

August 20, 2009

Mr. Jerry Wickham
Senior Hazardous Materials Specialist
Local Oversight Program
Alameda County Department of Environmental Health
1131 Harbor Bay Parkway
Alameda, California 94502-6577

RECEIVED

2:23 pm, Aug 20, 2009

Alameda County
Environmental Health

Subject: Remedial Action Workplan for Advanced Oxygen Releasing Compound ORC[®]
Application to Source Area Contamination, Redwood Regional Park Service Yard
7867 Redwood Road, Oakland, California
Alameda County Fuel Leak Case No. RO0000246.

Dear Mr. Wickham

INTRODUCTION AND BACKGROUND

On behalf of the responsible party, East Bay Regional Park District (EBRPD), Stellar Environmental Solutions, Inc. (SES) is submitting this Workplan for the above referenced site. The Alameda County Environmental Health Services (ACEHS) requested a pilot test workplan in a letter dated March 24, 2009 based on concerns about the subject property designated Fuel Leak Case (Case No RO0000246). An extension to comply with the requested workplan was granted through email from ACEHS for August 27, 2009.

Environmental remediation and investigations associated with former fuel underground storage tanks (UFSTs) have been conducted at the site since 1993 when the UFSTs were removed. The site currently contains 11 site groundwater monitoring wells, 7 of which are sampled on a quarterly basis; the site also contains an operating bioventing system that consists of four vent wells (VWs) and four vapor monitoring points (VMPs) that are monitored on a quarterly basis. Figure 1 shows the general site location and Figure 2 shows the site plan with wells delineated (Attachment A).

The proposed workplan presented is to complete a remedial application of Advanced Oxygen Release Compound (ORC[®]) in two principal areas; the upper yard area (source area), and

immediately downgradient in the downhill roadway area where high residual contamination in the capillary fringe and saturated zone are indicated to be present based on the hydrochemical history of the plume. The decision to propose an Advanced ORC[®] injection was arrived at after careful consideration of the original ORC[®] injection that occurred in 2001 and 2002, and the reasons for its failure to remediate the hydrocarbon plume.

RATIONALE FOR 2009 ORC[®] INJECTION

The reasons for the 2001 and 2002 ORC[®] injection remedy failure was subsequently determined to include:

1. The “area” type injection was focused only in the mid and downgradient portion of the plume—then thought to be the area of principal residual hydrocarbon mass; and
2. The residual contamination in the areas of the original UFST excavation and immediately downgradient were underestimated, as later verified by post 2002 bores and the data collected.

Following the 2001 and 2002 ORC[®] injections, there was a contaminant concentration rebound within approximately one year. This led to the realization that there was significant unrecorded contaminant mass upgradient of the injected area, despite base-of-excavation and other data points suggesting otherwise. Subsequent additional borings (BH-16 through BH-19) in 2003 confirmed the residual total petroleum hydrocarbon (TPH) mass upgradient. Due to the difficulty of excavating this area, which is a steep embankment slope, a soil bioventing system was installed to oxygenate the former UFST removal area. The bioventing remediation has been only partially successful as it does not effectively address the residual contamination held in the stratigraphic traps in the saturated zone and capillary fringe zone.

Significant increases in the hydrocarbon concentrations in upgradient well MW-2, which was installed in the former UFST excavation in 1994, were observed in December 2007. These increases suggested that the previous two years of drought resulted in a release of hydrocarbons from the original UFST excavation area and/or capillary fringe, and saturated areas were exposed. Attachment B contains tabulated and Excel plot trend data for MW-2.

In March 2009, a small pilot test injection of ORC[®] in the upgradient source area around well MW-2 indicated ORC[®] contact can result in reduction of the higher hydrocarbon concentrations. This suggested that ORC[®] would be efficient in achieving dissolved hydrocarbon concentration reductions in the former source area. Four additional monitoring events have been conducted at MW-2 since the March 2009 injection. The data has shown a consistent reduction in both diesel and gasoline grade hydrocarbons (see Attachment B).

Based on further examination of the 2001 and 2002 injection areas and considering the high variability of sediments, an in-situ injection design of “treatment zones” transverse to the plume versus the “area” design was decided upon. Special consideration was given to the upgradient source area as described below in detail.

Injection into the source area in a barrier zone configuration is justified by the calculation of the groundwater velocity. Based on the distance between the wells and the groundwater elevations measured over time, it takes less than one year for groundwater to migrate down to the Redwood creek interface. While the variation in lithology will result in a range of velocity in differing materials, injecting at the source will allow for the ORC[®] to be carried along the same pathways of contaminant migration.

PROPOSED SCOPE OF WORK

Project work elements proposed in this workplan include: 1) Pre-Field Work Planning and Permits; 2) ORC[®] Injection; 3) Post-Injection Monitoring and Laboratory Analyses; and 4) Technical Report Preparation.

Task 1 – Pre-Field Work Planning and Permits

This task includes the cost to conduct all the pre-field work planning and permitting elements for the proposed borehole program, including permitting:

- Obtain an Alameda County Public Works Drilling Permit;
- Complete a site Health and Safety Plan to reflect the boring and Advanced ORC[®] injection tasks;
- Complete a site visit to mark drilling locations and notify Underground Service Alert for utility location;
- Procure the necessary drilling contractor to accomplish the project (obtain multiple bids);
and
- Purchase Advanced ORC[®] from the distributor for delivery to the site.

Task 2 – Advanced ORC[®] Injection Plan

Advanced ORC[®] was selected to inoculate the groundwater in a treatment barrier design in the source zone, and immediately downgradient in the downhill roadway area. This remedy will create highly oxygenated barrier zones at critical locations transverse to the plume, focusing

depth and loading based on lithology and known or suspected TPH mass. Regeneration, the Advanced ORC[®] compound manufacturer, estimates that the radius of the product injection will be approximately 7.5 feet outside of each injection point. However, the SES design adopts a more conservative radius of effective injection, assuming sufficient overlap so that the ORC[®] is assured to reach all target zones. SES will place the injection points on 10 foot versus 15 foot centers, allowing for a more conservative 5 feet of outbound penetration to occur, while still providing effective coverage. The Advanced ORC[®] is a longer lasting and more powerful oxygen delivery compound than the original ORC[®] compound.

The injection system equipment will consist of:

- Direct-push Geoprobe[®] rig;
- Drive rods (typically 1½-inch outside diameter) and injection tooling with fluid deliver sub-assembly;
- Injection pump rated for 5 gallons per minute at 200 pounds per square inch (psi) for sandy formations, and 800 psi for silt and clay formations (Geoprobe[®] DP-800, Rupe Models 9-1500 and 9-1600, Wilden, etc.);
- Injection hosing and a pressure relief valve with a bypass;
- Pressure gauges;
- Power drill paint stirrer (3-inch-diameter or smaller propeller tip);
- 5-amp sump pump (such as Little Giant) and hose;
- One 55-gallon drum or similarly sized mixing tank for ORC[®] mixing;
- Granular bentonite, quick-set grout concrete for closing and sealing injection holes; and
- Portable electric supply and water supplied by drilling contractor.

Four Advanced ORC[®] zones, comprised of a total of 24 borehole injections, are proposed to deliver the Advanced ORC[®] product to treat and/or intercept all of the known and accessible hydrocarbon contamination throughout the plume.

The following are the parameters for the treatment injections. The injection specifications for each of the treatment zones are detailed in Table 1.

- The four projected strategic zones transverse to the plume (mainly in the upgradient plume area) cover a combined total area of approximately 2,300 square feet and are delineated separately in Table 1.
- A total of 24 injection points will be drilled using direct-push technology to various depths in each of the treatment zones as shown in Table 1.
- A total of approximately 2,158 pounds of ORC[®] mixed with water to achieve a 30% solid slurry will be delivered to the subsurface (9.5 lbs ORC[®] mixed with 2.7 gallons of water will be injected per bore-foot) (83 buckets ORC[®] x 25 lbs/bucket = 2,075 lbs).
- The oxidant loading will be approximately 9.5 pounds per foot which is based on a conservative average of 8,000 micrograms per liter (µg/L) TPH as gasoline (TPHg) and TPH as diesel (TPHd).
- Delivery point spacing is approximately 10 feet.
- The saturated thickness of the treatment zone (including capillary fringe) ranges from 7 to 15 feet as specified in Table 1 for each of the 4 treatment zones.
- The ideal schedule for injection would be immediately before or at the start of the rainy season (November-December) to allow for the optimum transport of the oxygenating compound.

Table 1
Proposed ORC[®] Treatment Zone Injection Parameters

ORC[®] Treatment Zone (see Figures for locations)	Treatment Zone Thickness	Treatment Zone Area (square feet)	Subsurface Treatment Zone Elevation Range (feet amsl)	Treatment Zone Depth Range (feet bgs)	Number of Bores in Treatment Zone	ORC[®] Product Injected per Bore/Zone (lbs)
ORC-1	7 feet	300	545-552	12-19	3	67/199
ORC-2	15 feet	700	533-548	16-31	7	143/1,000
ORC-3	10 feet	750	532-542	7-17	8	95/760
ORC-4	7 feet	600	529-536	13-20	6	67/199

Figure 3 presents the historical (2001-2002) and currently proposed Advanced ORC[®] injection treatment points and zones. The previous injection scheme focused on the lower and mid portion of the plume as shown, while this injection, with the exception of one line of injection points to address the high concentrations at MW-7 and MW-9, focuses on the upgradient and source area. All 24 injection bores are shown on Figure 3. A cross-section longitudinally through the contaminant plume is presented in Figure 4 to illustrate the variable depth of the Advanced ORC[®] injections and how they are related to both lithology and historical high-low water levels. This is a generalized depiction, and in fact the width of the injection material will be greater in some areas, as can be seen in Figure 3. Figure 5 shows the plan of the proposed treatment zones in relation to the current TPH contaminant plume. Attachment A contains the cited figures.

The Advanced ORC[®] injections should be effective in reducing the toxicity of the plume by accelerating the biodegradation significantly within the first approximately 6-12 months. The mobility of the plume will likewise be reduced, although historical data from the last 6 years suggest that the remnant source between the corporation yard access road and the former UFST excavation area exhibits contaminant persistence due to probable hydrocarbons sorption and possibly lithologic (trap) reasons. The idea of this revisited in-situ remedy (using Advanced ORC[®] this time) is to place the oxygenating material in the location where it can travel along the routes already established by the plume.

The volume of dissolved hydrocarbons within the generalized area will likely be reduced within the first 12 months by 50 percent or more—according to the manufacturer's data. This approach assures continued long-term treatment of remaining contaminants through low-cost bioremediation after the chemical oxidation treatment is complete.

Soil or groundwater waste is usually not generated during the injection process. All other investigation derived waste will be disposed of properly.

Task 3 – Post injection Monitoring and Laboratory Analyses

One sample set at the key wells MW-2, MW-7, MW-8, MW-9, and MW-11 one month after the ORC[®] injection event, followed by the regular quarterly sampling, will be conducted to monitor the remedy. In addition, dissolved oxygen will be measured in the field during quarterly sampling to monitor the effect of the Advanced ORC[®] application. Groundwater samples will be analyzed in accordance with ACEHS' current site groundwater monitoring requirements for the following:

- Total extractable and volatile hydrocarbons –TPH-d and TPH-g by EPA Method 8015M or 8260; and

- Aromatic hydrocarbons benzene, toluene, ethylbenzene, and total xylenes (BTEX) by EPA Method 8260.

Task 4 – Technical Reporting

SES will complete a report on the ORC[®] injection and post injection monitoring that will be integrated with the quarterly groundwater monitoring report in which the activity occurs.

The report will include:

- Summary of ORC[®] rationale and efficacy;
- Detailed description of the injection and associated field data;
- Baseline monitoring;
- Maps showing key site features and injection areas;
- Key indicators to monitor effectiveness; and
- Technical appendices.

As required, site data will be electronically uploaded to both the State of California GeoTracker system and ACEHS “ftp” system.

TEAM QUALIFICATIONS

SES has completed dozens of similar projects, including several under the jurisdiction of ACEHS. Our team will consist of:

- Stellar Environmental Solutions, Inc. (owners’ consultant responsible for overall project coordination, geologic evaluation, and report certification by a California Professional Geologist)
- A driller with a current C-57 license.
- The ELAT certified laboratory Curtis and Tompkins will perform the required laboratory analyses.

Mr. Jerry Wickham
August 20, 2009
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We trust that this workplan submittal meets your agency's needs. Please contact the undersigned directly if you have any questions.

Sincerely,



Henry Pietropaoli, P.G., R.E.A.
Principal Geologist/Task Manager



Richard S. Makdisi, P.G., R.E.A.
President/Technical Director



Attachments:

Attachment A – Figures Site Location, Site Plan Showing Proposed Injection Bore Locations and Site Cross-Section
Attachment B – Historical Groundwater Elevation Data , Analytical Results, MW-2 data

cc: Mr. Neal Fujita – East Bay Regional Park District

ATTACHMENT A

Referenced Site Figures



3-D TopoQuads Copyright © 1999 DeLorme Yarmouth, ME 04096 Source Data: USGS 750 ft Scale: 1 : 25,000 Detail: 13-0 Datum: WGS84



SITE LOCATION ON U.S.G.S. TOPOGRAPHIC MAP

Redwood Reg. Park Service Yard
Oakland, CA

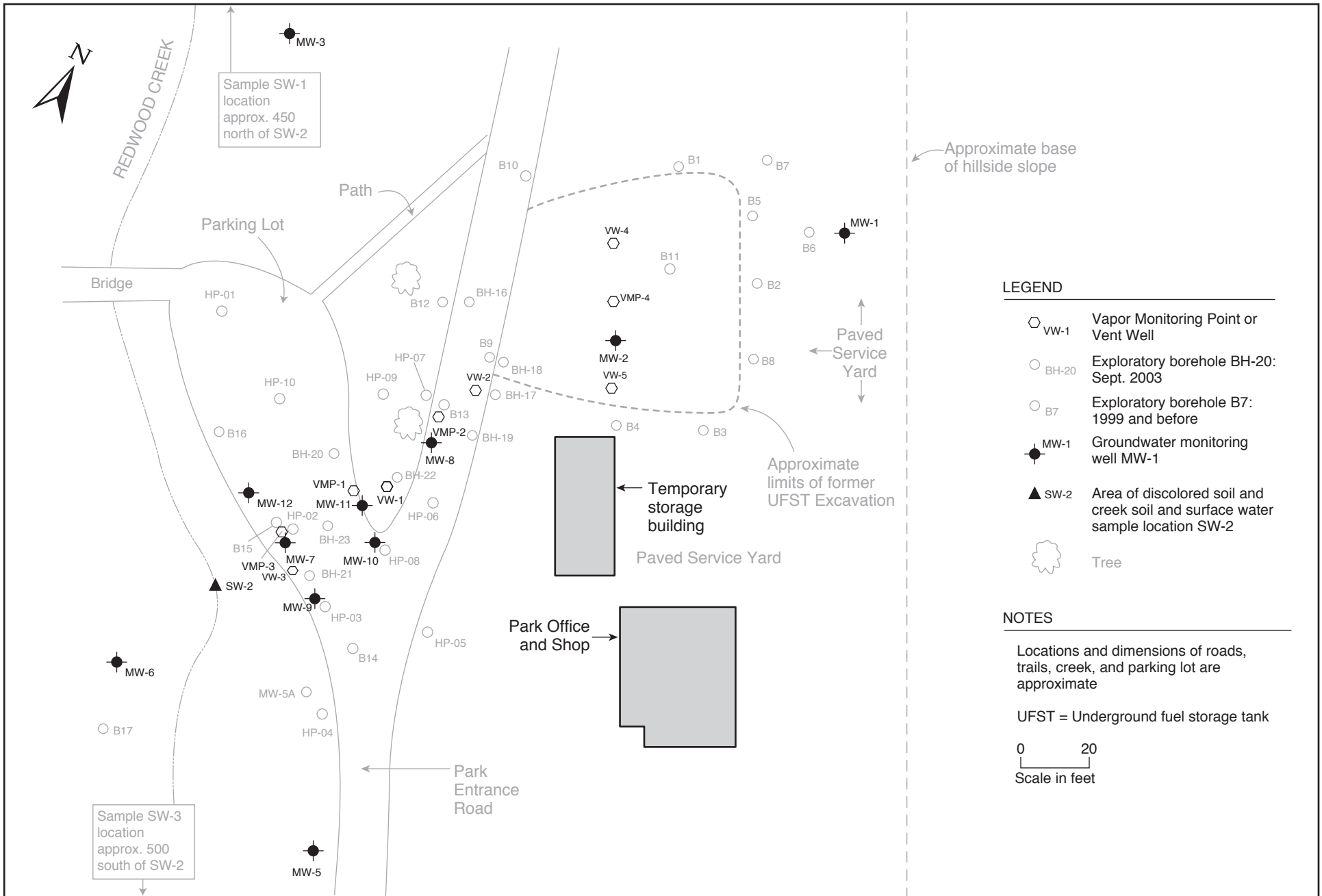
By: MJC

MARCH 2006

Figure 1



2006-17-01



SITE PLAN AND SAMPLING, MONITORING WELL AND VAPOR WELL LOCATIONS
Redwood Regional Park Service Yard, Oakland, CA

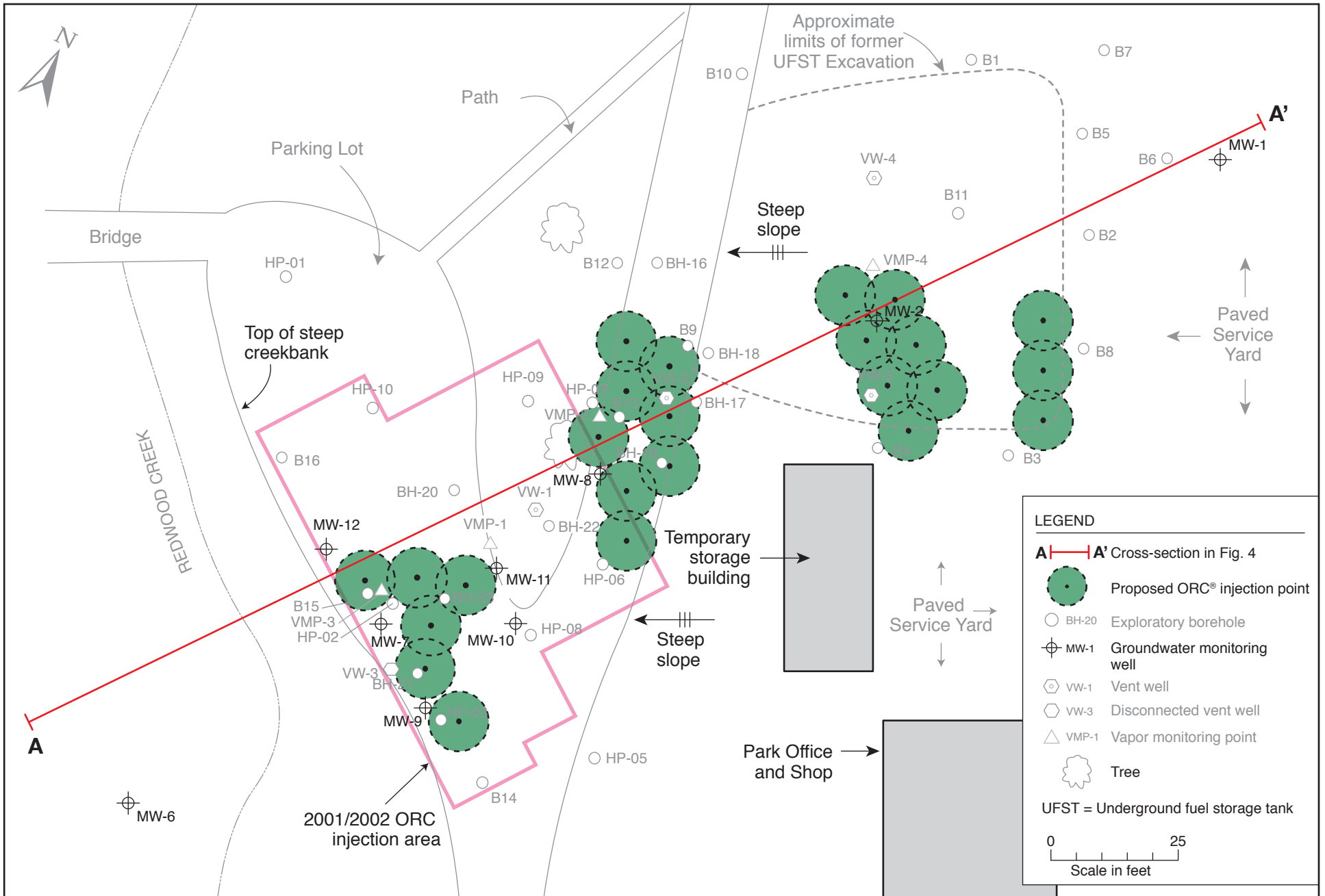
Figure 2

by: MJC

AUGUST 2009

2009-03-02





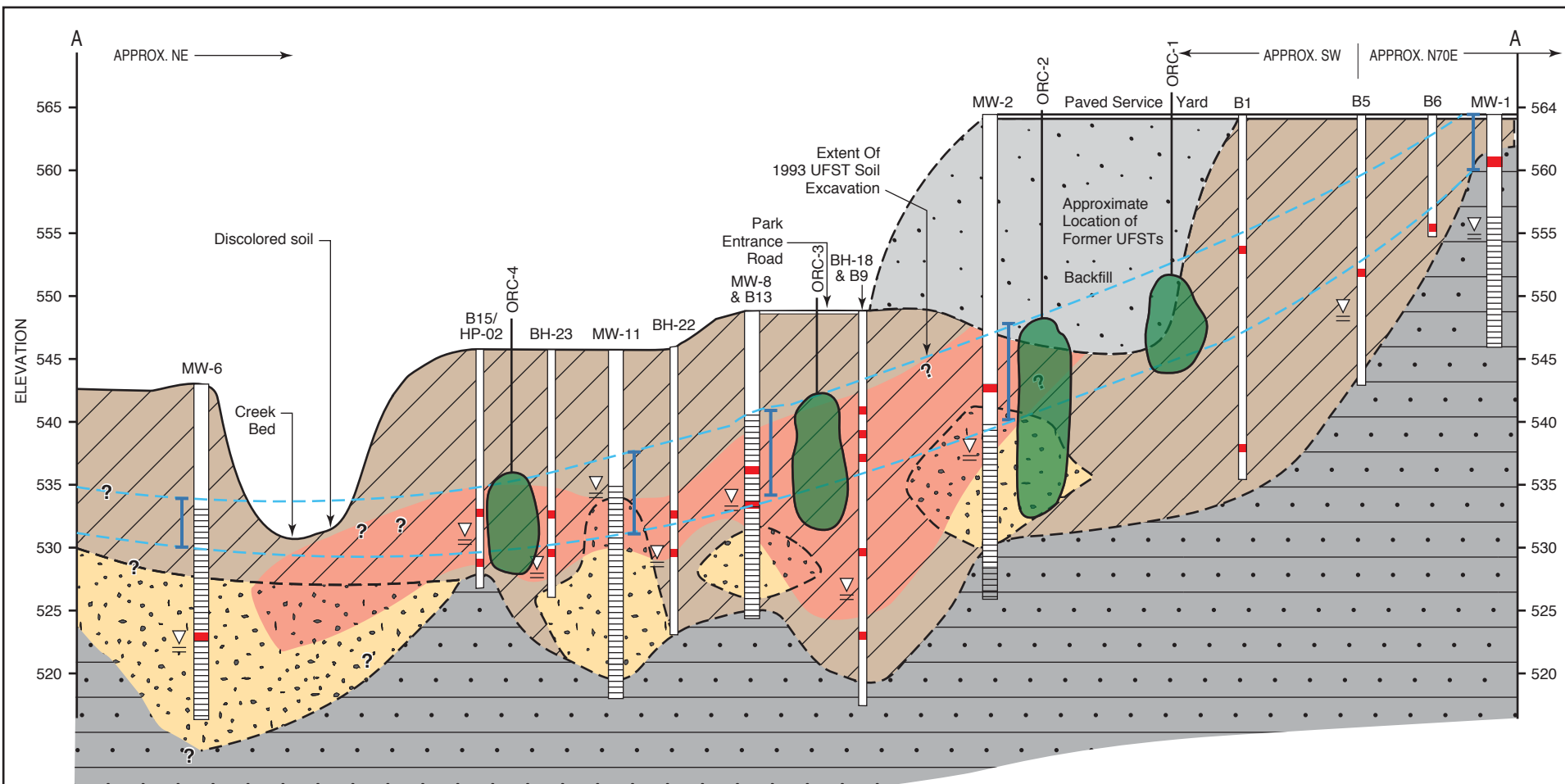
2009-03-03

**SITE PLAN SHOWING HISTORICAL AND PROPOSED
 ORC® INJECTION LOCATIONS
 Redwood Regional Park Service Yard, Oakland, CA**

Figure 3

by: MJC

AUGUST 2009

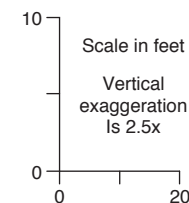


LEGEND

- | | | |
|---|---|--|
| B1 Exploratory Boring B1 | MW-1 Monitoring Well MW-1 | First occurrence of groundwater during drilling |
| Location of soil sample collected for laboratory analysis | Location of soil sample collected for laboratory analysis | Projected range of water levels |
| Well screen interval | Silt/clay | Historical range of equilibrated water levels in wells |
| Sand/gravel | Backfill | Siltstone (bedrock) |
| Zone of soil contamination | | |

NOTES

- Locations and dimensions of roads, trails and parking lot are approximate
- UFST = Underground fuel storage tank (not to scale)
- All elevations are expressed as feet above mean sea level (MSL)
- Well casing and boring widths not to scale
- Some borings projected into cross section (see Figure 2)

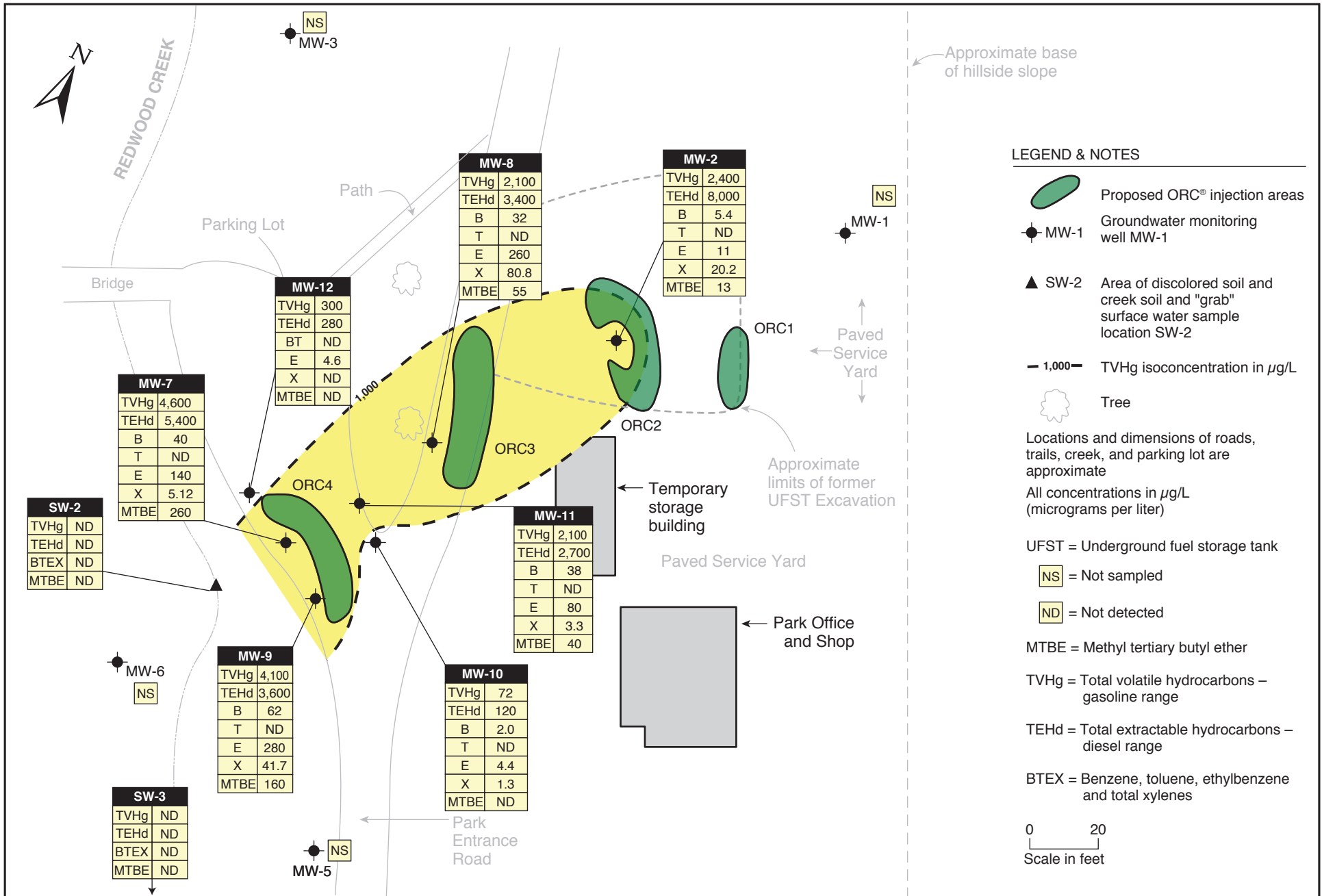


CROSS SECTION A-A' SHOWING ORC® INJECTION ZONES
Redwood Regional Park Service Yard, Oakland, CA

Figure 4

by: MJC

AUGUST 2009



2009-03-04

ATTACHMENT B

Historical Groundwater Elevation Data Analytical Tables and Well MW-2 Plot Data

**HISTORICAL GROUNDWATER ELEVATIONS IN MONITORING WELLS
REDWOOD REGIONAL PARK SERVICE YARD
7867 REDWOOD ROAD, OAKLAND, CALIFORNIA**

Well I.D.	MW-1	MW-2	MW-3	MW-4	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	MW-12
TOC Elevation (a)	565.83	566.42	560.81	548.10	547.41	545.43	547.56	549.13	549.28	547.22	547.75	544.67
Date Monitored	Groundwater Elevations (feet above mean sea level)											
09/18/98	563.7	544.2	540.8	534.5	531.1	531.4						
04/06/99	565.2	546.9	542.3	535.6	532.3	532.9						
12/20/99	562.9	544.7	541.5	534.9	531.2	532.2						
09/28/00	562.8	542.7	538.3	532.2	530.9	532.0						
01/11/01	562.9	545.1	541.7	535.0	531.2	532.3	534.9	538.1				
04/13/01	562.1	545.7	541.7	535.1	531.5	532.4	535.3	539.8				
09/01/01	560.9	542.0	537.7	533.9	530.7	531.8	534.0	535.6				
12/17/01	562.2	545.2	542.2	534.8	531.4	532.4	534.8	538.4	534.6	535.7	535.2	
03/14/02	563.0	547.1	542.2	535.5	532.4	533.3	535.7	541.8	535.0	537.6	536.6	
06/18/02	562.1	544.7	541.1	534.6	531.2	532.2	534.8	537.9	534.7	535.6	535.3	
09/24/02	561.4	542.2	537.3	533.5	530.6	531.8	533.5	535.5	535.3	533.8	531.7	
12/18/02	562.4	545.0	542.0	534.8	531.5	532.5	534.6	537.1	536.5	535.2	532.8	
03/27/03	562.6	545.7	541.7	534.8	531.6	532.4	535.1	539.9	537.2	536.2	533.6	
06/19/03	562.3	544.9	541.5	534.8	531.3	532.3	534.9	538.2	536.9	535.7	533.2	
09/10/03	561.6	542.1	537.9	533.8	530.8	531.9	533.7	535.6	535.6	534.1	531.9	
12/10/03	562.4	542.7	537.6	533.7	530.9	531.9	533.7	535.2	535.5	533.8	531.7	
03/18/04	563.1	546.6	541.9	535.0	531.7	532.4	535.2	540.9	537.4	536.6	533.8	
06/17/04	562.1	544.3	540.7	534.3	531.0	532.1	534.6	537.4	536.5	535.1	532.7	
09/21/04	561.5	541.1	536.5	533.1	530.5	531.6	533.1	534.7	532.7	533.2	533.2	
12/14/04	562.2	545.3	541.7	534.7	531.4	532.2	534.6	540.4	536.7	535.5	532.9	
03/16/05	563.8	547.3	541.7	535.3	532.4	532.8	535.6	541.8	538.0	537.1	534.2	
06/15/05	562.9	545.9	541.6	535.0	531.7	532.5	535.0	540.0	535.0	536.1	535.6	
09/13/05	562.3	543.5	539.7	534.4	530.9	532.2	534.3	536.7	536.1	534.7	532.4	
12/15/05	562.2	544.3	541.4	(b)	531.0	532.2	534.5	537.3	534.1	534.7	534.9	535.1
03/30/06	565.8	548.6	542.7	(b)	533.9	534.4	536.2	542.3	536.4	537.3	537.6	535.7
06/20/06	563.6	545.4	541.6	(b)	531.5	532.5	534.9	538.6	534.6	536.2	535.5	535.0
09/29/06	561.9	542.8	539.0	(b)	530.7	532.1	535.1	536.1	533.7	534.6	534.7	534.7
12/14/06	562.9	544.2	541.5	(b)	531.1	532.3	534.7	536.7	534.0	534.8	535.2	535.0
03/21/07	562.5	545.2	541.7	(b)	531.4	532.4	534.9	539.3	534.6	535.6	535.6	535.1
06/20/07	561.5	543.5	540.8	(b)	531.0	532.4	534.6	537.1	531.1	535.2	535.3	534.9
9/14/2007	560.71	541.02	536.99	(b)	530.46	531.58	533.42	534.86	532.64	533.47	533.68	533.74
12/6/2007	560.62	541.22	536.85	(b)	530.68	531.48	533.21	535.08	532.62	533.3	533.61	533.64
3/14/2008	561.76	545.73	541.63	(b)	531.34	532.30	534.88	539.30	534.67	536.04	535.89	535.72
6/13/2008	560.92	543.61	540.6	(b)	530.83	532.02	534.42	536.86	533.81	534.84	535.16	534.67
9/18/2008	560.43	540.15	536.41	(b)	529.85	531.11	532.69	534.15	531.97	532.65	533.09	533.12
12/17/2008	561.11	540.88	536.77	(b)	530.68	531.67	533.26	534.04	532.35	532.94	533.29	533.66
3/16/2009	561.84	546.25	539.51	(b)	531.63	532.58	534.65	539.51	534.56	535.55	535.49	535.08

TOC = Top of well Casing
(a) TOC Elevations resurveyed on December 15, 2005 in accordance GeoTracker requirements.
(b) Well decommissioned and replaced by MW-12 in December 2005.

HISTORICAL GROUNDWATER MONITORING WELLS ANALYTICAL RESULTS
REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA

(all concentrations in ug/L, equivalent to parts per billion [ppb])

Well MW-2										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Nov-94	66	< 50	3.4	< 0.5	< 0.5	0.9	4.3	NA	70.3
2	Feb-95	89	< 50	18	2.4	1.7	7.5	30	NA	118.6
3	May-95	< 50	< 50	3.9	< 0.5	1.6	2.5	8.0	NA	8
4	Aug-95	< 50	< 50	5.7	< 0.5	< 0.5	< 0.5	5.7	NA	5.7
5	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
6	Aug-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
7	Dec-96	< 50	< 50	6.3	< 0.5	1.6	< 0.5	7.9	NA	7.9
8	Feb-97	< 50	< 50	0.69	< 0.5	0.55	< 0.5	1.2	NA	1.24
9	May-97	67	< 50	8.9	< 0.5	5.1	< 1.0	14	NA	81
10	Aug-97	< 50	< 50	4.5	< 0.5	1.1	< 0.5	5.6	NA	5.6
11	Dec-97	61	< 50	21	< 0.5	6.5	3.9	31	NA	92.4
12	Feb-98	2,000	200	270	92	150	600	1,112	NA	3312
13	Sep-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	7.0	7
14	Apr-99	82	710	4.2	< 0.5	3.4	4.0	12	7.5	811.1
15	Dec-99	57	< 50	20	0.6	5.9	< 0.5	27	4.5	88.01
16	Sep-00	< 50	< 50	0.72	< 0.5	< 0.5	< 0.5	0.7	7.9	8.62
17	Jan-01	51	< 50	8.3	< 0.5	1.5	< 0.5	9.8	8.0	68.8
18	Apr-01	110	< 50	10	< 0.5	11	6.4	27	10	147.4
19	Aug-01	260	120	30	6.7	1.6	6.4	45	27	451.7
20	Dec-01	74	69	14	0.8	3.7	3.5	22	6.6	171.56
21	Mar-02	< 50	< 50	2.3	0.51	1.9	1.3	8.3	8.2	14.2
22	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	7.7	7.7
23	Sep-02	98	< 50	5.0	< 0.5	< 0.5	< 0.5	—	13	116.0
24	Dec-02	< 50	< 50	4.3	< 0.5	< 0.5	< 0.5	—	< 2.0	4.3
25	Mar-03	130	82	39	< 0.5	20	4.1	63	16	291.1
26	Jun-03	< 50	< 50	1.9	< 0.5	< 0.5	< 0.5	1.9	8.7	10.6
27	Sep-03	120	< 50	8.6	0.51	0.53	< 0.5	9.6	23	152.6
28	Dec-03	282	< 100	4.3	1.6	1.3	1.2	8.4	9.4	299.8
29	Mar-04	374	< 100	81	1.2	36	7.3	126	18	517.5
30	Jun-04	< 50	< 50	0.75	< 0.5	< 0.5	< 0.5	< 0.5	15	15.8
31	Sep-04	200	< 50	23	< 0.5	< 0.5	0.70	24	16	239.7
32	Dec-04	80	< 50	14	< 0.5	2.9	0.72	18	20	117.6
33	Mar-05	190	68	27	< 0.5	14	11	52	26	336.0
34	Jun-05	68	< 50	7.1	< 0.5	6.9	1.8	16	24	107.8
35	Sep-05	< 50	< 50	2.5	< 0.5	< 0.5	< 1.0	2.5	23	25.5
36	Dec-05	< 50	< 50	3.9	< 0.5	< 0.5	< 1.0	3.9	23	26.9

Well MW-2 (con't)										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
37	Mar-06	1300	300	77	4.4	91	250	422	18	2040.4
38	Jun-06	< 50	60	< 0.5	< 0.5	< 0.5	< 1.0	—	17	77.0
39	Sep-06	270	52	31	< 0.5	15	6.69	53	17	391.7
40	Dec-06	< 50	< 50	2.1	< 0.5	< 0.5	< 0.5	2	16	18.1
41	Mar-07	59	< 50	4	< 0.5	< 0.5	< 0.5	< 0.5	14	77.0
42	Jun-07	<50	<50	3.5	<0.5	<0.5	<0.5	4	8	11.5
43	Sep-07	2,600	260	160	44	86	431	721	15	3596.0
44	Dec-07	16,000	5,800	23	91	230	2,420	2764	16	24580.0
44a	Jan-08	480	200	1.1	3.2	5.5	68	78	11	768.8
45	Mar-08	20,000	24,000	21	39	300	2,620	2980	13	46993.0
45a	Apr-08	800	640	2.6	2.1	13	155	173	13	1625.7
45b	May-08	7,100	3,900	14	8.8	140	710	873	11	11883.8
46	Jun-08	5,700	1,000	9.4	5.2	80	550	645	11	7355.6
46a	Jul-08	6,400	2,200	13	5.1	140	570	728	2.9	9331.0
46b	Jul-08	390	55	1.3	0.77	4.6	44.4	51	9	505.1
46c	Aug-08	28,000	7,100	12	19	260	2,740	3031	<20	38131.0
46d	Aug-08	8,700	2,700	5.7	7.4	130	900.0	1043	3.5	12446.6
47	Sep-08	40,000	9,100	1.6	<0.5	110	910.0	1022	9.5	50131.1
48	Dec-08	9,200	2,200	0.52	<0.5	<0.5	201.0	202	12	11613.5
49	Mar-09	3,100	37,000	1.1	1.4	7.9	35.0	45	14	40159.4
50	May-09	5,000	15,000	1.5	<0.5	9.8	39.0	50	13	20063.3
51	Jun-09	2,400	8,000	5.4	<0.5	11	20.2	36.6	13	10449.6
52	Aug-09	1,900	3,100	1.6	1.8	11	23.8	38.2	7.1	5045.3

Well MW-4										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Nov-94	2,600	230	120	4.8	150	88	363	NA	3,193
2	Feb-95	11,000	330	420	17	440	460	1,337	NA	12,667
3	May-95	7,200	440	300	13	390	330	1,033	NA	8,673
4	Aug-95	1,800	240	65	6.8	89	67	227	NA	2,267
5	May-96	1,100	140	51	< 0.5	< 0.5	47	98	NA	1,338
6	Aug-96	3,700	120	63	2.0	200	144	409	NA	4,229
7	Dec-96	2,700	240	19	< 0.5	130	93	242	NA	3,182
8	Feb-97	3,300	< 50	120	1.0	150	103	374	NA	3,674
9	May-97	490	< 50	2.6	6.7	6.4	6.7	22	NA	512
10	Aug-97	1,900	150	8.6	3.5	78	53	143	NA	2,193
11	Dec-97	1,000	84	4.6	2.7	61	54	123	NA	1,207
12	Feb-98	5,300	340	110	24	320	402	856	NA	6,496
13	Sep-98	1,800	< 50	8.9	< 0.5	68	27	104	23	1,927
14	Apr-99	2,900	710	61	1.2	120	80	263	32	3,905
15	Dec-99	1,000	430	4.0	2.0	26	14	46	< 2.0	1,476
16	Sep-00	570	380	< 0.5	< 0.5	16	4.1	20	2.4	973
17	Jan-01	1,600	650	4.2	0.89	46	13.8	65	8.4	2,323
18	Apr-01	1,700	1,100	4.5	2.8	48	10.7	66	5.0	2,871
19	Aug-01	1,300	810	3.2	4.0	29	9.7	46	< 2.0	2,156
20	Dec-01	< 50	110	< 0.5	< 0.5	< 0.5	1.2	1.2	< 2.0	111
21	Mar-02	<50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
22	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
23	Sep-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
24	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
25	Mar-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
26	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
27	Sep-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
28	Dec-03	<50	<100	<0.3	<0.3	<0.3	<0.6	—	< 5.0	0
29	Mar-04	<50	<100	<0.3	<0.3	<0.3	<0.6	—	< 5.0	0
30	Jun-04	<50	2,500	<0.3	<0.3	<0.3	<0.6	—	< 5.0	0
31	Sep-04	<50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0	0
32	Dec-04	<50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0	0
33	Mar-05	<50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0	0
34	Jun-05	<50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0	0
35	Sep-05	<50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0	0

Groundwater monitoring in this well discontinued with Alameda County Health Care Services Agency approval.

Well MW-5										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Nov-94	50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	50
2	Feb-95	70	< 50	0.6	< 0.5	< 0.5	< 0.5	0.6	NA	70.6
3	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
4	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
5	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
6	Aug-96	80	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	80
7	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
8	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
9	May-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
10	Aug-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
11	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
12	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
13	Sep-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2	0
Groundwater monitoring in this well discontinued in 1998 with Alameda County Health Care Services Agency approval.										
Subsequent groundwater monitoring conducted to confirm plume's southern limit										
14	Jun-04	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	5.9	5.9
15	Sep-04	< 50	< 50	< 0.5	< 0.5	< 0.5	< 1.0	—	< 2.0	0

Well MW-7										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Jan-01	13,000	3,100	95	4	500	289	888	95	17,083
2	Apr-01	13,000	3,900	140	< 0.5	530	278	948	52	17,900
3	Aug-01	12,000	5,000	55	25	440	198	718	19	17,737
4	Dec-01	9,100	4,600	89	< 2.5	460	228	777	< 10	14,477
5	Mar-02	8,700	3,900	220	6.2	450	191	867	200	13,667
6	Jun-02	9,300	3,500	210	6.3	380	155	751	18	13,569
7	Sep-02	9,600	3,900	180	< 0.5	380	160	720	< 2.0	14,220
8	Dec-02	9,600	3,700	110	< 0.5	400	189	699	< 2.0	13,999
9	Mar-03	10,000	3,600	210	12	360	143	725	45	14,370
10	Jun-03	9,300	4,200	190	< 10	250	130	570	200	14,270
11	Sep-03	10,000	3,300	150	11	300	136	597	< 2.0	13,897
12	Dec-03	9,140	1,100	62	45	295	184	586	89	10,915
13	Mar-04	8,170	600	104	41	306	129	580	84	9,434
14	Jun-04	9,200	2,700	150	< 0.5	290	91	531	< 2.0	12,431
15	Sep-04	9,700	3,400	98	< 0.5	300	125	523	< 2.0	13,623
16	Dec-04	8200	4,000	95	< 0.5	290	124	509	< 2.0	12,709
17	Mar-05	10,000	4,300	150	<0.5	370	71	591	<2.0	14,891
18	Jun-05	10,000	3,300	210	<1.0	410	56	676	<4.0	13,976
19	Sep-05	7,600	2,700	110	<1.0	310	54	474	<4.0	10,774
20	Dec-05	2,900	3,300	31	<1.0	140	41	212	<4.0	6,412
21	Mar-06	6,800	3,000	110	< 1.0	280	42	432	110	10,342
22	Jun-06	6,900	3,600	63	< 2.5	290	43	396	< 10	10,896
23	Sep-06	7,900	3,600	64	< 0.5	260	58	382	49	11,931
24	Dec-06	7,300	2,400	50	< 0.5	220	42	312	< 2.0	10,012
25	Mar-07	6,200	2,900	34	< 0.5	190	15	239	< 2.0	9,339
26	Jun-07	6,800	3,000	30	<1.0	160	27	217	<4.0	10,017
27	Sep-07	6,400	3,000	<0.5	<0.5	170	43	213	<2.0	9,613
28	Dec-07	4,800	2,800	<0.5	<0.5	100	26.5	126.5	2.7	7,729
30	Mar-08	5,400	5,900	21	<0.5	150	15	186	51	11,537
31	Jun-08	4,800	3,500	55	<0.5	140	7.03	202	<2.0	8,502
32	Sep-08	6,400	2,800	22	<0.5	100	9.30	131	<2.0	9,331
33	Dec-08	3,500	3,600	5	<0.5	100	9.10	114	<2.0	7,214
34	Mar-09	5,100	6,700	19	<0.5	140	12.30	171	51	12,022
35	Jun-09	4,600	5,400	40	< 0.5	140	5.12	185	260	10,445

Well MW-8										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Jan-01	14,000	1,800	430	17	360	1230	2,037	96	17,933
2	Apr-01	11,000	3,200	320	13	560	1,163	2,056	42	16,298
3	Aug-01	9,600	3,200	130	14	470	463	1,077	14	13,891
4	Dec-01	3,500	950	69	2.4	310	431	812	< 4.0	5,262
5	Mar-02	14,000	3,800	650	17	1,200	1,510	3,377	240	21,417
6	Jun-02	2,900	1,100	70	2.0	170	148	390	19	4,409
7	Sep-02	1,000	420	22	< 0.5	64	50	136	< 2.0	1,556
8	Dec-02	3,300	290	67	< 0.5	190	203	460	< 2.0	4,050
9	Mar-03	13,000	3,500	610	12	1,100	958	2,680	< 10	19,180
10	Jun-03	7,900	2,200	370	7.4	620	562	1,559	< 4.0	11,659
11	Sep-03	3,600	400	120	3.3	300	221	644	< 2.0	4,644
12	Dec-03	485	100	19	1.5	26	36	83	< 5.0	668
13	Mar-04	16,000	900	592	24	1,060	1,870	3,546	90	20,536
14	Jun-04	5,900	990	260	9.9	460	390	1,120	< 10	8,010
15	Sep-04	2,000	360	100	< 2.5	180	102	382	< 10	2,742
16	Dec-04	15,000	4,000	840	21	1,200	1,520	3,581	< 10	22,581
17	Mar-05	24,000	7,100	840	51	1,800	2,410	5,101	<10	36,201
18	Jun-05	33,000	5,700	930	39	2,500	3,860	7,329	<20	46,029
19	Sep-05	5,600	1,200	270	6.6	400	390	1,067	<20	7,867
20	Dec-05	3,700	1,300	110	< 5.0	320	356	786	<20	5,786
21	Mar-06	22,000	4,300	550	30	1,800	2,380	4,760	<20	31,060
22	Jun-06	19,000	5,000	500	28	1,800	1,897	4,225	<20	28,225
23	Sep-06	9,000	820	170	7.7	730	539	1,447	<10	11,267
24	Dec-06	4,400	800	75	4.2	320	246	645	< 2.0	5,845
25	Mar-07	15,000	4,500	340	19	1,300	1,275	2,934	< 20	22,434
26	Jun-07	10,000	3,500	220	11	670	675	1,576	<4.0	15,076
27	Sep-07	9,400	3,400	200	6.9	1,000	773	1,980	<8.0	14,780
28	Dec-07	1,200	500	15	0.88	95	57.7	168.58	<2.0	1,869
30	Mar-08	11,000	13,000	150	13	1,100	950.0	2,213	76	26,289
31	Jun-08	2,000	1,700	27	2.5	190	113.2	333	<2.0	4,033
32	Sep-08	5,500	4,400	89	3.9	630	194.4	917	<2.0	10,817
33	Dec-08	520	400	1.5	<0.5	20	4.4	26	4.5	950
34	Mar-09	4,600	7,300	55	<5.0	410	639.0	1,104	<20	13,004
35	Jun-09	2,100	3,400	32	< 0.5	260	80.8	373	55	5,928

Well MW-9										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Aug-01	11,000	170	340	13	720	616	1,689	48	12,907
2	Dec-01	9,400	2,700	250	5.1	520	317	1,092	< 10	13,192
3	Mar-02	1,700	300	53	4.2	120	67	244	20	2,264
4	Jun-02	11,000	2,500	200	16	600	509	1,325	85	14,910
5	Sep-02	3,600	2,800	440	11	260	39	750	< 4.0	7,150
6	Dec-02	7,000	3,500	380	9.5	730	147	1,266	< 10	11,766
7	Mar-03	4,400	1,400	320	6.9	400	93	820	< 2.0	6,620
8	Jun-03	7,600	1,600	490	10	620	167	1,287	< 4.0	10,487
9	Sep-03	8,300	2,900	420	14	870	200	1,504	< 10	12,704
10	Dec-03	7,080	700	287	31	901	255	1,474	< 10	9,254
11	Mar-04	3,550	600	122	15	313	84	534	35	4,719
12	Jun-04	6,800	1,700	350	< 2.5	620	99	1,069	< 10	9,569
13	Sep-04	7,100	1,900	160	8.1	600	406	1,174	< 10	10,174
14	Dec-04	4,700	2,800	160	< 2.5	470	< 0.5	630	< 10	8,130
15	Mar-05	4,200	1,600	97	< 2.5	310	42	449	< 10	6,249
16	Jun-05	9,900	2,000	170	< 2.5	590	359	1,119	< 10	13,019
17	Sep-05	3,600	1,200	250	< 0.5	330	36	616	< 2.0	5,416
18	Dec-05	8,700	1,500	150	4	650	551	1,355	< 4.0	11,555
19	Mar-06	3,600	880	37	< 1.0	210	165	412	< 4.0	4,892
20	Jun-06	3,200	1,300	39	< 1.0	220	144	403	4.2	4,908
21	Sep-06	12,000	3,300	130	8	850	604	1,592	< 1.0	16,892
22	Dec-06	12,000	2,800	140	9.4	880	634	1,663	< 10	16,463
23	Mar-07	9,600	2,900	120	8.7	780	453	1,362	< 10	13,862
24	Jun-07	7,100	2,200	75	5.2	480	298	858	< 4.0	10,158
25	Sep-07	4,500	2,100	60	3.8	420	227	710	< 4.0	7,310
26	Dec-07	6,200	2,000	51	< 0.5	340	128.8	519.8	< 2.0	8,720
27	Mar-08	6,400	3,500	67	5.2	480	177.6	724.6	38	10,668
28	Jun-08	10,000	3,400	89	< 2.5	510	231.0	830.0	< 10	14,230
29	Sep-08	4,800	2,700	53	< 0.5	250	66.4	369.4	< 2.0	7,869
30	Dec-08	4,300	2,300	45	< 0.5	330	39.1	414.1	< 2.0	7,014
31	Mar-09	4,000	2,200	< 2.0	< 0.5	160	34.9	194.9	< 2.0	6,395
32	Jun-09	4,100	3,600	62	< 0.5	280	41.7	383.7	160	8,244

Well MW-10										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Aug-01	550	2,100	17	< 0.5	31	44	92	40	2,782
2	Dec-01	< 50	81	< 0.5	< 0.5	< 0.5	< 0.5	—	25	106
3	Mar-02	< 50	< 50	0.61	< 0.5	< 0.5	< 0.5	0.61	6.0	7
4	Jun-02	< 50	< 50	0.59	< 0.5	0.58	< 0.5	1.2	9.0	10
5	Sep-02	160	120	10	< 0.5	6.7	3.6	20	26	326
6	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	16	16
7	Mar-03	110	< 50	11	< 0.5	12	1.3	24	15	149
8	Jun-03	110	< 50	9.6	< 0.5	6.8	< 0.5	16	9.0	135
9	Sep-03	< 50	< 50	1.1	< 0.5	1.5	< 0.5	2.6	7.0	10
10	Dec-03	162	<100	6.9	<0.3	8.0	<0.6	15	9.9	187
11	Mar-04	94	<100	2.8	<0.3	5.7	7.0	16	<5.0	110
12	Jun-04	150	56	11	< 0.5	12	< 0.5	23	15	244
13	Sep-04	< 50	< 50	1.6	< 0.5	1.9	< 1.0	3.5	5.8	9
14	Dec-04	64	< 50	3.7	< 0.5	3.7	0.7	8.1	10	82
15	Mar-05	95	98	8.3	<0.5	7.7	0.77	17	13	223
16	Jun-05	150	57	14	<0.5	10	1.0	25	<2.0	232
17	Sep-05	87	< 50	5.0	<0.5	3.6	<1.0	8.6	<2.0	96
18	Dec-05	< 50	< 50	1.2	<0.5	<0.5	<1.0	1.2	7.8	9
19	Mar-06	58	71	3.2	<0.5	2.2	<1.0	5.4	8.8	143
20	Jun-06	73	140	4.9	<0.5	2.5	<1.0	7.4	5.3	226
21	Sep-06	88	51	<0.5	<0.5	<0.5	<0.5	<0.5	9.6	149
22	Dec-06	<50	<50	0.61	<0.5	0.55	<0.5	1.2	3.7	5
23	Mar-07	57	<50	3.6	<0.5	2.2	<0.5	5.8	3.1	66
24	Jun-07	60	65	2.4	<0.5	1.6	<0.5	4.0	4.0	133
25	Sep-07	84	<50	3.6	<0.5	2.3	0.52	6.4	3.6	94
26	Dec-07	130	67	0.77	<0.5	340	0.83	341.6	<2.0	539
27	Mar-08	78	170	1.7	<0.5	3.1	0.97	5.8	2.4	256
28	Jun-08	230	320	12	<0.5	9.9	3.5	25.4	<2.0	575
29	Sep-08	80	<50	1.6	<0.5	0.52	<0.5	2.1	3.0	85
30	Dec-08	<50	66	0.89	<0.5	<0.5	<0.5	0.9	2.1	69
31	Mar-09	76	230	<2.0	<0.5	1.4	<0.5	1.4	<2.0	307
32	Jun-09	72	120	2.0	< 0.5	4.4	1.3	7.7	<2.0	200

Well MW-11										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Aug-01	17,000	7,800	390	17	820	344	1,571	< 10	26,371
2	Dec-01	5,800	2,800	280	7.8	500	213	1,001	< 10	9,601
3	Mar-02	100	94	< 0.5	< 0.5	0.64	< 0.5	0.64	2.4	197
4	Jun-02	8,200	2,600	570	13	560	170	1,313	< 4	12,113
5	Sep-02	12,000	4,400	330	13	880	654	1,877	< 10	18,277
6	Dec-02	18,000	4,500	420	< 2.5	1,100	912	2,432	< 10	24,932
7	Mar-03	7,800	2,600	170	4.7	530	337	1,042	53	11,495
8	Jun-03	14,000	3,800	250	< 2.5	870	693	1,813	< 10	19,613
9	Sep-03	10,000	3,000	250	9.9	700	527	1,487	< 4	14,487
10	Dec-03	15,000	1,100	314	60	1,070	802	2,246	173	18,519
11	Mar-04	4,900	400	72	17	342	233	664	61	6,025
12	Jun-04	10,000	2,300	210	2.8	690	514	1,417	< 10	13,717
13	Sep-04	7,200	2,300	340	< 2.5	840	75	1,255	< 10	10,755
14	Dec-04	11,000	3,900	180	5.1	780	695	1,660	< 10	16,560
15	Mar-05	4,600	1,900	69	<2.5	300	206	575	< 10	7,075
16	Jun-05	1,400	590	85	<0.5	110	8.2	203	< 2.0	2,193
17	Sep-05	12,000	3,100	220	< 1.0	840	762	1,822	< 4.0	16,922
18	Dec-05	2,500	2,100	120	< 2.5	260	16	396	< 10	4,996
19	Mar-06	2,200	1,300	27	<2.5	130	5.2	162	< 10	3,662
20	Jun-06	3,700	1,900	170	<1.0	230	14	414	< 4.0	6,014
21	Sep-06	3,600	2,100	80	<0.5	230	8.8	319	< 2.0	6,019
22	Dec-06	6,000	3,500	83	<1.0	260	16.4	359	< 4.0	9,859
23	Mar-07	4,500	1,900	110	< 0.5	170	7.9	288	< 2.0	6,688
24	Jun-07	4,300	2,200	120	<0.5	140	6.6	267	<4.0	6,767
25	Sep-07	5,500	2,700	86	<0.5	180	16.1	282	<2.0	8,482
26	Dec-07	7,100	4,000	68	<0.5	140	14	222	35	11,357
27	Mar-08	5,300	4,000	130	<0.5	120	13	263	8.8	9,572
28	Jun-08	3,600	4,200	190	<0.5	140	11	341	<2.0	8,141
29	Sep-08	7,300	4,600	130	<0.5	110	4.5	245	<2.0	12,145
30	Dec-08	2,800	1,600	93	<0.5	82	0.69	176	<2.0	4,576
31	Mar-09	4,100	4,600	18	<0.5	82	8	108	8.0	8,816
32	Jun-09	2,100	2,700	38	< 0.5	80	3.3	121	3.3	4,925

Well MW-12										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Dec-05	1,300	700	< 0.5	< 0.5	33	5.6	39	< 2.0	2,039
2	Mar-06	1,100	540	<0.5	<0.5	8.5	1.5	10	49	1,699
3	Jun-06	680	400	<0.5	<0.5	5.8	1.4	7.2	< 2.0	1,087
4	Sep-06	910	480	<0.5	<0.5	9.9	1.5	11.4	21	1,422
5	Dec-06	770	230	< 0.5	< 0.5	7.4	2.0	9.4	< 2.0	1,009
6	Mar-07	390	110	< 0.5	< 0.5	1.7	1.7	3.4	< 2.0	503
7	Jun-07	590	280	<0.5	<0.5	4.5	0.9	5.4	<2.0	875
8	Sep-07	390	180	<0.5	<0.5	2.4	2.4	4.8	<2.0	575
9	Dec-07	210	140	<0.5	<0.5	2.1	1.3	3.4	<2.0	353
10	Mar-08	720	500	<0.5	4.4	9.0	2.8	16.2	<2.0	1,236
11	Jun-08	220	50	<0.5	<0.5	2.0	<0.5	2.0	<2.0	272
12	Sep-08	370	95	<0.5	<0.5	2.8	0.98	3.8	<2.0	469
13	Dec-08	93	170	<0.5	<0.5	0.76	<0.5	0.8	<2.0	264
14	Mar-09	180	130	<0.5	<0.5	1.70	<0.5	1.7	<2.0	312
15	Jun-09	300	280	< 0.5	< 0.5	4.60	< 0.5	4.6	<2.0	585

**HISTORICAL SURFACE WATER ANALYTICAL RESULTS
REDWOOD REGIONAL PARK SERVICE YARD, OAKLAND, CALIFORNIA**

(all concentrations in ug/L, equivalent to parts per billion [ppb])

Sampling Location SW-1 (Upstream of Contaminated Groundwater Discharge Location SW-2)										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Feb-94	50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	50
2	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
3	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
4	Aug-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
5	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
6	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
7	Aug-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
8	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
9	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	—	NA	0
10	Sep-98	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
11	Apr-99	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	—	< 2.0	0
Sampling at this location discontinued after April 1999 with Alameda County Health Services Agency approval.										

Sampling Location SW-2 (Area of Historical Contaminated Groundwater Discharge)										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	Feb-94	130	< 50	1.9	< 0.5	4.4	3.2	9.5	NA	139.5
2	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA	0
3	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA	0
4	May-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA	0
5	Aug-96	200	< 50	7.5	< 0.5	5.4	< 0.5	13	NA	212.9
6	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA	0
7	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA	0
8	Aug-97	350	130	13	0.89	19	11	44	NA	523.59
9	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA	0
10	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	NA	0
11	Sep-98	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0	0
12	Apr-99	81	<50	2.0	< 0.5	2.5	1.3	5.8	2.3	89.1
13	Dec-99	1,300	250	10	1.0	47	27	85	2.2	1637.2
14	Sep-00	160	100	2.1	< 0.5	5.2	1.9	9.2	3.4	272.6
15	Jan-01	< 50	< 50	< 0.5	< 0.5	0.53	< 0.5	0.5	< 2.0	0.53
16	Apr-01	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0	0
17	Sep-01	440	200	2.1	< 0.5	17	1.3	20	10	670.4
18	Dec-01	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0	0
19	Mar-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0	0
20	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0	0
21	Sep-02	220	590	10	< 0.5	13	< 0.5	23	< 2.0	833
22	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0	0
23	Mar-03	< 50	< 50	< 0.5	< 0.5	0.56	< 0.5	0.56	2.8	3.36
24	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 2.0	0
25	Sep-03	190	92	2.1	< 0.5	4.2	< 0.5	6.3	< 2.0	288.3
26	Dec-03	86	< 100	< 0.3	< 0.3	< 0.3	< 0.6	<0.6	< 5.0	86
27	Mar-04	<50	<100	<0.3	<0.3	1.1	<0.6	1.1	< 5.0	1.1
28	Jun-04	<50	<50	<0.5	<0.5	0.83	<0.5	0.83	< 2.0	0.83
29	Sep-04	260	370	4.4	<0.5	6.3	< 1.0	11	< 2.0	640.7
30	Dec-04	<50	<50	<0.5	<0.5	<0.5	< 1.0	1.0	< 2.0	0
31	Mar-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
32	Jun-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
33	Sep-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
34	Dec-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
35	Mar-06	<50	62	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	62
36	Jun-06	<50	110	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	110
37	Sep-06	62	94	<0.5	<0.5	0.81	<0.5	0.8	< 2.0	156.81
38	Dec-06	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
39	Mar-07	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
40	Jun-07	<50	<50	<0.5	<0.5	<0.5	<0.5	<1.0	<2.0	0
41	Sep-07	<50	77	<0.5	<0.5	<0.5	<0.5	<1.0	<2.0	77
42	Dec-07	130	430	<0.5	<0.5	1.5	<0.5	1.5	<2.0	561.5
43	Mar-08	<50	130	<0.5	<0.5	<0.5	0.61	0.61	<2.0	130.61
44	Jun-08	<50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	0
45	Sep-08	530	690	<0.5	<0.5	4.3	<0.5	4.3	<2.0	1224.3
46	Dec-08	<50	83	<5.0	<5.0	<5.0	<5.0	<0.5	<2.0	83
47	Mar-09	<50	<50	<0.5	<0.5	<0.5	<0.5	<1.0	<2.0	0
48	Jun-09	<50	<50	<5.0	<5.0	<5.0	<5.0	<0.5	<2.0	0

Sampling Location SW-3 (Downstream of Contaminated Groundwater Discharge Location SW-2)										
Event	Date	TVHg	TEHd	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	Total Hydrocarbons
1	May-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	0
2	Aug-95	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	0
3	May-96	< 50	74	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	74
4	Aug-96	69	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	69
5	Dec-96	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	0
6	Feb-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	0
7	Aug-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	0
8	Dec-97	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	0
9	Feb-98	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	NA	0
10	Sep-98	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
11	Apr-99	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
12	Dec-99	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
13	Sep-00	NS	NS	NS	NS	NS	NS	NS	NS	NS
14	Jan-01	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
15	Apr-01	< 50	<50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
16	Sep-01	NS	NS	NS	NS	NS	NS	< 0.5	NS	0
17	Dec-01	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
18	Mar-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
19	Jun-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	2.4	2.4
20	Sep-02	NS	NS	NS	NS	NS	NS	NS	NS	NS
21	Dec-02	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
22	Mar-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
23	Jun-03	< 50	< 50	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 2.0	0
24	Sep-03	NS	NS	NS	NS	NS	NS	NS	NS	NS
25	Dec-03	60	< 100	< 0.3	< 0.3	< 0.3	< 0.6	<0.6	< 5.0	60
26	Mar-04	<50	<100	<0.3	<0.3	<0.6	<0.6	<0.6	< 5.0	0
27	Jun-04	NS	NS	NS	NS	NS	NS	NS	NS	NS
28	Sep-04	NS	NS	NS	NS	NS	NS	NS	NS	NS
29	Dec-04	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
30	Mar-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
31	Jun-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
32	Sep-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
33	Dec-05	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
34	Mar-06	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
35	Jun-06	<50	120	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	120
36	Sep-06	<50	120	<0.5	<0.5	<0.5	<0.5	0.5	7.8	127.8
37	Dec-06	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	< 2.0	0
38	Mar-07	<50	<50	<0.5	<0.5	<0.5	< 1.0	<1.0	3.3	3.3
39	Jun-07	<50	<50	<0.5	<0.5	<0.5	<0.5	0.5	<2.0	0
40	Sep-07	NS	NS	NS	NS	NS	NS	NS	NS	NS
41	Dec-07	NS	NS	NS	NS	NS	NS	NS	NS	NS
42	Mar-08	<50	200	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	200
43	Jun-08	<50	55	<0.5	<0.5	<0.5	<0.5	<0.5	<2.0	55
44	Sep-08	NS	NS	NS	NS	NS	NS	NS	NS	NS
45	Dec-08	<50	360	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	360
46	Mar-09	<50	<50	<0.5	<0.5	<0.5	<0.5	0.5	<2.0	0
47	Jun-09	<50	<50	<5.0	<5.0	<5.0	<5.0	<5.0	<2.0	0

NS = Not Sampled (no surface water present during sampling event)

Gasoline and Diesel Hydrochemical Trends: Well MW-2 Redwood Regional Park Service Yard, Oakland, California

