 2. Redox Initial 29.8 mvs D.O. Initial 2.57.217-8 2. Redox Initial 29.8 mvs Discharge Water Disposal:  Sterr S/N DB02 D0953 D0953 9092 Storm Sewer Other  WELLSAMPING Sample No. Volume/Cont Analysis Requested Preservatives Lab Comments  53087-1 3 yows TP Hg BT&x, MT&B HC1 \$500.000 FT PHG BT&x, MT&x, MT&x			,	ļ	· ·	PUREENVOLUMENT			•
CLOCK COLUMN D.O. Initial D.S.Z. P.17-8 2 Redox Initial J.S. P.17-8 2 Redox Initial J.S. P.17-8 2 Redox final Discharge Water Disposal: Storm Sewer Other  Sample No. Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments SCOULT SCOULT  Duplicate Samples  Blank Samples  Other Samples  Other Samples					<u> </u>	Volume: ———		gallons	-
D.O. Initial 2.3.2 e17-8 2 D.O. final Polet Redox final Discharge Water Disposal:  Sterr S/N DB02 D0953 D0953 9092 Storm Sewer Other  WELDSAMPING  Sample No. Volume/Cont Analysis Requested Preservatives Lab Comments  Sample No. TP H.g. BTEE, MTOE HC. SETULAT  GUALITY CONTROL SAMPLES  Duplicate Samples Blank Samples Other Samples						Observations During P	urging (Well C	ondition, Color,	Odor):
D.O. final Molet Redox final Discharge Water Disposal:  etter S/N DB02 D0953 D0953 9092 Storm Sewer Other  WELLSAMPLING  Baller - Type: Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments  53087-1 3 yows TP Ha BTEX, MTOR HCI SECULAR  GUALITY CONTROL SAMPLES  Duplicate Samples Blank Samples Other Samples		<del></del>	,		<del> </del>		3	31 ugh	hydro Carbon
Discharge Water Disposal:  eter S/N DB02 D0953 D0953 9092 Storm Sewer Other  WELLSAMPLING  Baller - Type: Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments  53087-1 3 YOVS TP Hq BTEx, MTOB HCL SCOUNT  COMMENTS  QUALITY CONTROL SAMPLES  Duplicate Samples Blank Samples Other Samples				·		D.O. Initial <u>0.37 @</u>	11.82	_	•
Sample No. Volume/Cont Analysis Requested Preservatives Lab Comments  Sample No. TP Hq BTEK, MT6B HC1  SECULIAN  GUALITY CONTROL SAMPLES  Duplicate Samples Blank Samples Other Samples					†			Redox tinal _	<del></del>
Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments  Sample No. TPHq BTEx, MT6 B HC1 SSC  SECULIAL  QUALITY CONTROL SAMPLES  Duplicate Samples Blank Samples Other Samples	eter S/N	DB02	DO953	DO953	9092			Other	
Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments  Sample No. TPHq BTEx, MT6 B HC1 SSC  SECULIAL  QUALITY CONTROL SAMPLES  Duplicate Samples Blank Samples Other Samples		icanolina galas-ga	**************************************						
Sample No. Volume/Cont. Analysis Requested Preservatives Lab Comments  53087-1 3 yours TP Hg BT&x, MT68 HC. &SC.  SECURITY  QUALITY CONTROL SAMPLES  Duplicate Samples Blank Samples Other Samples			e de la constante de la consta	<u> </u>	WELLSYAMIFC				
Duplicate Samples  TP Hq BTEK, MT6E HC1  SECULAT					-		·		
Duplicate Samples    Setuch	530 <b>2</b> 7	NO.						Com	ments
Duplicate Samples Other Samples				4	<u> </u>				
Duplicate Samples Blank Samples Other Samples							-		
Duplicate Samples Blank Samples Other Samples									
Duplicate Samples Other Samples									
Duplicate Samples Other Samples				*, w <sub>*</sub>					
Duplicate Samples Other Samples									
Duplicate Samples Other Samples									
Duplicate Samples Other Samples									
Duplicate Samples Other Samples		1111 J. 2 2 2 3 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		e Malana anamara					
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# 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	53087-3
MW-5	53087-5
MW-6	53087-6