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**FOURTH QUARTER 2007  
GROUNDWATER MONITORING  
AND ANNUAL SUMMARY REPORT**

**240 W. MACARTHUR BOULEVARD  
OAKLAND, CALIFORNIA**

*Prepared for:*

**MR. GLEN POY-WING  
OAKLAND AUTO WORKS  
OAKLAND, CALIFORNIA**

**January 2008**

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GROUNDWATER MONITORING  
AND ANNUAL SUMMARY REPORT**

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*Prepared for:*

**MR. GLEN POY-WING  
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*Prepared by:*

**STELLAR ENVIRONMENTAL SOLUTIONS, INC.  
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**January 30, 2008**

Project No. 2003-43

January 30, 2008

Mr. Jerry Wickham  
Hazardous Materials Specialist  
Alameda County Environmental Health Department  
Local Oversight Program  
1131 Harbor Bay Parkway, Suite 250  
Alameda, CA 94502

Subject: Fourth Quarter 2007 Groundwater Monitoring and Annual Summary Report  
Oakland Auto Works Facility – 240 W. MacArthur Boulevard, Oakland, California  
Alameda County Environmental Health Department Fuel Leak Case No. RO0000142

Dear Mr. Wickham:

Enclosed is the Stellar Environmental Solutions, Inc. report summarizing recent activities conducted at the referenced site. This report presents the findings of the Fourth Quarter 2007 groundwater monitoring event (the 37<sup>th</sup> site groundwater monitoring event since August 1997).

This report also summarizes historical findings, evaluates hydrologic and hydrochemical contaminant trends, and assesses contaminant plume stability and the potential for migration. This report was uploaded to both the State Water Board's GeoTracker system and the Alameda County Environmental Health Department's Electronic Upload ftp system.

We declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge.

If you have any questions regarding this report, please contact us at (510) 644-3123.

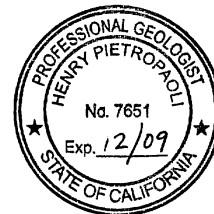
Sincerely,



Henry Pietropaoli, R.G., R.E.A.  
Project Manager



Richard S. Makdisi, R.G., R.E.A.  
Principal



cc: Mr. Glen Poy-Wing, property owner and Responsible Party

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## **1.0 INTRODUCTION**

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### **PROJECT BACKGROUND**

The subject property, located at 240 W. MacArthur Boulevard, Oakland, Alameda County, California, is owned by Glen Poy-Wing and his wife of Oakland Auto Works, for whom Stellar Environmental Solutions, Inc. (SES) has provided environmental consulting services since July 2003. The site has undergone contaminant investigations and remediation since 1991 (discussed below).

A list of all known environmental reports is included in Section 7.0, References and Bibliography. This report presents finding for the 36<sup>th</sup> site groundwater monitoring event since monitoring began in August 1997.

In 2002, the current property owners purchased the property and assumed responsibility for continued environmental investigations. The property was formerly owned by Mr. Warren Dodson (Dodson Ltd.) and operated as Vogue Tyres.

### **REGULATORY STATUS**

The Alameda County Environmental Department of Environmental Health (ACEH) is the lead regulatory agency for the case, acting as a Local Oversight Program (LOP) for the Regional Water Quality Control Board (Water Board). There are no ACEH or Water Board cleanup orders for the site; however, all site work has been conducted under oversight of ACEH. In our August 2003 review of the ACEH case file, we determined that all known technical reports for the site were included in the case file to that point.

The previous consultant requested site closure in March 2003 (AEC, 2003a). ACEH received that request and, in a letter dated April 16, 2003, requested additional site characterization prior to considering case closure. That work was subsequently conducted by SES, and was summarized in our April 2004 Soil and Groundwater Investigation Report (SES, 2004c). In December 2004, SES submitted a workplan for interim remedial action (including additional site characterization and an evaluation of soil vapor extraction as an interim corrective action). ACEH responded to that workplan in its March 2006 letter (Water Board, 2006), approving the work (with minor technical revisions). The December 2004 workplan was implemented in May 2007 and presented in a separate technical report, dated August 1, 2007. ACEH responded in its

letter dated August 24, 2007 requesting a workplan for the installation and operation of a soil vapor extraction (SVE) system. The SVE system design was submitted by SES to ACEH, and was approved by ACEH in its letter dated October 5, 2007; the letter included a request for a SVE System Start-Up Report by March 10, 2008.

The site is in compliance with State Water Resources Control Board's "GeoTracker" requirements for uploading of technical data and reports. In addition, electronic copies of technical documentation reports published since the Second Quarter of 2005 have been uploaded to ACEH's file transfer protocol (ftp) system.

The site has been granted a Letter of Commitment (and has been receiving financial reimbursement) from the California Underground Storage Tank Cleanup Fund.

## **SCOPE OF REPORT**

This report discusses the work conducted between October 1 and December 31, 2007 (i.e., the 37<sup>th</sup> groundwater monitoring and sampling event, conducted on December 19, 2007).

## **SITE DESCRIPTION**

The project site is located at 240 W. MacArthur Boulevard in Oakland, California (see Figure 1). The rectangular-shaped project site is approximately 14,000 square feet (140 feet long by 100 feet wide), and is oriented with its long axis parallel to W. MacArthur Boulevard (approximately northwest-southeast). The project site is essentially flat and is wholly paved. One structure currently exists on the property—an automobile servicing shop that covers approximately 50 percent of the property.

The building is currently occupied by Oakland Auto Works. Figure 2 is a site plan showing adjacent land uses.

Adjacent land use includes: a Shell-branded service station (*to the south*); W. MacArthur Boulevard (*to the west*); Howe Street (*to the north*); and a paved driveway, then a multi-story (with basement) health services building (*to the east*).

## **HISTORICAL ENVIRONMENTAL ACTIVITIES**

This section summarizes historical (prior to the current quarter) environmental remediation and site characterization activities, based on documentation provided by the current property owners as well as ACEH files. Figure 2 shows the site plan with the current groundwater well and former underground fuel storage tank (UFST) locations.





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

**240 W. MacArthur Blvd.  
Oakland, CA**

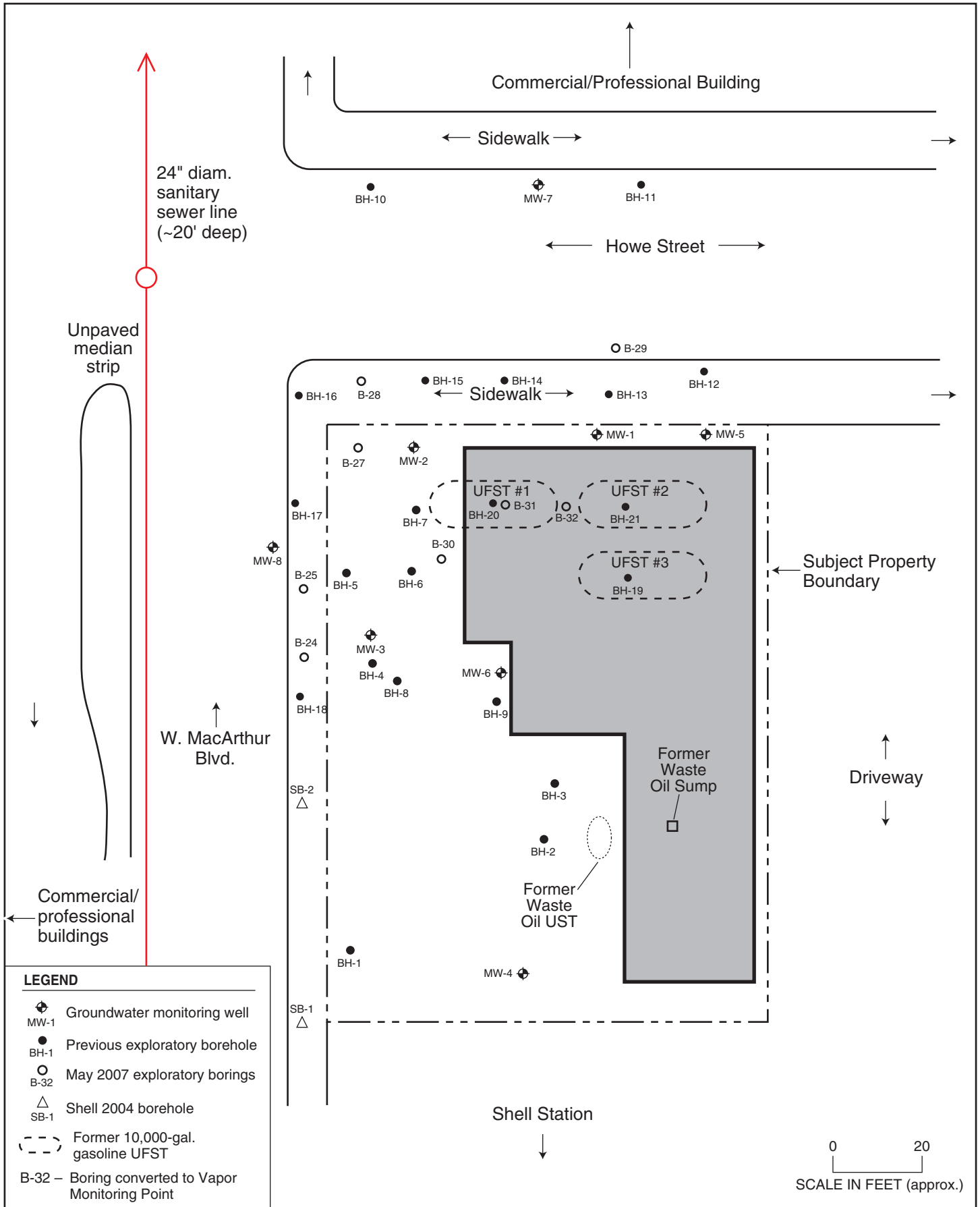
By: MJC

APRIL 2004

**Figure 1**

**★ Stellar Environmental Solutions, Inc.**  
Geoscience & Engineering Consulting

2008-43-01



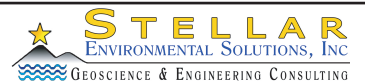
**SITE PLAN WITH BOREHOLE AND GROUNDWATER WELL LOCATIONS**

240 W. MacArthur Blvd.  
Oakland, CA

By: MJC

JUNE 2007

**Figure 2**



2008-43-155

Historical remediation and site characterization activities include:

- **Pre-1991.** Three 10,000-gallon gasoline UFSTs from a former Gulf service station occupancy were removed prior to 1991 (there is no available documentation regarding the removals).
- **1991.** A waste oil sump was removed. Limited overexcavation was conducted, and there was no evidence of residual soil contamination, with the exception of 360 milligrams per kilogram (mg/kg) of petroleum oil & grease (Mittelhauser Corporation, 1991b).
- **1996.** A 350-gallon waste oil UFST was removed. Elevated levels of diesel and oil & grease were detected in confirmation soil samples. Subsequent overexcavation was conducted, and there was no evidence of residual soil contamination (All Environmental, Inc., 1997a).
- **January 1997.** In accordance with a request by ACEH, a subsurface investigation was conducted (All Environmental, Inc., 1997b). Six exploratory boreholes were advanced to a maximum depth of 20 feet, and soil samples were collected.
- **August 1997.** Additional site characterization was conducted. This included sampling of three boreholes, installation of four groundwater monitoring wells, and the initial groundwater sampling event.
- **February 2001.** Four additional groundwater monitoring wells were installed. Maximum historical soil concentrations were detected in well MW-5 in the northeastern corner of the subject property: 11,700 mg/kg of gasoline and 25.6 mg/kg of benzene (AEC, 2001b).
- **October 2001.** Short-term (less than 1-day duration) groundwater and vapor extraction from five wells was conducted over 4 days (AEC, 2001e) (referred to by that consultant as “Hi-Vac” process).
- **2003.** A sensitive receptor and vicinity water well survey was conducted.
- **April 2004.** Additional site characterization was conducted, including: advancing and sampling of 12 exploratory boreholes; analysis of 64 soil and 12 grab-groundwater sample results; and further evaluation of site hydrogeology and contaminant extent and magnitude.
- **June 2004 to present.** Quarterly groundwater monitoring.
- **May to June 2007.** Additional site characterization and interim remedial action evaluation. This included eight exploratory boreholes; analysis of 8 soil-gas, 18 soil, and 8 grab-groundwater samples; and a 6-hour SVE pilot test.

- **September 2007.** A workplan for installation and operation of a full SVE system was submitted to ACEH on September 28, 2007. ACEH has requested submittal of a SVE System Start-Up Report by March 10, 2008.

To date, a total of 37 groundwater monitoring events have been conducted at the site.

## **2.0 PHYSICAL SETTING**

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The following evaluation of the physical setting of the site—including topography, surface water drainage, and geologic and hydrogeologic conditions—is based on previous (1991 through April 2003) site investigations conducted by others, and site investigations and groundwater monitoring data collected by SES since 2003.

### **TOPOGRAPHY AND SURFACE WATER DRAINAGE**

The site is on a gently-sloping alluvial fan at the base of the Berkeley/Oakland Hills, which rise approximately 1,100 feet above mean sea level (amsl) and are located approximately 3 miles east of San Francisco Bay. The mean elevation of the subject property is approximately 82 feet amsl. The subject property is essentially flat, with a local topographic gradient to the west. The nearest surface water bodies are: 1) Glen Echo Creek, a northeast-southwest trending creek located approximately 800 feet southeast of the subject property; and 2) Rockridge Branch, a north-south trending creek located approximately 1,000 feet northwest of the subject property. Both creeks are culverted underground in the areas nearest the subject property.

### **LITHOLOGY**

A previous SES report included geologic cross-sections through the area of historical investigations (SES, 2004c). The following summarizes site lithologic conditions.

The unsaturated zone (from ground surface to approximately 20 feet below ground surface [bgs]) consists of interbedded silty/sandy clays with silty/clayey sand, with occasional gravelly zones. In the sand zones, clay and/or silt content is high, and the sand is generally very fine- to fine-grained—such that the unit is, in essence, gradational between a clayey sand and a sandy clay. The most laterally-extensive unsaturated zone unit is a sandy clay encountered between ground surface and approximately 15 feet, locally pinching out and displaying lenticular form. Locally, this unit is interbedded with a sandy clay. The sediment types and geometry are suggestive of channel deposits, which is a common depositional facies in this area.

Depth to groundwater in all onsite April 2004 boreholes and all May 2007 boreholes was approximately 20 to 21 feet bgs, predominantly in a saturated, loose, clayey sand. The saturated portion of this clayey sand constitutes the bottom of the unit; the saturated zone is approximately 0.5 to 2.5 feet thick, underlain in all boreholes by a cohesive, non-water-bearing clay. The top of

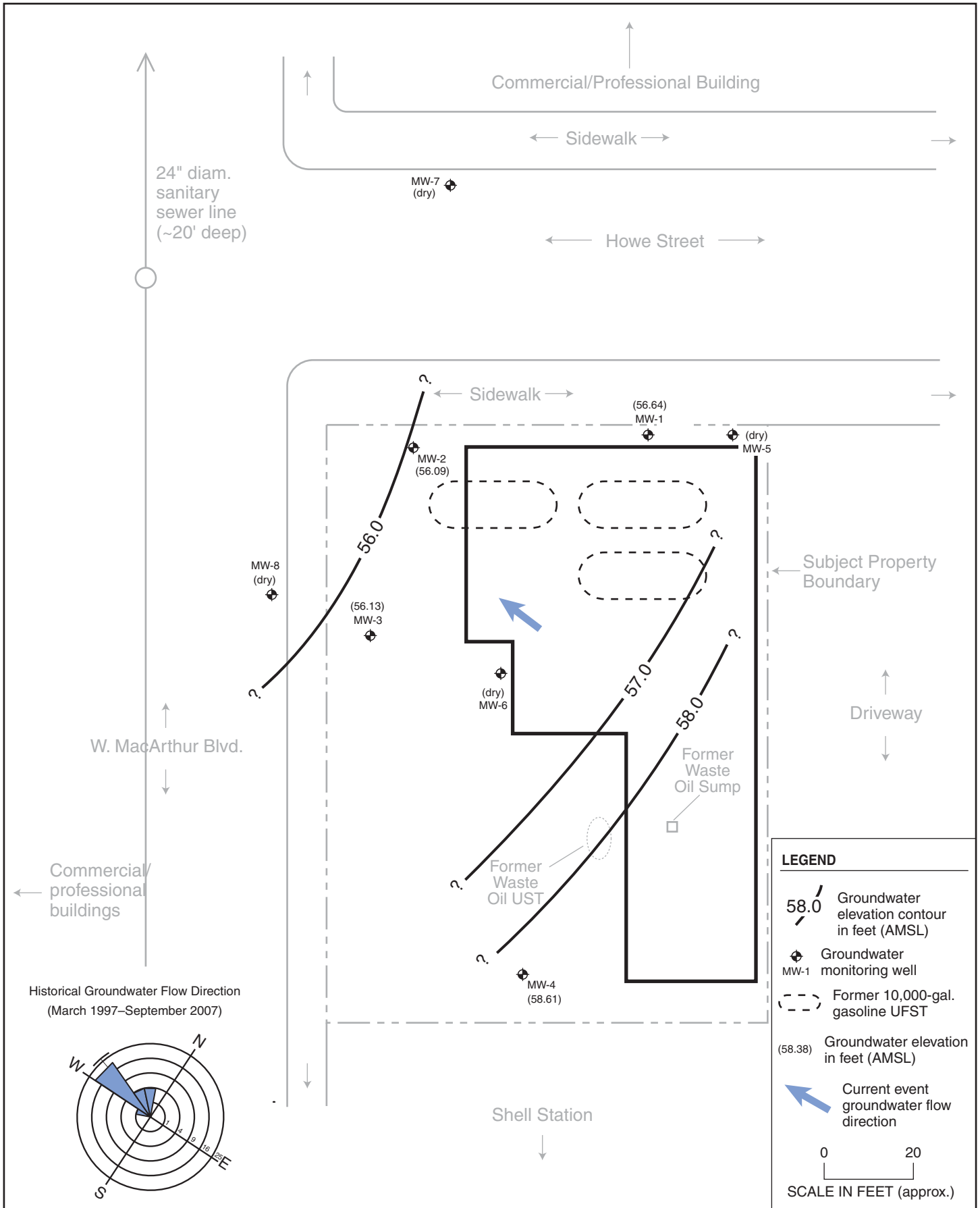
this clay was consistently at a depth of approximately 21 to 23 feet. Of the 12 boreholes in the April 2004 investigation, 9 were advanced at least 1.5 feet into this clay before terminating (and not encountering visible moisture or sand). Two boreholes B31 and B32 were advanced to 32 feet bgs in the May 2007 investigation and showed this clay extending from its upper reach of 21 to 23 feet bgs to 32 feet bgs. One of the boreholes in the April 2004 investigation was advanced deeper, documenting a thickness of at least 4.5 feet. The lithologic data (supported by soil sample analytical data from both the 2004 and 2007 investigations) strongly suggest that this clay unit inhibits downward migration of groundwater contamination.

The site lithology is consistent with that documented at the adjacent Shell service station site. Specifically, those boreholes have documented the thin upper, water-bearing zone underlain by the likely non-water-bearing clay unit. In three of the four Shell well boreholes, that clay unit was at least 2 feet thick. In one of the well boreholes, the clay unit was underlain by a saturated clayey sand unit (from approximately 22 to 25.5 feet bgs, which was underlain by a non-water-bearing clay). There are insufficient data to conclude whether the second deepest saturated clayey sand is connected to the more shallow sitewide saturated zone. The subsequent (March 2004) Shell boreholes SB-1 and SB-2 (between the Shell wells and the subject property) all terminated at 20 feet bgs, which was too shallow to encounter the underlying clay unit.

## **GROUNDWATER HYDROLOGY**

The number and positioning of the existing eight site monitoring wells is currently adequate to evaluate the general groundwater flow direction and gradient. Four of the wells (MW-1, MW-2, MW-3, and MW-4) are screened between approximately 15 and 25 feet bgs, and the other four (MW-5, MW-6, MW-7, and MW -8) are screened at a depth of 10 to 20 feet.

Figure 3 is a groundwater elevation map that shows elevations and contours from the current (December 2007) groundwater monitoring event. Due to low groundwater levels encountered during the December 2007 event, data from four of the site monitoring wells (MW-5, MW-6, MW-7, and MW-8) could not be reliably used in the construction of the Figure 3 groundwater elevation map. These are the second lowest groundwater elevations recorded since monitoring began in 1997. Groundwater flow direction in this event was generally to the west, although the data suggest local variations. A generally westward (with a slight southern component) groundwater flow direction has also been measured at the adjacent Shell-branded service station (Cambria Environmental Technology, 2004). Subject property groundwater gradient in the current event ranged between approximately 0.002 and 0.03 feet/foot. Historical groundwater gradient has varied between approximately 0.002 and 0.008 feet/foot, averaging approximately 0.005 feet/foot. The slightly steeper gradient (higher than the historical average) measured during this event indicate recharging conditions resulting from the current rainfall season.



**GROUNDWATER ELEVATION MAP—December 19, 2007**

240 W. MacArthur Blvd.  
Oakland, CA

By: MJC

JANUARY 2008

**Figure 3**



Figure 3 contains a rose diagram that shows historical groundwater flow direction measured at the site. The rose diagram is a histogram that has been wrapped around a circle and has the following characteristics:

- Each wedge represents a 15-degree arc of groundwater flow direction.
- The length of each wedge (circle radius) represents the number of sampling events with data falling within the 15-degree arc.
- The bold black line from the center of the circle to the outer edge is the mean groundwater flow direction.
- The arcs extending to either side of the mean groundwater flow direction line represent the 95-degree confidence interval of the data.

Historical equilibrated water levels (in wells) have been measured at depths of approximately 13 to 16 feet (slightly higher than first occurrence of groundwater encountered during drilling), indicating that groundwater occurs under slightly confining conditions. The range of water level elevations has varied by approximately 3 feet, and shows a strong seasonal variation, with highest elevations during the rainy winter-spring seasons and lowest elevations during the dry summer-fall seasons.

Appendix D contains historical site groundwater monitoring well elevation data.



### **3.0 DECEMBER 2007 GROUNDWATER MONITORING AND SAMPLING**

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This section presents the groundwater sampling and analytical methods for the current event (Fourth Quarter 2007), conducted on December 19, 2007. Table 1 summarizes monitoring well construction and groundwater monitoring data. Groundwater analytical results are presented and discussed in Section 4.0. Monitoring and sampling protocols were in accordance with the SES technical workplan (SES, 2003) submitted to ACEH, and subsequent technical revision requested by ACEH. The groundwater sampling event involved the collection of one set of “post-purge” samples from all wells, in accordance with recent revisions to the quarterly monitoring program approved by ACEH.

Specific activities for this event included:

- Measuring static water levels and field measurement of “pre-purge” groundwater samples for hydrogeochemical parameters (temperature, pH, electrical conductivity, turbidity, and dissolved oxygen) in the eight site wells; and
- Collecting “post-purge” groundwater samples from four of the eight onsite wells for field measurement of the aforementioned hydrogeochemical parameters, and for offsite laboratory analyses for contaminants of concern.

Four of the eight monitoring wells could not be sampled due to seasonally lowered groundwater levels that resulted from the low seasonal rainfall in 2007. The locations of all site monitoring wells are shown on Figure 2. Well construction information and water level data are summarized in Table 1. All site wells are 2-inch-diameter PVC, although the borehole geologic logs for MW-1 through MW-4 completed by the previous consultant mistakenly indicated that they are 4-inch-diameter. Appendix A contains the groundwater monitoring field records for the current event.

Groundwater monitoring well water level measurements, sampling, and field analyses were conducted by Blaine Tech Services (San Jose, California) under the supervision of SES personnel. To minimize the potential for cross-contamination, wells were purged and sampled in order of increasing contamination (based on the previous quarter analytical results).

**Table 1**  
**Groundwater Monitoring Well Construction and Groundwater Elevation Data**  
**240 W. MacArthur Boulevard, Oakland, California**

Well	Well Depth (feet bgs)	Well Screened Interval		Groundwater Level Depth <sup>(a)</sup> December 19, 2007	Groundwater Elevation <sup>(b)</sup> December 19, 2007
		Depth (feet)	Elevation (feet)		
MW-1	25	19.5 to 24.5	54.5 to 49.5	22.51	56.64
MW-2	25	14.5 to 24.5	64.2 to 54.2	22.36	56.09
MW-3	25	14.5 to 24.5	63.4 to 53.4	21.45	56.13
MW-4	25	14.5 to 24.5	63.6 to 53.6	19.13	58.61
MW-5	20	9 to 19	70.6 to 60.6	Dry	NR
MW-6	20	9 to 19	69.7 to 59.7	Dry	NR
MW-7	20	9 to 19	69.6 to 59.6	Dry	NR
MW-8	20	9 to 19	67.7 to 57.7	Dry	NR

Notes:

<sup>(a)</sup> Pre-purge measurement, feet below top of well casing.

<sup>(b)</sup> Pre-purge measurement, feet above mean sea level

NR = not recorded (dry or only residual water in silt trap)

As the first monitoring task, static water levels were measured in the eight site wells using an electric water level indicator. Each well was then purged of three wetted casing volumes, and aquifer stability parameters were measured between each purging. When measurements indicated that representative formation water was entering the well, a groundwater sample set was collected from each well with the purging bailer. Samples were then transferred to appropriate sampling containers (40-ml VOA vials with hydrochloric acid preservative, and 1-liter amber glass jars), labeled, and placed in coolers with “blue ice.” All groundwater samples were managed under chain-of-custody procedures from the time of sample collection until samples were received in the laboratory.

Approximately 5.5 gallons of wastewater (purge water and equipment decontamination rinseate) was containerized in a labeled, 55-gallon steel drum and temporarily stored onsite. This non-hazardous water will continue to be accumulated onsite until it is cost-effective to coordinate its disposal, at which time it will be profiled and disposed of at a permitted wastewater treatment facility.

## **4.0 REGULATORY CONSIDERATIONS, ANALYTICAL RESULTS, AND FINDINGS**

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This section presents analytical results of the most recent monitoring event, preceded by a summary of relevant regulatory considerations.

### **REGULATORY CONSIDERATIONS**

#### **Environmental Screening Levels**

There are no published cleanup goals for detected site contaminants in groundwater. The Water Board has published “Environmental Screening Levels” (ESLs), which are screening-level concentrations for soil and groundwater that incorporate both environmental and human health risk considerations, and are used as a preliminary guide in determining whether additional remediation and/or investigation are warranted. The ESLs are not cleanup criteria; rather, they are conservative screening-level criteria designed to be protective of both drinking water resources and aquatic environments in general. The groundwater ESLs are composed of one or more components, including ceiling value, human toxicity, indoor air impacts, and aquatic life protection. Exceedance of ESLs suggests that additional remediation and/or investigation may be warranted, such as monitoring plume stability to demonstrate no risk to sensitive receptors in the case of sites where drinking water is not threatened.

The City of Oakland, via its Urban Land Redevelopment Program, utilizes a similar ESL approach in evaluating whether active remediation is necessary at sites proposed for redevelopment. This program is not currently applicable to the site, as no redevelopment is being proposed.

For all site contaminants with published drinking water standards—benzene, toluene, ethylbenzene, and xylenes (BTEX); and methyl *tertiary*-butyl ether (MTBE)—the drinking water standards are equal to or greater than the published ESLs.

#### **Sensitive Receptors**

Risk evaluation commonly includes the identification of sensitive receptors, including vicinity groundwater supply wells. As discussed in a previous report (SES, 2004c), the Department of Water Resources identified only one groundwater supply well within 1,500 feet of the site.

Based on its distance and upgradient location relative to the site, there is no reasonable potential for this well to intercept shallow groundwater emanating from the subject property.

As specified in the *San Francisco Bay Region Water Quality Control Plan* (Water Board, 2004), all groundwaters are considered potential sources of drinking water unless otherwise approved by the Water Board, and are assumed to ultimately discharge to a surface water body and potentially impact aquatic organisms. In the case of groundwater contamination, ESLs are published for two scenarios: groundwater is a source of drinking water, and groundwater is not a source of drinking water. Qualifying for the higher ESLs (applicable to groundwater is not a source of drinking water) requires meeting one of the following two criteria:

1. The Water Board has completed the *East Bay Plain Groundwater Basin Beneficial Use Evaluation Report* (Water Board, 1999) that delineates three types of areas with regard to beneficial uses of groundwater: Zone A (significant drinking water resource), Zone B (groundwater unlikely to be used as drinking water resource), and Zone C (shallow groundwater proposed for designation as Municipal Supply Beneficial Use). The subject site falls within Zone A.
2. A site-specific exemption can be obtained from the Water Board. Such an exemption has not been obtained for this site.

As discussed below, multiple groundwater contaminants have been detected in excess of ESLs, for both groundwater beneficial scenarios (groundwater is versus is not a potential drinking water resource). These data indicate that continued site characterization is warranted until it can be demonstrated that site-sourced contamination poses no unacceptable risk to sensitive receptors. Our subsequent discussion of groundwater contamination is in the context of the ESL criteria for sites where groundwater is a potential drinking water resource.

## **GROUNDWATER SAMPLE ANALYTICAL METHODS**

Groundwater samples were analyzed in accordance with the methods proposed in the SES technical workplan. Analytical methods included:

- Total volatile hydrocarbons – gasoline range (TVHg), by EPA Method 8015B (all wells);
- BTEX and MTBE, by EPA Method 8260B;
- The lead scavengers 1,2-dichloroethane (EDC) and 1,2-dibromoethane (EDB), by EPA Method 8260B (all wells except MW-4 and MW-7, which historically have had little or no site-sourced contamination);
- Total extractable hydrocarbons – diesel range (TEHd), by EPA Method 8015M (all wells except MW-4 and MW-7, which historically have never detected diesel); and
- Fuel oxygenates, by EPA Method 8260B.

Groundwater samples were analyzed in accordance with the methods proposed in the SES technical workplan. The analytical results for the current event indicate no significant differences from historical analytical results.

## **GROUNDWATER SAMPLE RESULTS**

Four of the eight monitoring wells could not be sampled during this event because of insufficient water due to seasonally lowered groundwater levels, and only a limited volume could be collected from MW-4. Tables 2 and 3 summarize the contaminant analytical results of the current monitoring event. Appendix B contains the certified analytical laboratory report and chain-of-custody record. Appendix C contains historical site groundwater monitoring well analytical data.

The low rainfall in the 2006-2007 year resulted in the most subsequent drop in water level elevations since the initiation of groundwater elevation monitoring in 2001. A resultant significant decrease in gasoline and diesel concentrations in all monitoring wells, with the exception of the downgradient well MW-3, occurred in the past three quarters. This drop in concentrations is attributed to a portion of the dissolved mass of contamination absorbing onto the newly created vadose zone.

### **Gasoline and Diesel**

Figure 4 shows gasoline isoconcentration contours for the recent event. Gasoline was detected in all four of the wells sampled. Detected concentrations ranged from 90 micrograms per liter ( $\mu\text{g/L}$ ) in well MW-4 to 2,700  $\mu\text{g/L}$  in well MW-1. All of the gasoline concentrations (except for MW-4) exceeded the 100- $\mu\text{g/L}$  ESL criterion.

The gasoline concentrations in Fourth Quarter 2007 compared to Third Quarter 2007 show a slight increase in the gasoline concentrations at the monitoring well near the source area (MW-1). There was a slight decrease in the downgradient well MW-3 since the previous sampling in June 2007. Gasoline is known to be present offsite under Howe Street (to the northwest) and under W. MacArthur Boulevard (to the southwest).

Figure 5 shows diesel isoconcentration contours for the recent event. Diesel was detected in all of the wells in which it was analyzed for, but is of secondary concern relative to gasoline, with concentrations historically at significantly lower levels than gasoline. Diesel was detected at concentrations ranging from 510 to 2,600  $\mu\text{g/L}$ , exceeding the 100- $\mu\text{g/L}$  ESL criterion in all three of the wells in which it was sampled for. The diesel plume footprint is similar to that of the gasoline plume, but somewhat smaller. Diesel is known to be present offsite under Howe Street (to the northwest) and under W. MacArthur Boulevard (to the southwest).

**Table 2**  
**Groundwater Sample Analytical Results –December 19, 2007**  
**Hydrocarbons, BTEX, and MTBE**

Well	TVHg	TEHd	Benzene	Toluene	Ethyl-benzene	Total Xylenes	MTBE
MW-1	<b>2,700</b>	<b>840</b>	<b>170</b>	5.5	7.5	<b>34.6</b>	3.1
MW-2	<b>1,200</b>	<b>510</b>	<b>14</b>	<0.5	<0.5	0.5	<b>33</b>
MW-3	<b>1,400</b>	<b>2,600</b>	<b>11</b>	0.8	0.7	3.9	<b>84</b>
MW-4	90	NA	NA	NA	NA	NA	NA
MW-5	NS	NS	NS	NS	NS	NS	NS
MW-6	NS	NS	NS	NS	NS	NS	NS
MW-7	NS	NA	NA	NA	NA	NA	NA
MW-8	NS	NS	NS	NS	NS	NS	NS
<b>Environmental Screening Levels <sup>(a)</sup></b>							
	100	100	1.0	40	30	20	5.0
<b>Drinking Water Standards <sup>(b)</sup></b>							
	100	100	1.0 <sup>(d)</sup>	40	30	13	5.0

Notes:

<sup>(a)</sup> For commercial/industrial sites where a known or potential drinking water resource is threatened.

<sup>(b)</sup> Drinking water standards are State of California Secondary Maximum Contaminant Levels – Proposed, unless specified otherwise.

MTBE = methyl *tertiary*-butyl ether; TEHd = total extractable hydrocarbons - diesel range; TVHg = total volatile hydrocarbons - gasoline range  
 NA = not analyzed for this contaminant; NS = not sampled

All concentrations are expressed in micrograms per liter (µg/L), equivalent to parts per billion (ppb). Analytical results in **bold** are above the ESLs.

**Table 3**  
**Groundwater Sample Analytical Results – December 19, 2007**  
**Lead Scavengers and Fuel Oxygenates**

Well	EDC	DIPE	TBA
MW-1	<1.0	<1.0	<b>26</b>
MW-2	<0.5	3.4	<b>21</b>
MW-3	<0.5	8.6	<b>71</b>
MW-4	NA	NA	NA
MW-5	NS	NS	NS
MW-6	NS	NS	NS
MW-7	NA	NA	NA
MW-8	NS	NS	NS
<b>Drinking Water Standards <sup>(a)</sup></b>			
	NLP	NLP	NLP
<b>ESLs <sup>(b)</sup></b>			
	0.5	NLP	12

Notes:

<sup>(a)</sup> Drinking water standards are State of California Secondary Maximum Contaminant Levels – Proposed, unless specified otherwise.

<sup>(b)</sup> For commercial/industrial sites where known/potential drinking water resource is threatened.

DIPE = isopropyl ether; EDC = ethylene dichloride (1,2-dichloroethane); TBA = *tertiary*-butyl alcohol  
 NA = not analyzed for this contaminant; NS = not sampled; NLP = no level published.

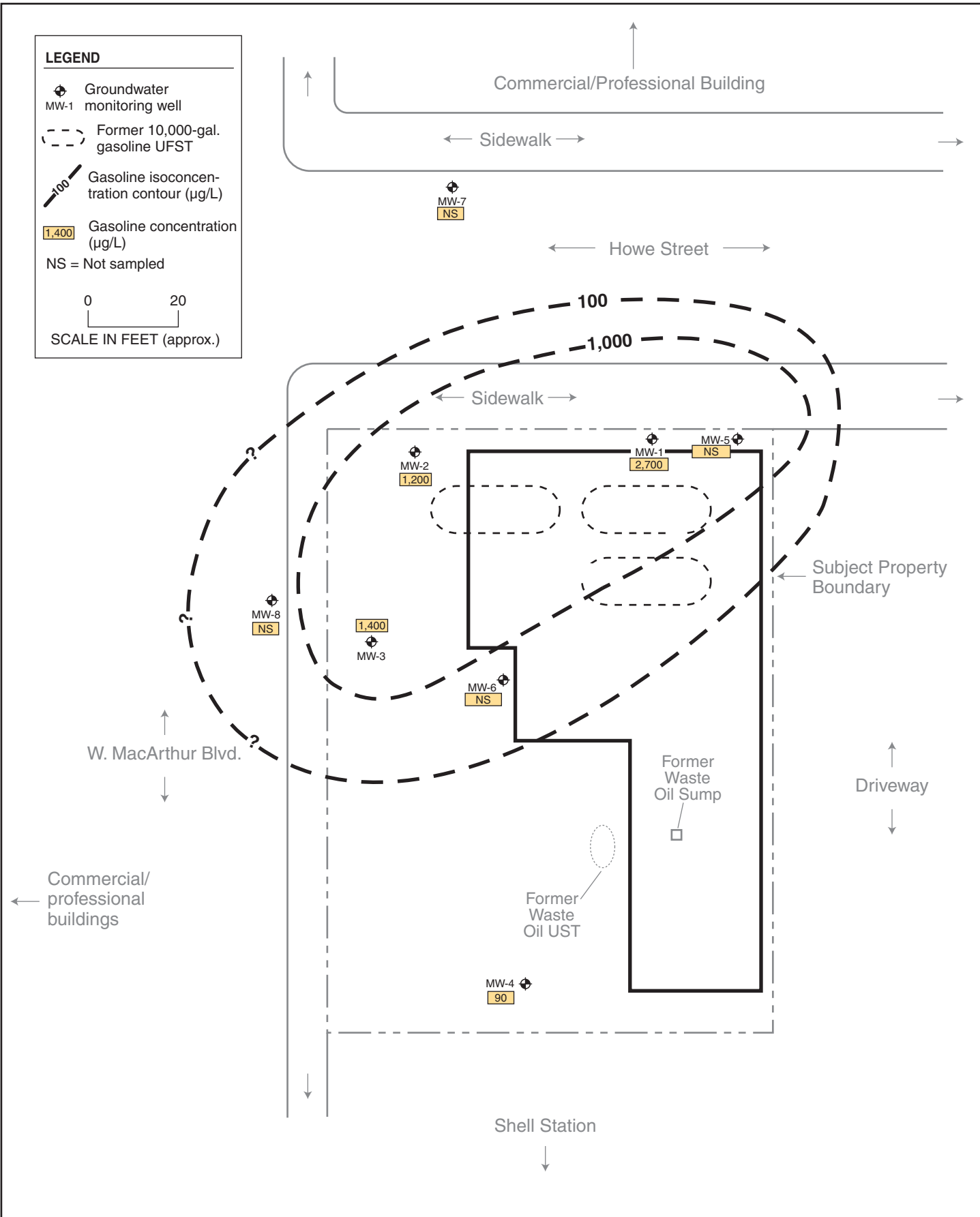
All concentrations are expressed in micrograms per liter (µg/L), equivalent to parts per billion (ppb). Analytical results in **bold** are above the ESLs.

The table includes only detected fuel oxygenates and lead scavengers; contaminants analyzed for and not detected include EDB, ETBE, and TAME.

**LEGEND**

- Groundwater monitoring well
- Former 10,000-gal. gasoline UFGT
- Gasoline isoconcentration contour ( $\mu\text{g/L}$ )
- Gasoline concentration ( $\mu\text{g/L}$ )
- NS = Not sampled

0      20  
SCALE IN FEET (approx.)



**GASOLINE ISOCONCENTRATION CONTOURS (DECEMBER 2007)**

240 W. MacArthur Blvd.  
Oakland, CA

By: MJC

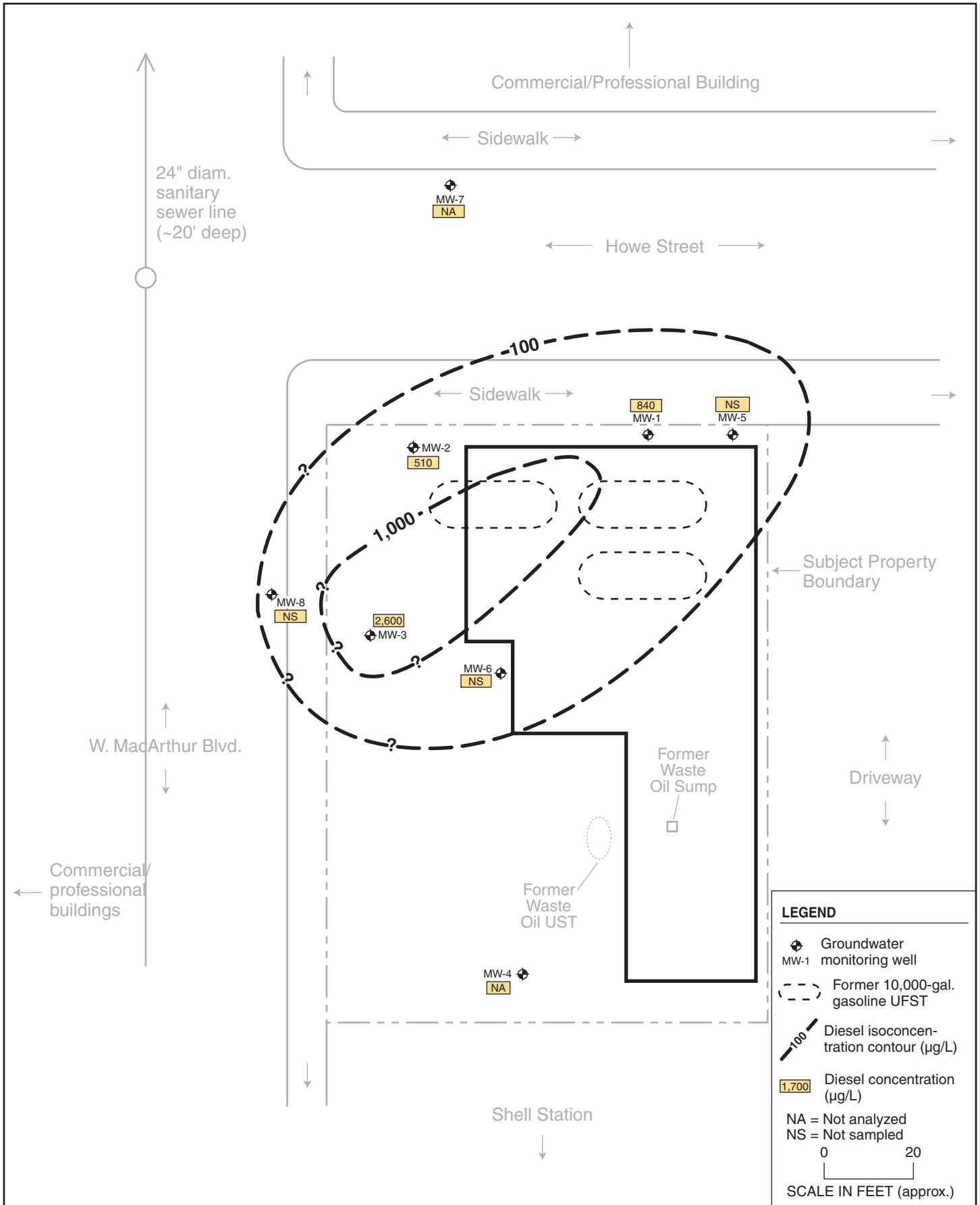
JANUARY 2008

**Figure 4**



2008-43-182





2003-43-184



**DIESEL ISOCONCENTRATION CONTOURS (DECEMBER 2007)**

240 W. MacArthur Blvd.  
Oakland, CA

By: MJC

JANUARY 2008

**Figure 5**





## **Benzene, Toluene, Ethylbenzene, and Total Xylenes**

Figure 6 shows benzene isoconcentration contours for the recent event. Benzene was detected in all three of the wells in which it was analyzed—at concentrations of 170 µg/L in MW-1, 14 µg/L in MW-2, and 11 µg/L in MW-3. All concentrations were in excess of the 1.0-µg/L ESL criterion, with the maximum benzene concentration detected in source area well MW-1, as historically has been the case. The lateral extent of the benzene plume was constrained onsite in three directions in the current event; however, it is known to extend under Howe Street to the northwest (historical concentrations up to approximately 100 µg/L). The benzene plume configuration is generally the same as for gasoline and diesel.

The ESL criterion was exceeded for total xylenes in source area well MW-1 (34.6 µg/L). Trace concentrations of toluene, ethylbenzene, and xylenes were detected below ESL criteria during this event. Historically, these analytes are detected in generally the same wells in which benzene is detected.

## **Methyl tertiary-Butyl Ether**

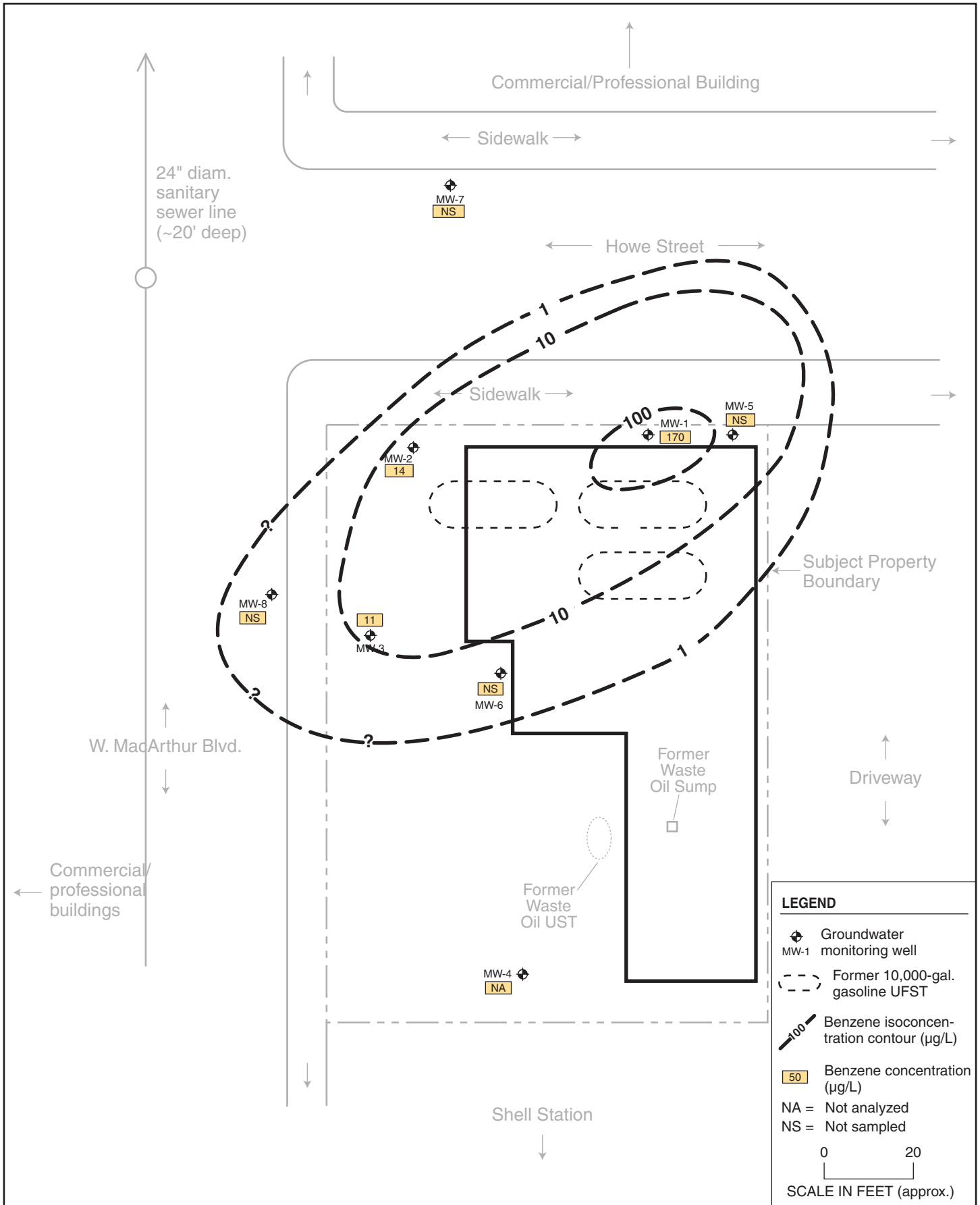
Figure 7 shows MTBE isoconcentration contours for the recent event. MTBE was detected in all three of the wells in which it was analyzed for, and exceeded the ESL criteria in MW-2 (33 µg/L) and MW-3 (84 µg/L). The center of mass of the MTBE plume has migrated downgradient from the source area to the southern side of the property (adjacent to W. MacArthur Boulevard).

The lateral extent of the MTBE plume was constrained onsite in three directions in the current event; however, it is known to extend to the west underneath W. MacArthur Boulevard. As discussed in previous reports (SES, 2004c), MTBE appears to be migrating onto the subject property from the adjacent (to the east) Shell-branded service station. This contamination, however, is unrelated to the separate site-sourced MTBE contamination.

## **Lead Scavengers and Fuel Oxygenates**

The lead scavengers EDC and EDB were not detected in any of the three wells in which they were analyzed for during this event.

Two fuel oxygenates were detected during the current event. DIPE was detected in two of the three wells in which it was analyzed for—at 3.4 µg/L in MW-2, and 8.6 µg/L in MW-3. TBA was detected above ESL criteria in all three wells in which it was analyzed for—at 26 µg/L in MW-1, 21 µg/L in MW-2, and 71 µg/L in MW-3. No other fuel oxygenates were detected.



## BENZENE ISOCONCENTRATION CONTOURS (DECEMBER 2007)

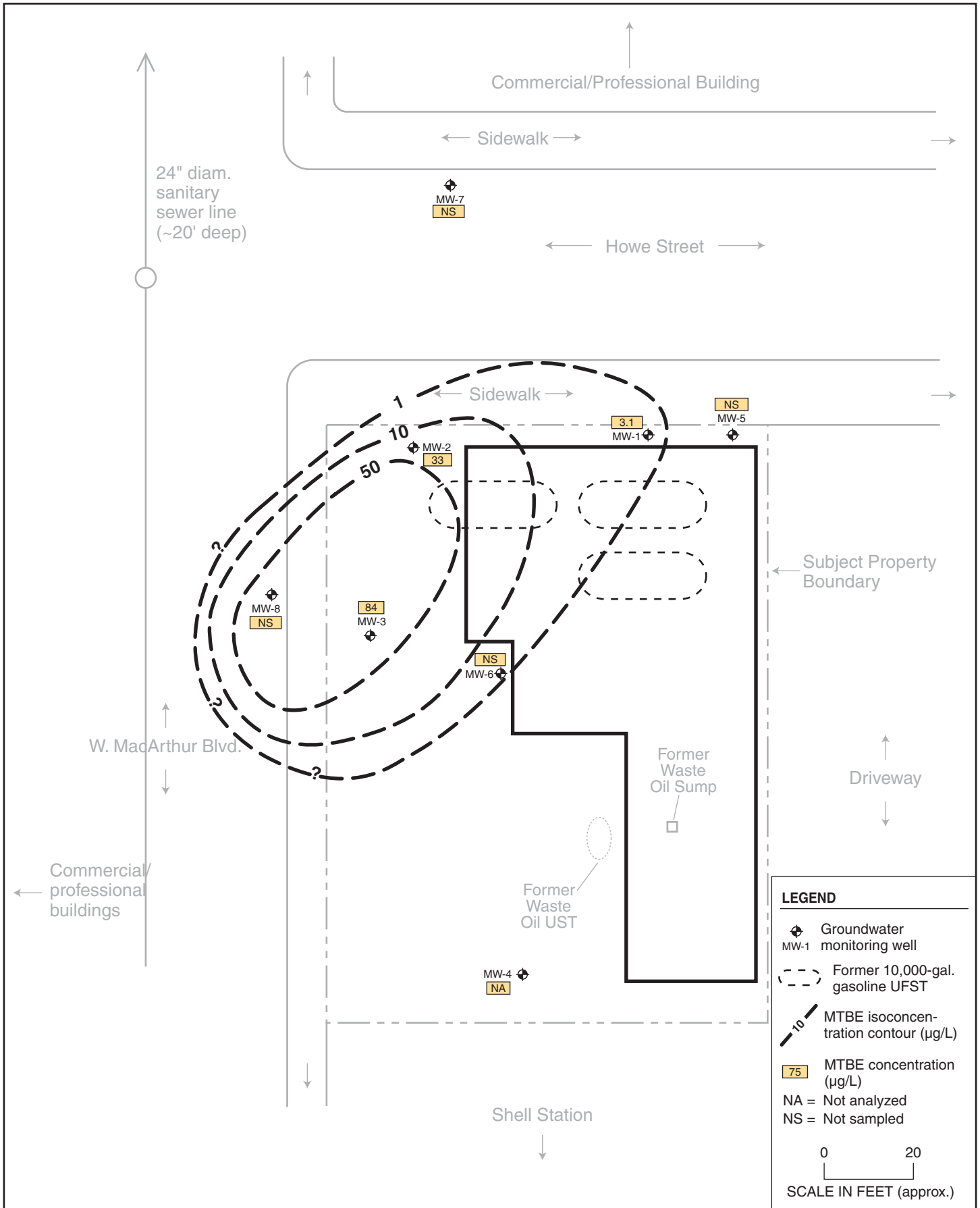
240 W. MacArthur Blvd.  
Oakland, CA

By: MJC

JANUARY 2008

Figure 6





**MTBE ISOCONCENTRATION CONTOURS (DECEMBER 2007)**

240 W. MacArthur Blvd.  
Oakland, CA

By: MJC

JANUARY 2008

**Figure 7**



## **Summary of Groundwater Contamination**

Concentration in all wells except MW-3 showed a decreasing trend in 2007 in the various petroleum concentrations, reflecting drought year of low rainfall and subsequent drop in water level elevations. This is attributed to a portion of the dissolved mass of contamination absorbing onto the newly created vadose zone.

In the Q4 groundwater monitoring event, the maximum concentrations of gasoline, diesel, and benzene were detected in well MW-1 (near the former UFSTs), while the maximum concentration of diesel was detected in downgradient well MW-3. The TVHg concentration at MW-1 dropped significantly, from 16,000 µg/L in December 2006 to 2,700 µg/L in December 2007.

Maximum concentrations of MTBE were historically detected in downgradient wells (adjacent to W. MacArthur Boulevard), indicating that the center of mass of MTBE has migrated downgradient. Groundwater contamination is known to extend offsite to the northwest southwest (beneath Howe Street and W. MacArthur Boulevard). Discussion of contaminant trends is limited for this event because historical low groundwater levels resulted in only four of the eight wells being sampled.

## **QUALITY CONTROL SAMPLE ANALYTICAL RESULTS**

Laboratory QC samples (e.g., method blanks, matrix spikes, surrogate spikes) were analyzed by the laboratory in accordance with requirements of each analytical method. All laboratory QC sample results and sample holding times were within the acceptance limits of the methods (Appendix B).

## **5.0 EVALUATION OF HYDROCHEMICAL TRENDS AND PLUME STABILITY**

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This section evaluates the observed hydrologic and hydrochemical trends with regard to plume stability and contaminant migration. An assessment is made of the nature of residual contaminated soil that acts as a continued source of groundwater contamination. A conceptual model (incorporating site lithology, hydrogeology, and hydrochemistry) is presented to explain the spatial extent and magnitude of the dissolved hydrocarbon plume.

### **CONTAMINANT SOURCE ASSESSMENT**

Three UFSTs were removed (i.e., discharge was discontinued) prior to 1991, although there is no documentation of conditions at the time of the removals nor of any contaminated soil removal at that time. Borehole soil sampling has provided data on the extent and magnitude of soil contamination in the vicinity of the former UFSTs (“source area”) and the outlying area (in the capillary fringe above the groundwater plume). A full discussion of residual soil contamination was presented in the SES August 2007 Corrective Action Assessment Report (SES, 2007d).

#### **Source Area**

A substantial mass of soil contamination is present at depths between approximately 13 feet bgs and 18 to 21 feet bgs (top of the underlying non-water-bearing clay unit) in the immediate vicinity of former UFSTs (BH-13, BH-19, BH-20, BH-21, B30 and B31); this mass has a footprint of approximately 40 feet by 40 feet. This source area contamination is almost certainly related to downward migration of contamination following UFST and/or piping leakage, and is responsible for the continued relatively elevated concentrations of gasoline, diesel, BTEX, and MTBE in groundwater in the wells and bores. No contamination was detected in the UFST excavation fill material. Soil contamination was detected in two of the three saturated zone soil samples, and no contamination was detected in the underlying clay samples.

Source area wells MW-1 and MW-5 historically showed evidence of separate-phase hydrocarbons (i.e., floating product). Limited “Hi-Vac” removal (short-term pumping) of contaminated groundwater from these wells in October 2001 appears to have removed the floating product, which has not been observed since that time.

The 2006-2007 year low rainfall resulted in the most subsequent drop in water level elevations since the initiation of groundwater elevation monitoring in 2001. A resultant significant decrease in the gasoline and diesel concentrations in all source area monitoring wells occurred in the past three quarters. This drop in concentrations is attributed to a portion of the dissolved mass of contamination absorbing onto the newly created vadose zone.

### **Outlying Area Soil Contamination**

Soil contamination has been detected in boreholes greater than 10 feet from the former UFSTs only to the southwest (BH-16, approximately 40 feet away) and to the south (BH-4 and BH-8, approximately 40 feet away). Intervening boreholes (MW-2, BH-7, and BH-15) showed low to no soil contamination. Low to no soil contamination was detected in boreholes other than those discussed above, even in the capillary fringe. Soil contamination above ESL criteria appears to be constrained on site, except for the apparently localized “hot spot” at BH-16 (southwest corner of property). Bore B27 showed no soil contamination, and was located downgradient of the source (between the source and BH-16, 15 feet to the west). This distribution suggests that the detected soil contamination is influenced by localized lithologic and groundwater hydrologic controls.

Consideration of potential sources (discrete former UFSTs), historical groundwater flow direction and water levels, and distribution suggests that the detected soil contamination is the result of leaks from at least two, and possibly three, former UFSTs. The unsaturated zone soil contamination to the south and southwest likely resulted from desorption from source area contaminated groundwater, the distribution of which is strongly influenced by localized lithologic and groundwater hydrologic controls. The contaminant mass in outlying area unsaturated zone soils is small relative to the source area.

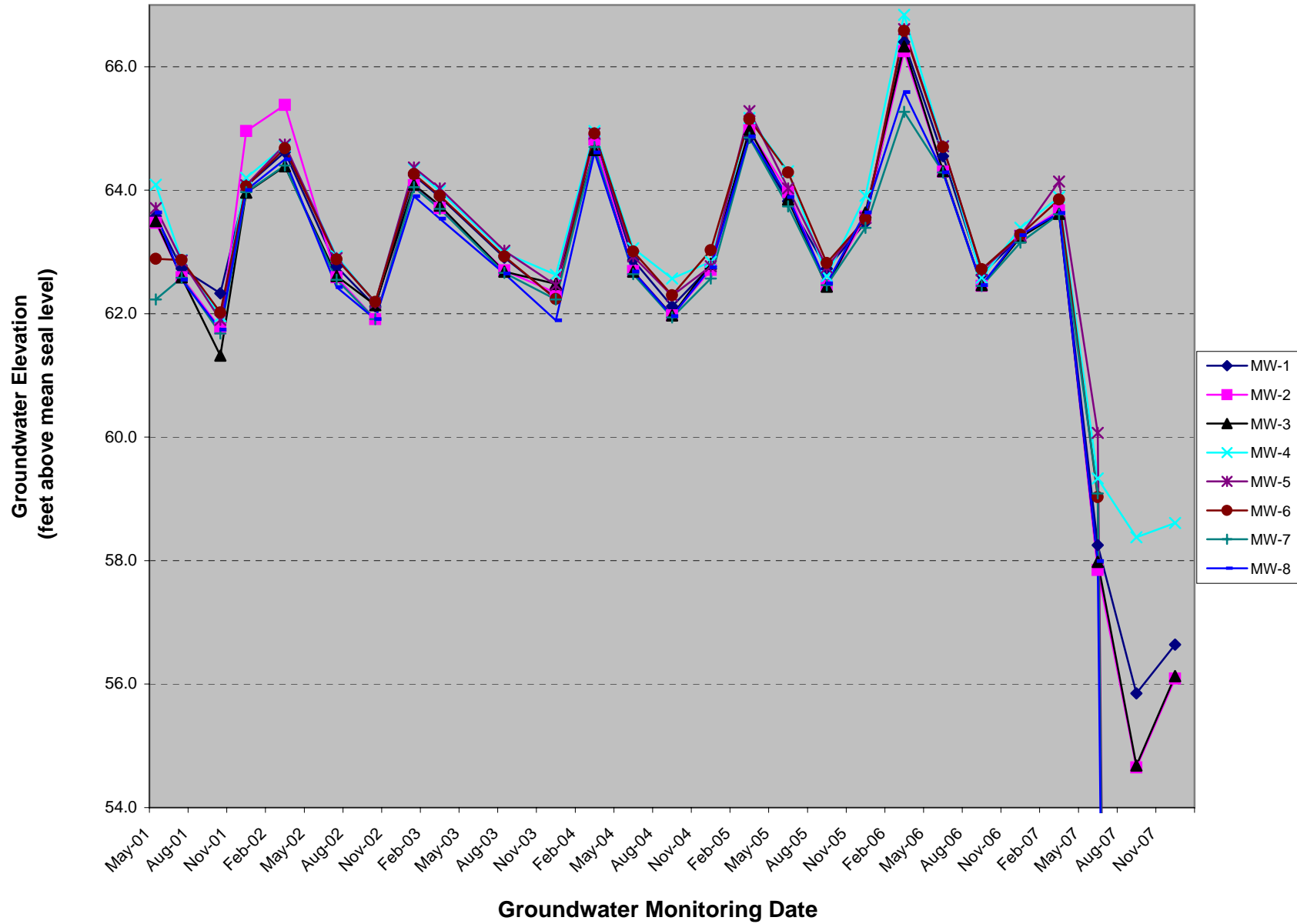
### **Summary**

A substantial mass of unsaturated zone soil contamination is located beneath the subject property building and to the immediate south-southwest. While the contamination is largely constrained on site, it will continue to be a source of long-term groundwater contamination unless abated.

### **WATER LEVEL TRENDS**

Appendix D contains historical groundwater elevation and gradient data. Figure 8 shows a trendline of site groundwater elevations in wells since May 2001.

**FIGURE 8: Historical Groundwater Elevations in Monitoring Wells  
240 W. Macarthur Blvd., Oakland, CA**



The data support the following conclusions:

- Groundwater elevations in all wells show a strong elevation change correlation with rainy versus dry season. Decreases in elevation are seen from approximately March through December, followed by an increase in March. This is a common seasonal trend observed in the upper water-bearing zone in the Bay Area region.
- The past three monitoring events in 2007 showed the lowest groundwater elevations recorded since monitoring began in 1997. Prior to 2007, the range of water level elevations (in a given year) varied by approximately 3 feet, and no substantial differences in elevations (beyond the seasonal fluctuations) have been noted since 2001.
- Historical groundwater flow direction has been predominantly to the west-northwest.
- Historical groundwater gradient has varied between approximately 0.002 feet/foot and 0.008 feet/foot, averaging approximately 0.005 feet/foot. Subject property groundwater gradient in the current event ranged between approximately 0.002 and 0.03 feet/foot. The slightly steeper gradient (higher than the historical average) measured during this December 2007 event indicate recharging conditions resulting from the current rainfall season.

## **HYDROCHEMICAL TRENDS**

Historical groundwater analytical results are included in Appendix C.

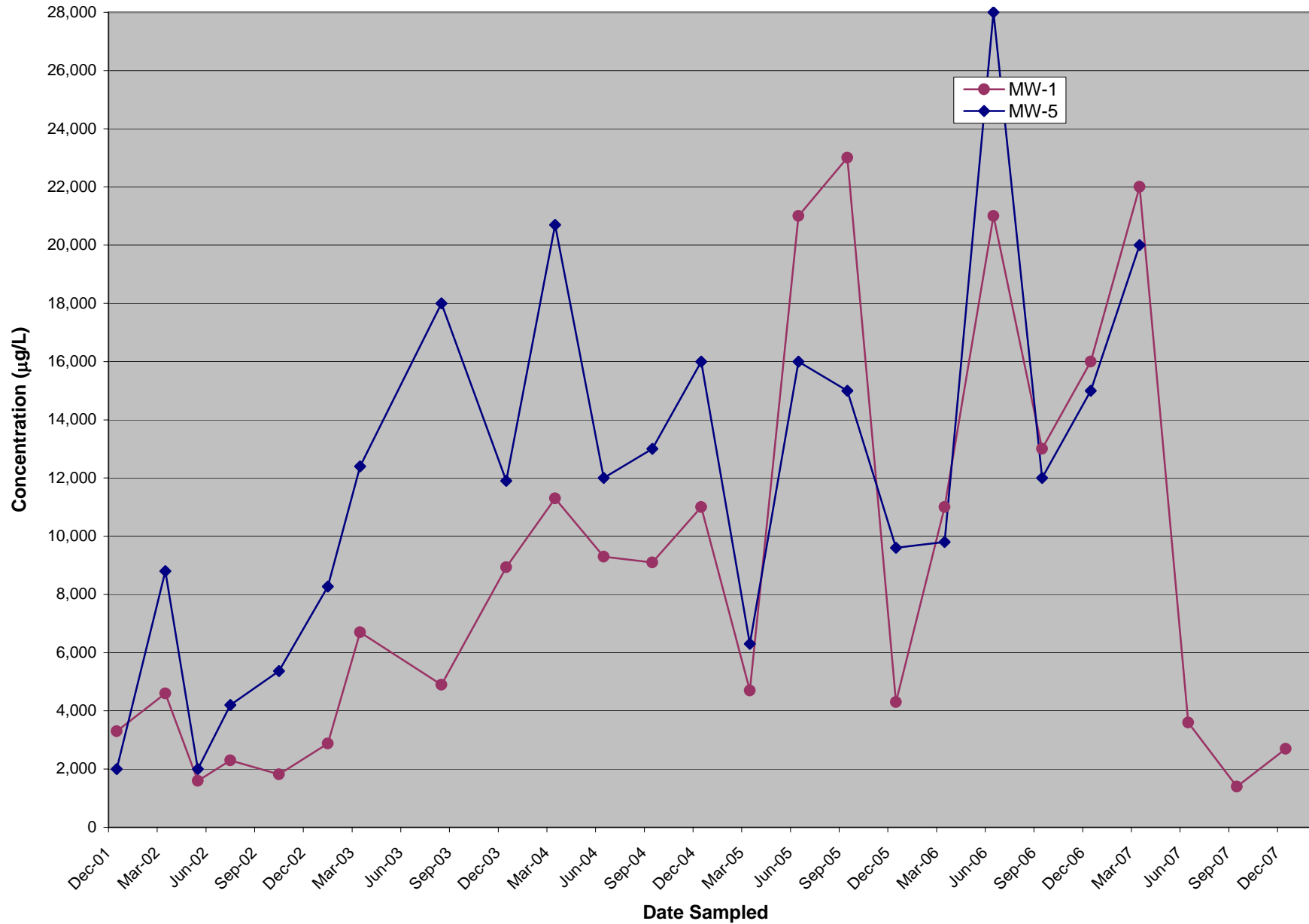
### **Gasoline**

Figures 9 and 10 show hydrochemical trend data for gasoline in source area wells (MW-1 and MW-5) and downgradient wells (MW-2, MW-3, MW-6, and MW-8), respectively, for the past 6 years of monitoring.

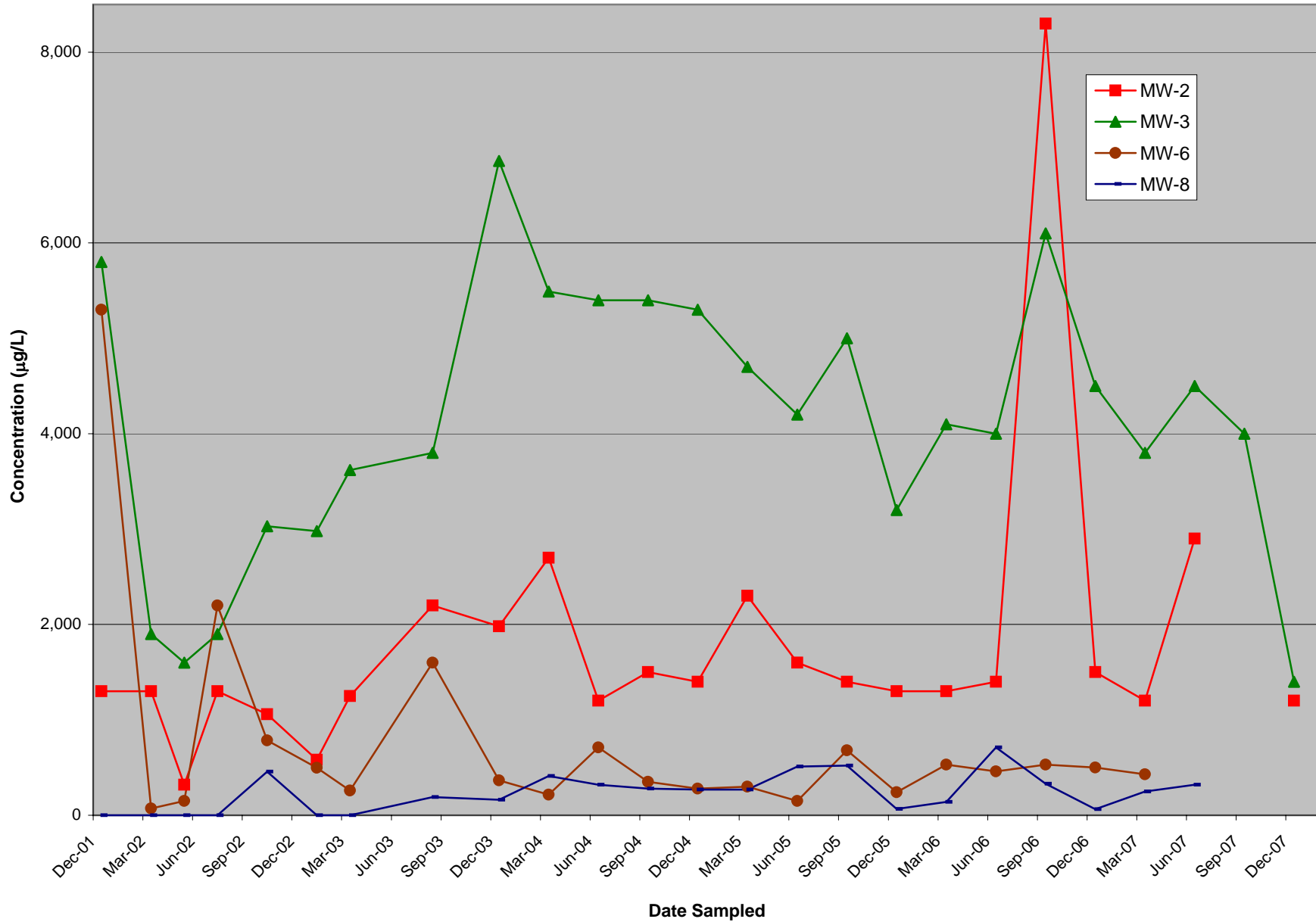
Source area wells MW-1 and MW-5 showed an overall trend of increased gasoline concentration between December 2001 and June 2005, followed by a decrease in December 2005, and thereafter the increasing trend continued. Historically, MW-5 has displayed higher gasoline concentrations than MW-1; however, during the monitoring events in June and September 2005; March, September, and December 2006; and March 2007, the concentrations of gasoline in MW-1 exceeded that of MW-5. Because of very low groundwater, MW-5 has not had sufficient water for sampling since March 2007. Gasoline concentrations have generally shown the expected seasonal trend of higher concentrations in the high-water (rainy) period and lower concentrations in the low-water (dry) period. This drop in concentration has been quite pronounced since March 2007 due to the much lower than average groundwater conditions.



**Figure 9: Gasoline Hydrochemical Trends  
Source Area Wells  
240 W. MacArthur Blvd, Oakland, California**



**Figure 10: Gasoline Hydrochemical Trends  
Downgradient Wells  
240 W. MacArthur Blvd, Oakland, California**



Downgradient wells MW-2, MW-3, MW-6, and MW-8 have shown relatively stable gasoline concentrations over the previous 5 years of monitoring, with some seasonal variations within particular years. The September 2006 event showed the second highest historical gasoline concentration (8,300 µg/L) in well MW-2, but returned to average historical levels in December 2006. Downgradient well MW-3 showed a trend of decreasing gasoline concentrations from December 2001 to June 2002, then increasing concentrations until December 2003, then has remained within historical range since. All downgradient well gasoline concentrations in the current event are between the historical site minima and maxima for individual wells.

## **Diesel**

Figures 11 and 12 show hydrochemical trend data for diesel in source area wells and downgradient wells, respectively, for the past 4½ years of monitoring.

Source area wells MW-1 and MW-5 have shown substantial variations (generally correlating with seasonal variations in groundwater elevations) in diesel concentrations. Both gasoline and diesel concentrations in both MW-1 and MW-5 in the December 2007 event are within the historical site maxima and minima for those wells.

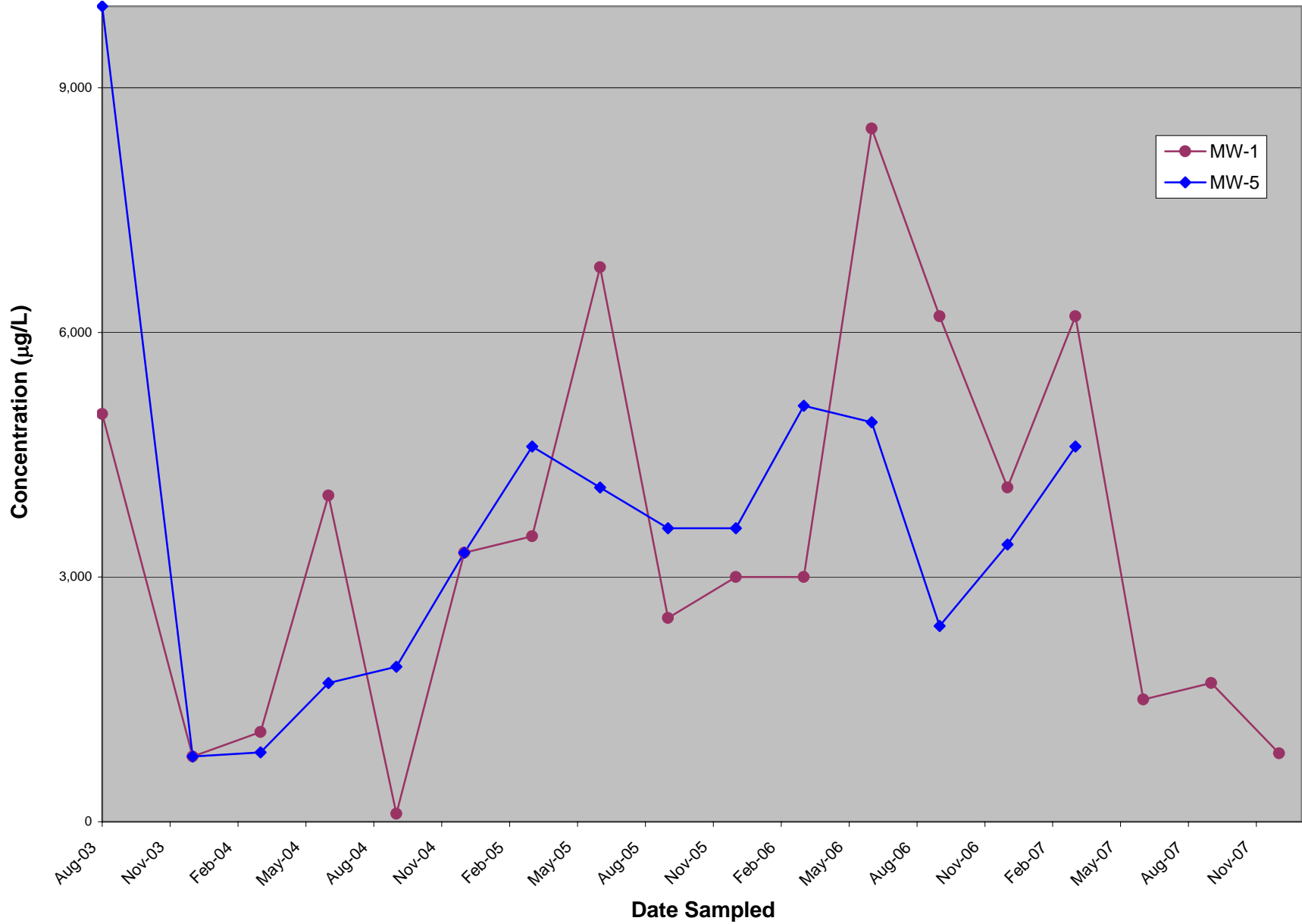
Downgradient wells MW-2, MW-3, MW-6, and MW-8 have shown substantial variations in diesel concentration. In general, a substantial decrease was observed in wells MW-2, MW-3, and MW-6 from August 2003 to December 2003, followed by an overall increasing trend up to the December 2006 event, where concentrations were within historical range. Since August 2005, MW-3 has showed a general increase in diesel concentration, with the September 2006 and December 2007 events both showing the historical highest diesel concentration of 2,600 µg/L. MW-2 has shown a general decrease in diesel concentration since September 2006. Well MW-8 (the most downgradient well) has historically shown low to non-detect diesel concentrations, with the exception of an apparently anomalous measurement of approximately 2,500 milligrams per liter (mg/L) in September 2004, and then a return to a concentrations of less than 100 mg/L.

## **Benzene**

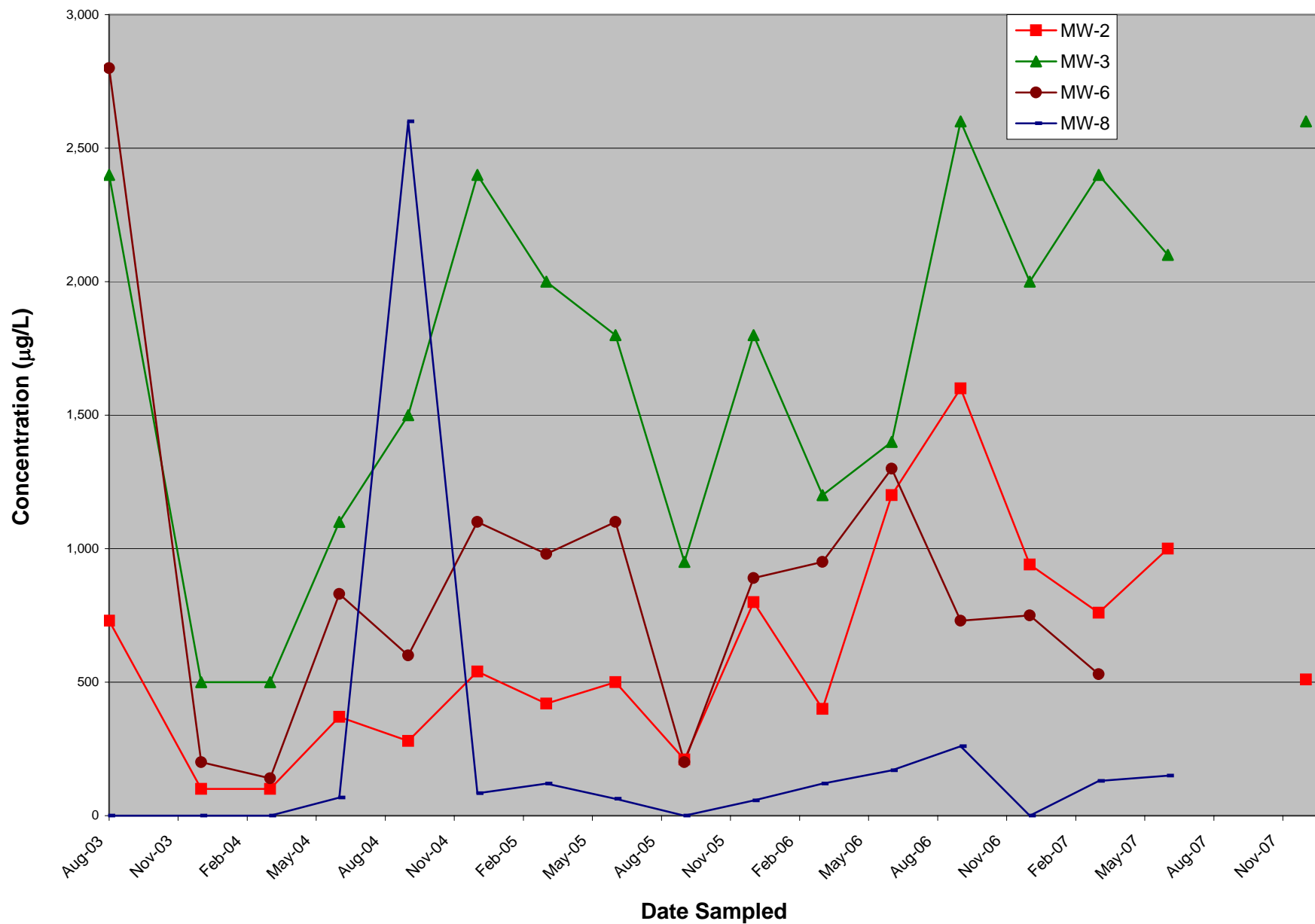
Figure 13 shows hydrochemical trend data for benzene in key site wells for the past 6 years of monitoring.

Source area wells MW-1 and MW-5 have shown substantial variations in benzene concentrations—an overall increase in concentration over time. Benzene concentrations generally have been comparable between MW-1 and MW-5, with concentrations in MW-1 higher than MW-5 since June 2004, with generally the same trend of seasonal fluctuations.

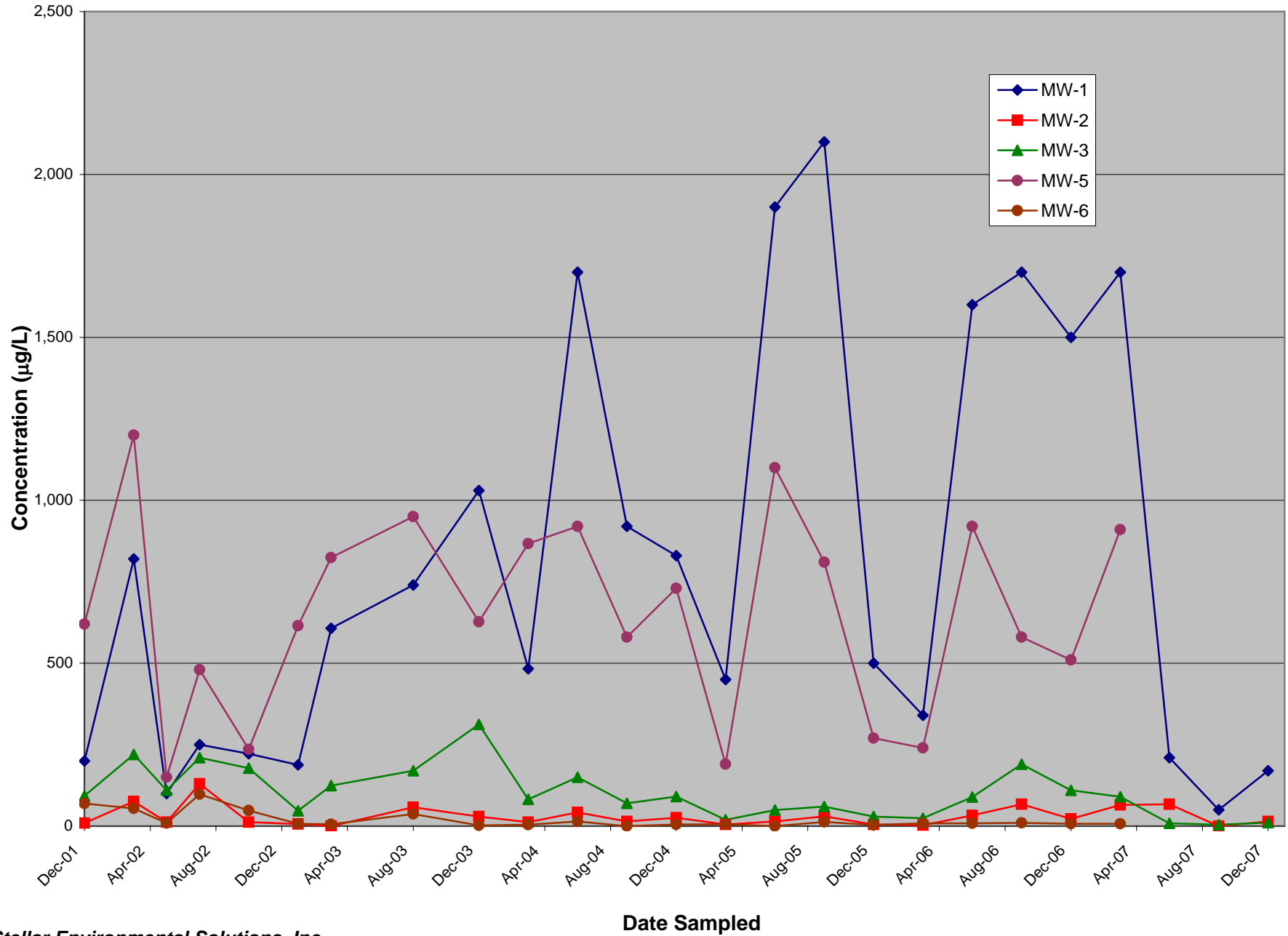
**Figure 11: Diesel Hydrochemical Trends  
Source Area Wells  
240 W. MacArthur Blvd, Oakland, California**



**Figure 12: Diesel Hydrochemical Trends  
Downgradient Wells  
240 W. MacArthur Blvd, Oakland, California**



**Figure 13: Benzene Hydrochemical Trends**  
**240 W. MacArthur Blvd, Oakland, California**



Historical maximum benzene concentrations were observed in June 2005 (MW-5) and September 2005 (MW-1), followed by a decrease in December 2005; they remained within the historical range during 2006. The 3<sup>rd</sup> and 4<sup>th</sup> quarters of 2007 showed the lowest benzene detections in MW-1 since March 1998. MW-5 has not been sampled since March 2007 because of low groundwater.

Downgradient wells MW-2, MW-3, and MW-6 have all shown a relatively stable benzene concentration trend, with the most recent concentrations comparable to those in December 2001.

## **MTBE**

Figure 14 shows hydrochemical trend data for MTBE in key site wells for the past 6 years of monitoring.

Source area wells MW-1 and MW-5 have shown substantial variations in MTBE concentrations, with generally the same trend of higher concentrations in the wet season and lower concentrations in the dry season. Following historical maximum concentrations in December 2003, MTBE concentrations in MW-1 and MW-5 decreased to low or non-detectable concentrations by June 2004, and have remained there since.

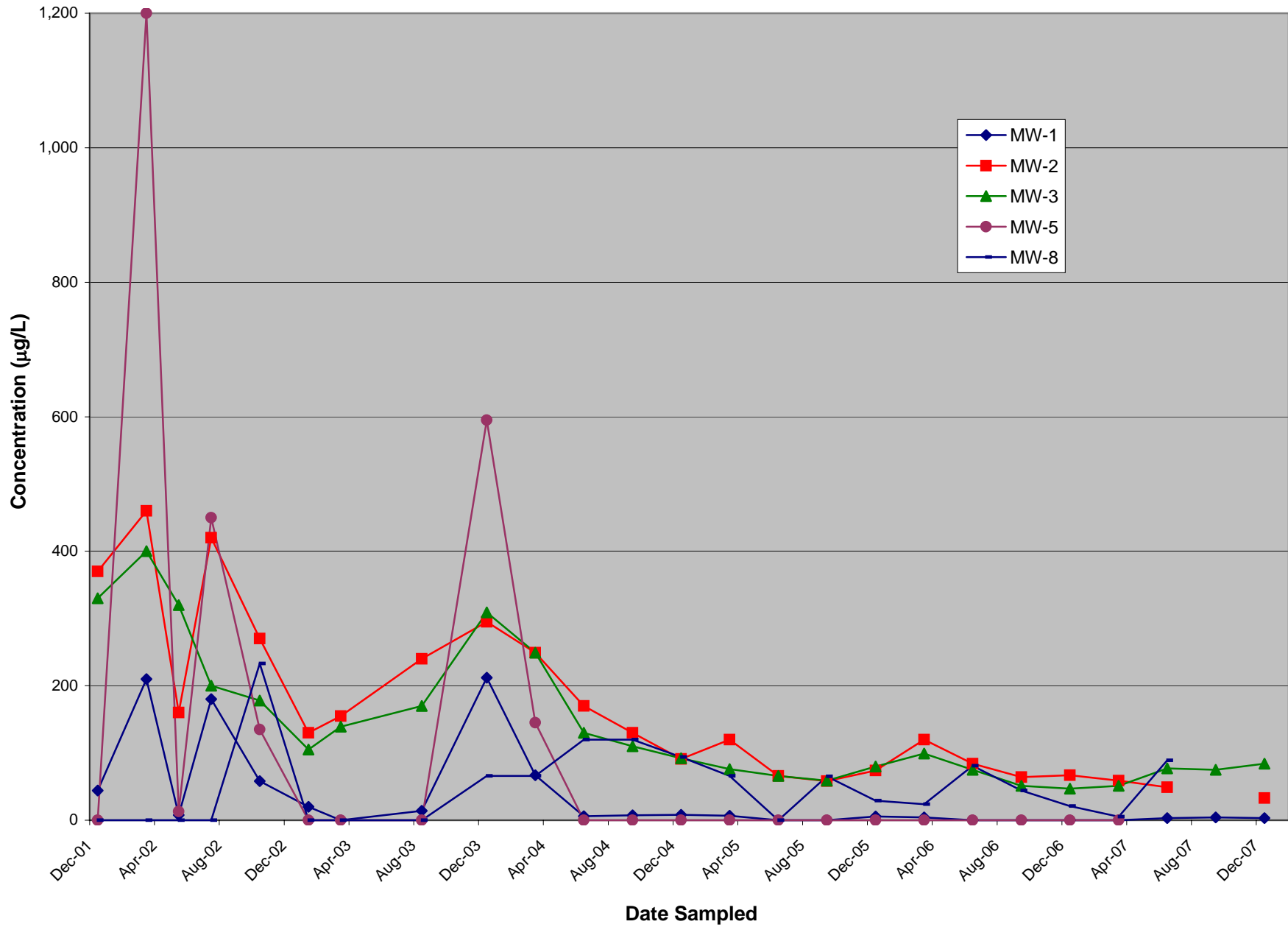
Downgradient wells MW-2 and MW-3 have shown substantial variations in MTBE concentration over the 6 years of monitoring, with the expected higher concentrations in the rainy season. MTBE concentrations have shown a declining trend since December 2003, and in the most recent event were approximately 200 percent lower than in December 2001.

MTBE concentrations in MW-8 (the most downgradient well) also have shown substantial variations in concentration, with an increasing trend from August 2003 through September 2004, and have since fluctuated between non-detect and 94 µg/L. MTBE has not been detected above 5 µg/L in downgradient well MW-6 since October 2002, with the exception of a reported concentration of 28 µg/L in June 2005; the reported MTBE concentration in the following September 2005 event was less than 0.5 µg/L. The data indicate that the center of MTBE mass in the plume has migrated beyond the source area to the downgradient (southern) portion of the property.

## **PLUME GEOMETRY AND MIGRATION INDICATIONS**

The contaminant plume in groundwater (gasoline, diesel, and BTEX concentrations above ESL criteria) has a maximum extent within the isoconcentration contours of approximately 160 feet long by 120 feet wide in the December 2007 monitoring event, with a generally north-south longitudinal axis. The source area is represented by wells MW-1 and MW-5. Well MW-1 has

**Figure 14: MTBE Hydrochemical Trends**  
**240 W. MacArthur Blvd, Oakland, California**





shown concentrations of gasoline and benzene remaining high and trending upward in concentration in the past, but decreasing over the past year. MW-5 data are limited, as that well has not contained enough water for sampling since March 2007.

The 2006-2007 year low rainfall resulted in the most subsequent drop in water level elevations since the initiation of groundwater elevation monitoring in 2001. A resultant significant decrease in the gasoline and diesel concentrations in all source area monitoring wells occurred in the past three quarters. The drop in concentrations is attributed to a portion of the dissolved mass of contamination absorbing onto the newly created vadose zone.

Contaminant concentrations above ESL criteria extend off site to the north-northwest (under Howe Street), and for gasoline extend underneath W. Macarthur Boulevard to the south. The MTBE plume shows generally the same configuration, except that it is situated downgradient from the source area. The northern (upgradient) limit of the plume is inferred to be within 10 to 20 feet of the former UFSTs. The eastern limit of the plume is constrained on site.

The plume geometry has not varied substantially over the past 6 years of monitoring, although seasonal fluctuations in contaminant concentrations have been observed. Increasing diesel concentrations in downgradient well MW-3 suggest that the center of contaminant mass for this constituent is moving slowly downgradient. Relatively stable gasoline and benzene concentrations in downgradient wells suggest that migration of these constituents is not occurring. Due to very low groundwater conditions during the last three quarters of 2007, many of the wells screened above 20 feet bgs could not be sampled and the remaining wells showed a general decrease in contaminant concentration with the exception of diesel in MW-3.

Groundwater contaminant migration appears to be controlled locally by hydrogeologic conditions. Based on our experience, it is likely that the contaminant concentrations attenuate to below ESL criteria no more than 50 feet off site. However, continued quarterly groundwater monitoring in site wells is warranted to confirm that groundwater contaminant concentrations do not increase and/or there is no indication of significant plume migration.

## **CLOSURE CRITERIA ASSESSMENT AND PROPOSED ACTIONS**

The Water Board generally requires that the following criteria be met before issuing regulatory closure of contaminant cases:

1. ***The contaminant source has been removed (i.e., the source of the discharge and obviously-contaminated soil).*** This criterion has not been met. While the UFSTs have been removed, borehole soil sampling has shown a mass of residual source area soil contamination that will act as an ongoing source of groundwater contamination. Reducing source area (and outlying area) soil contamination should reduce the potential

for offsite migration of groundwater contamination by removing contaminant mass, and should reduce the overall time to achieve regulatory closure. The property owner has proposed to ACEH to implement a SVE system as an interim remedial action to reduce contaminant mass. A corrective action assessment and remedial evaluation was conducted in May and June 2007. A workplan for installation and operation of a soil vapor extraction system has been submitted and approved by ACEH.

2. ***The groundwater contaminant plume is well characterized, and is stable or reducing in magnitude and extent.*** As discussed above, in our professional opinion, this criterion has not been met, and continued groundwater monitoring will be needed to demonstrate plume stability.
3. ***If residual contamination (soil or groundwater) exists, there is no reasonable risk to sensitive receptors (i.e., contaminant discharge to surface water or water supply wells) or to site occupants.*** This criterion is generally met by conducting a Risk-Based Corrective Action assessment that models the fate and transport of residual contamination in the context of potential impacts to sensitive receptors (e.g., water wells, residential land use). While no downgradient water wells have been identified, a deep sanitary sewer line is located approximately 40 feet from the downgradient property line. It is possible that this line could act as a preferential pathway for migration of site-sourced groundwater contamination. However, it is highly unlikely that contaminated groundwater that might be entrained in the line backfill material would migrate to the nearest surface water body.

## **6.0 SUMMARY, CONCLUSIONS, AND PROPOSED ACTIONS**

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### **SUMMARY AND CONCLUSIONS**

- The site has undergone site investigations and remediation since 1991 (SES has been involved since August 2003) to address soil and groundwater contamination resulting from leaking UFSTs that were reportedly removed.
- Sufficient site characterization has been conducted to evaluate the risks associated with residual soil contamination, and to evaluate corrective action options. The data indicate that, if remedial action is not implemented, residual site contamination will remain at elevated levels for many years and longer. A workplan for installation and operation of a SVE system has been submitted and approved by ACEH.
- A total of 37 groundwater monitoring/sampling events have been conducted in the eight site wells between August 1997 and the current event. ACEH is the lead regulatory agency.
- Four of the eight monitoring wells could not be sampled during this monitoring event because of insufficient water due to seasonal low groundwater levels. The third and fourth quarters of 2007 monitoring events recorded the lowest groundwater elevations since monitoring began in August 1997. Due to very low groundwater conditions during the last three quarters of 2007, many of the wells screened above 20 feet bgs could not be sampled, and the remaining wells showed a general decrease in contaminant concentrations with the exception of diesel in MW-3.
- The 2006-2007 year low rainfall resulted in the most subsequent drop in water level elevations since the initiation of groundwater elevation monitoring in 2001. A resultant significant decrease in the gasoline and diesel concentrations in all source area monitoring wells occurred in the past three quarters. The drop in concentrations is attributed to a portion of the dissolved mass of contamination absorbing onto the newly created vadose zone.
- Groundwater at the site appears to be slightly confined, with a flow direction ranging between northwest and west. Subject property groundwater gradient in the current event ranged between approximately 0.002 and 0.03 feet/foot. Historical groundwater gradient has varied between approximately 0.002 and 0.008 feet/foot, averaging approximately 0.005 feet/foot. The slightly steeper gradient (higher than the historical average)

measured during the December 2007 event indicate recharging conditions resulting from the current rainfall season.

- The groundwater plume geometry is typical of what has been observed in previous monitoring events. Seasonal effects do not appear to change the plume migration direction.
- The primary site chemicals of concern, with regard to concentrations and risk issues, are gasoline, benzene, and MTBE. Diesel, aromatic hydrocarbons, lead scavengers, and fuel oxygenates are present at lesser concentrations and over a smaller area.
- The greatest concentrations of gasoline, diesel, and benzene in groundwater are located in the northern corner of the site (near the source area). Maximum groundwater contamination by MTBE was detected in the downgradient portion of the property, indicating that the center of mass of these contaminants has migrated downgradient. Groundwater contamination above ESL criteria extends offsite (likely no more than 25 feet) beneath Howe Street and W. MacArthur Boulevard.
- As stipulated by ACEH, analysis for lead scavengers will continue to be conducted in wells MW-1, MW-5, and MW-6. Fuel oxygenates were detected in those wells, and in MW-2, MW-3, and MW-8. Because lead scavengers and fuel oxygenates are analyzed by the same method at no additional cost, the responsible party has elected to continue analysis for lead scavengers and fuel oxygenates in all wells except MW-4 and MW-7.
- A previous water well survey identified no vicinity water wells with the potential to intercept site-sourced groundwater contamination.
- Potential preferential pathways identified include deep sanitary sewer lines beneath Howe Street and W. MacArthur Boulevard (adjacent to the subject property). Based on the detection of gasoline and MTBE in well MW-7 (beyond the Howe Street deep utilities), it appears unlikely that the Howe Street deep utilities are acting as a preferential pathway for site-sourced groundwater contamination. The influence of deep utilities beneath W. MacArthur Boulevard is not known.
- The adjacent Shell service station is contributing minor MTBE groundwater contamination to the eastern corner of the subject property. This contamination is unrelated to the separate, site-sourced MTBE groundwater contamination in the northern and western portions of the subject property.
- The site is currently receiving reimbursements from the California Tank Fund.
- The lower than normal water level elevations present excellent conditions for maximizing contaminant mass recovery through the proposed SVE system.

## PROPOSED ACTIONS

The Responsible Party proposes to implement the following actions to address regulatory concerns:

- ACEH has requested a SVE System Start-Up Report to be submitted by March 10, 2008. SES recommends that the SVE be installed and operated in February 2008 to remove source area subsurface contamination and move the site toward regulatory closure.
- Quarterly groundwater monitoring of site wells should be continued to monitor the stability of the contaminant plume.
- Required Electronic Data Format uploads should continued to be made to the GeoTracker database, and electronic copies of technical reports should be uploaded to ACEH's ftp system.
- Reimbursement requests should continue to be submitted under the State of California Petroleum UST Cleanup Fund. In the event the property is sold, the current Responsibility Party will coordinate with the new Responsibility Party to transfer Tank Fund eligibility.

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---

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## 8.0 LIMITATIONS

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This report has been prepared for the exclusive use of the current property owners (Mr. and Mrs. Glen Poy-Wing, d.b.a. Oakland Auto Works) their representatives, and the regulators. No reliance on this report shall be made by anyone other than those for whom it was prepared.

The findings and conclusions presented in this report are based on the review of previous investigators' findings at the site, as well as site activities conducted by SES since August 2003. This report provides neither a certification nor guarantee that the property is free of hazardous substance contamination. This report has been prepared in accordance with generally accepted methodologies and standards of practice of the area. The SES personnel who performed this limited remedial investigation are qualified to perform such investigations and have accurately reported the information available, but cannot attest to the validity of that information. No warranty, expressed or implied, is made as to the findings, conclusions, and recommendations included in the report.

The findings of this report are valid as of the present. Site conditions may change with the passage of time, natural processes, or human intervention, which can invalidate the findings and conclusions presented in this report. As such, this report should be considered a reflection of the current site conditions as based on the investigation and remediation completed.

## **APPENDIX A**

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### **Current Event Groundwater Monitoring Field Records**

# SPH or Purge Water Drum Log

Client: Stellar Env.  
 Site Address: 240 W. Macarthur Blvd., Oakland

STATUS OF DRUM(S) UPON ARRIVAL						
Date	6/22/07	9/18/07	12/19/07			
Number of drum(s) empty:	0	2	2			
Number of drum(s) 1/4 full:	1					
Number of drum(s) 1/2 full:	<del>2</del> 1					
Number of drum(s) 3/4 full:	0					
Number of drum(s) full:	1	1	1			
Total drum(s) on site:	3	3	3			
Are the drum(s) properly labeled?	Y	Y	Y			
Drum ID & Contents:	Purge H <sub>2</sub> O → soil cuttings, purge & soil					
If any drum(s) are partially or totally filled, what is the first use date:			2			

- If you add any SPH to an empty or partially filled drum, drum must have at least 20 gals. of Purgewater or DI Water.
- If drum contains SPH, the drum MUST be steel AND labeled with the appropriate label.
- All BTS drums MUST be labeled appropriately.

STATUS OF DRUM(S) UPON DEPARTURE						
Date	6/22/07	9/18/07	12/19/07			
Number of drums empty:	0		1			
Number of drum(s) 1/4 full:	0	1	1			
Number of drum(s) 1/2 full:	1					
Number of drum(s) 3/4 full:	1					
Number of drum(s) full:	1	1	1			
Total drum(s) on site:	3	3	3			
Are the drum(s) properly labeled?	Y	Y	Y			
Drum ID & Contents:	Purge H <sub>2</sub> O → soil cuttings, purge & soil					

**LOCATION OF DRUM(S)**  
 Describe location of drum(s): Next to Dumpster

FINAL STATUS						
Number of new drum(s) left on site this event	0	0	0			
Date of inspection:	6/22/07	<del>9/18/07</del>	12/19/07			
Drum(s) labelled properly:	Y	Y	Y			
Logged by BTS Field Tech:	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>			
Office reviewed by:	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>			

# WELLHEAD INSPECTION CHECKLIST

Date 12-19-07 Client Stellar  
 Site Address 240 W. MacArthur, Oakland  
 Job Number 071219-KR1 Technician KR

Well ID	Well Inspected - No Corrective Action Required	Water Bailed From Wellbox	Wellbox Components Cleaned	Cap Replaced	Debris Removed From Wellbox	Lock Replaced	Other Action Taken (explain below)	Well Not Inspected (explain below)
MW - 1			missing	2/2	bolts, cement core			damaged
MW - 2				1/2	tabs stripped			
MW - 3				2/2	tabs stripped			
MW - 4	X							
MW - 5				1/2	tabs stripped			
MW - 6	X							
MW - 7					lid cracked			
MW - 8	X							

NOTES: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

# WELL GAUGING DATA

Project # 071219-KR1 Date 12-19-07 Client Stellar

Site 240 W. MacArthur Blvd., Oakland

Well ID	Time	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or TOC	Notes	
MW-4	938	2					19.13	23.85	TOC		
MW-7	940	2					19.98	20.00	↓		
MW-8	943	2					19.95	19.95			
MW-6	945	2					19.99	20.09			
MW-2	950	2					22.36	24.28			
MW-3	956	2					21.45	24.10			
MW-1	959	2	S	No SPH detected			22.51	24.35			IN
MW-5	1001	2					20.05	20.06		↓	





# WELL MONITORING DATA SHEET I

Project #: <u>071219-KK1</u>	Client: <u>Stellar</u>
Sampler: <u>KK</u>	Date: <u>12-19-07</u>
Well I.D.: <u>MW-31</u>	Well Diameter: <u>3</u> 4 6 8
Total Well Depth (TD): <u>24.10</u> <del>24.35</del>	Depth to Water (DTW): <u>22.51</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: PVC Grade	D.O. Meter (if req'd): <u>YSI</u> HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: <input type="checkbox"/> Bailer <input checked="" type="checkbox"/> Disposable Bailer <input type="checkbox"/> Positive Air Displacement <input type="checkbox"/> Electric Submersible	Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Extraction Pump Other: _____	Sampling Method: <input type="checkbox"/> Bailer <input checked="" type="checkbox"/> Disposable Bailer <input type="checkbox"/> Extraction Port <input type="checkbox"/> Dedicated Tubing Other: _____
---	---	--

.3 (Gals.) X 3 = .9 Gals.  
 1 Case Volume      Specified Volumes      Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1217	63.2	7.27	686	143	.3	
1222	63.1	6.99	703	164	.6	
1229	63.2	6.80	721	244	.9	
						Fe 2+ = 2.3

Did well dewater? Yes  No  Gallons actually evacuated: .9

Sampling Date: 12.19.07 Sampling Time: 1240 Depth to Water: 23.56

Sample I.D.: MW-1 Laboratory: Kiff CalScience Other CIT

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other: See COC

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5) Other:

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

5.8

## WELL MONITORING DATA SHEET

Project #: <b>071219-KR 1</b>	Client: <b>Stellar</b>
Sampler: <b>KR</b>	Date: <b>12.19.07</b>
Well I.D.: <b>MW-2</b>	Well Diameter: <b>(2)</b> 3 4 6 8 _____
Total Well Depth (TD): <b>24.28</b>	Depth to Water (DTW): <b>22.36</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <b>(PVC)</b> Grade	D.O. Meter (if req'd): <b>(YSI)</b> HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer	Waterra	Sampling Method: Bailer
<input checked="" type="checkbox"/> Disposable Bailer	<input type="checkbox"/> Peristaltic	<input checked="" type="checkbox"/> Disposable Bailer
<input type="checkbox"/> Positive Air Displacement	<input type="checkbox"/> Extraction Pump	<input type="checkbox"/> Extraction Port
<input type="checkbox"/> Electric Submersible	Other: _____	<input type="checkbox"/> Dedicated Tubing
		Other: _____

.3 (Gals.) X 3 = .9 Gals.
1 Case Volume      Specified Volumes      Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1108	64.8	6.70	621	71000	.3	silty
1111	65.2	6.80	622	71000	.6	
1113	66.1	6.74	621	71000	.9	
						Fl 2 <sup>+</sup> = 1.0

Did well dewater?    Yes     No       Gallons actually evacuated: **.9**

Sampling Date: **12.19.07**    Sampling Time: **1120**    Depth to Water: **23.00**

Sample I.D.: **MW-2**      Laboratory:    Kiff    CalScience    Other **CST**

Analyzed for:    TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: **See COC**

EB I.D. (if applicable):      @      Time      Duplicate I.D. (if applicable):

Analyzed for:    TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other:

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

## WELL MONITORING DATA SHEET

Project #: <b>071219-KK1</b>	Client: <b>Stellar</b>
Sampler: <b>KR</b>	Date: <b>12-19-07</b>
Well I.D.: <b>MW-3</b>	Well Diameter: <b>(2)</b> 3 4 6 8 _____
Total Well Depth (TD): <b>24.10</b>	Depth to Water (DTW): <b>21.45</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <b>(PVC)</b> Grade	D.O. Meter (if req'd): <b>(YSI)</b> HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer <input checked="" type="checkbox"/> Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer <input checked="" type="checkbox"/> Disposable Bailer Extraction Port Dedicated Tubing Other: _____
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$.4 \text{ (Gals.)} \times 3 = 1.2 \text{ Gals.}$ 1 Case Volume      Specified Volumes      Calculated Volume	<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1139	66.7	7.22	750	>1000	.4	
1143	67.0	7.24	746	>1000	.8	
well dewatered @				.35 gallons		
					Fe 2+ = 1.8	

Did well dewater?  Yes    No      Gallons actually evacuated: **.85**

Sampling Date: **12-19-07**    Sampling Time: **1200**    Depth to Water: **21.42**

Sample I.D.: **MW-3**      Laboratory: Kiff    CalScience    Other: **C3T**

Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: **See COC**

EB I.D. (if applicable): \_\_\_\_\_ @ \_\_\_\_\_ Time      Duplicate I.D. (if applicable): \_\_\_\_\_

Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: \_\_\_\_\_

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	<b>0.6</b> mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

## WELL MONITORING DATA SHEET

Project #: <b>071219-KK1</b>	Client: <b>Stellar</b>
Sampler: <b>1K</b>	Date: <b>12-19-07</b>
Well I.D.: <b>MW-4</b>	Well Diameter: <b>2</b> 3 4 6 8 _____
Total Well Depth (TD): <b>23.85</b>	Depth to Water (DTW): <b>19.13</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <b>FWC</b> Grade	D.O. Meter (if req'd): <b>YSI</b> HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer <input checked="" type="checkbox"/> Disposable Bailer <input type="checkbox"/> Positive Air Displacement <input type="checkbox"/> Electric Submersible	Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Extraction Pump Other _____	Sampling Method: Bailer <input checked="" type="checkbox"/> Disposable Bailer <input type="checkbox"/> Extraction Port <input type="checkbox"/> Dedicated Tubing Other: _____
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Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

<b>.7</b> (Gals.) X	<b>3</b> Specified Volumes	<b>=</b>	<b>2.1</b> Gals. Calculated Volume
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Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
1030	61.6	<del>7.10</del> 7.10	500	808	.7	
1033	63.7	6.97	464	71000	1.4	
1038	61.4	6.70	485	71000	2.1	
1041	66.0	6.40	456	71000	2.8	
					<b>Fe 2+ = 0.0</b>	

Did well dewater? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Gallons actually evacuated: <b>2.8</b>	
Sampling Date: <b>12-19-07</b>	Sampling Time: <b>1050</b>	Depth to Water: <b>21.10</b>
Sample I.D.: <b>MW-4</b>	Laboratory: Kiff CalScience	Other: <b>CST</b>
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other: <b>See COC</b>	
EB I.D. (if applicable): @ _____ Time	Duplicate I.D. (if applicable):	
Analyzed for: TPH-G BTEX MTBE TPH-D Oxygenates (5)	Other:	
D.O. (if req'd): Pre-purge: _____ mg/L	Post-purge: <b>1.2</b> mg/L	
O.R.P. (if req'd): Pre-purge: _____ mV	Post-purge: _____ mV	

## WELL MONITORING DATA SHEET

Project #: 071219-KR1	Client: Stellar
Sampler: KR	Date: 12.19.07
Well I.D.: mw-5	Well Diameter: ② 3 4 6 8
Total Well Depth (TD): 20.06	Depth to Water (DTW): 20.05
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: <del>Bailer</del> <del>Disposable Bailer</del> <del>Positive Air Displacement</del> <del>Electric Submersible</del>	Water: <del>Peristaltic</del> <del>Extraction Pump</del> Other: _____	Sampling Method: <del>Bailer</del> <del>Disposable Bailer</del> <del>Extraction Port</del> <del>Dedicated Tubing</del> Other: _____
--	---	---

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

	(Gals.) X _____	= _____	Gals.
I Case Volume	Specified Volumes	Calculated Volume	

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
Insufficient water. Unable to sample.						

Did well dewater?    Yes    No                      Gallons actually evacuated: \_\_\_\_\_

Sampling Date: \_\_\_\_\_                      Sampling Time: \_\_\_\_\_                      Depth to Water: \_\_\_\_\_

Sample I.D.: \_\_\_\_\_                      Laboratory:    Kiff    CalScience    Other: \_\_\_\_\_

Analyzed for:    TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: \_\_\_\_\_

EB I.D. (if applicable): \_\_\_\_\_ @ \_\_\_\_\_ Time                      Duplicate I.D. (if applicable): \_\_\_\_\_

Analyzed for:    TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: \_\_\_\_\_

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

## WELL MONITORING DATA SHEET

Project #: <b>071219-KK1</b>	Client: <b>Stellar</b>
Sampler: <b>KR</b>	Date: <b>12-19-07</b>
Well I.D.: <b>MW-6</b>	Well Diameter: <b>2</b> 3 4 6 8 _____
Total Well Depth (TD): <b>20.09</b>	Depth to Water (DTW): <b>19.99</b>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <b>PVC</b> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: Bailer Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: Bailer Disposable Bailer Extraction Port Dedicated Tubing Other: _____
--	--	---

\_\_\_\_\_ (Gals.) X \_\_\_\_\_ = \_\_\_\_\_ Gals.  
 1 Case Volume                      Specified Volumes                      Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius <sup>2</sup> * 0.163

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
<b>Insufficient water. Unable to sample.</b>						

Did well dewater?    Yes    No                      Gallons actually evacuated: \_\_\_\_\_

Sampling Date: \_\_\_\_\_                      Sampling Time: \_\_\_\_\_                      Depth to Water: \_\_\_\_\_

Sample I.D.: \_\_\_\_\_                      Laboratory: Kiff    CalScience    Other \_\_\_\_\_

Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: \_\_\_\_\_

EB I.D. (if applicable): \_\_\_\_\_ @ \_\_\_\_\_ Time                      Duplicate I.D. (if applicable): \_\_\_\_\_

Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: \_\_\_\_\_

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

# WELL MONITORING DATA SHEET

Project #: <u>071219-KR1</u>	Client: <u>Stellar</u>
Sampler: <u>KR</u>	Date: <u>12.19.07</u>
Well I.D.: <u>MW-7</u>	Well Diameter: <u>(2)</u> 3 4 6 8 _____
Total Well Depth (TD): <u>20.00</u>	Depth to Water (DTW): <u>19.98</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: <u>Bailer</u> Disposable Bailer Positive Air Displacement Electric Submersible	Waterra Peristaltic Extraction Pump Other _____	Sampling Method: <u>Bailer</u> Disposable Bailer Extraction Port Dedicated Tubing Other: _____
---	--	--

_____ (Gals.) X _____ = _____ Gals. I Case Volume      Specified Volumes      Calculated Volume	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
						<u>Insufficient water. Unable to sample.</u>

Did well dewater?    Yes    No	Gallons actually evacuated: _____
Sampling Date: _____	Sampling Time: _____
Sample I.D.: _____	Depth to Water: _____
Laboratory: Kiff    CalScience    Other _____	
Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: _____	
EB I.D. (if applicable): _____ @ _____ Time	Duplicate I.D. (if applicable): _____
Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: _____	
D.O. (if req'd): Pre-purge: _____ mg/L	Post-purge: _____ mg/L
O.R.P. (if req'd): Pre-purge: _____ mV	Post-purge: _____ mV

# WELL MONITORING DATA SHEET

Project #: <u>071219-KR1</u>	Client: <u>Stellar</u>
Sampler: <u>KR</u>	Date: <u>12-19-07</u>
Well I.D.: <u>MW-8</u>	Well Diameter: <u>2</u> 3 4 6 8
Total Well Depth (TD): <u>19.95</u>	Depth to Water (DTW): <u>19.95</u>
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: <u>PVC</u> Grade	D.O. Meter (if req'd): YSI HACH
DTW with 80% Recharge [(Height of Water Column x 0.20) + DTW]:	

Purge Method: <input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Disposable Bailer <input type="checkbox"/> Positive Air Displacement <input type="checkbox"/> Electric Submersible	<input type="checkbox"/> Waterra <input type="checkbox"/> Peristaltic <input type="checkbox"/> Extraction Pump <input type="checkbox"/> Other _____	Sampling Method: <input checked="" type="checkbox"/> Bailer <input type="checkbox"/> Disposable Bailer <input type="checkbox"/> Extraction Port <input type="checkbox"/> Dedicated Tubing Other: _____
---	--	--

_____ (Gals.) X _____ = _____ Gals. 1 Case Volume      Specified Volumes      Calculated Volume	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Well Diameter</th> <th>Multiplier</th> <th>Well Diameter</th> <th>Multiplier</th> </tr> </thead> <tbody> <tr> <td>1"</td> <td>0.04</td> <td>4"</td> <td>0.65</td> </tr> <tr> <td>2"</td> <td>0.16</td> <td>6"</td> <td>1.47</td> </tr> <tr> <td>3"</td> <td>0.37</td> <td>Other</td> <td>radius<sup>2</sup> * 0.163</td> </tr> </tbody> </table>	Well Diameter	Multiplier	Well Diameter	Multiplier	1"	0.04	4"	0.65	2"	0.16	6"	1.47	3"	0.37	Other	radius <sup>2</sup> * 0.163
Well Diameter	Multiplier	Well Diameter	Multiplier														
1"	0.04	4"	0.65														
2"	0.16	6"	1.47														
3"	0.37	Other	radius <sup>2</sup> * 0.163														

Time	Temp (°F or °C)	pH	Cond. (mS or µS)	Turbidity (NTUs)	Gals. Removed	Observations
Insufficient water - unable to sample						

Did well dewater?    Yes    No	Gallons actually evacuated: _____
Sampling Date: _____	Sampling Time: _____
Depth to Water: _____	
Sample I.D.: _____	Laboratory: Kiff    CalScience    Other _____
Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: _____	
EB I.D. (if applicable): _____ @ _____ Time	Duplicate I.D. (if applicable): _____
Analyzed for: TPH-G    BTEX    MTBE    TPH-D    Oxygenates (5)    Other: _____	
D.O. (if req'd): Pre-purge: _____ mg/L	Post-purge: _____ mg/L
O.R.P. (if req'd): Pre-purge: _____ mV	Post-purge: _____ mV



## **APPENDIX B**

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### **Current Event Analytical Laboratory Report and Chain-of-Custody Record**

200126

# Chain of Custody Record

Laboratory Curtis and Tompkins, Ltd. Method of Shipment Hand Delivery  
 Address 2323 Fifth Street Shipment No. \_\_\_\_\_  
Berkeley, California 94710 Airbill No. \_\_\_\_\_  
510-486-0900 Cooler No. \_\_\_\_\_  
 Project Owner Mr. Glen Poy-Wing Project Manager Bruce Rucker  
 Site Address 240 W. MacArthur Blvd. Telephone No. (510) 644-3123  
Oakland, California Fax No. (510) 644-3859  
 Project Name Oakland Auto Works Samplers: (Signature) [Signature]  
 Project Number 2003-43

Lab job no. \_\_\_\_\_  
 Date 12-19-07  
 Page 1 of 1

82608

Field Sample Number	Location/Depth	Date	Time	Sample Type	Type/Size of Container	Preservation		Filtered	No. of Containers	Analysis Required					Remarks
						Cooler	Chemical			IVH-G (Bois)	TEH-D (Bois)	BTEX, MTR E	EDB, EDC	5 ORGANICS	
mw-1		12-19	1240	W	3 VOA / 1 Amber	yes			4	X	X	X	X	X	Limited Sample Volume
mw-2			1120		3 VOA / 2 Amber	yes			5	X	X	X	X		
mw-3			1200		3 VOA / 2 Amber	yes			5	X	X	X	X		
mw-4			1050		3 VOA	yes			3	X					
						yes									
						yes									
						yes									

Relinquished by: Signature <u>[Signature]</u> Printed <u>Kenneth M. Rogowski</u> Company <u>BTS</u>	Date <u>12/19/07</u> Time <u>1400</u>	Received by: Signature <u>[Signature]</u> Printed <u>Kenneth Rogowski</u> Company <u>BTS</u>	Date <u>12/19/07</u> Time <u>1600</u>	Relinquished by: Signature <u>[Signature]</u> Printed <u>KEN SHIH</u> Company <u>BTS</u>	Date <u>12/20/07</u> Time <u>1006</u>	Received by: Signature <u>[Signature]</u> Printed <u>Jason</u> Company <u>UltraEx</u>	Date <u>12/20</u> Time <u>1006</u>
--	--	---	--	---	--	--	---------------------------------------

Turnaround Time: <u>5 Day TAT</u> Comments: _____	Relinquished by: Signature <u>Jason</u> Printed <u>Jgson</u> Company <u>UltraEx</u>	Date <u>12/20/07</u> Time <u>1123</u>	Received by: Signature <u>[Signature]</u> Printed <u>Robert Butta</u> Company _____	Date <u>12/20/07</u> Time <u>1123</u>
--	--	--	--	--

2000-00-01



Curtis & Tompkins, Ltd., Analytical Laboratories, Since 1878

2323 Fifth Street, Berkeley, CA 94710, Phone (510) 486-0900

Laboratory Job Number 200126  
ANALYTICAL REPORT

Stellar Environmental Solutions  
2198 6th Street  
Berkeley, CA 94710

Project : 2003-43  
Location : Oakland Auto Works  
Level : II

<u>Sample ID</u>	<u>Lab ID</u>
MW-1	200126-001
MW-2	200126-002
MW-3	200126-003
MW-4	200126-004

This data package has been reviewed for technical correctness and completeness. Release of this data has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures. The results contained in this report meet all requirements of NELAC and pertain only to those samples which were submitted for analysis. This report may be reproduced only in its entirety.

Signature:   
Project Manager

Date: 01/09/2008

Signature:   
Operations Manager

Date: 01/10/2008

**CASE NARRATIVE**

Laboratory number: 200126  
Client: Stellar Environmental Solutions  
Project: 2003-43  
Location: Oakland Auto Works  
Request Date: 12/20/07  
Samples Received: 12/20/07

This hardcopy data package contains sample and QC results for four water samples, requested for the above referenced project on 12/20/07. The samples were received intact.

**TPH-Purgeables and/or BTXE by GC (EPA 8015B):**

No analytical problems were encountered.

**TPH-Extractables by GC (EPA 8015B):**

No analytical problems were encountered.

**Volatile Organics by GC/MS (EPA 8260B):**

No analytical problems were encountered.

**Total Volatile Hydrocarbons**

Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	133115
Units:	ug/L	Sampled:	12/19/07
Diln Fac:	1.000	Received:	12/20/07

Field ID:	MW-1	Lab ID:	200126-001
Type:	SAMPLE	Analyzed:	12/22/07

Analyte	Result	RL
Gasoline C7-C12	2,700	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	126	73-134
Bromofluorobenzene (FID)	113	77-140

Field ID:	MW-2	Lab ID:	200126-002
Type:	SAMPLE	Analyzed:	12/22/07

Analyte	Result	RL
Gasoline C7-C12	1,200	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	116	73-134
Bromofluorobenzene (FID)	104	77-140

Field ID:	MW-3	Lab ID:	200126-003
Type:	SAMPLE	Analyzed:	12/22/07

Analyte	Result	RL
Gasoline C7-C12	1,400	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	134	73-134
Bromofluorobenzene (FID)	112	77-140

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 Z= Sample exhibits unknown single peak or peaks  
 ND= Not Detected  
 RL= Reporting Limit

Total Volatile Hydrocarbons			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	133115
Units:	ug/L	Sampled:	12/19/07
Diln Fac:	1.000	Received:	12/20/07

Field ID: MW-4                      Lab ID: 200126-004  
 Type: SAMPLE                      Analyzed: 12/22/07

Analyte	Result	RL
Gasoline C7-C12	90 Y Z	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	81	73-134
Bromofluorobenzene (FID)	90	77-140

Type: BLANK                      Analyzed: 12/21/07  
 Lab ID: QC421405

Analyte	Result	RL
Gasoline C7-C12	ND	50

Surrogate	%REC	Limits
Trifluorotoluene (FID)	96	73-134
Bromofluorobenzene (FID)	93	77-140

Y= Sample exhibits chromatographic pattern which does not resemble standard  
 Z= Sample exhibits unknown single peak or peaks  
 ND= Not Detected  
 RL= Reporting Limit

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8015B
Type:	LCS	Diln Fac:	1.000
Lab ID:	QC421407	Batch#:	133115
Matrix:	Water	Analyzed:	12/21/07
Units:	ug/L		

Analyte	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,000	1,073	107	79-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	107	73-134
Bromofluorobenzene (FID)	94	77-140

## Batch QC Report

Total Volatile Hydrocarbons			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8015B
Field ID:	ZZZZZZZZZZ	Batch#:	133115
MSS Lab ID:	200139-002	Sampled:	12/20/07
Matrix:	Water	Received:	12/20/07
Units:	ug/L	Analyzed:	12/21/07
Diln Fac:	1.000		

Type: MS Lab ID: QC421408

Analyte	MSS Result	Spiked	Result	%REC	Limits
Gasoline C7-C12	1,946	2,000	3,564	81	72-120

Surrogate	%REC	Limits
Trifluorotoluene (FID)	115	73-134
Bromofluorobenzene (FID)	99	77-140

Type: MSD Lab ID: QC421409

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Gasoline C7-C12	2,000	3,494	77	72-120	2	20

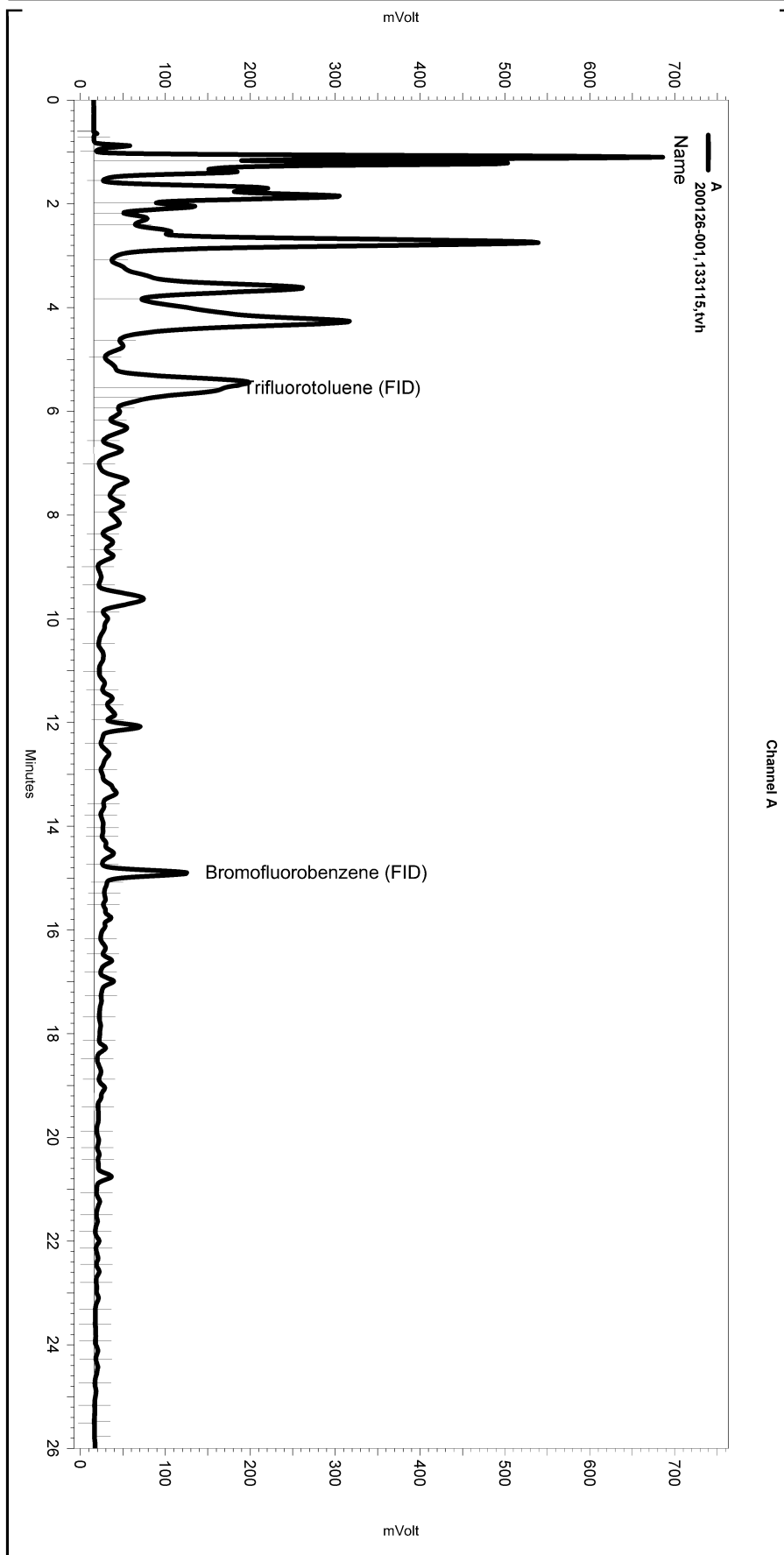
Surrogate	%REC	Limits
Trifluorotoluene (FID)	114	73-134
Bromofluorobenzene (FID)	101	77-140

RPD= Relative Percent Difference



Sequence File: \\Lims\gdrive\ezchrom\Projects\GC07\Sequence\355.seq  
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 Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\355\_020  
 Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\tvhbtxe340a.met

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 Run Date: 12/22/2007 2:40:33 AM  
 Analysis Date: 12/26/2007 12:00:47 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: a1.3



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Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
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Yes	Threshold	0	0	50

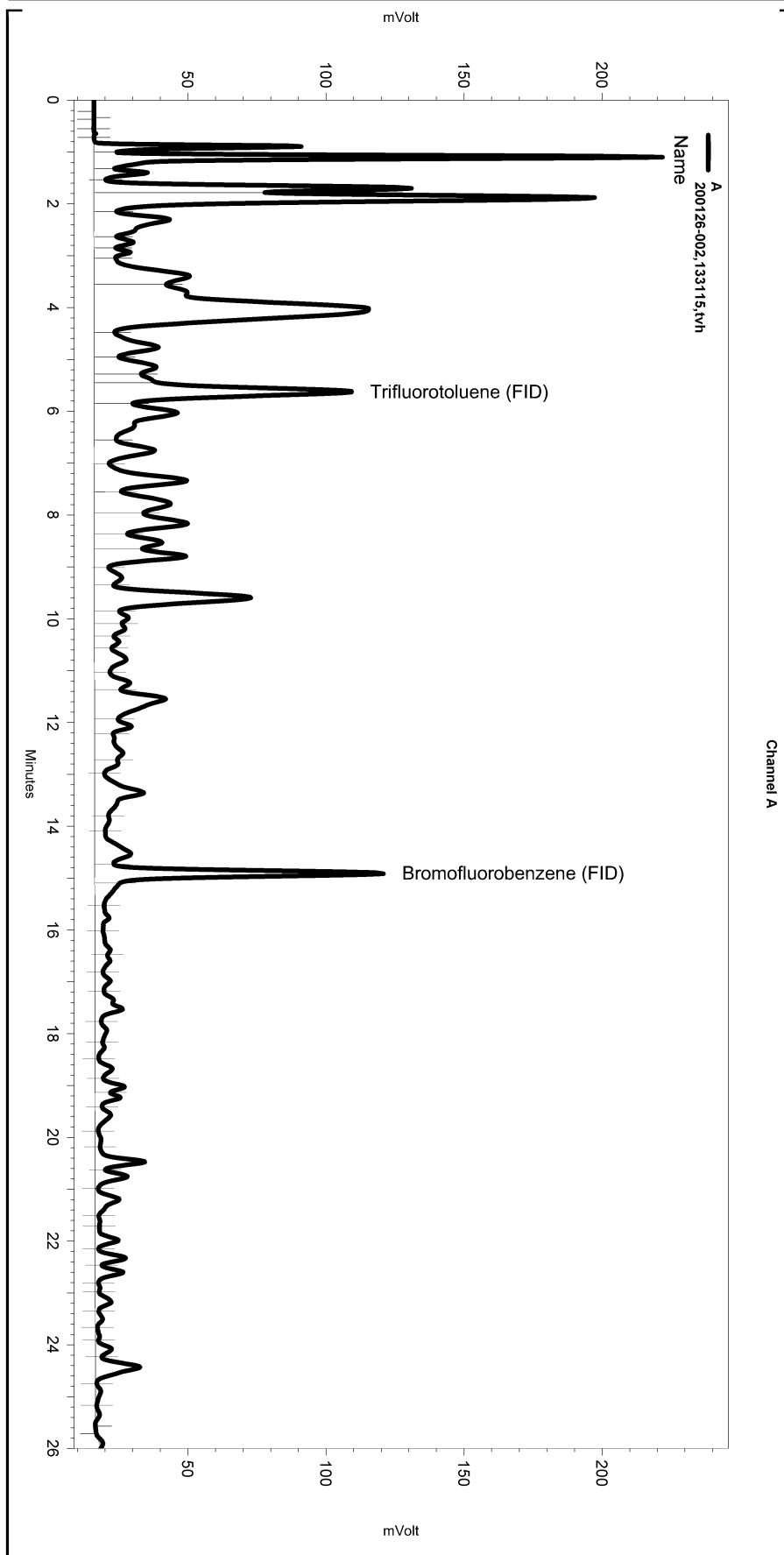
Manual Integration Fixes

Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\355\_020

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Yes	Split Peak	5.741	0	0
Yes	Split Peak	15.088	0	0

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 Sample Name: 200126-002,133115,tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\355\_021  
 Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\TVHBTX340A.MET

Software Version 3.1.7  
 Run Date: 12/22/2007 3:16:08 AM  
 Analysis Date: 12/26/2007 12:00:51 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: a1.3



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Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

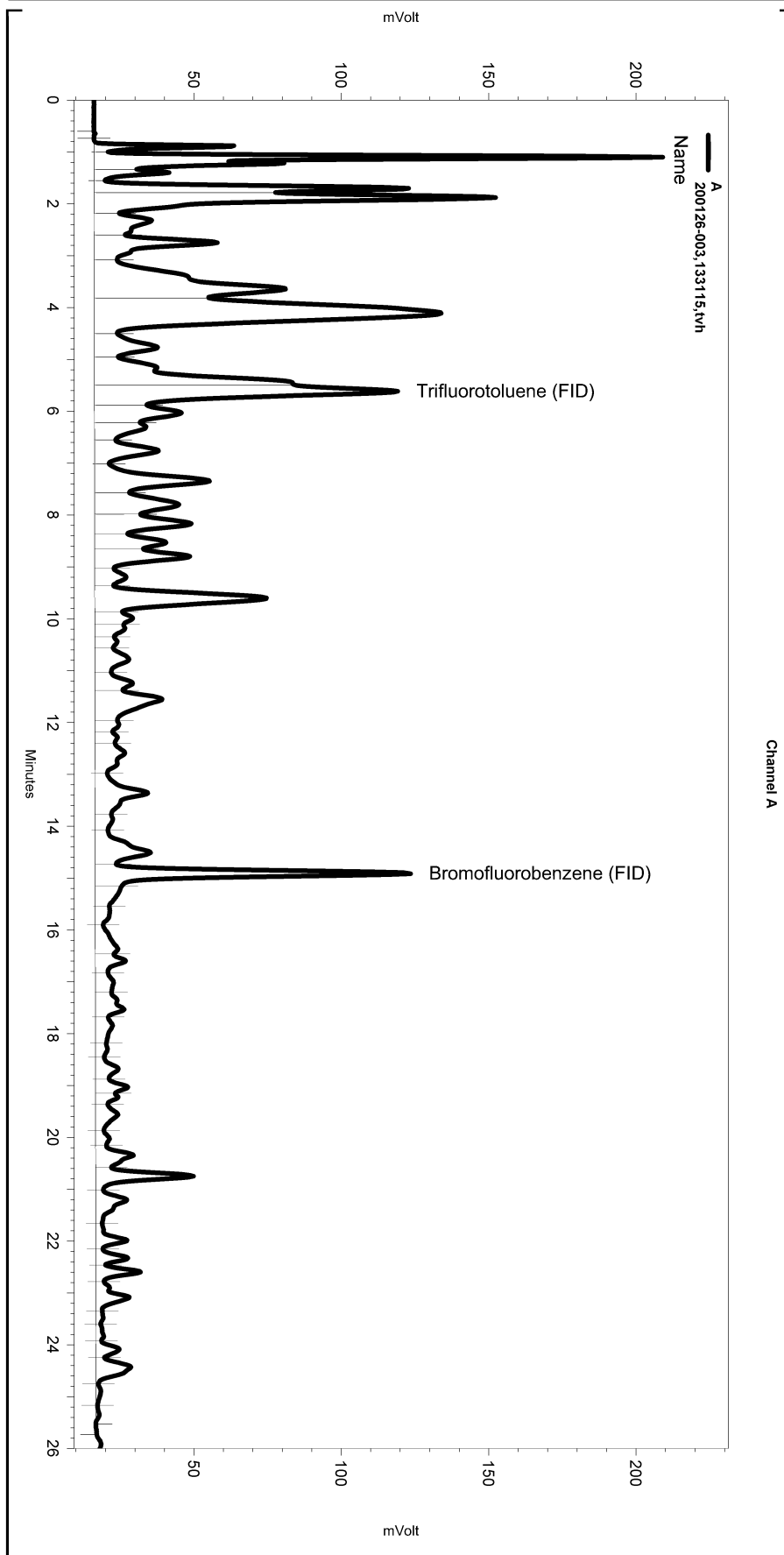
Manual Integration Fixes

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Yes	Split Peak	5.448	0	0
Yes	Split Peak	15.103	0	0

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 Sample Name: 200126-003,133115,tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\355\_022  
 Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\tvhbtxe340a.met

Software Version 3.1.7  
 Run Date: 12/22/2007 3:51:36 AM  
 Analysis Date: 12/26/2007 12:00:55 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: a1.3



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No items selected for this section

Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

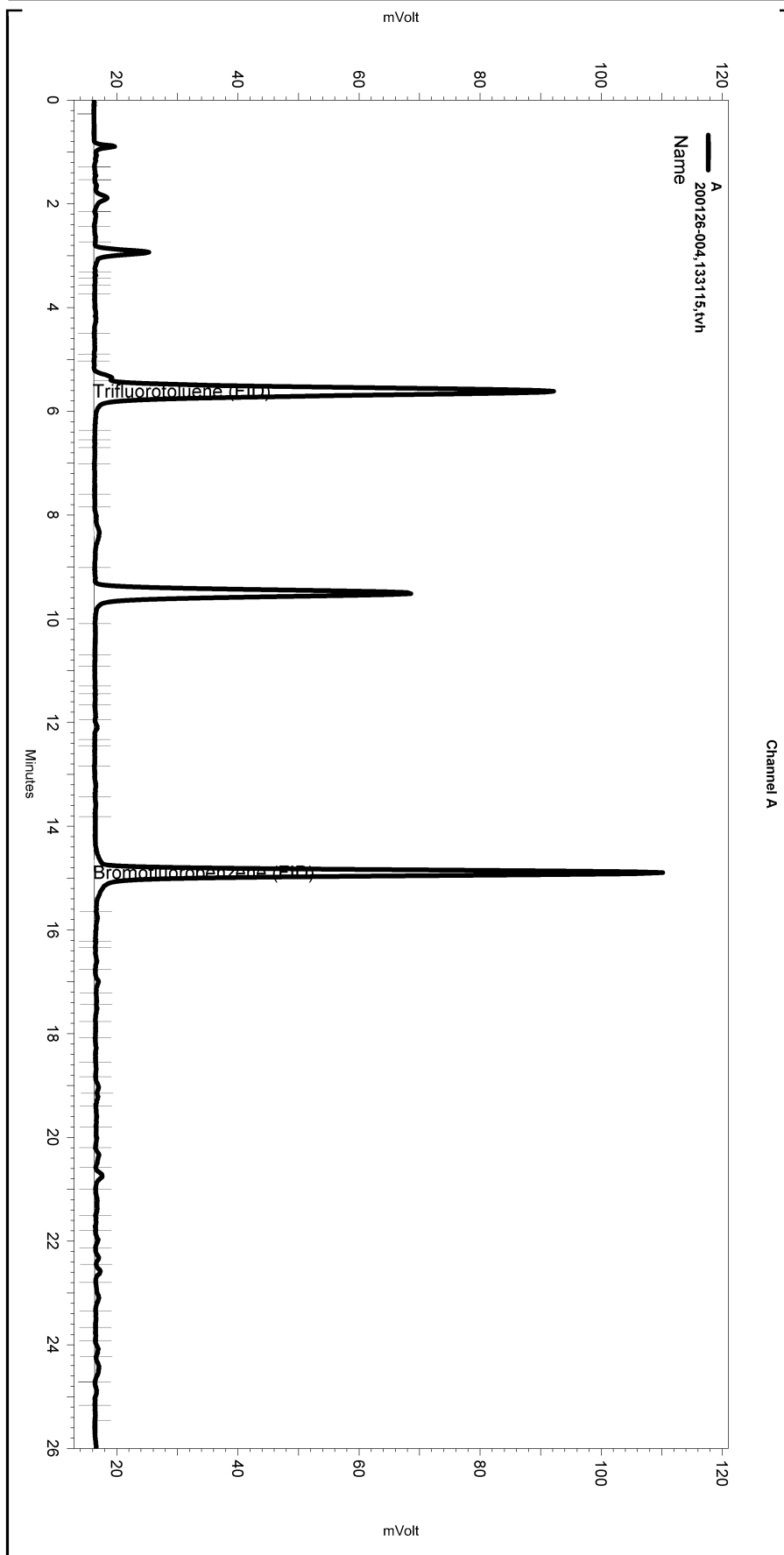
Manual Integration Fixes

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Yes	Split Peak	5.499	0	0
Yes	Split Peak	15.144	0	0

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 Sample Name: 200126-004,133115,tvh  
 Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\355\_023  
 Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
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 Analysis Date: 12/26/2007 12:00:59 PM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: a1.3



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Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

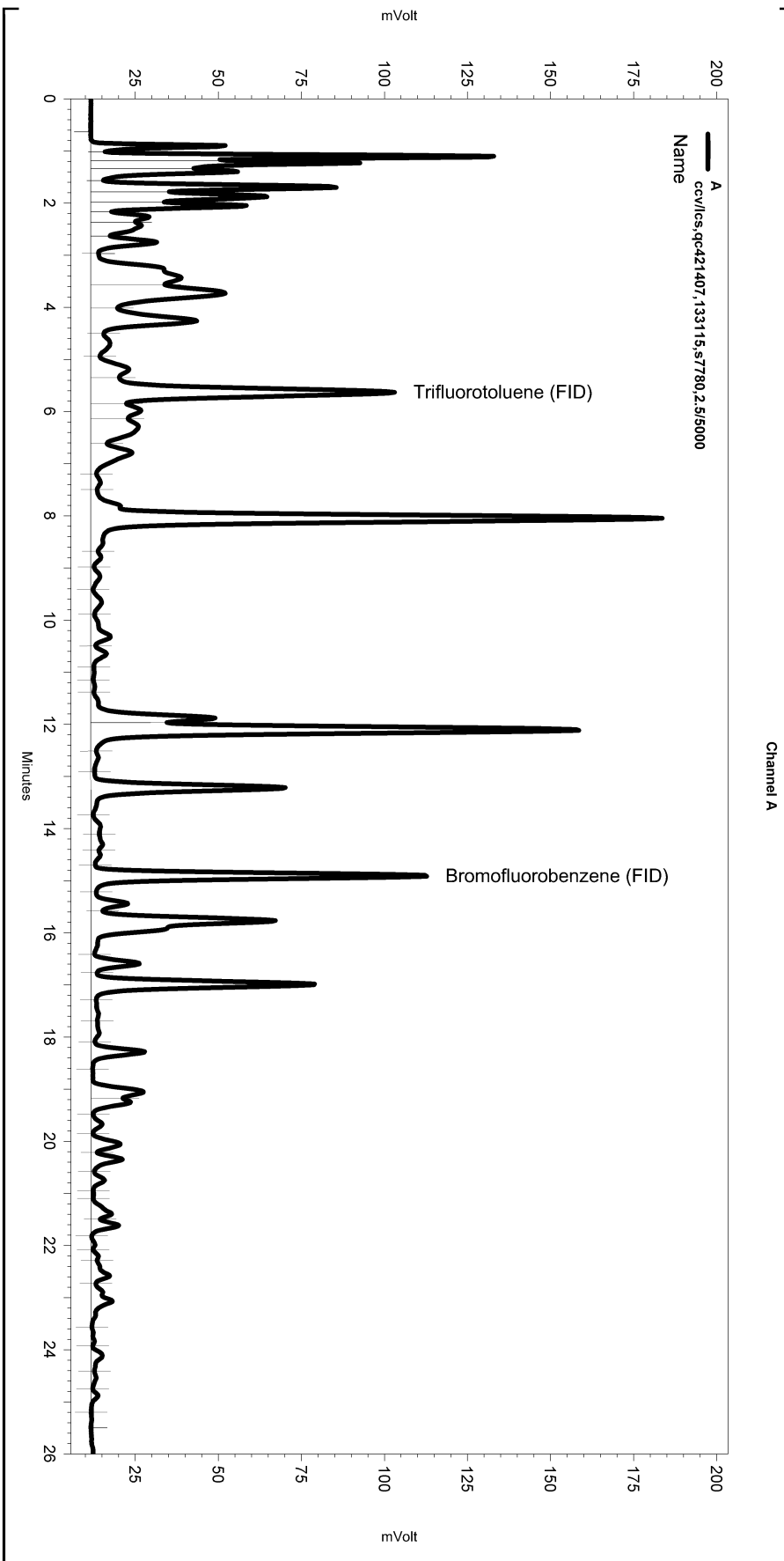
Manual Integration Fixes

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Yes	Split Peak	5.41	0	0

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 Data File: \\Lims\gdrive\ezchrom\Projects\GC07\Data\355\_005  
 Instrument: GC07 (Offline) Vial: N/A Operator: Tvh 2. Analyst (lims2k3\tvh2)  
 Method Name: \\Lims\gdrive\ezchrom\Projects\GC07\Method\tvhbtxe340a.met

Software Version 3.1.7  
 Run Date: 12/21/2007 5:13:20 PM  
 Analysis Date: 12/26/2007 8:06:32 AM  
 Sample Amount: 5 Multiplier: 5  
 Vial & pH or Core ID: {Data Description}



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Integration Events

Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
Yes	Width	0	0	0.2
Yes	Threshold	0	0	50

Manual Integration Fixes

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Enabled	Event Type	Start (Minutes)	Stop (Minutes)	Value
None				

### Total Extractable Hydrocarbons

Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2003-43	Analysis:	EPA 8015B
Matrix:	Water	Sampled:	12/19/07
Units:	ug/L	Received:	12/20/07
Diln Fac:	1.000	Prepared:	12/26/07
Batch#:	133183	Analyzed:	12/29/07

Field ID: MW-1 Lab ID: 200126-001  
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	840 Y	50

Surrogate	%REC	Limits
Hexacosane	116	61-133

Field ID: MW-2 Lab ID: 200126-002  
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	510 Y	50

Surrogate	%REC	Limits
Hexacosane	84	61-133

Field ID: MW-3 Lab ID: 200126-003  
Type: SAMPLE

Analyte	Result	RL
Diesel C10-C24	2,600 Y	50

Surrogate	%REC	Limits
Hexacosane	92	61-133

Type: BLANK Lab ID: QC421677

Analyte	Result	RL
Diesel C10-C24	ND	50

Surrogate	%REC	Limits
Hexacosane	110	61-133

Y= Sample exhibits chromatographic pattern which does not resemble standard  
ND= Not Detected  
RL= Reporting Limit

## Batch QC Report

Total Extractable Hydrocarbons			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 3520C
Project#:	2003-43	Analysis:	EPA 8015B
Matrix:	Water	Batch#:	133183
Units:	ug/L	Prepared:	12/26/07
Diln Fac:	1.000	Analyzed:	12/28/07

Type: BS Cleanup Method: EPA 3630C  
 Lab ID: QC421678

Analyte	Spiked	Result	%REC	Limits
Diesel C10-C24	2,500	2,365	95	58-128

Surrogate	%REC	Limits
Hexacosane	111	61-133

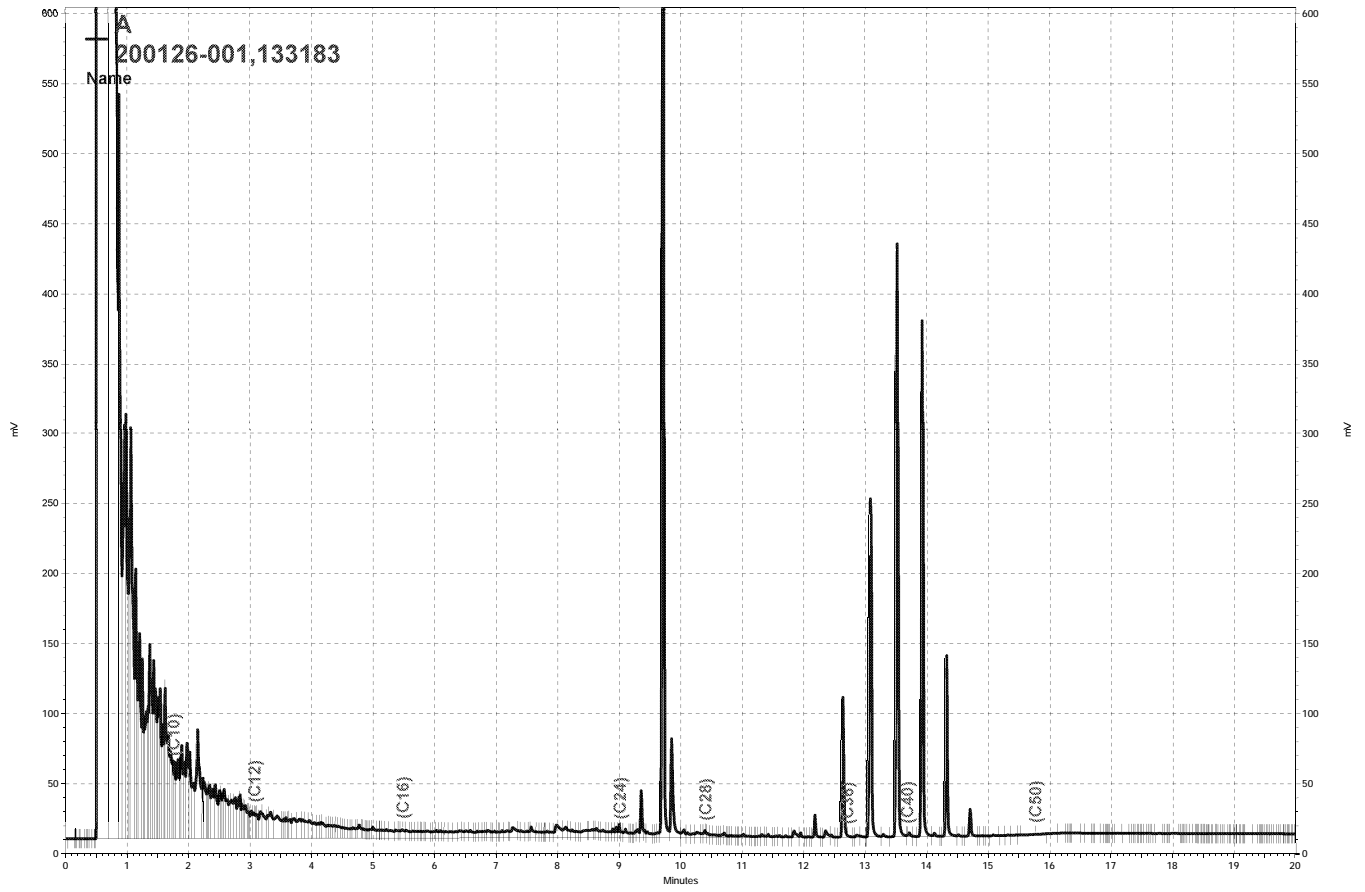
Type: BSD Cleanup Method: EPA 3630C  
 Lab ID: QC421679

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
Diesel C10-C24	2,500	2,220	89	58-128	6	29

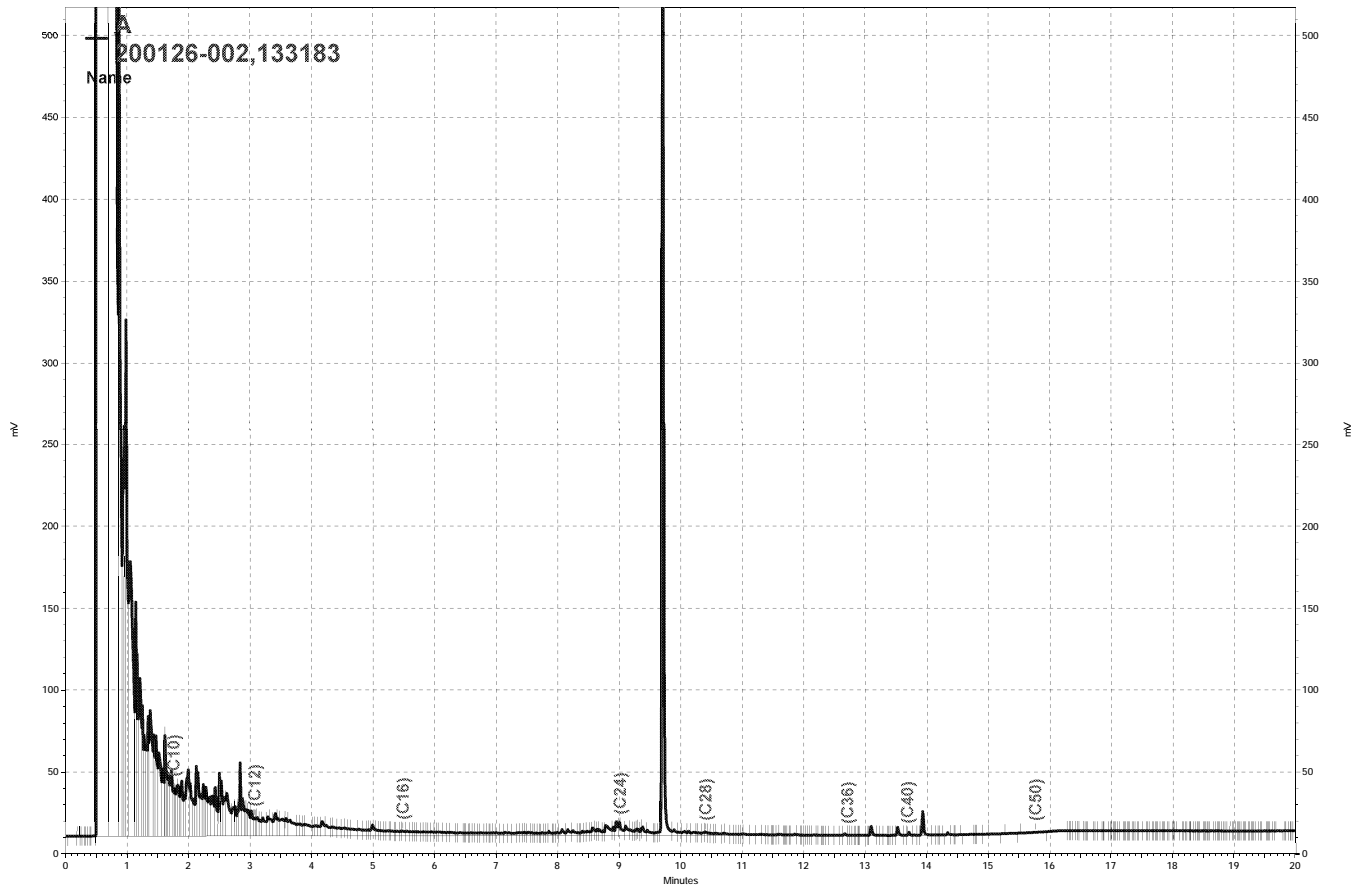
Surrogate	%REC	Limits
Hexacosane	105	61-133

RPD= Relative Percent Difference

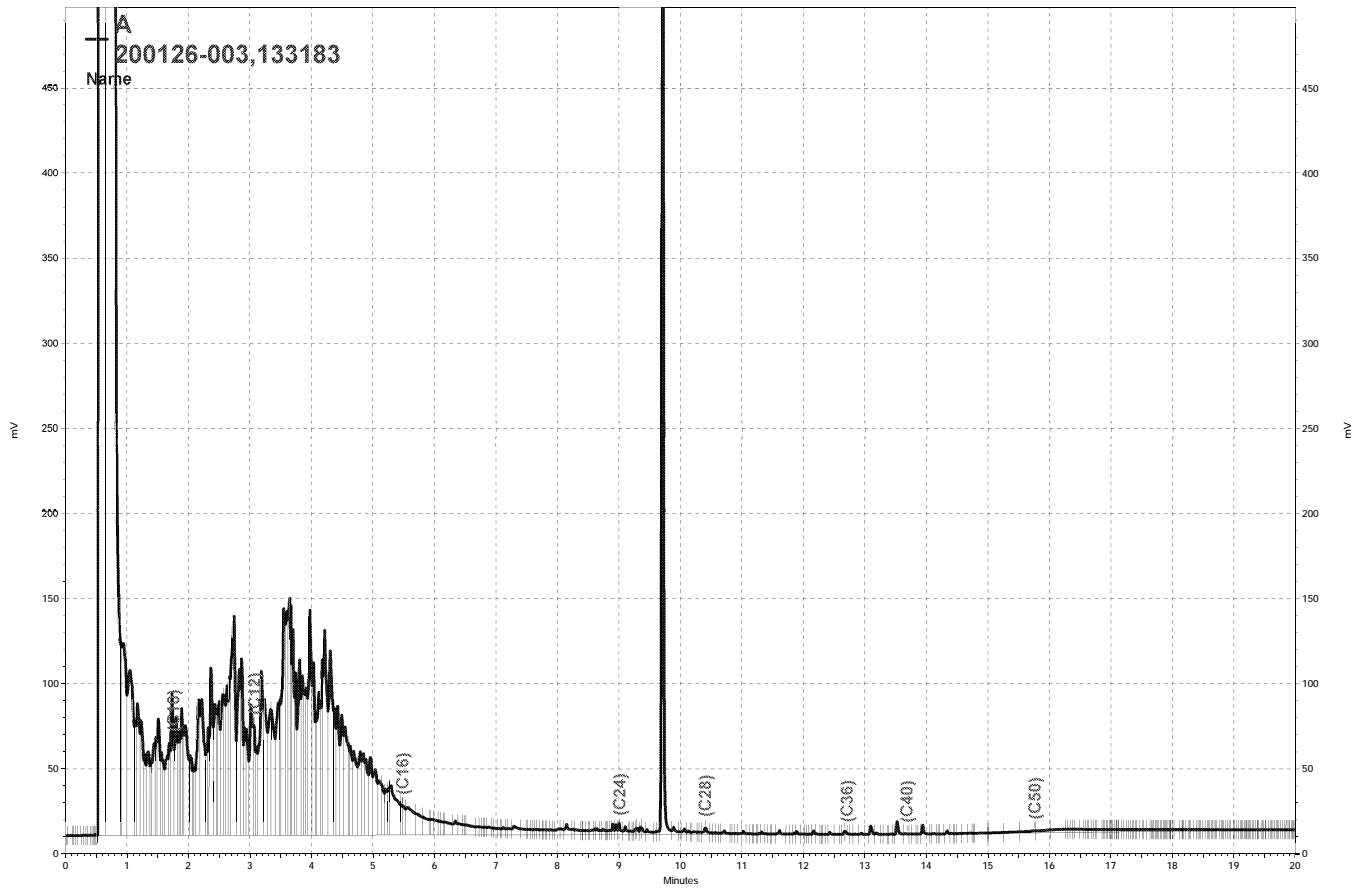


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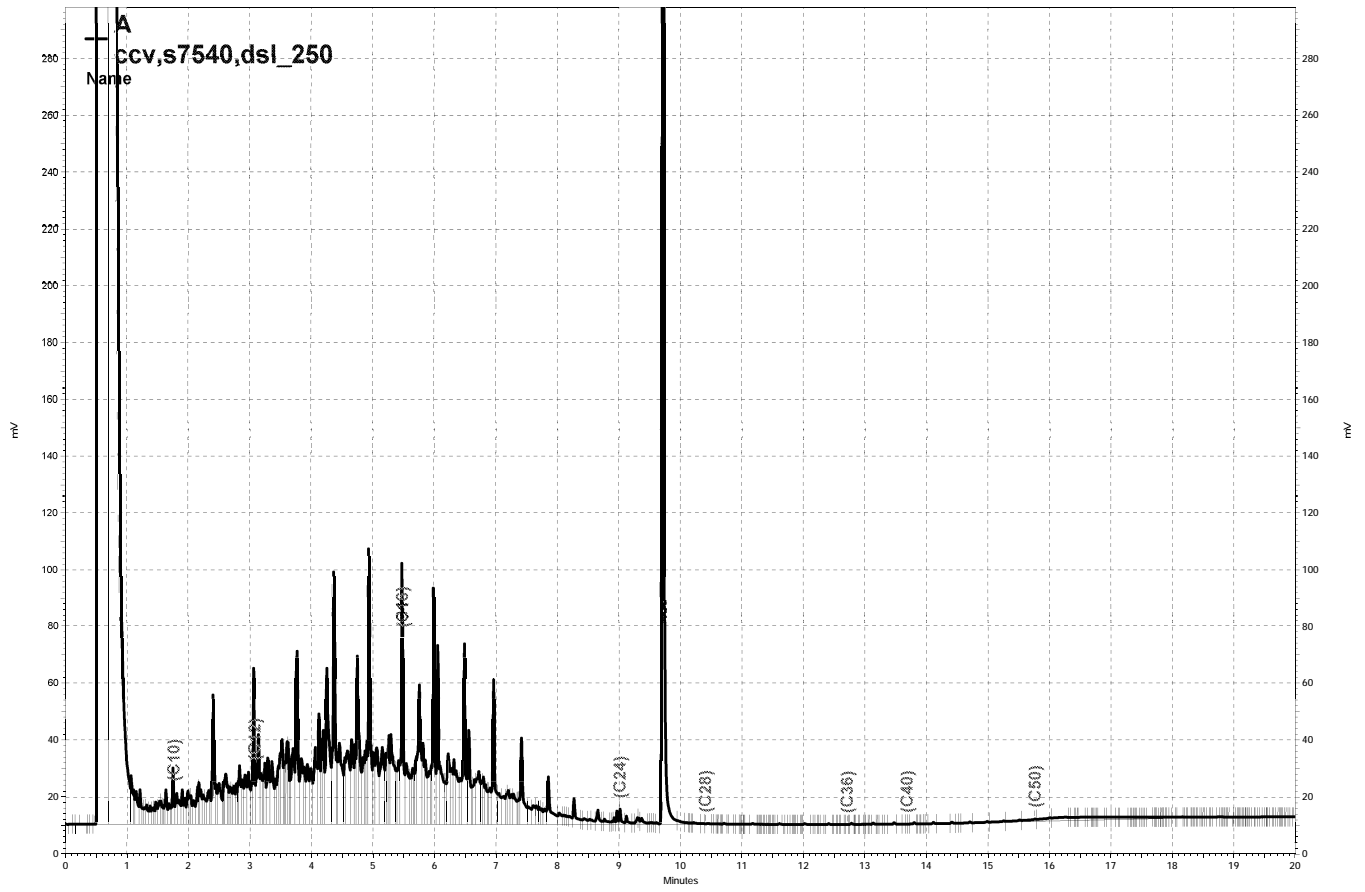




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<b>BTXE &amp; Oxygenates</b>			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8260B
Field ID:	MW-1	Batch#:	133208
Lab ID:	200126-001	Sampled:	12/19/07
Matrix:	Water	Received:	12/20/07
Units:	ug/L	Analyzed:	12/27/07
Diln Fac:	2.000		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	26	20
MTBE	3.1	1.0
Isopropyl Ether (DIPE)	ND	1.0
Ethyl tert-Butyl Ether (ETBE)	ND	1.0
1,2-Dichloroethane	ND	1.0
Benzene	170	1.0
Methyl tert-Amyl Ether (TAME)	ND	1.0
Toluene	5.5	1.0
1,2-Dibromoethane	ND	1.0
Ethylbenzene	7.5	1.0
m,p-Xylenes	30	1.0
o-Xylene	4.6	1.0

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	92	80-122
1,2-Dichloroethane-d4	96	74-137
Toluene-d8	100	80-120
Bromofluorobenzene	101	80-120

ND= Not Detected  
 RL= Reporting Limit

<b>BTXE &amp; Oxygenates</b>			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8260B
Field ID:	MW-2	Batch#:	133157
Lab ID:	200126-002	Sampled:	12/19/07
Matrix:	Water	Received:	12/20/07
Units:	ug/L	Analyzed:	12/26/07
Diln Fac:	1.000		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	21	10
MTBE	33	0.5
Isopropyl Ether (DIPE)	3.4	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	14	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	0.5	0.5
o-Xylene	ND	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	93	80-122
1,2-Dichloroethane-d4	102	74-137
Toluene-d8	102	80-120
Bromofluorobenzene	99	80-120

ND= Not Detected  
 RL= Reporting Limit

<b>BTXE &amp; Oxygenates</b>			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8260B
Field ID:	MW-3	Batch#:	133157
Lab ID:	200126-003	Sampled:	12/19/07
Matrix:	Water	Received:	12/20/07
Units:	ug/L	Analyzed:	12/26/07
Diln Fac:	1.000		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	71	10
MTBE	84	0.5
Isopropyl Ether (DIPE)	8.6	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	11	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	0.8	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	0.7	0.5
m,p-Xylenes	3.4	0.5
o-Xylene	0.5	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	95	80-122
1,2-Dichloroethane-d4	92	74-137
Toluene-d8	103	80-120
Bromofluorobenzene	104	80-120

ND= Not Detected  
 RL= Reporting Limit

**Batch QC Report**

<b>BTXE &amp; Oxygenates</b>			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	133157
Units:	ug/L	Analyzed:	12/26/07
Diln Fac:	1.000		

Type: BS Lab ID: QC421580

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	125.0	134.4	107	59-149
MTBE	25.00	24.44	98	60-130
Isopropyl Ether (DIPE)	25.00	26.57	106	59-120
Ethyl tert-Butyl Ether (ETBE)	25.00	25.46	102	65-134
1,2-Dichloroethane	25.00	24.58	98	76-121
Benzene	25.00	27.65	111	80-120
Methyl tert-Amyl Ether (TAME)	25.00	26.60	106	67-132
Toluene	25.00	28.30	113	80-122
1,2-Dibromoethane	25.00	25.90	104	80-120
Ethylbenzene	25.00	29.79	119	80-127
m,p-Xylenes	50.00	60.04	120	80-130
o-Xylene	25.00	28.95	116	80-126

Surrogate	%REC	Limits
Dibromofluoromethane	97	80-122
1,2-Dichloroethane-d4	94	74-137
Toluene-d8	99	80-120
Bromofluorobenzene	99	80-120

Type: BSD Lab ID: QC421581

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	125.0	140.7	113	59-149	5	20
MTBE	25.00	23.22	93	60-130	5	20
Isopropyl Ether (DIPE)	25.00	25.83	103	59-120	3	20
Ethyl tert-Butyl Ether (ETBE)	25.00	24.58	98	65-134	4	20
1,2-Dichloroethane	25.00	23.55	94	76-121	4	20
Benzene	25.00	25.41	102	80-120	8	20
Methyl tert-Amyl Ether (TAME)	25.00	25.41	102	67-132	5	20
Toluene	25.00	25.93	104	80-122	9	20
1,2-Dibromoethane	25.00	24.91	100	80-120	4	20
Ethylbenzene	25.00	26.97	108	80-127	10	20
m,p-Xylenes	50.00	54.93	110	80-130	9	20
o-Xylene	25.00	25.68	103	80-126	12	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-122
1,2-Dichloroethane-d4	91	74-137
Toluene-d8	100	80-120
Bromofluorobenzene	97	80-120

RPD= Relative Percent Difference

## Batch QC Report

BTXE & Oxygenates			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC421582	Batch#:	133157
Matrix:	Water	Analyzed:	12/26/07
Units:	ug/L		

Analyte	Result	RL
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

Surrogate	%REC	Limits
Dibromofluoromethane	95	80-122
1,2-Dichloroethane-d4	97	74-137
Toluene-d8	99	80-120
Bromofluorobenzene	100	80-120

ND= Not Detected

RL= Reporting Limit



**Batch QC Report**

<b>BTXE &amp; Oxygenates</b>			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8260B
Matrix:	Water	Batch#:	133208
Units:	ug/L	Analyzed:	12/27/07
Diln Fac:	1.000		

Type: BS Lab ID: QC421783

Analyte	Spiked	Result	%REC	Limits
tert-Butyl Alcohol (TBA)	100.0	103.5	103	59-149
MTBE	20.00	18.80	94	60-130
Isopropyl Ether (DIPE)	20.00	20.67	103	59-120
Ethyl tert-Butyl Ether (ETBE)	20.00	19.47	97	65-134
1,2-Dichloroethane	20.00	19.29	96	76-121
Benzene	20.00	22.02	110	80-120
Methyl tert-Amyl Ether (TAME)	20.00	20.44	102	67-132
Toluene	20.00	22.44	112	80-122
1,2-Dibromoethane	20.00	20.31	102	80-120
Ethylbenzene	20.00	22.83	114	80-127
m,p-Xylenes	40.00	45.64	114	80-130
o-Xylene	20.00	22.22	111	80-126

Surrogate	%REC	Limits
Dibromofluoromethane	98	80-122
1,2-Dichloroethane-d4	94	74-137
Toluene-d8	99	80-120
Bromofluorobenzene	99	80-120

Type: BSD Lab ID: QC421784

Analyte	Spiked	Result	%REC	Limits	RPD	Lim
tert-Butyl Alcohol (TBA)	100.0	106.4	106	59-149	3	20
MTBE	20.00	18.87	94	60-130	0	20
Isopropyl Ether (DIPE)	20.00	20.21	101	59-120	2	20
Ethyl tert-Butyl Ether (ETBE)	20.00	20.13	101	65-134	3	20
1,2-Dichloroethane	20.00	18.44	92	76-121	4	20
Benzene	20.00	20.37	102	80-120	8	20
Methyl tert-Amyl Ether (TAME)	20.00	19.67	98	67-132	4	20
Toluene	20.00	19.56	98	80-122	14	20
1,2-Dibromoethane	20.00	19.81	99	80-120	2	20
Ethylbenzene	20.00	20.89	104	80-127	9	20
m,p-Xylenes	40.00	42.82	107	80-130	6	20
o-Xylene	20.00	19.88	99	80-126	11	20

Surrogate	%REC	Limits
Dibromofluoromethane	94	80-122
1,2-Dichloroethane-d4	90	74-137
Toluene-d8	98	80-120
Bromofluorobenzene	100	80-120

RPD= Relative Percent Difference

**Batch QC Report**

<b>BTXE &amp; Oxygenates</b>			
Lab #:	200126	Location:	Oakland Auto Works
Client:	Stellar Environmental Solutions	Prep:	EPA 5030B
Project#:	2003-43	Analysis:	EPA 8260B
Type:	BLANK	Diln Fac:	1.000
Lab ID:	QC421785	Batch#:	133208
Matrix:	Water	Analyzed:	12/27/07
Units:	ug/L		

<b>Analyte</b>	<b>Result</b>	<b>RL</b>
tert-Butyl Alcohol (TBA)	ND	10
MTBE	ND	0.5
Isopropyl Ether (DIPE)	ND	0.5
Ethyl tert-Butyl Ether (ETBE)	ND	0.5
1,2-Dichloroethane	ND	0.5
Benzene	ND	0.5
Methyl tert-Amyl Ether (TAME)	ND	0.5
Toluene	ND	0.5
1,2-Dibromoethane	ND	0.5
Ethylbenzene	ND	0.5
m,p-Xylenes	ND	0.5
o-Xylene	ND	0.5

<b>Surrogate</b>	<b>%REC</b>	<b>Limits</b>
Dibromofluoromethane	97	80-122
1,2-Dichloroethane-d4	94	74-137
Toluene-d8	98	80-120
Bromofluorobenzene	100	80-120

ND= Not Detected  
 RL= Reporting Limit

## **APPENDIX C**

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### **Historical Groundwater Monitoring Well Analytical Data**

**Table C-1**  
**Historical Groundwater Monitoring Well Groundwater Analytical Results**  
**Petroleum and Aromatic Hydrocarbons (µg/L)**  
**240 W. MacArthur Boulevard, Oakland, Alameda, California**

Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-1</b>									
Yes	1	Aug-97	1,140	< 1,000	110	16	15	112	NA
Yes	2	Dec-97	ND	NA	ND	ND	ND	31	NA
Yes	3	Mar-98	370	NA	8.9	< 0.5	< 0.5	2.2	18
Yes	4	Jul-98	6,400	NA	1,300	23	3.7	58	97
Yes	5	Oct-98	2,500	NA	360	44	1.3	150	< 0.5
Yes	6	Jan-99	2,700	NA	1,200	28	140	78	130
(a)	7	Jun-00	27,000	NA	5,200	500	320	3,100	1,300
(a)	8	Dec-00	976,000	NA	2,490	1,420	3,640	10,100	< 150
(a)	9	Feb-01	NA	NA	NA	NA	NA	NA	NA
(a)	10	May-01	20,000	NA	2,900	310	230	1,900	< 30
(a)	11	Jul-01	92,000	NA	2,900	580	2,800	20,000	560
Pre“hi-vac”	12	Oct 22-01	20,000	NA	3,700	560	410	4,600	2,600
Post “hi-vac”	12	Oct 26-01	< 0.05	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
(a)	13	Dec-01	3,300	NA	200	12	5.7	43	44
No	14	Mar-02	4,600	NA	820	4.4	100	300	210
No	15	May-02	1,600	NA	100	23	20	190	7.7
No	16	Jul-02	2,300	NA	250	15	13	180	180
No	17	Oct-02	1,820	NA	222	16	< 0.3	59	58
No	18	Jan-03	2,880	NA	188	< 50	< 50	157	20
No	19	Mar-03	6,700	NA	607	64	64	288	< 0.18
No	20	Aug-03	4,900	5,000	740	45	85	250	14
Yes	21	Dec-03	8,930	800	1,030	55	127	253	212
Yes	22	Mar-04	11,300	1,100	483	97	122	452	67
Yes	23	Jun-04	9,300	4,000	1,700	75	92	350	6.0
Yes	24	Sep-04	9,100	97	920	19	82	201	7.2
Yes	25	Dec-04	11,000	3,300	830	21	74	118	7.9
Yes	26	Mar-05	4,700	3,500	450	28	42	97	6.7
Yes	27	Jun-05	21,000	6,800	1,900	270	320	2,800	< 13
Yes	28	Sep-05	23,000	2,500	2,100	100	200	880	< 2.5
Yes	29	Dec-05	4,300	3,000	500	22	72	228	5.5
Yes	30	Mar-06	11,000	3,000	340	45	89	630	4.3
Yes	31	Jun-06	21,000	8,500	1,600	160	170	1,000	< 2.5
Yes	32	Sep-06	13,000	6,200	1,700	76	110	440	< 13
Yes	33	Dec-06	16,000	4,100	1,500	100	160	670	< 13
Yes	34	Mar-07	22,000	6,200	1,700	140	180	1,100	< 13
Yes	35	Jun-07	3,600	1,500	210	10	19	61	3.2
Yes	36	Sep-07	1,400	1,700	50	< 0.5	1.3	< 0.5	4.1
Yes	37	Dec-07	2,700	840	170	5.5	7.5	34.6	3.1

(table continued on next page; footnotes on final page)

Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-2</b>									
Yes	1	Aug-97	5,350	< 1,000	108	36	33	144	NA
Yes	2	Dec-97	1,600	NA	73	ND	ND	ND	NA
Yes	3	Mar-98	3,400	NA	830	100	210	240	870
Yes	4	Jul-98	3,100	NA	25	2.2	< 0.5	0.9	1,900
Yes	5	Oct-98	4,300	NA	< 0.5	1.2	< 0.5	1	4,200
Yes	6	Jan-99	2,900	NA	160	8.9	6.9	78.4	2,100
(a)	7	Jun-00	2,700	NA	200	17	30	16	680
(a)	8	Dec-00	3,020	NA	56.7	< 1.5	< 1.5	< 3.0	3,040
(a)	9	Feb-01	NA	NA	NA	NA	NA	NA	NA
(a)	10	May-01	720	NA	49	< 3.0	4.6	< 3.0	380
(a)	11	Jul-01	8,400	NA	350	44	77	78	550
Pre "hi-vac"	12	Oct 22-01	850	NA	170	4.9	5.1	14	260
Post "hi-vac"	12	Oct 26-01	770	NA	86	5.5	9.6	8.5	310
(a)	13	Dec-01	1,300	NA	9.2	< 2.0	< 2.0	< 2.0	370
No	14	Mar-02	1,300	NA	76	3.8	21	15	460
No	15	May-02	320	NA	12	1.1	4.6	4.8	160
No	16	Jul-02	1,300	NA	130	1	9.4	5.6	420
No	17	Oct-02	1,060	NA	12	2.2	4.2	3.5	270
No	18	Jan-03	581	NA	6.5	< 5.0	< 5.0	< 5.0	130
No	19	Mar-03	1,250	NA	< 0.22	< 0.32	< 0.31	< 0.4	155
No	20	Aug-03	2,200	730	58	9.2	< 0.5	28	240
Yes	21	Dec-03	1,980	100	29	22.0	7.4	13	295
Yes	22	Mar-04	2,700	100	12	16.0	9	12	249
Yes	23	Jun-04	1,200	370	42	0.7	2.6	0.9	170
Yes	24	Sep-04	1,500	280	14	< 0.5	< 0.5	0.6	130
Yes	25	Dec-04	1,400	540	26	1.1	1.8	3.5	91
Yes	26	Mar-05	2,300	420	5.3	< 1.0	3.7	< 2.0	120
Yes	27	Jun-05	1,600	500	14	< 0.5	1.8	0.68	66
Yes	28	Sep-05	1,400	210	30	1.3	12	26	58
Yes	29	Dec-05	1,300	800	4.9	0.6	0.7	0.8	74
Yes	30	Mar-06	1,300	400	3.2	< 0.7	< 0.7	< 1.4	120
Yes	31	Jun-06	1,400	1,200	33.0	1.3	3.5	< 1.6	84
Yes	32	Sep-06	8,300	1,600	67.0	4.1	4.6	15.4	64
Yes	33	Dec-06	1,500	940	22.0	2.9	2.6	3.5	67
Yes	34	Mar-07	1,200	760	65	1.9	3.7	1.6	59
Yes	35	Jun-07	2,900	1,000	67	3.2	14.0	7.5	49
Yes	36	Sep-07	NS	NS	NS	NS	NS	NS	NS
Yes	37	Dec-07	1,200	510	14	< 0.5	< 0.5	0.5	33

(table continued on next page; footnotes on final page)

Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-3</b>									
Yes	1	Aug-97	8,500	< 1,000	450	30	53	106	NA
Yes	2	Dec-97	5,200	NA	180	6	5	9.3	NA
Yes	3	Mar-98	1,000	NA	6	< 0.5	< 0.5	< 0.5	810
Yes	4	Jul-98	6,400	NA	490	57	23	78	220
Yes	5	Oct-98	2,100	NA	< 5.0	< 5.0	< 5.0	< 5.0	2,100
Yes	6	Jan-99	4,400	NA	450	65	26	42	1,300
(a)	7	Jun-00	1,700	NA	110	13	34	13	96
(a)	8	Dec-00	5,450	NA	445	< 7.5	23.8	< 7.5	603
(a)	9	Feb-01	NA	NA	NA	NA	NA	NA	NA
(a)	10	May-01	1,900	NA	180	12	< 3.0	19	330
(a)	11	Jul-01	10,000	NA	830	160	150	260	560
Pre“hi-vac”	12	Oct 22-01	1,400	NA	240	7.8	4.1	15	220
Post “hi-vac”	12	Oct 26-01	1,900	NA	200	16	51	30	290
(a)	13	Dec-01	5,800	NA	93	< 20	31	< 20	330
No	14	Mar-02	1,900	NA	220	16	31	24	400
No	15	May-02	1,600	NA	110	3.4	29	14	320
No	16	Jul-02	1,900	NA	210	27	30	55	200
No	17	Oct. 2002	3,030	NA	178	19	6.2	36	178
No	18	Jan-03	2,980	NA	47	< 5.0	7.6	6.3	105
No	19	Mar-03	3,620	NA	124	< 0.32	22	12	139
No	20	Aug-03	3,800	2,400	170	28	31	31	170
Yes	21	Dec-03	6,860	500	312	20	55	58	309
Yes	22	Mar-04	5,490	500	82	34	46	49	249
Yes	23	Jun-04	5,400	1,100	150	30	45	66	130
Yes	24	Sep-04	5,400	1,500	70	3.2	16	13	110
Yes	25	Dec-04	5,300	2,400	91	7.4	21	19	92
Yes	26	Mar-05	4,700	2,000	19	1.1	10	3.7	76
Yes	27	Jun-05	4,200	1,800	49	4.5	23	16	66
Yes	28	Sep-05	5,000	950	60	3.1	12	26	59
Yes	29	Dec-05	3,200	1,800	29	1.3	6.6	5.6	80
Yes	30	Mar-06	4,100	1,200	24	1.1	8.5	3.4	99
Yes	31	Jun-06	4,000	1,400	89.0	8.4	14.0	16.7	75
Yes	32	Sep-06	6,100	2,600	190	15.0	24.0	59.0	51
Yes	33	Dec-06	4,500	2,000	110	4.0	7.3	19.1	47
Yes	34	Mar-07	3,800	2,400	90	3.7	9.8	11.1	51
Yes	35	Jun-07	4,500	2,100	8.9	1.4	14.0	4.0	77
Yes	36	Sep-07	4,000	NS	4.6	< 0.5	1.3	< 0.5	75
Yes	37	Dec-07	1,400	2,600	11.0	0.8	0.7	3.9	84

(table continued on next page; footnotes on final page)

Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-4</b>									
Yes	1	Aug-97	< 500	< 1,000	< 0.5	< 0.5	< 0.5	< 1.5	NA
Yes	2	Dec-97	ND	NA	ND	ND	ND	ND	NA
Yes	3	Mar-98	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Yes	4	Jul-98	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Yes	5	Oct-98	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Yes	6	Jan-99	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
(a)	7	Jun-00	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
(a)	8	Dec-00	< 500	NA	< 0.3	< 0.3	< 0.6	< 0.3	< 0.3
(a)	9	Feb-01	NA	NA	NA	NA	NA	NA	NA
(a)	10	May-01	< 50	NA	1.2	< 0.3	0.55	1.2	2.9
(a)	11	Jul-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pre“hi-vac”	12	Oct 22-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Post “hi-vac”	12	Oct 26-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
(a)	13	Dec-01	ND	NA	ND	ND	ND	ND	ND
No	14	Mar-02	< 50	NA	< 1	< 1	< 1	< 1	< 1
No	15	May-02	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
No	16	Jul-02	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
No	17	Oct-02	< 100	NA	< 0.3	< 0.3	< 0.3	< 0.6	< 0.3
No	18	Jan-03	< 100	NA	< 0.3	< 0.3	< 0.3	< 0.6	14
No	19	Mar-03	< 15	NA	< 0.4	< 0.02	< 0.02	< 0.06	5.2
No	20	Aug-03	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Yes	21	Dec-03	63	NA	< 0.3	< 0.3	< 0.3	< 0.6	< 5.0
Yes	22	Mar-04	< 50	NA	< 0.3	< 0.3	< 0.3	< 0.6	< 5.0
Yes	23	Jun-04	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	0.9
Yes	24	Sep-04	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	2.3
Yes	25	Dec-04	< 50	NA	NA	NA	NA	NA	NA
Yes	26	Mar-05	< 50	NA	NA	NA	NA	NA	NA
Yes	27	Jun-05	< 50	NA	NA	NA	NA	NA	NA
Yes	28	Sep-05	< 50	NA	NA	NA	NA	NA	NA
Yes	29	Dec-05	< 50	NA	NA	NA	NA	NA	NA
Yes	30	Mar-06	< 50	NA	NA	NA	NA	NA	NA
Yes	31	Jun-06	< 50	NA	NA	NA	NA	NA	NA
Yes	32	Sep-06	< 50	NA	NA	NA	NA	NA	NA
Yes	33	Dec-06	59	NA	NA	NA	NA	NA	NA
Yes	34	Mar-07	<50	NA	NA	NA	NA	NA	NA
Yes	35	Jun-07	57	NA	NA	NA	NA	NA	NA
Yes	36	Sep-07	70	NA	NA	NA	NA	NA	NA
Yes	37	Dec-07	90	NA	NA	NA	NA	NA	NA

(table continued on next page; footnotes on final page)

Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-5</b>									
(a)	9	Feb-01	5,660	NA	76.9	21.1	47.3	312	< 0.3
(a)	10	May-01	22,000	NA	2,600	480	220	2,700	< 30
(a)	11	Jul-01	72,000	NA	3,500	1,100	4,300	22,000	2,500
Pre“hi-vac”	12	Oct 22-01	26,000	NA	2,800	980	6,000	950	2,300
Post “hi-vac”	12	Oct 26-01	17,000	NA	1,200	470	2,900	440	900
(a)	13	Dec-01	2,000	NA	620	190	110	910	< 20
No	14	Mar-02	8,800	NA	1,200	72	7.4	350	1,200
No	15	May-02	2,000	NA	150	38	21	260	13
No	16	Jul-02	4,200	NA	480	68	29	280	450
No	17	Oct-02	5,370	NA	236	45	23	39	135
No	18	Jan-03	8,270	NA	615	156	174	1,010	< 10
No	19	Mar-03	12,400	NA	824	195	213	1,070	< 0.18
No	20	Aug-03	18,000	10,000	950	290	330	1,820	< 2.0
Yes	21	Dec-03	11,900	800	627	263	288	1,230	595
Yes	22	Mar-04	20,700	850	867	266	305	678	145
Yes	23	Jun-04	12,000	1,700	920	240	260	1,150	< 3.1
Yes	24	Sep-04	13,000	1,900	580	240	260	1,260	< 4.2
Yes	25	Dec-04	16,000	3,300	730	200	250	1,100	< 4.2
Yes	26	Mar-05	6,300	4,600	190	28	42	280	< 1.7
Yes	27	Jun-05	16,000	4,100	1,100	260	380	1,590	< 7.1
Yes	28	Sep-05	15,000	3,600	810	210	300	1,300	< 1.3
Yes	29	Dec-05	9,600	3,600	270	80	110	710	< 1.7
Yes	30	Mar-06	9,800	5,100	240	47	97	590	< 2.0
Yes	31	Jun-06	28,000	4,900	920.0	250.0	350.0	1,480	< 2.0
Yes	32	Sep-06	12,000	2,400	580	170	230	980	< 3.6
Yes	33	Dec-06	15,000	3,400	510	160	260	1,190	<3.6
Yes	34	Mar-07	20,000	4,600	910	230	360	1,560	<3.6
No	35	Jun-07	NS	NS	NS	NS	NS	NS	NS
No	36	Sep-07	NS	NS	NS	NS	NS	NS	NS
No	37	Dec-07	NS	NS	NS	NS	NS	NS	NS

(table continued on next page; footnotes on final page)



Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-6</b>									
(a)	9	Feb-01	1,340	NA	17	0.967	11.1	51.4	< 0.3
(a)	10	May-01	610	NA	15	0.97	< 0.5	46	< 0.5
(a)	11	Jul-01	2,500	NA	130	4.7	53	170	120
Pre“hi-vac”	12	Oct 22-01	280	NA	18	1.2	6.2	4.7	6
Post “hi-vac”	12	Oct 26-01	3,600	NA	210	20	170	62	120
(a)	13	Dec-01	5,300	NA	69	5.6	14	17	< 2.0
No	14	Mar-02	71	NA	54	4.2	27	17	8.5
No	15	May-02	150	NA	9.3	< 0.5	< 0.5	< 0.5	1.5
No	16	Jul-02	2,200	NA	98	32	46	150	66
No	17	Oct-02	786	NA	48	5.0	2.2	44	16
No	18	Jan-03	497	NA	6.8	< 5.0	< 5.0	11	< 1.0
No	19	Mar-03	258	NA	5.4	< 0.32	3.3	< 1.1	< 0.18
No	20	Aug-03	1,600	2,800	37	4	23	58	< 0.5
Yes	21	Dec-03	365	200	2.5	3.8	1.4	6.1	< 5.0
Yes	22	Mar-04	215	140	4.0	1.2	1.4	1.4	3.7
Yes	23	Jun-04	710	830	14.0	0.7	5.2	6.6	< 0.5
Yes	24	Sep-04	350	600	< 0.5	2.4	< 0.5	< 0.5	< 0.5
Yes	25	Dec-04	280	1,100	4.9	< 0.5	1.4	4.4	< 0.5
Yes	26	Mar-05	300	980	5.4	< 0.5	3.3	2.3	< 0.5
Yes	27	Jun-05	150	1,100	< 0.5	< 0.5	< 0.5	0.77	28
Yes	28	Sep-05	680	200	13	0.9	6.6	13	< 0.5
Yes	29	Dec-05	240	890	3.6	< 0.5	0.7	2.4	0.5
Yes	30	Mar-06	530	950	8.3	< 0.5	4.0	2.1	0.6
Yes	31	Jun-06	460	1,300	8.3	< 0.5	1.4	2.6	< 0.5
Yes	32	Sep-06	530	730	10.0	0.8	4.1	7.5	< 0.5
Yes	33	Dec-06	500	750	7.5	< 0.5	2.6	2.5	< 0.5
Yes	34	Mar-07	430	530	7.1	< 0.5	1.7	0.8	< 0.5
No	35	Jun-07	NS	NS	NS	NS	NS	NS	NS
No	36	Sep-07	NS	NS	NS	NS	NS	NS	NS
No	37	Dec-07	NS	NS	NS	NS	NS	NS	NS

(table continued on next page; footnotes on final page)

Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-7</b>									
(a)	9	Feb-01	ND	NA	ND	ND	ND	ND	ND
(a)	10	May-01	< 50	NA	0.75	0.77	0.48	2.4	1.1
(a)	11	Jul-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pre“hi-vac”	12	Oct 22-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Post “hi-vac”	12	Oct 26-01	6,000	NA	170	550	110	120	970
(a)	13	Dec-01	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	43
No	14	Mar-02	< 50	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
No	15	May-02	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
No	16	Jul-02	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
No	17	Oct-02	< 100	NA	< 0.3	< 0.3	< 0.3	< 0.6	< 5.0
No	18	Jan-03	NA	NA	NA	NA	NA	NA	NA
No	19	Mar-03	< 15	NA	< 0.04	< 0.02	< 0.02	< 0.06	< 0.03
No	20	Aug-03	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Yes	21	Dec-03	< 50	NA	< 0.3	< 0.3	< 0.3	< 0.6	< 5.0
Yes	22	Mar-04	86	NA	< 0.3	< 0.3	< 0.3	< 0.6	57
Yes	23	Jun-04	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Yes	24	Sep-04	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Yes	25	Dec-04	< 50	NA	NA	NA	NA	NA	NA
Yes	26	Mar-05	< 50	NA	NA	NA	NA	NA	NA
Yes	27	Jun-05	< 50	NA	NA	NA	NA	NA	NA
Yes	28	Sep-05	< 50	NA	NA	NA	NA	NA	NA
Yes	29	Dec-05	< 50	NA	NA	NA	NA	NA	NA
Yes	30	Mar-06	< 50	NA	NA	NA	NA	NA	NA
Yes	31	Jun-06	< 50	NA	NA	NA	NA	NA	NA
Yes	32	Sep-06	< 50	NA	NA	NA	NA	NA	NA
Yes	33	Dec-06	< 50	NA	NA	NA	NA	NA	NA
Yes	34	Mar-07	< 50	NA	NA	NA	NA	NA	NA
No	35	Jun-07	NS	NA	NA	NA	NA	NA	NA
No	36	Sep-07	NS	NA	NA	NA	NA	NA	NA
No	37	Dec-07	NS	NA	NA	NA	NA	NA	NA

(table continued on next page; footnotes on final page)

Well Purged?	Sampling Event No.	Date Sampled	TVH-g	TEH-d	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE
<b>MW-8</b>									
(a)	9	Feb-01	1,000	NA	3.97	< 0.3	3.78	1.63	620
(a)	10	May-01	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	4.4
(a)	11	Jul-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Pre"hi-vac"	12	Oct 22-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Post "hi-vac"	12	Oct 26-01	< 5.0	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
(a)	13	Dec-01	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
No	14	Mar-02	< 50	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
No	15	May-02	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
No	16	Jul-02	< 50	NA	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
No	17	Oct-02	458	NA	1.7	< 0.3	< 0.3	< 0.6	233
No	18	Jan-03	< 100	NA	< 0.3	< 0.3	< 0.3	< 0.6	< 5.0
No	19	Mar-03	< 15	NA	< 0.22	< 0.32	< 0.31	< 0.4	< 0.18
No	20	Aug-03	190	< 50	< 0.5	< 0.5	< 0.5	0.6	< 0.5
Yes	21	Dec-03	163	< 100	< 0.3	< 0.3	< 0.3	< 0.6	66
Yes	22	Mar-04	412	< 100	1.2	< 0.3	1.7	3.9	66
Yes	23	Jun-04	320	68	< 0.5	< 0.5	< 0.5	< 0.5	120
Yes	24	Sep-04	280	2600	< 0.5	< 0.5	< 0.5	< 0.5	120
Yes	25	Dec-04	270	84	< 0.5	< 0.5	< 0.5	< 0.5	94
Yes	26	Mar-05	270	120	< 0.5	< 0.5	< 0.5	< 1.0	66
Yes	27	Jun-05	510	63	6.8	< 0.5	2.4	5.3	< 0.5
Yes	28	Sep-05	520	< 50	< 0.5	< 0.5	< 0.5	< 1.0	65
Yes	29	Dec-05	65	57	< 0.5	< 0.5	< 0.5	< 1.0	29
Yes	30	Mar-06	140	120	< 0.5	< 0.5	< 0.5	0.6	24
Yes	31	Jun-06	710	170	< 0.5	< 0.5	< 0.5	< 1.0	81
Yes	32	Sep-06	330	260	< 0.5	< 0.5	< 0.5	< 0.5	44
Yes	33	Dec-06	63	< 50	< 0.5	< 0.5	< 0.5	< 0.5	21
Yes	34	Mar-07	250	130	< 0.5	< 0.5	< 0.5	0.5	5
Yes	35	Jun-07	320	150	5.2	< 0.5	< 0.5	0.7	89
Yes	36	Sep-07	NS	NS	NS	NS	NS	NS	NS
Yes	37	Dec-07	NS	NS	NS	NS	NS	NS	NS

Notes:

(a) Data not available to Ses as to whether the samples were collected "post-purge" or before purging.

"No Purge" means no purging was conducted before the groundwater sample was collected.

TVH-g = Total Volatile Hydrocarbons - gasoline range. TEH-d = Total Extractable Hydrocarbons - diesel range.

NA = Not analyzed for this constituent in this event.

ND = Not Detected (method reporting limit not specified in the information available to SES).

**TABLE C-2**  
**Historical Groundwater Monitoring Well Groundwater Analytical Results**  
**Fuel Oxygenates and VOCs (µg/L)**  
**240 W. MacArthur Boulevard, Oakland, California**

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	7	Jun-00	< 5.0	< 5.0	51	< 5	< 1,000	< 1000	< 50	< 5	< 5	< 5	< 5	ND
	14	Mar-02	< 1.0	< 1.0	< 1	1.6	< 10	NA	< 2	< 1	< 1	< 1	< 1	ND
	18	Jan-03	< 50	< 50	150	< 50	NA	68	< 10	< 50	< 50	< 50	< 50	ND
<b>MW-1</b>	19	Mar-03	< 0.26	< 0.17	373	< 0.49	NA	< 10	< 0.29	< 0.88	< 0.30	< 0.23	< 0.36	ND
	20	Aug-03	< 1.0	7.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21	Dec-03	< 5.0	< 5.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	< 0.26	< 0.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 5.0	< 5.0	NA	NA	NA	270	< 5.0	NA	NA	NA	NA	NA
	24	Sep-04	< 5.0	< 5.0	NA	NA	NA	120	< 5.0	NA	NA	NA	NA	NA
	25	Dec-04	< 1.3	< 1.3	NA	NA	NA	< 25	< 1.3	NA	NA	NA	NA	NA
	26	Mar-05	< 0.50	< 0.50	NA	NA	NA	< 10	< 0.50	NA	NA	NA	NA	NA
	27	Jun-05	< 13	< 13	NA	NA	NA	< 250	< 13	NA	NA	NA	NA	NA
	28	Sep-05	< 2.5	6.5	NA	NA	NA	240	< 2.5	NA	NA	NA	NA	NA
	29	Dec-05	< 1.3	< 1.3	NA	NA	NA	100	< 3.6	NA	NA	NA	NA	NA
	30	Mar-06	< 2.0	< 2.0	NA	NA	NA	83	< 2.0	NA	NA	NA	NA	NA
	31	Jun-06	< 2.5	< 2.5	NA	NA	NA	220	< 2.5	NA	NA	NA	NA	NA
	32	Sep-06	< 13	< 13	NA	NA	NA	320	< 13	NA	NA	NA	NA	NA
	33	Dec-06	< 13	< 13	NA	NA	NA	320	< 13	NA	NA	NA	NA	NA
	34	Mar-07	< 13	< 13	NA	NA	NA	< 250	< 13	NA	NA	NA	NA	NA
	35	Jun-07	< 1.7	< 1.7	NA	NA	NA	37	< 1.7	NA	NA	NA	NA	NA
	36	Sep-07	< 0.5	1.8	NA	NA	NA	66	< 0.5	NA	NA	NA	NA	NA
	37	Dec-07	< 1.0	< 1.0	NA	NA	NA	26	< 1.0	NA	NA	NA	NA	NA

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Table C-2 Continued

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	7	Jun-00	< 0.5	< 0.5	< 0.5	< 0.5	< 100	< 100	< 5.0	< 0.5	< 0.5	< 0.5	< 0.5	ND
	14	Mar-02	< 1.0	< 1.0	< 1	< 1	220	NA	< 2	< 1	< 1	< 1	< 1	ND
	18	Jan-03	< 5	< 5	< 5	< 5	NA	34	< 1	< 5	24	< 5	< 5	ND
	19	Mar-03	< 0.26	< 0.17	< 0.49	< 0.26	NA	94	< 0.29	< 0.88	15	< 0.23	< 0.36	ND
<b>MW-2</b>	21	Dec-03	< 0.6	< 0.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	20	Aug-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21	Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 0.5	2.0	NA	NA	NA	190	1.1	NA	NA	NA	NA	NA
	24	Sep-04	< 0.5	1.2	NA	NA	NA	130	0.9	NA	NA	NA	NA	NA
	25	Dec-04	< 0.5	< 0.5	NA	NA	NA	< 10	0.8	NA	NA	NA	NA	NA
	26	Mar-05	< 1.0	< 1.0	NA	NA	NA	< 20	1.3	NA	NA	NA	NA	NA
	27	Jun-05	< 0.50	< 0.50	NA	NA	NA	200	0.79	NA	NA	NA	NA	NA
	28	Sep-05	< 0.50	0.6	NA	NA	NA	150	0.8	NA	NA	NA	NA	NA
	29	Dec-05	< 0.50	< 0.50	NA	NA	NA	54	1.0	NA	NA	NA	NA	NA
	30	Mar-06	< 0.7	< 0.7	NA	NA	NA	56	1.2	NA	NA	NA	NA	NA
	31	Jun-06	< 0.8	1.4	NA	NA	NA	56	< 0.8	NA	NA	NA	NA	NA
	32	Sep-06	< 0.5	1.3	NA	NA	NA	59	0.8	NA	NA	NA	NA	NA
	33	Dec-06	< 0.5	1.3	NA	NA	NA	59	0.8	NA	NA	NA	NA	NA
	34	Mar-07	< 0.5	2.5	NA	NA	NA	65	1.2	NA	NA	NA	NA	NA
	35	Jun-07	< 0.5	< 0.5	NA	NA	NA	24	6.1	NA	NA	NA	NA	NA
	36	Sep-07	< 0.5	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA
	37	Dec-07	< 0.5	< 0.5	NA	NA	NA	21	3.4	NA	NA	NA	NA	NA

(table continued on next page)

Table C-2 Continued

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	14	Mar-02	< 1.0	< 1.0	1.8	4.7	180	NA	< 2	2.2	< 1	< 1	< 1	ND
	18	Jan-03	< 5	< 5	< 5	5.0	NA	76	< 1	< 5	21	< 5	< 5	(a)
	19	Mar-03	< 0.26	< 0.17	< 0.49	< 0.26	NA	< 10	< 0.29	< 0.88	24	< 0.23	< 0.36	ND
<b>MW-3</b>	20	Aug-03	< 0.5	< 0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21	Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 0.5	< 0.5	NA	NA	NA	130	1.9	NA	NA	NA	NA	NA
	24	Sep-04	< 0.5	< 0.5	NA	NA	NA	82	1.5	NA	NA	NA	NA	NA
	25	Dec-04	< 0.7	< 0.7	NA	NA	NA	< 14	1.3	NA	NA	NA	NA	NA
	26	Mar-05	< 1.0	< 1.0	NA	NA	NA	< 20	1.1	NA	NA	NA	NA	NA
	27	Jun-05	< 0.5	< 0.5				160	1.4					
	28	Sep-05	< 0.5	1.5	NA	NA	NA	94	0.9	NA	NA	NA	NA	NA
	29	Dec-05	< 0.7	< 0.7	NA	NA	NA	67	1.2	NA	NA	NA	NA	NA
	30	Mar-06	< 0.5	< 0.5	NA	NA	NA	29	1.0	NA	NA	NA	NA	NA
	31	Jun-06	< 0.5	< 0.5	NA	NA	NA	52	2.2	NA	NA	NA	NA	NA
	32	Sep-06	<1.7	1.8	NA	NA	NA	53	1.7	NA	NA	NA	NA	NA
	33	Dec-06	<1.7	1.8	NA	NA	NA	53	1.7	NA	NA	NA	NA	NA
	34	Mar-07	<0.5	<0.5	NA	NA	NA	37	1.9	NA	NA	NA	NA	NA
	35	Jun-07	<0.5	<0.5	NA	NA	NA	10	1.0	NA	NA	NA	NA	NA
	36	Sep-07	<0.5	<0.5	NA	NA	NA	49	1.9	NA	NA	NA	NA	NA
	37	Dec-07	<0.5	<0.5	NA	NA	NA	71	8.6	NA	NA	NA	NA	NA

(table continued on next page)

Table C-2 Continued

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	7	Jun-00	< 0.5	< 0.5	< 0.5	< 0.5	< 100	< 100	< 5.0	< 0.5	< 0.5	< 0.5	< 0.5	ND
	14	Mar-02	< 1.0	< 1.0	< 1	< 1	< 10	NA	< 2	< 1	2.9	3.7	5.0	ND
	18	Jan-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
<b>MW-4</b>	19	Mar-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
	20	Aug-03	< 0.5	< 0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21	Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 0.5	< 0.5	NA	NA	NA	< 10	< 0.5	NA	NA	NA	NA	NA
	24	Sep-04	< 0.5	< 0.5	NA	NA	NA	< 10	< 0.5	NA	NA	NA	NA	NA
	25	Dec-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	26	Mar-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	27	Jun-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	28	Sep-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	29	Dec-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	30	Mar-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	31	Jun-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	32	Sep-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	33	Dec-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	34	Mar-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	36	Sep-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	37	Dec-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

(table continued on next page)

Table C-2 Continued

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	14	Mar-02	< 1.0	< 1.0	< 1	2.7	640	NA	< 2	< 1	< 1	< 1	< 1	ND
	18	Jan-03	< 50	< 50	512	122	NA	< 100	< 10	120	< 50	< 50	< 50	ND
	19	Mar-03	< 0.26	< 0.17	554	107	NA	< 10	< 0.29	251	< 0.3	< 0.23	< 0.36	(b)
<b>MW-5</b>	20	Aug-03	< 2.0	6.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21	Dec-03	< 5.0	< 5.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	< 0.26	< 0.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 3.1	< 3.1	NA	NA	NA	120	< 3.1	NA	NA	NA	NA	NA
	24	Sep-04	< 4.2	18	NA	NA	NA	87	< 4.2	NA	NA	NA	NA	NA
	25	Dec-04	< 4.2	< 4.2	NA	NA	NA	< 83	< 4.2	NA	NA	NA	NA	NA
	26	Mar-05	< 1.7	< 1.7	NA	NA	NA	< 33	< 1.7	NA	NA	NA	NA	NA
	27	Jun-05	< 7.1	< 7.1	NA	NA	NA	< 140	< 7.1	NA	NA	NA	NA	NA
	28	Sep-05	< 1.3	7.7	NA	NA	NA	87	< 0.50	NA	NA	NA	NA	NA
	29	Dec-05	< 1.7	< 1.7	NA	NA	NA	< 33	< 1.7	NA	NA	NA	NA	NA
	30	Mar-06	< 2.0	< 2.0	NA	NA	NA	< 2.0	< 2.0	NA	NA	NA	NA	NA
	31	Jun-06	< 2.0	10	NA	NA	NA	61	< 2.0	NA	NA	NA	NA	NA
	32	Sep-06	< 3.6	5.5	NA	NA	NA	76	< 3.6	NA	NA	NA	NA	NA
	33	Dec-06	< 3.6	5.5	NA	NA	NA	76	< 3.6	NA	NA	NA	NA	NA
	34	Mar-07	< 3.6	< 3.6	NA	NA	NA	< 71	< 3.6	NA	NA	NA	NA	NA
	35	Jun-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA
	36	Sep-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA
	37	Dec-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA

(table continued on next page)



Table C-2 Continued

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	14	Mar-02	< 1.0	< 1.0	< 1	2.2	< 10	NA	< 2	1.6	< 1	< 1	< 1	ND
	18	Jan-03	< 5.0	< 5.0	13	< 5	NA	46	< 1	< 5	< 5	< 5	< 5	ND
	19	Mar-03	< 0.26	6.9	< 0.49	< 0.26	NA	40	< 0.29	< 0.88	< 0.3	< 0.23	< 0.36	(c.)
	20	Aug-03	< 0.5	12.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
<b>MW-6</b>	21	Dec-03	< 5.0	11 / 17.1 <sup>(d)</sup>	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	< 0.26	31	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 0.5	19	NA	NA	NA	54	1.0	NA	NA	NA	NA	NA
	24	Sep-04	< 0.5	31	NA	NA	NA	43	1.0	NA	NA	NA	NA	NA
	25	Dec-04	< 0.5	24	NA	NA	NA	32	0.7	NA	NA	NA	NA	NA
	26	Mar-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	27	Jun-05	< 0.50	< 0.50	NA	NA	NA	26	< 0.50	NA	NA	NA	NA	NA
	28	Sep-05	< 0.50	15	NA	NA	NA	43	0.7	NA	NA	NA	NA	NA
	29	Dec-05	< 0.50	13	NA	NA	NA	30	0.9	NA	NA	NA	NA	NA
	30	Mar-06	< 0.50	15	NA	NA	NA	19	0.6	NA	NA	NA	NA	NA
	31	Jun-06	< 0.50	28	NA	NA	NA	53	1.3	NA	NA	NA	NA	NA
	32	Sep-06	< 0.50	11	NA	NA	NA	46	0.7	NA	NA	NA	NA	NA
	33	Dec-06	< 0.50	11	NA	NA	NA	46	0.7	NA	NA	NA	NA	NA
	34	Mar-07	< 0.5	10	NA	NA	NA	25	< 0.5	NA	NA	NA	NA	NA
	35	Jun-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA
	36	Sep-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA
	37	Dec-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA

(table continued on next page)

Table C-2 Continued

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	14	Mar-02	< 1.0	< 1.0	< 1	< 1	< 10	NA	< 2	< 1	< 1	< 1	< 1	ND
	18	Jan-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
	19	Mar-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
<b>MW-7</b>	20	Aug-03	< 0.5	< 0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21	Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 0.5	< 0.5	NA	NA	NA	< 10	< 0.5	NA	NA	NA	NA	NA
	24	Sep-04	< 0.5	< 0.5	NA	NA	NA	< 10	< 0.5	NA	NA	NA	NA	NA
	25	Dec-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	26	Mar-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	27	Jun-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	28	Sep-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	29	Dec-05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	30	Mar-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	31	Jun-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	32	Sep-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	32	Sep-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	33	Dec-06	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	34	Mar-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	35	Jun-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	36	Sep-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	37	Dec-07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

(table continued on next page)

Table C-2 Continued

Well I.D.	Sampling Event No.	Date Sampled	EDB	EDC	1,2,4-TMB	1,3,5-TMB	t-Butanol	TBA	DIPE	Naphthalene	cis-1,2-DCE	TCE	PCE	Others
	14	Mar-02	< 1.0	< 1.0	< 1	< 1	< 10	NA	< 2	< 1	< 1	< 1	< 1	ND
	18	Jan-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND
	19	Mar-03	< 0.26	< 0.17	< 0.49	< 0.26	NA	< 10	< 0.29	< 0.88	< 0.3	< 0.23	< 0.36	ND
<b>MW-8</b>	20	Aug-03	< 0.5	< 0.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	21	Dec-03	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	22	Mar-04	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	23	Jun-04	< 0.5	< 0.5	NA	NA	NA	61	1.0	NA	NA	NA	NA	NA
	24	Sep-04	< 0.5	< 0.5	NA	NA	NA	96	1.1	NA	NA	NA	NA	NA
	25	Dec-04	< 0.5	< 0.5	NA	NA	NA	< 10	1.0	NA	NA	NA	NA	NA
	26	Mar-05	< 0.5	< 0.5	NA	NA	NA	< 10	0.6	NA	NA	NA	NA	NA
	27	Jun-05	< 0.50	25.0	NA	NA	NA	42	1.1	NA	NA	NA	NA	NA
	28	Sep-05	< 0.50	< 0.5	NA	NA	NA	120	1.4	NA	NA	NA	NA	NA
	29	Dec-05	< 0.50	< 0.50	NA	NA	NA	27	< 0.50	NA	NA	NA	NA	NA
	30	Mar-06	< 0.50	< 0.50	NA	NA	NA	17	0.6	NA	NA	NA	NA	NA
	31	Jun-06	< 0.50	< 0.50	NA	NA	NA	20	0.9	NA	NA	NA	NA	NA
	32	Sep-06	< 0.50	< 0.50	NA	NA	NA	12	< 0.50	NA	NA	NA	NA	NA
	33	Dec-06	< 0.50	< 0.50	NA	NA	NA	12	< 0.50	NA	NA	NA	NA	NA
	34	Mar-07	< 0.50	< 0.50	NA	NA	NA	< 10	< 0.50	NA	NA	NA	NA	NA
	35	Jun-07	< 0.5	< 0.5	NA	NA	NA	14	1.3	NA	NA	NA	NA	NA
	36	Sep-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA
	37	Dec-07	NS	NS	NA	NA	NA	NS	NS	NA	NA	NA	NA	NA

Table C-2 - Footnotes

Notes:

Table includes only detected contaminants.

EDB = Ethylene dibromide, aka 1,2-Dibromoethane (lead scavenger)

EDC = Ethylene dichloride, aka 1,2-Dichloroethane (lead scavenger)

PCE = Tetrachloroethylene

DCE = Dichloroethylene

TCE = Trichloroethylene

TMB = Trimethylbenzene

DIPE = Isopropyl Ether (a.k.a. di-isopropyl ether)

TBA = Tertiary butyl alcohol

NLP = No Level Published

NA = Not analyzed for this constituent. ND = Not Detected

(a) Also detected were: n-propylbenzene (5.4 mg/L); p-Isopropyltoluene (14 mg/L); sec-Butylbenzene (7.2 mg/L)

(b) Also detected were: isopropylbenzene (38 mg/L); n-Butylbenzene (20 mg/L); n-propylbenzene (36 mg/L); p-Isopropyltoluene (14 mg/L).

(c.) Also detected were: isopropylbenzene (3.4 mg/L); n-propylbenzene (2.3 mg/L).

(d) Pre-purge / post-purge sampling, conducted in same event.

NS = Not Sampled

## **APPENDIX D**

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### **Historical Groundwater Elevation Data**

**Table D-1**  
**Historical Water Levels in Monitoring Wells**  
**240 W. MacArthur Boulevard, Oakland, Alameda, California**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-1	1	Aug-97	16.83	62.32
	2	Dec-97	NA	NA
	3	Mar-98	13.58	65.57
	4	Jul-98	15.55	63.60
	5	Oct-98	15.70	63.45
	6	Jan-99	15.21	63.94
	7	Jun-00	15.41	63.74
	8	Dec-00	NA	NA
	9	Feb-01	NA	NA
	10	May-01	15.57	63.58
	11	Jul-01	16.42	62.73
	12	Oct-01	16.82	62.33
	13	Dec-01	15.08	64.07
	14	Mar-02	14.53	64.62
	15	May-02	NA	NA
	16	Jul-02	16.39	62.76
	17	Oct-02	17.03	62.12
	18	Jan-03	14.91	64.24
	19	Mar-03	15.26	63.89
	20	Aug-03	16.24	62.91
	21	Dec-03	16.90	62.25
	22	Mar-04	14.33	64.82
	23	Jun-04	16.28	62.87
	24	Sep-04	17.03	62.12
	25	Dec-04	16.38	62.77
	26	Mar-05	14.30	64.85
	27	Jun-05	15.53	63.82
	28	Sep-05	16.42	62.73
	29	Dec-05	15.67	63.48
	30	Mar-06	12.75	66.40
	31	Jun-06	14.60	64.55
	32	Sep-06	16.52	62.63
	33	Dec-06	15.89	63.26
	34	Mar-07	15.50	63.65
	35	Jun-07	20.90	58.25
	36	Sep-07	23.30	55.85
	37	Dec-07	22.51	56.64

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

Data prior to August 2003 are likely not valid as well elevations were not surveyed.

**Table D-1 (continued)**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-2				
	1	Aug-97	16.32	62.13
	2	Dec-97	NA	NA
	3	Mar-98	13.05	64.95
	4	Jul-98	14.95	63.50
	5	Oct-98	15.09	63.36
	6	Jan-99	14.61	63.84
	7	Jun-00	14.80	63.65
	8	Dec-00	NA	NA
	9	Feb-01	NA	NA
	10	May-01	14.98	63.47
	11	Jul-01	15.86	62.59
	12	Oct-01	16.69	61.76
	13	Dec-01	13.49	64.96
	14	Mar-02	13.07	65.38
	15	May-02	NA	NA
	16	Jul-02	15.86	62.59
	17	Oct-02	16.54	61.91
	18	Jan-03	14.37	64.08
	19	Mar-03	14.74	63.71
	20	Aug-03	15.75	62.70
	21	Dec-03	16.11	62.34
	22	Mar-04	13.83	64.82
	23	Jun-04	15.76	62.69
	24	Sep-04	16.48	61.97
	25	Dec-04	15.74	62.71
	26	Mar-05	13.48	64.97
	27	Jun-05	14.48	63.97
	28	Sep-05	16.00	62.45
	29	Dec-05	14.88	63.57
	30	Mar-06	12.20	66.25
	31	Jun-06	14.15	64.30
	32	Sep-06	16.00	62.45
	33	Dec-06	15.19	63.26
	34	Mar-07	14.78	63.67
	35	Jun-07	20.60	57.85
	36	Sep-07	23.80	54.65 (dry)
37	Dec-07	22.36	56.09	

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

Data prior to August 2003 are likely not valid as well elevations were not surveyed.

**Table D-1 (continued)**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-3	1	Aug-97	15.36	62.22
	2	Dec-97	NA	NA
	3	Mar-98	12.18	65.40
	4	Jul-98	14.08	63.50
	5	Oct-98	14.24	63.34
	6	Jan-99	13.74	63.84
	7	Jun-00	13.94	63.64
	8	Dec-00	NA	NA
	9	Feb-01	NA	NA
	10	May-01	14.08	63.50
	11	Jul-01	14.99	62.59
	12	Oct-01	16.26	61.32
	13	Dec-01	13.62	63.96
	14	Mar-02	13.19	64.39
	15	May-02	NA	NA
	16	Jul-02	14.97	62.61
	17	Oct. 2002	15.44	62.14
	18	Jan-03	13.49	64.09
	19	Mar-03	13.83	63.75
	20	Aug-03	14.90	62.68
	21	Dec-03	15.10	62.48
	22	Mar-04	12.93	64.65
	23	Jun-04	14.90	62.68
	24	Sep-04	15.61	61.97
	25	Dec-04	14.77	62.81
	26	Mar-05	12.60	64.98
	27	Jun-05	13.73	63.85
	28	Sep-05	15.14	62.44
	29	Dec-05	13.94	63.64
	30	Mar-06	11.25	66.33
	31	Jun-06	13.27	64.31
	32	Sep-06	15.12	62.46
	33	Dec-06	14.34	63.24
	34	Mar-07	13.96	63.62
	35	Jun-07	19.60	57.98
	36	Sep-07	22.90	54.68
	37	Dec-07	21.45	56.13

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

Data prior to August 2003 are likely not valid as well elevations were not surveyed.

**Table D-1 (continued)**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-4	1	Aug-97	NA	NA
	2	Dec-97	NA	NA
	3	Mar-98	11.87	65.87
	4	Jul-98	13.90	63.84
	5	Oct-98	14.10	63.64
	6	Jan-99	13.56	64.18
	7	Jun-00	13.75	63.99
	8	Dec-00	NA	NA
	9	Feb-01	NA	NA
	10	May-01	13.65	64.09
	11	Jul-01	14.87	62.87
	12	Oct-01	15.78	61.96
	13	Dec-01	13.54	64.20
	14	Mar-02	13.02	64.72
	15	May-02	NA	NA
	16	Jul-02	14.81	62.93
	17	Oct-02	15.56	62.18
	18	Jan-03	13.39	64.35
	19	Mar-03	13.75	63.99
	20	Aug-03	14.75	62.99
	21	Dec-03	15.11	62.63
	22	Mar-04	12.78	64.96
	23	Jun-04	14.68	63.06
	24	Sep-04	15.17	62.57
	25	Dec-04	14.90	62.84
	26	Mar-05	12.57	65.17
	27	Jun-05	13.43	64.31
	28	Sep-05	15.13	62.61
	29	Dec-05	13.83	63.91
	30	Mar-06	10.90	66.84
	31	Jun-06	13.02	64.72
	32	Sep-06	15.16	62.58
	33	Dec-06	14.35	63.39
	34	Mar-07	13.85	63.89
	35	Jun-07	18.41	59.33
	36	Sep-07	19.36	58.38
	37	Dec-07	19.13	58.61

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

Data prior to August 2003 are likely not valid as well elevations were not surveyed.



**Table D-1 (continued)**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-5	9	Feb-01	NA	NA
	10	May-01	15.65	63.71
	11	Jul-01	16.50	62.86
	12	Oct-01	17.46	61.90
	13	Dec-01	15.28	64.08
	14	Mar-02	14.62	64.74
	15	May-02	NA	NA
	16	Jul-02	16.46	62.90
	17	Oct-02	17.18	62.18
	18	Jan-03	14.99	64.37
	19	Mar-03	15.33	64.03
	20	Aug-03	16.34	63.02
	21	Dec-03	16.90	62.46
	22	Mar-04	14.44	64.92
	23	Jun-04	16.43	62.93
	24	Sep-04	17.07	62.29
	25	Dec-04	16.59	62.77
	26	Mar-05	14.08	65.28
	27	Jun-05	15.33	64.03
	28	Sep-05	16.61	62.75
	29	Dec-05	15.81	63.55
	30	Mar-06	12.75	66.61
	31	Jun-06	14.65	64.71
	32	Sep-06	16.66	62.70
	33	Dec-06	16.10	63.26
	34	Mar-07	15.22	64.14
	35	Jun-07	19.29	60.07
	36	Sep-07	NM	dry
	37	Dec-07	NM	dry

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

NM = Not Measurable

Data prior to August 2003 are likely not valid as well elevations were not surveyed.

**Table D-1 (continued)**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-6	9	Feb-01	NA	NA
	10	May-01	15.54	62.89
	11	Jul-01	15.56	62.87
	12	Oct-01	16.41	62.02
	13	Dec-01	14.37	64.06
	14	Mar-02	13.75	64.68
	15	May-02	NA	NA
	16	Jul-02	15.55	62.88
	17	Oct-02	16.24	62.19
	18	Jan-03	14.17	64.26
	19	Mar-03	14.52	63.91
	20	Aug-03	15.50	62.93
	21	Dec-03	16.19	62.24
	22	Mar-04	13.51	64.92
	23	Jun-04	15.42	63.01
	24	Sep-04	16.13	62.30
	25	Dec-04	15.40	63.03
	26	Mar-05	13.28	65.15
	27	Jun-05	14.14	64.29
	28	Sep-05	15.61	62.82
	29	Dec-05	14.90	63.53
	30	Mar-06	11.85	66.58
	31	Jun-06	13.73	64.70
	32	Sep-06	15.71	62.72
	33	Dec-06	15.15	63.28
	34	Mar-07	14.58	63.85
	35	Jun-07	19.40	59.03
	36	Sep-07	20.00	58.43 (dry)
	37	Dec-07	NM	dry

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

NM = Not Measurable

Data prior to August 2003 are likely not valid as well elevations were not surveyed.

**Table D-1 (continued)**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-7	9	Feb-01	NA	NA
	10	May-01	15.04	62.23
	11	Jul-01	15.69	62.58
	12	Oct-01	16.59	61.68
	13	Dec-01	14.30	63.97
	14	Mar-02	13.87	64.40
	15	May-02	NA	NA
	16	Jul-02	15.72	62.55
	17	Oct-02	16.36	61.91
	18	Jan-03	14.22	64.05
	19	Mar-03	14.57	63.70
	20	Aug-03	15.61	62.66
	21	Dec-03	16.04	62.23
	22	Mar-04	13.57	64.70
	23	Jun-04	15.63	62.64
	24	Sep-04	16.33	61.94
	25	Dec-04	15.70	62.57
	26	Mar-05	13.42	64.85
	27	Jun-05	14.53	63.74
	28	Sep-05	15.81	62.46
	29	Dec-05	14.88	63.39
	30	Mar-06	13.00	65.27
	31	Jun-06	13.98	64.29
	32	Sep-06	15.82	62.45
	33	Dec-06	15.12	63.15
	34	Mar-07	14.66	63.61
	35	Jun-07	19.18	59.09
	36	Sep-07	19.96	58.31 (dry)
	37	Dec-07	NM	dry

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

NM = Not Measurable

Data prior to August 2003 are likely not valid as well elevations were not surveyed.

**Table D-1 (continued)**

Well I.D.	Sampling Event No.	Date Measured	Water Level Depth (a)	Water Level Elevation (b)
MW-8	10	May-01	12.75	63.64
	11	Jul-01	13.84	62.55
	12	Oct-01	14.65	61.74
	13	Dec-01	12.39	64.00
	14	Mar-02	11.89	64.50
	15	May-02	NA	NA
	16	Jul-02	13.96	62.43
	17	Oct-02	14.48	61.91
	18	Jan-03	12.49	63.90
	19	Mar-03	12.85	63.54
	20	Aug-03	13.75	62.65
	21	Dec-03	14.50	61.89
	22	Mar-04	11.78	64.61
	23	Jun-04	13.71	62.68
	24	Sep-04	14.43	61.96
	25	Dec-04	13.64	62.75
	26	Mar-05	11.52	64.87
	27	Jun-05	12.50	63.89
	28	Sep-05	13.90	62.49
	29	Dec-05	12.75	63.64
	30	Mar-06	10.80	65.59
	31	Jun-06	12.10	64.29
	32	Sep-06	13.93	62.46
	33	Dec-06	13.12	63.27
	34	Mar-07	12.76	63.63
	35	Jun-07	18.40	57.99
	36	Sep-07	19.12	57.27 (dry)
	37	Dec-07	NM	dry

Notes:

(a) Feet below well top of casing.

(b) Relative to mean sea level.

NA = Data Not Available

NM = Not Measurable

Data prior to August 2003 are likely not valid as well elevations were not surveyed.