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# GROUNDWATER MONITORING REPORT

Cavanaugh Motors Facility  
1700 Park Street  
Alameda, California

April 23, 1996

Prepared for

Mr. Dave Cavanaugh  
**Cavanaugh Motors**  
1700 Park Street  
Alameda, California 94501

Prepared by

E-Tech Services  
408 Lewis Lane  
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Project No. 95009

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**CERTIFICATION OF PROFESSIONAL SUPERVISION**

Groundwater Monitoring Report  
Cavanaugh Motors Facility  
1700 Park Street  
Alameda, California

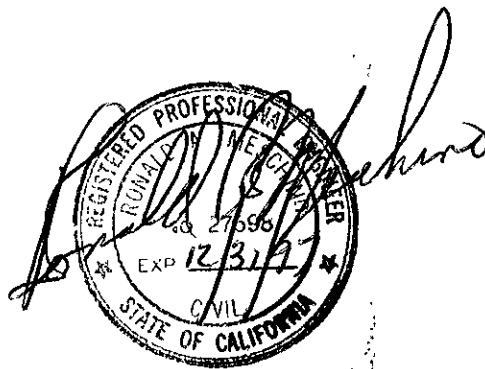
E-Tech Services supervised the preparation of this Groundwater Monitoring Report, dated April 23, 1996, for the Cavanaugh Motors facility in the City of Alameda, Alameda County, California. Techniques and standards of care common to the consulting geologic profession in California, were used in the preparation of this report.

This document, signed and stamped with seal, follows section 7835 of the Geologist and Geophysicists Act, Business and Professionals Code, State of California and the requirements of the California Regional Water Quality Control Board, San Francisco Bay Region.

*Tom Ghiotto*  
Tom Ghiotto  
Senior Project Manager

E-Tech Services Certifying Professional;

Ron Mecshino Date:  
Registered Civil Engineer No. 27598  
License expires December 31, 1997.



# GROUNDWATER MONITORING REPORT

1700 Park Street, Alameda, California.

## 1.0 SUMMARY OF FINDINGS

In December 1989 and August 1990, two underground storage tanks (a gasoline tank and a waste oil tank) were removed from separate locations on the site. In April, 1990, and January 1991, approximately 120 cubic yards of accessible contaminated soils were excavated from the tank locations. Approximately 120 cubic yards of contaminated soils are being treated on site.

TMC ENVIRONMENTAL, INC. (TMC) subsequently installed six groundwater monitoring wells at the site and are indicated in this report as MW-1, MW-2, MW-3, MW-4, MW-5, and MW-6. Monitoring well MW-1, which was located in the former gasoline tank excavation pit, has since been destroyed with the authorization of the Alameda County Health Care Services Agency, Department of Environmental Health, Division of Hazardous Materials (ACHCSA), and under permit from the Alameda County Flood Control and Water District, Zone Seven (ZONE 7). The well destruction was performed by Bay Area Exploration, Inc. (BAE), a State licensed drilling contractor, on February 27, 1995. Monitoring well MW-2 is located up-gradient from the former gasoline tank and is near the southern limits of the site. Monitoring well MW-4 is located in the western portion of the site, "cross-gradient" from the former gasoline tank. Groundwater monitoring well MW-6 is located within the limits of the former waste oil tank excavation inside the existing auto repair shop. Monitoring wells MW-3 and MW-5 are located in the down gradient direction from the former waste oil tank.

Due to the proximity of buildings, not all of the soil contamination was excavated from the former gasoline tank pit. In March, 1993, TMC installed a soil vapor extraction system in the vicinity of the former gasoline tank to remediate gasoline-contaminated soils (associated with the former gasoline tank) remaining at the site. To verify that the soil contamination was remediated, four soil borings were placed within the soil contaminant plume. TMC performed this work August 25, 1994. Sample results revealed that the soil vapor extraction system was effective in remediating soil contamination that remained in the vicinity of the former gasoline tank. With the authorization of the ACHCSA, the vapor wells associated with this system were subsequently destroyed by BAE on February 27, 1995 under permit from ZONE 7. TMC supervised all well destruction activities.

Per the request of the ACHCSA, TMC installed an additional groundwater monitoring well (August 25, 1994) down gradient from the former gasoline tank. This well was constructed similarly to the existing monitoring wells and is indicated as MW-7 on the attached plates. Chemical analysis of soil samples recovered from this well revealed non-detectable levels of gasoline and benzene, toluene, ethylbenzene, and xylene (BTEX).

Per the authorization of the ACHCSA, TMC modified the quarterly sampling schedule as follows: sample MW-7 quarterly; sample MW-3, MW-5, and MW-6 semi-annually; and discontinue sampling of MW-2 and MW-4. However, groundwater elevation data is collected from all wells during every sampling episode. The elevation data is subsequently used in the calculation of the average groundwater gradient and flow direction across the site.

As of November 1995, E-Tech Services (E-Tech), of Pacifica, California has been contracted as Mr. Cavanaugh's Environmental Consultant. The first sampling episode performed by E-Tech is this quarter, dated December 18, 1995. It is the understanding of E-Tech that this is the fifteenth (15th) quarterly monitoring episode performed at the subject site. It is also the understanding of E-Tech that this is the final sampling episode required for the site as per Ms. Eva Chu of the Alameda County Health Department. E-Tech was informed that Ms. Chu will be submitting a request for site closure to the Regional Water Quality Control Board (RWQCB) and that upon receipt of permission, Mr. Cavanaugh could destroy the wells and that all environmental work would be completed for the site.

Groundwater gradient and direction was estimated by using water levels measurements from monitoring wells MW-2, MW-4 and MW-5. Recent groundwater data indicates groundwater flows in a north westerly direction, with a gradient of 0.0760 feet/foot.

## 2.0 GENERAL SITE INFORMATION

### 2.1 SITE LOCATION

The Cavanaugh Motors property, called "site" in this report, is at the following address and description (see Plate 1, Site Vicinity Map):

1700 Park Street, City of Alameda  
Alameda County, California  
Appraisers parcel number: APN 70-192-21-1 and 24  
Lots 1, 2, 3, portion of 4, 7 Block E of Alameda  
Station Homestead Tract (Book 17 page 60)

The site is at the northeast corner of the intersection of Park Street and Buena Vista Avenue. The corner lot is approximately 150 feet by 200 feet in dimension.

## **2.2 RESPONSIBLE PARTY**

The current property owners are:

Lee and Dave Cavanaugh  
1700 Park Street, Alameda, California 94501

Mr. Dave Cavanaugh is the site contact, and can be reached at (510) 523-5246.

## **2.3 CONSULTANT OF RECORD**

The consultant of record for this project is:

E-Tech Services (E-Tech )  
408 Lewis Lane  
Pacifica, California 94044

The contacts for E-Tech are Mr. Tom Ghigliotto, Senior Project Manager and Mr. Marc Edwards, project Manager. Mr. Ghigliotto and Mr. Edwards can be reached at (415) 359-6590

## **2.4 LEAD IMPLEMENTING AGENCY**

The enforcing agency authorized by the Regional Water Quality Control Board (RWQCB) to oversee this site is:

Alameda County Health Care Services Agency  
Department of Environmental Health  
Division of Hazardous Materials  
1131 Harbor Bay Parkway, Alameda, California 94501

The officer overseeing this case is Ms. Eva Chu. Ms. Chu can be called at (510) 337-2864.

E-Tech followed the guidelines of the enforcing agency and the Bay Area Regional Water Quality Control Board (RWQCB) in preparing this report. The investigation, reclamation, and reporting guidelines applicable to leaking underground fuel tanks, available through these agencies, apply to this site. These guidelines are available from the Alameda County Health Care Services Agency (ACHCSA).

## 2.5 SITE CONDITION

The site is presently being used as an automobile dealership and repair facility. The property is located in a commercial and residential neighborhood. Current activities include: a new car showroom; sales offices; parts storage and distribution; outside car storage; and a vehicle repair shop; see Plate 2, Site Plan. No underground storage facilities exist at the site.

Foot and vehicle traffic is heavy in this neighborhood and site. The site contains a large building with paved parking areas and driveways. Access to the dealership is from both Park Street that borders the property on the north, and from Buena Vista Avenue that borders the property on the south. A gasoline station and automobile dealers occur across Park Street to the west and south, respectively. A motor vehicle repair shop bounds the site on the northeast. Adjacent to the site on the eastern portion of the site is a residential neighborhood.

Six groundwater monitoring wells exist at the site. These are indicated in this report and on Plate 2, Site Plan, as MW-2, MW-3, MW-4, MW-5, MW-6 and MW-7. These wells are constructed to monitor the shallow water bearing zone beneath the site. Monitoring well MW-1, which was located in the former gasoline tank excavation pit, was destroyed on February 27, 1995 with the authorization of the ACHCSA and under permit from ZONE 7.

## 2.6 GEOLOGY

The site is approximately one half mile west of the Oakland Estuary and Inner Harbor Waterway. San Francisco Bay is about one mile west of the site. The Inner Harbor Waterway connects San Leandro Bay and San Francisco Bay. As suggested by U.S. Geological Survey geological publications, the site is on the Alameda Bay Plain that has an alluvial fan environment. The Merritt Sand Formation is the main stratigraphic unit in the upper aquifer. This unit usually has unconsolidated beach sand and near shore deposits. Borings on the site have encountered unconsolidated sands and clayey sands. Lenses of clayey sand occur in the sand. It appears that groundwater in the Merritt Sand Formation is unconfined. Groundwater is approximately eight feet below surface grade (BSG) at the site during most of the year, but may rise to within five feet BSG during winter rainfall.

## 2.7 ENVIRONMENTAL SITE WORK

In December 1989 and August 1990, two underground storage tanks (one gasoline and one automotive waste oil) were removed from separate locations at the site; see Plate 2. Soil samples recovered during the tank removal activities revealed the presence of petroleum materials. The soils found to be contaminated, and accessible, were excavated and stockpiled on site. Approximately 120 cubic yards of contaminated soil were removed and stockpiled on site. Site

conditions prevented the complete removal of contaminated soils associated with the gasoline tank.

Subsequent to the tank removals and soil excavation, TMC performed a subsurface soils and groundwater investigation at the site. As part of the investigation, six groundwater monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5 and MW-6. Detectable levels of gasoline were found in soils and groundwater in the vicinity of the former gasoline tank. Detectable levels of diesel/kerosene and dichlorobenzene were found in the vicinity of the former waste oil tank. Results of this investigation work and the subsequent quarterly monitoring indicate ground water contamination associated with the former tanks is localized.

During the subsurface investigation work, four vapor extraction wells (VW-1, VW-2, VW-3 and VW-4) were installed at the site. The purpose of the extraction wells was to remediate the contaminated soils in the vicinity of the former gasoline tank. TMC constructed a soil vapor extraction system in February 1993. Initial pilot tests of the system revealed that elevated groundwater levels at the site (due to high rainfall) hampered the effectiveness of the system. Once the groundwater levels dropped, the system was started (July 7, 1993). Its operation continued until influent soil - vapor readings declined and stabilized to approximately 40 ppm. The system was shut down January 24, 1994.

On August 25, 1994, TMC drilled four soil borings in the vicinity of MW-1 and the former gasoline tank. These borings are indicated as VB-1, VB-2, VB-3, and VB-4. The purpose of this work was to verify that the soil vapor extraction system was effective in remediating soil contaminated soils associated with the former tank.

TMC additionally constructed a groundwater monitoring well approximately 10 feet down gradient from the former gasoline tank, indicated as MW-7.

Results of the soil samples recovered from the verification bores (VB-1 through VB-4) and the groundwater monitoring well MW-7 revealed detectable levels of Ethyl Benzene in sample VB3-2 (7 - 7½ feet) of 12 parts per billion (ppb). All other soil samples had non-detectable levels of the target analytes.

## 2.8 DESTRUCTION OF MW-1 AND FORMER VAPOR EXTRACTION WELLS

On February 27, 1995 TMC supervised the destruction of monitoring well MW-1 and the vapor recovery wells. MW-1 was destroyed in anticipation of excavation activities scheduled to occur in the immediate vicinity of the former well and the former gasoline tank. The vapor extraction wells were destroyed as they were no longer in use. The well destruction activities were approved by the ACHCSA and were permitted by ZONE 7 prior to the commencement of work. TMC supervised the destruction which was performed by Bay Area Exploration (BAE) of Fairfield, California.



### 3.0 GROUNDWATER SAMPLING

On March 19, 1995, E-Tech recovered groundwater samples from monitoring wells MW-3, MW-5, MW-6 and MW-7 in accordance with the sampling schedule set forth in the ACHCSA letter dated December 29, 1994.

All ground water samples were analyzed for the target chemicals of total petroleum hydrocarbons as gasoline (TPH-g), and benzene, toluene, ethylbenzene, and total xylenes (BTEX). The following tables summarize recent and previous analyses results. Table 1, Gasoline Results for Groundwater Samples, lists the historic gasoline results for samples recovered from the site and this sampling of all wells.

TABLE 1 GASOLINE RESULTS FOR GROUND WATER SAMPLES

<i>Date Sampled</i>	<i>Monitoring Well</i>	<i>TPH gas ug/L</i>	<i>Benzene ug/L</i>	<i>Toluene ug/L</i>	<i>Ethyl benzene ug/L</i>	<i>Xylenes ug/L</i>
<i>June 1990 Groundwater Sampling</i>						
6-08-90	MW-1	28000	6200	7000	630	6100
6-08-90	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
6-08-90	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
6-08-90	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
<i>December 1990 Groundwater Sampling</i>						
12-17-90	MW-1	7200	620	250	1200	1400
12-17-90	MW-2	ND<50	1.1	ND<0.5	2.3	2.1
12-17-90	MW-3	140	ND<0.5	1.3	1.3	9.1
12-17-90	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
<i>July 1991 Groundwater Sampling</i>						
7-29-91	MW-1	21000	890	1900	320	1700

Date Sampled	Monitoring Well	TPH gas ug/L	Benzene ug/L	Toluene ug/L	Ethyl benzene ug/L	Xylenes ug/L
7-30-91	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-18-91	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-30-91	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-18-91	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	0.9
7-18-91	MW-6	ND<50	1.3	ND<0.5	ND<0.5	1.6
<i>December 1991 Groundwater Sampling</i>						
12-4-91	MW-1	4300	3.2	1.3	88	630
12-4-91	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
12-4-91	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>April 1992 Groundwater Sampling</i>						
4-30-92	MW-1	16000	910	2000	250	1400
4-29-92	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
4-29-92	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
4-29-92	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
4-30-92	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
4-30-92	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>July 1992 Groundwater Sampling</i>						
7-28-92	MW-1	12000	1200	2300	340	1800
7-27-92	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
7-27-92	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
7-27-92	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
7-27-92	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
7-28-92	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5

Date Sampled	Monitoring Well	TPH gas ug/L	Benzene ug/L	Toluene ug/L	Ethyl benzene ug/L	Xylenes ug/L
<i>October 1992 Groundwater Sampling</i>						
10-19-92	MW-1	5000	400	710	170	750
10-19-92	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
10-19-92	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
10-19-92	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
10-19-92	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
10-19-92	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>February 1993 Groundwater Sampling</i>						
2-24-93	MW-1	8800	780	1200	230	1000
2-24-93	MW-2	ND<50	0.5	ND<0.5	ND<0.5	ND<0.5
2-24-93	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
2-24-93	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
2-24-93	MW-5	ND<50	ND<0.5	1.8	ND<0.5	ND<0.5
2-24-93	MW-6	ND<50	ND<0.5	6.8	ND<0.5	ND<0.5
<i>May 1993 Groundwater Sampling</i>						
5-19-93	MW-1	24000	2500	4700	560	3100
5-19-93	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-19-93	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-19-93	MW-4	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-19-93	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-19-93	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>August 1993 Groundwater Sampling</i>						
8-11-93	MW-1	13000	1200	2100	350	2000
8-11-93	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
8-11-93	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
8-11-93	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5

Date Sampled	Monitoring Well	TPH gas ug/L	Benzene ug/L	Toluene ug/L	Ethyl benzene ug/L	Xylenes ug/L
8-11-93	MW-5	ND<50	ND<0.5	ND<0.5	0.8	ND<0.5
8-11-93	MW-6	ND<50	ND<0.5	ND<0.5	7.9	ND<0.5
<i>February 1994 Groundwater Sampling</i>						
2-2-94	MW-1	7300	600	920	250	1,000
2-2-94	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
2-2-94	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
2-2-94	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
2-2-94	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
2-2-94	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>May 1994 Groundwater Sampling</i>						
5-26-94	MW-1	15000	1200	2000	370	1500
5-26-94	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-26-94	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-26-94	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-26-94	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
5-26-94	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>September 1994 Groundwater Sampling</i>						
9-15-94	MW-1	4900	150	340	100	410
9-15-94	MW-2	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
9-15-94	MW-3	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
9-15-94	MW-4	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
9-15-94	MW-5	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
9-15-94	MW-6	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
9-15-94	MW-7	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>January 13, 1995 Groundwater Sampling</i>						
1-13-95	MW-1	11000	260	770	310	1200

Date Sampled	Monitoring Well	TPH gas ug/L	Benzene ug/L	Toluene ug/L	Ethyl benzene ug/L	Xylenes ug/L
1-13-95	MW-2	ns	ns	ns	ns	ns
1-13-95	MW-3	NA	NA	NA	NA	NA
1-13-95	MW-4	ns	ns	ns	ns	ns
1-13-95	MW-5	NA	NA	NA	NA	NA
1-13-95	MW-6	NA	NA	NA	NA	NA
1-13-95	MW-7	ND<50.0	ND<0.5	ND<0.5	ND<0.5	ND<0.5
<i>April 26, 1995 Groundwater Sampling</i>						
4-26-95	MW-2	ns	ns	ns	ns	ns
4-26-95	MW-3	ns	ns	ns	ns	ns
4-26-95	MW-4	ns	ns	ns	ns	ns
4-26-95	MW-5	ns	ns	ns	ns	ns
4-26-95	MW-6	ns	ns	ns	ns	ns
4-26-95	MW-7	ND<50.0	ND<0.50	ND<05	ND<0.5	
<i>December 18, 1995 Groundwater Sampling</i>						
12-18-95	MW-7	ND	ND	ND	ND	ND
<i>March 19, 1996 Groundwater Sampling</i>						
3-19-96	MW3	ND	ND	ND	ND	ND
3-19-96	MW5	ND	ND	ND	ND	ND
3-19-96	MW6	ND	ND	ND	ND	ND
3-19-96	MW7	ND	ND	ND	ND	ND

ND - Not detected below reporting limits; NA - Not analyzed; ns - Not sampled

Samples collected from MW-3, MW-5, MW-6 and MW-7 (located down gradient of the former gasoline tank) continue to reveal non-detectable levels of TPH-g and BTEX. TPH-g and BTEX were also non-detectable at the September 1994 and January and April 1995 sampling episodes for MW-7. The four consecutive quarters of non-detectable levels of any target analyte in the down gradient direction of the former tank pit, suggests that the vapor recovery system installed and run by TMC was effective in removing any petroleum

Table 2 presents historic results of laboratory analyses for extractable petroleum hydrocarbons (Diesel/Kerosene, Oil and Grease) and purgeable halocarbons (Chlorobenzene). This table presents past sampling event data as well as the most recent for monitoring wells MW-3, MW-5, and MW-6.

**TABLE 2 DIESEL, OIL & GREASE AND CHLOROBENZENE RESULTS FOR WATER SAMPLES**

<i>Date Sampled</i>	<i>Monitoring Well</i>	<i>Diesel ug/L</i>	<i>Kerosene ug/L</i>	<i>Oil &amp; Grease mg/L</i>	<i>Chlorobenzene ug/L</i>
<i>July 1991 Groundwater Sampling</i>					
7-18-91	MW-3	NA	NA	ND<5	NA
7-18-91	MW-5	NA	NA	ND<5	NA
7-18-91	MW-6	NA	NA	ND<5	NA
<i>December 1991 Groundwater Sampling</i>					
12-4-91	MW-3	ND<50	ND<50	ND<5	ND<1.0
12-4-91	MW-5	ND<50	ND<50	ND<5	4.6
12-4-91	MW-6	1,400	ND<50	ND<5	33
<i>April 1992 Groundwater Sampling</i>					
4-29-92	MW-3	ND<50	ND<50	ND<5	ND<1.0
4-29-92	MW-5	ND<50	ND<50	ND<5	3
4-29-92	MW-6	670	ND<50	ND<5	7
<i>July 1992 Groundwater Sampling</i>					
7-28-92	MW-3	ND<50	ND<50	ND<5	ND<1.0
7-28-92	MW-5	ND<50	ND<50	ND<5	2
7-28-92	MW-6	1,700	ND<50	ND<5	17
<i>October 1992 Groundwater Sampling</i>					
10-19-92	MW-3	ND<50	ND<50	ND<5	ND<1.0
10-19-92	MW-5	ND<50	ND<50	ND<5	2
10-19-92	MW-6	500	ND<50	ND<5	26

Date Sampled	Monitoring Well	Diesel ug/L	Kerosene ug/L	Oil & Grease mg/L	Chlorobenzene ug/L
<i>February 1993 Groundwater Sampling</i>					
2-24-93	MW-3	ND<50	ND<50	ND<5	ND<1.0
2-24-93	MW-5	ND<50	ND<50	ND<5	1
2-24-93	MW-6	ND<50	170 +	ND<5	6
<i>May 1993 Groundwater Sampling</i>					
5-19-93	MW-3	ND<50	ND<50	ND<5	ND
5-19-93	MW-5	ND<50	ND<50	ND<5	2
5-19-93	MW-6	670	ND<50	ND<5	4
<i>August 1993 Groundwater Sampling</i>					
8-11-93	MW-3	ND<50	ND<50	ND<5	ND<1
8-11-93	MW-5	ND<50	ND<50	ND<5	ND<1
8-11-93	MW-6	80	*	7.0	10
<i>February 1994 Groundwater Sampling</i>					
2-2-94	MW-3	ND<50	ND<50	ND<05	ND<1
2-2-94	MW-5	ND<50	ND<50	ND<5	ND<1
2-2-94	MW-6	ND<50	220	ND<5	3
<i>May 1994 Groundwater Sampling</i>					
5-24-94	MW-3	ND<50	N/A	ND<5	ND<0.4
5-24-94	MW-5	ND<50	N/A	ND<5	0.6
5-24-94	MW-6	ND<50	N/A	ND<5	5.5
<i>September 1994 Groundwater Sampling</i>					
9-15-94	MW-3	ND<50	N/A	ND<5	ND<0.4
9-15-94	MW-5	ND<50	N/A	ND<5	ND<0.4
9-15-94	MW-6	ND<50	N/A	ND<5	4.6

Date Sampled	Monitoring Well	Diesel ug/L	Kerosene ug/L	Oil & Grease mg/L	Chlorobenzene ug/L
<i>January 13, 1995 Groundwater Sampling</i>					
1-13-95	MW-3	ND<50	N/A	ND<0.5	ND
1-13-95	MW-5	ND<50	N/A	ND<0.5	1.1
1-13-95	MW-6	210	N/A	ND<0.5	5.0
<i>April 26, 1995 Groundwater Sampling</i>					
4-26-95	MW-3	ns	ns	ns	ns
4-26-95	MW-5	ns	ns	ns	ns
4-26-95	MW-6	ns	ns	ns	ns
<i>December 18, 1995 Groundwater Sampling</i>					
12-18-95	MW-3	ns	ns	ns	ns
12-18-95	MW-5	ns	ns	ns	ns
12-18-95	MW-6	ns	ns	ns	ns
<i>March 19, 1996 Groundwater Sampling</i>					
3-19-96	MW-3	ND	NA	0.2	ND
3-19-96	MW-5	ND	NA	ND	ND
3-19-96	MW-6	ND	NA	0.2	1.6

ND - NOT DETECTED BELOW REPORTING LIMITS

NA - NOT ANALYZED BY LABORATORY

ns - NOT SAMPLED

† - DOES NOT MATCH DIESEL STANDARD (POSSIBLE MOTOR OIL HYDROCARBONS)

\* - KEROSENE RANGE NOT REPORTED DUE TO OVERLAP OF HYDROCARBON RANGES

## 4.0 GROUNDWATER MEASUREMENTS

After the wells were uncapped for sampling and measurement, each was allowed to equilibrate with atmospheric pressure. The wells were periodically measured until two successive



measurements of the water elevation in each well agreed within 0.01 of a foot. Details of groundwater measuring are in Attachment 3, Records of Water Sample Collection. By measuring the water levels in three groundwater monitoring wells, MW-2, MW-4, and MW-5, E-Tech calculated the down gradient direction and horizontal gradient. Table 3 summarizes groundwater level data collected over the fifteen sampling episodes.

**TABLE 3      GROUNDWATER MEASUREMENTS FROM MONITORING WELLS**

<i>Date</i>	<i>Well Label</i>	<i>Water Level</i>	<i>Casing Elevation (msl)</i>	<i>Water Elevation (msl)</i>
6-20-90	MW2	-7.16	16.73	9.57
6-20-90	MW3	-7.37	15.89	8.52
6-20-90	MW4	-7.60	16.39	8.79
9-13-90	MW2	-8.78	16.73	7.95
9-13-90	MW3	-8.70	15.89	7.19
9-13-90	MW4	-8.80	16.39	7.59
12-17-90	MW2	-8.78	16.73	7.95
12-17-90	MW3	-8.42	15.89	7.47
12-17-90	MW4	-8.61	16.39	7.78
12-4-91	MW2	-7.99	16.73	8.74
12-4-91	MW3	-8.18	15.89	7.71
12-4-91	MW4	-8.26	16.39	8.13
4-29-92	MW2	-6.05	16.73	10.68
4-29-92	MW3	-6.73	15.89	9.16
4-29-92	MW4	-6.81	16.39	9.58
8-29-92	MW1	-7.92	16.39	8.47
8-29-92	MW2	-7.82	16.73	8.91
8-29-92	MW3	-8.21	15.89	7.68
8-29-92	MW4	-8.14	16.39	8.25
8-29-92	MW5	-7.57	15.13	7.56

Date	Well Label	Water Level	Casing Elevation (msl)	Water Elevation (msl)
8-29-92	MW6	-8.00	15.98	7.98
10-19-92	MW1	-8.44	16.39	7.95
10-19-92	MW2	-8.37	16.73	8.36
10-19-92	MW3	-8.58	15.89	7.31
10-19-92	MW4	-8.53	16.39	7.86
10-19-92	MW5	-7.96	15.13	7.17
10-19-92	MW6	-8.44	15.98	7.54
2-24-93	MW1	-5.36	16.39	11.03
2-24-93	MW2	-5.42	16.73	11.31
2-24-93	MW3	-6.11	15.89	9.78
2-24-93	MW4	-6.30	16.39	10.09
2-24-93	MW5	-5.32	15.13	9.81
2-24-93	MW6	-5.40	15.98	10.58
5-19-93	MW-1	-6.35	16.39	10.04
5-19-93	MW-2	-6.35	16.73	10.38
5-19-93	MW-3	-7.14	15.89	8.75
5-19-93	MW-4	-7.09	16.39	9.30
5-19-93	MW-5	-6.38	15.13	8.77
5-19-93	MW-6	-6.57	15.98	9.41
8-11-93	MW-1	-8.06	16.39	8.33
8-11-93	MW-2	-8.09	16.73	8.64
8-11-93	MW-3	-8.45	15.89	7.44
8-11-93	MW-4	-8.31	16.39	8.08
8-11-93	MW-5	-7.68	15.13	7.45
8-11-93	MW-6	-8.16	15.98	7.82
2-2-94	MW-1	-7.43	16.39	8.96
2-2-94	MW-2	-7.48	16.73	9.25

<i>Date</i>	<i>Well Label</i>	<i>Water Level</i>	<i>Casing Elevation (msl)</i>	<i>Water Elevation (msl)</i>
2-2-94	MW-3	-7.69	15.89	8.20
2-2-94	MW-4	-7.83	16.39	8.56
2-2-94	MW-5	-6.98	15.13	8.15
2-2-94	MW-6	-7.40	15.98	8.58
5-26-94	MW-1	-6.95	16.39	9.44
5-26-94	MW-2	-6.97	16.73	9.76
5-26-94	MW-3	-7.39	15.89	8.50
5-26-94	MW-4	-7.44	16.39	8.95
5-26-94	MW-5	-6.72	15.13	8.41
5-26-94	MW-6	-7.01	15.98	8.97
9-15-94	MW-1	-8.04	16.34	8.30
9-15-94	MW-2	-7.95	16.72	8.77
9-15-94	MW-3	-8.28	15.89	7.61
9-15-94	MW-4	-8.15	16.35	8.20
9-15-94	MW-5	-7.68	15.13	7.45
9-15-94	MW-6	-8.10	15.98	7.88
9-15-94	MW-7	-8.13	16.31	8.18
1-13-95	MW-1	-5.59	16.34	10.75
1-13-95	MW-2	-5.64	16.72	11.08
1-13-95	MW-3	-5.94	15.89	9.95
1-13-95	MW-4	-6.27	16.35	10.08
1-13-95	MW-5	-5.13	15.13	10.00
1-13-95	MW-6	-5.49	15.98	10.49
1-13-95	MW-7	-5.72	16.31	10.59

<i>Date</i>	<i>Well Label</i>	<i>Water Level</i>	<i>Casing Elevation (msl)</i>	<i>Water Elevation (msl)</i>
4-26-95	MW-2	-5.27	16.72	11.45
4-26-95	MW-3	*	15.89	
4-26-95	MW-4	-6.17	16.35	10.18
4-26-95	MW-5	-5.47	15.13	9.66
4-26-95	MW-6	-5.38	15.98	10.60
4-26-95	MW-7	-5.37	16.31	10.34
7-12-95	MW-2	-6.55	16.72	10.17
7-12-95	MW-3	-7.38	15.89	8.51
7-12-95	MW-4	-7.19	16.35	9.16
7-12-95	MW-5	-6.74	15.13	8.39
7-12-95	MW-6	-6.84	15.98	9.14
7-12-95	MW-7	-6.76	16.31	9.55
12-18-95	MW-2	-7.74	16.72	8.98
12-18-95	MW-5	-7.89	15.13	7.24
12-18-95	MW-7	-8.96	16.31	7.35
12-18-95	MW-4	-9.14	16.35	7.21
3-18-96	MW-2	-5.18	16.72	11.54
3-18-96	MW-5	-6.54	15.13	8.59
3-18-96	MW-7	-5.30	16.31	11.01
3-18-96	MW-4	-6.03	16.35	10.32

\* Could not remove well cover - defective bolts

Table 4 summarizes the estimated groundwater down flow direction and horizontal gradient. E-Tech used a three point solution to estimate the direction and gradient. Groundwater level data from MW-2, MW-4 and MW-5 were used in the estimate.

TABLE 4 GROUNDWATER GRADIENT AND DIRECTION

<i>Measurement Date</i>	<i>Down Gradient Direction</i>	<i>Horizontal Gradient</i>	<i>Average Water Level feet above msl</i>
6-20-90	North 26 degrees West	0.009 ft/ft	9.0
9-13-90	North 2 degrees East	0.005 ft/ft	7.9
12-17-90	North 19 degrees East	0.003 ft/ft	8.1
12-4-91	North 12 degrees West	0.008 ft/ft	8.5
4-29-92	North 20 degrees West	0.012 ft/ft	9.8
8-29-92	North 5 degrees West	0.009 ft/ft	8.1
10-19-92	North 2 degrees East	0.007 ft/ft	7.7
2-24-93	North 31 degrees West	0.014 ft/ft	10.4
5-19-93	North 7 degrees West	0.014 ft/ft	9.4
8-11-93	North 4 degrees West	0.008 ft/ft	7.96
2-24-94	North 12 degrees West	0.008 ft/ft	8.69
5-26-94	North 10 degrees West	0.010 ft/ft	8.91
9-15-94	North 1.5 degrees West	0.008 ft/ft	8.19
1-13-95	North 43 degrees West	0.011 ft/ft	10.42
4-26-95	North 29.5 degrees West	0.015 ft/ft	10.57
12-18-95	North 45 degrees West	0.0203 ft/ft	7.81
3-19-96	North 107 degrees Wset	0.0760 ft/ft	9.14

Review of previous groundwater measurements indicate the down gradient direction and the horizontal gradient vary between groundwater sampling measurement episodes. The variation is relatively low for measurements of this type. The changing groundwater gradient and elevations indicate the shallow water bearing zone is sensitive to seasonal changes in rainfall.

The most recent data indicate a North 107 degrees West flow direction at an average horizontal gradient of 0.0760 ft/ft. The horizontal gradient is similar to the topographic slope of the lot.

Groundwater measurement episodes indicate a range of flow direction from N107°W to N19°E, and a range of horizontal gradient from 0.005 to 0.0760 ft/ft. Plate 3, Groundwater Gradient Map, and the attached worksheet illustrate the most recent (Marcg 1996) horizontal gradient calculated across the site.

## **5.0 WATER SAMPLE DATA QUALITY**

The quality assurance and quality control (QA/QC) review of the new sample data for this report indicates that the data is acceptable for the purpose and objectives of this project. E-Tech did not review data summarized from previous reports. The U.S. Environmental Protection Agency (EPA) Test Methods for Evaluating Solid Waste (SW-846) and the California Department of Health Services (DOHS) Leaking Underground Fuel Tank (LUFT) Manual were used to evaluate the sampling data since the SW-846 and LUFT methodologies were primarily used to analyze the samples. The samples were analyzed by Global Environmental Laboratory of Fremont, California, a State-certified analytical laboratory. The certified laboratory reports and chain-of-custody forms are presented in the attachments.

### **5.1 QUALITY OF GROUNDWATER SAMPLES**

During sampling, all monitoring wells were purged of at least 3 bore volumes of water, in accordance with EPA protocol. At the end of purging, the well water was clear in all wells. The deionized water equipment blank for the sampling reported no detectable compounds.

### **5.2 CHAIN OF CUSTODY DOCUMENTATION**

Complete chain-of-custody forms were maintained for all samples from the time of their collection until their submission to the laboratory. No errors in chain-of-custody protocol were noted.

### **5.3 TOTAL PETROLEUM HYDROCARBONS AS GASOLINE WITH BTEX**

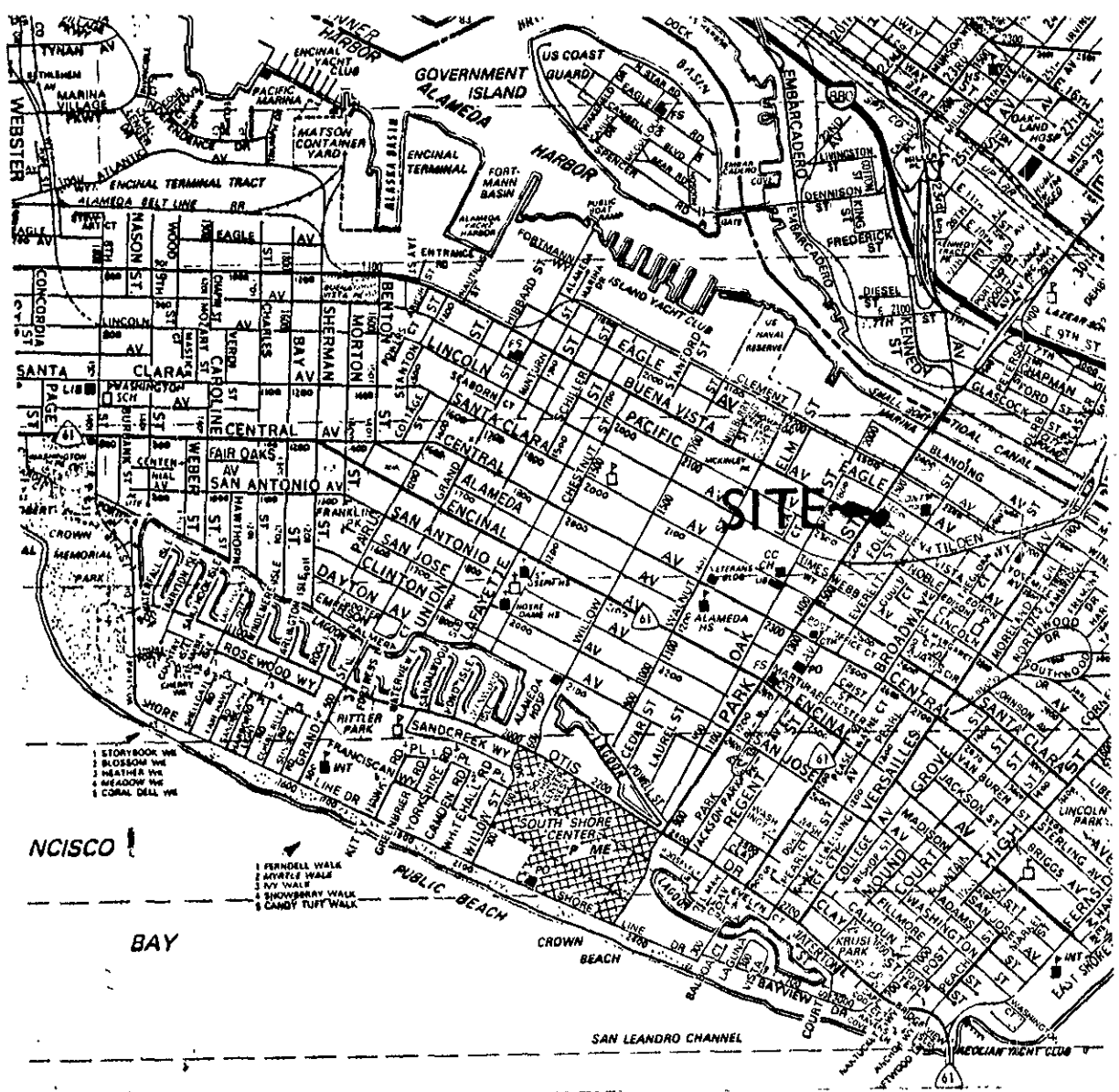
Based on the QC data reviewed, total petroleum hydrocarbons (TPH) as gasoline analysis by EPA Method 8015M and benzene, toluene, ethylbenzene, and total xylenes (BTEX) analyses by EPA Method 8020 appear reasonably representative. Samples were analyzed within the Regional Water Quality Control Board specified 7-day maximum holding time for water samples. Matrix spike/matrix spike duplicate percent recoveries and relative percent differences (RPD's) were either within EPA-specified limits or were within limits set by professional judgment where no EPA limits exist.

## **6.0 COMMENTS AND SCHEDULE OF ACTIVITIES**

As per Ms. Eva Chu of the ACHCSD, there has been a site closure request submitted to the Regional Water Quality Control Board (RWQCB) which she feels confident will be granted. E-Tech was informed by Ms. Chu that the RWQCB will issue permission to destroy the remaining wells at the site. Therefore, there are no activities scheduled for the site until such notice is received. Upon receipt of the permission letter E-Tech will submit the proper permits for destruction and will write a workplan if necessary.

## **7.0 LIMITATIONS**

The procedures and opinions in this report agree with professional practice as provided in the guidelines of the California Regional Water Quality Control Board for addressing fuel leaks from underground tanks. This report is only part of the ongoing work required by the lead implementing agency at this site. The lab test results rely on limited data collected at the sampling location only. Budget constraints restrict the amount of testing allowed. The lab test results may not apply to the general site as a whole. Therefore, E-Tech Services cannot have complete knowledge of the underlying conditions. E-Tech provides the information in the resulting report to the client so that the client may make a more informed decision about site conditions. The professional opinion and judgement in the reports is subject to revisions in light of new information. E-Tech does not state or imply any guarantees or warranties that the subject property is or is not free of environmental impairment. Monitoring wells are temporary sampling and remediation wells that eventually must be permitted and destroyed by a licensed driller at the client's expense.



Base map from THE THOMAS GUIDE, Alameda County  
Calif., Scale 1 inch = 1/4 Mile



Ph: (415) 359-6590 Fax: (415) 359-7083

# SITE VICINITY MAP

1700 Park Street  
Alameda, California

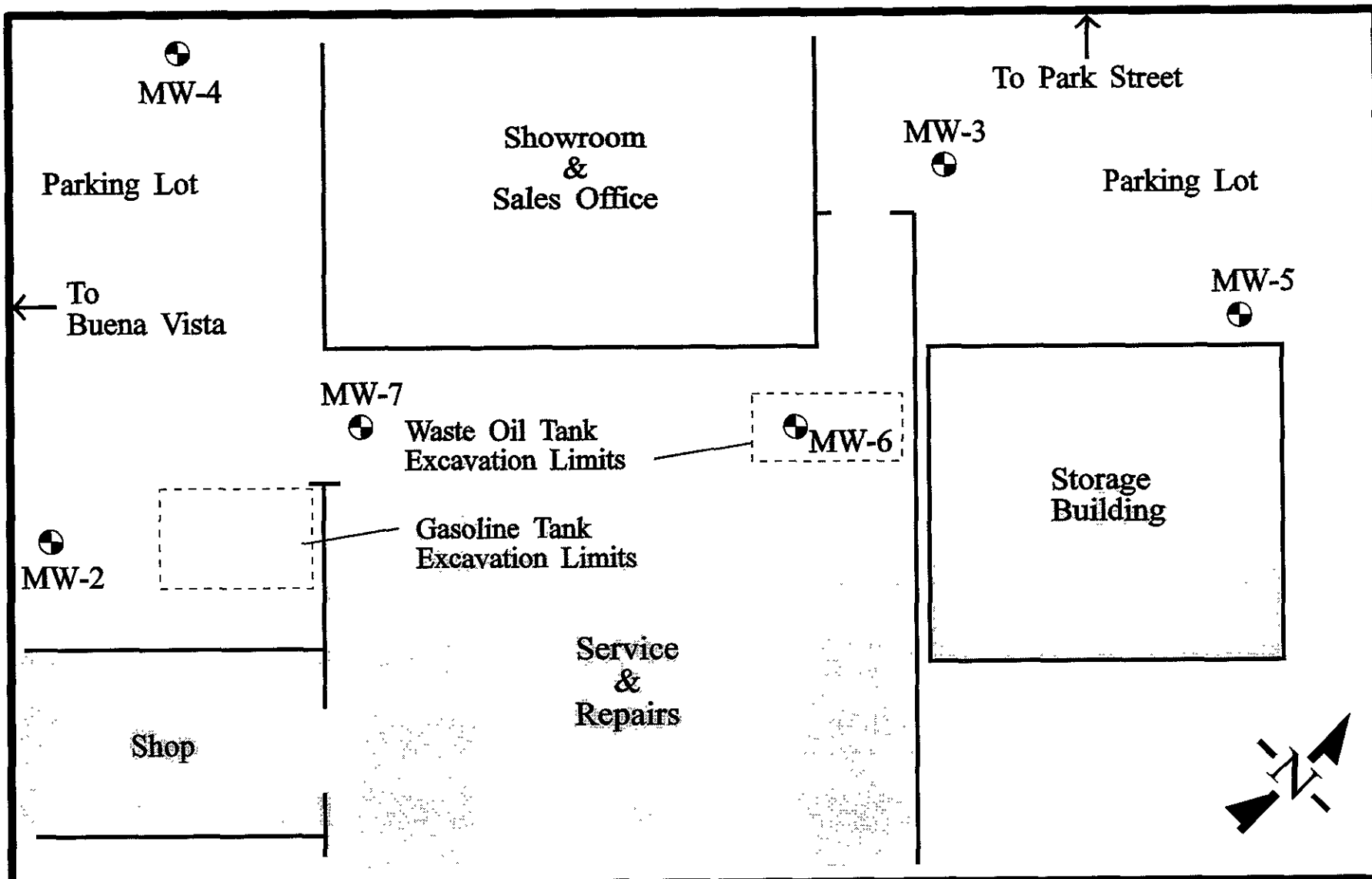
Job: 95009

March 1996

# PLATE

# 1





**LEGEND**

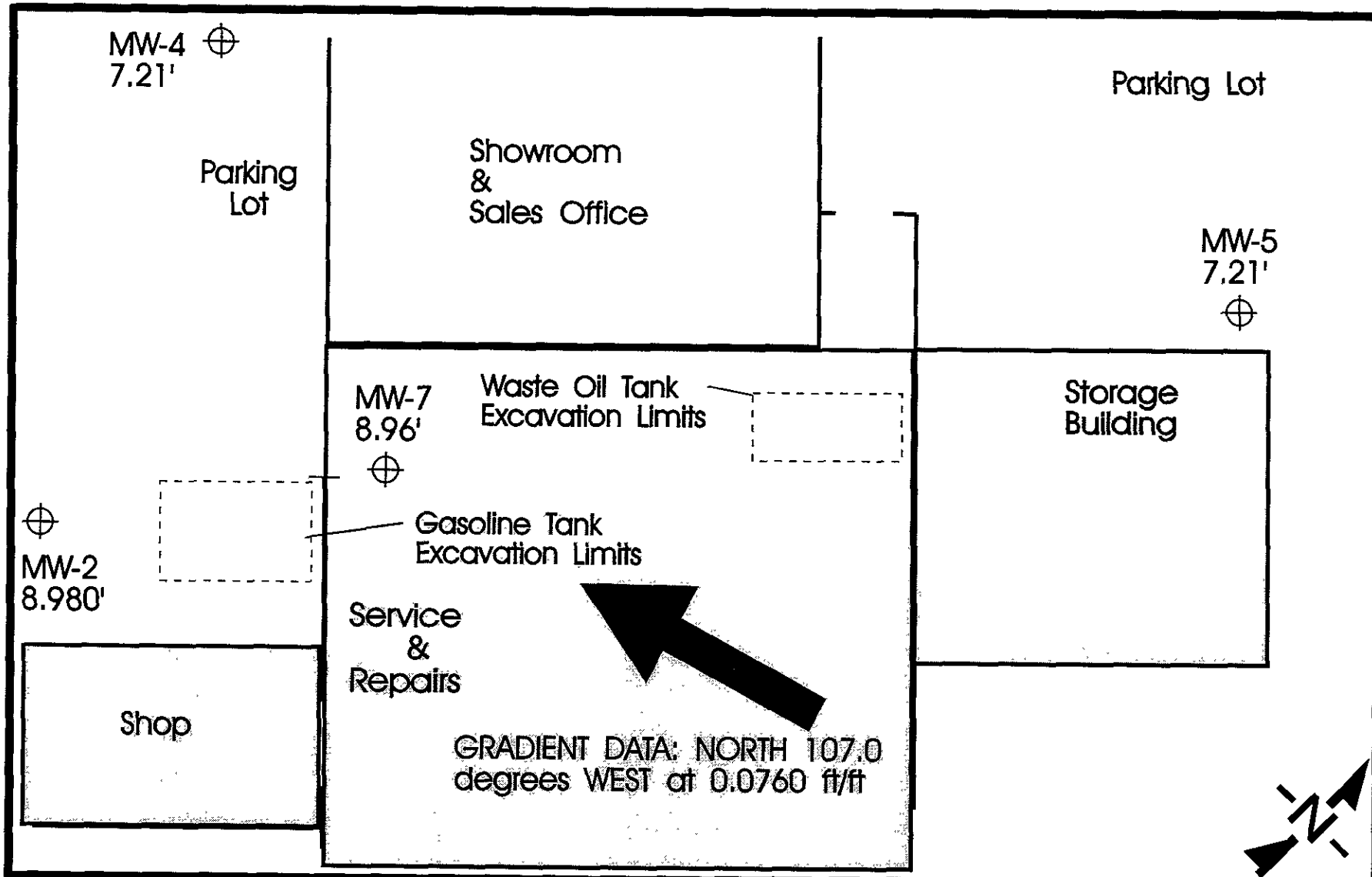
MW-0  
 Monitoring Well

Project No. 95009

April 23, 1996 Scale 1 inch = 20 feet

**LOCATIONS OF  
 MONITORING WELLS  
 Cavanaugh Motors**

1700 Park Street, Alameda California



**LEGEND**

⊕  
MW-0  
1.00 ft

All Elevations Are In Feet MSL.

Project# 95009 April 1996

Approximate Scale: 1 Inch = 20 feet

**GROUNDWATER GRADIENT  
MAP**

**Cavanaugh Motors**

1700 Park Street, Alameda Ca

ATTACHMENT 1  
LABORATORY REPORTS



# Global Environmental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

## DHS (LUFT) TPH-BTEX REPORT (ug/L)

Attn.: Mr. Tom Ghigliotto  
E-Tech  
408 Lewis Lane  
Pacifica, CA 94044  
Project: 95009  
Matrix: Water

Date Sampled: 3-19-96  
Date Received: 3-20-96  
Date Analyzed: 3-25-96  
Date Reported: 3-26-96  
Lab. Project #: 960320A

Client I.D.	Lab. I.D.	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Dilution Factor
MW-3	960320A02	ND	ND	ND	ND	1
MW-5	960320A03	ND	ND	ND	ND	1
MW-6	960320A04	ND	ND	ND	ND	1
MW-7	960320A05	ND	ND	ND	ND	1
Units		ug/L	ug/L	ug/L	ug/L	
Reporting Limits		0.5ug/L	0.5ug/L	0.5ug/L	0.5ug/L	

ND Not Detected. All analytes recorded as ND were found to be at or below to Reporting Limit.

Reviewed By:

  
Lei Chen, Laboratory Director

Global Enviromental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

**DHS (LUFT) TPH-GASOLINE REPORT**  
(ug/L)

Attn.: Mr. Tom Ghigliotto  
E-Tech  
408 Lewis Lane  
Pacifica, CA 94044

Project: 95009

Matrix: Water

Date Sampled: 3-19-96  
Date Received: 3-20-96  
Date Analyzed: 3-25-96  
Date Reported: 3-26-96  
Lab. Project #: 960320A

Client I.D.	Lab. I.D.	8015M GASOLINE	Dilution Factor
MW-3	960320A02	ND	1
MW-5	960320A03	ND	1
MW-6	960320A04	ND	1
MW-7	960320A05	ND	1
Units		ug/L	
Reporting Limit		50ug/L	

ND Not Detected. All analytes recorded as ND were found to be at or below to Reporting Limit.

Reviewed By:

  
Lei Chen, Laboratory Director

Global Enviromental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

**DHS (LUFT) TPH-GASOLINE REPORT**  
(ug/L)


Attn.: Mr. Tom Ghigliotto  
E-Tech  
408 Lewis Lane  
Pacifica, CA 94044  
Project: 95009  
Matrix: Water

Date Sampled: 3-19-96  
Date Received: 3-20-96  
Date Analyzed: 3-25-96  
Date Reported: 3-26-96  
Lab. Project #: 960320A

Client I.D.	Lab. I.D.	8015M GASOLINE	Dilution Factor
MW-3	960320A02	ND	1
MW-5	960320A03	ND	1
MW-6	960320A04	ND	1
MW-7	960320A05	ND	1
Units		ug/L	
Reporting Limit		50ug/L	

ND Not Detected. All analytes recorded as ND were found to be at or below to Reporting Limit.

Reviewed By:

  
Lei Chen, Laboratory Director



Global Enviromental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

**DHS (LUFT) TPH-DIESEL REPORT**  
(ug/L)

Attn.: Mr. Tom Ghigliotto  
E-Tech  
408 Lewis Lane  
Pacifica, CA 94044  
Project: 95009  
Matrix: Water

Date Sampled: 3-19-96  
Date Received: 3-20-96  
Date Analyzed: 3-25-96  
Date Reported: 3-26-96  
Lab. Project #: 960320A

Client I.D.	Lab. I.D.	8015M Diesel	Dilution Factor
MW-3	960320A02	ND	1
MW-5	960320A03	ND	1
MW-6	960320A04	ND	1
Units		ug/L	
Reporting Limit		50ug/L	

ND Not Detected. All analytes recorded as ND were found to be at or below to Reporting Limit.

Reviewed By:

Lei Chen, Laboratory Director



# Global Environmental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

## EPA 5520BF REPORT (mg/L)

Client:	Mr. Tom Ghigliotto	Date Sampled:	3-19-96
	E-Tech	Date Received:	3-20-96
	408 Lewis Lane	Date Analyzed:	3-22-96
	Pacifica, CA 94044	Date Reported:	3-25-96
Project:	Cavanaugh : 95009	Lab Job #:	960320A
Matrix:	Water	Analysis:	TOG

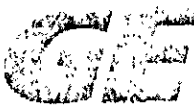
Client ID	Lab ID	Result	Reporting Limit	Spike % Recovery
MW-3	960320A02	0.2	0.1	112
MW-5	960320A03	ND	0.1	112
MW-6	960320A04	0.2	0.1	112

ND = Not Detected at or below to Reporting Limit

Reviewed By:

Lei Chen, Laboratory Director





# Global Environmental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

## EPA 8010 REPORT (ug/L)

Attn:	Mr. Tom Ghigliotto	Date Sampled:	3-19-96
	E-Tech	Date Received:	3-20-96
	408 Lewis Lane	Date Analyzed:	3-24-96
	Pacifica, CA 94044	Date Reported:	3-20-98
Project:	Cavanaugh : 95009	Lab Job #:	960320A
Matrix:	Water	Lab ID #:	960320A03
Client I.D.:	MW-5		

Analyte	Result	Reporting Limit
Dichlorofluoromethane	ND	1.0
Chloromethane	ND	1.0
Bromomethane	ND	1.0
Vinyl chloride	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoroethane	ND	1.0
1,1-Dichloroethene	ND	1.0
Methylene Chloride	ND	2.0
Trans-1,2-Dichloroethene	ND	1.0
1,1-Dichloroethane	1.4	1.0
Cis-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon Tetrachloride	ND	1.0
1,2-Dichloroethane	ND	1.0
Trichloroethene	ND	1.0
1,2-Dichloropropene	ND	1.0
2-Chloro-vinyl ether	ND	2.0
Bromodichloromethane	ND	1.0
Trans-1,3-Dichloropropene	ND	1.0
Cis-1,3-Dichloropropene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
Tetrachloroethene	ND	1.0
Dibromochloromethane	ND	1.0
Chlorobenzene	ND	1.0
Bromoform	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not Detected at or below to Reporting Limit

Reviewed By:

Lei Chen, Laboratory Director



Global Enviromental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

EPA 8010 REPORT  
(ug/L)

Attn:	Mr. Tom Ghigliotto	Date Sampled:	3-19-96
	E-Tech	Date Recieved:	3-20-96
	408 Lewis Lane	Date Analyzed:	3-24-96
	Pacifica, CA 94044	Date Reported:	3-20-98
Project:	Cavanaugh : 95009	Lab Job #:	960320A
Matrix:	Water	Lab ID #:	960320A02
Client I.D.:	MW-3		

Analyte	Result	Reporting Limit
Dichlorofluoromethane	ND	1.0
Chloromethane	ND	1.0
Bromomethane	ND	1.0
Vinyl chloride	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoroethane	ND	1.0
1,1-Dichloroethene	ND	1.0
Methylene Chloride	ND	2.0
Trans-1,2-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
Cis-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon Tetrachloride	ND	1.0
1,2-Dichloroethane	ND	1.0
Trichloroethene	ND	1.0
1,2-Dichloropropene	ND	1.0
2-Chloro-vinyl ether	ND	2.0
Bromodichloromethane	ND	1.0
Trans-1,3-Dichloropropene	ND	1.0
Cis-1,3-Dichloropropene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
Tetrachloroethene	ND	1.0
Dibromochloromethane	ND	1.0
Chlorobenzene	ND	1.0
Bromoform	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not Detected at or below to Reporting Limit

Reviewed By:

Lei Chen, Laboratory Director

Global Environmental Laboratory, Inc.

4118 CLIPPER COURT, FREMONT, CA 94538

PHONE (510) 498-1991

FAX (510) 498-1994

EPA 8010 REPORT  
(ug/L)

Attn:	Mr. Tom Ghigliotto	Date Sampled:	3-19-96
	E-Tech	Date Recieved:	3-20-96
	408 Lewis Lane	Date Analyzed:	3-24-96
	Pacifica, CA 94044	Date Reported:	3-20-98
Project:	Cavanaugh : 95009	Lab Job #:	960320A
Matrix:	Water	Lab ID #:	960320A04
Client I.D.:	MW-6		

Analyte	Result	Reporting Limit
Dichlorofluoromethane	ND	1.0
Chloromethane	ND	1.0
Bromomethane	ND	1.0
Vinyl chloride	ND	1.0
Chloroethane	ND	1.0
Trichlorofluoroethane	ND	1.0
1,1-Dichloroethene	ND	1.0
Methylene Chloride	ND	2.0
Trans-1,2-Dichloroethene	ND	1.0
1,1-Dichloroethane	ND	1.0
Cis-1,2-Dichloroethene	ND	1.0
Chloroform	ND	1.0
1,1,1-Trichloroethane	ND	1.0
Carbon Tetrachloride	ND	1.0
1,2-Dichloroethane	ND	1.0
Trichloroethene	ND	1.0
1,2-Dichloropropene	ND	1.0
2-Chloro-vinyl ether	ND	2.0
Bromodichloromethane	ND	1.0
Trans-1,3-Dichloropropene	ND	1.0
Cis-1,3-Dichloropropene	ND	1.0
1,1,2-Trichloroethane	ND	1.0
Tetrachloroethene	ND	1.0
Dibromochloromethane	ND	1.0
Chlorobenzene	1.6	1.0
Bromoform	ND	1.0
1,1,2,2-Tetrachloroethane	ND	1.0
1,3-Dichlorobenzene	ND	1.0
1,4-Dichlorobenzene	ND	1.0
1,2-Dichlorobenzene	ND	1.0

ND = Not Detected at or below to Reporting Limit

Reviewed By:



Lei Chen, Laboratory Director

EPA METHOD TEST QA/QC TABLE

GLOBAL PROJECT #: 960320A

Lab I.D.: 960320A03-SP, 960320A-MSP  
 Project: 95009  
 Ext/Prep. Method: EPA 5030  
 Date: 03-25-96

Analytical Method: EPA M8015  
 Analysis date: 03-25-96  
 Matrix: Water  
 Unit: ug/L

Analyte	Sample Result	Spike Level	Matrix Spike Result	MS Recovery %	Matrix Spike Dup. Result	MSD Recovery %	Average Recovery %R	LCL %R	UCL %R	RPD %	UCL %RPD
Benzene	0.00	20.00	17.84	89	17.75	89	89	76	127	1	11
Toluene	0.00	20.00	18.28	91	18.47	92	92	76	125	1	13
Chlorobenzene	0.00	20.00	17.75	89	17.38	87	88	75	130	2	13
Gasoline	0.00	1000.00	929.00	93	945.00	95	94	70	130	2	30
Diesel	0.00	1000.00	977.14	98	1180.62	118	108	70	130	19	30

Notes:  
 Sample Result-Concentration of Sample which is to used for Sample Spike & Sample Spike Duplicate  
 Spike Level- Level of Concentration Added to the Sample  
 MSP Result- Matrix Spike Result  
 MSP %R- Matrix Spike Percent Recovery  
 MSPD Result- Matrix Spike Duplicate Result  
 MSPD %R- Matrix Spike Duplicate Percent Recovery  
 AVG. %R - Average Recovery for MSP & MSPD % Recovery  
 LCL- Lower Criteria Level  
 UCL- Upper Criteria Level  
 RPD- Relative Percent Difference

EPA METHOD TEST QA/QC TABLE

GLOBAL PROJECT #: 960320A

Lab I.D. Number: 960320A02-SP  
 Client Project: 95009  
 Ext/Prep. Method: EPA 5030  
 Date: 03-24-96

Analytical Method: EPA 8010  
 Analysis date: 03-24-96  
 Matrix: Water  
 Unit: ug/L

Analyte	Sample Result	Spike Level	MSP Result	MSP %R	MSPD Result	MSPD %R	AVE. %R	LCL %R	UCL %R	RPD %	UCL %RPD
1,1-dichloroethene	0.00	25.00	26.75	107	26.56	106	107	61	145	1	20
Trichloroethene	0.00	25.00	21.65	87	21.58	86	86	71	120	0	20
Chlorobenzene	0.00	25.00	20.88	84	20.74	83	83	75	130	1	20



(415) 359-6590 / FAX (415) 359-7083

CHAIN OF CUSTODY RECORD  
ANALYSIS REQUEST FORM

Project No. 95009	Project Contact: Tom Ghigliotto	Sampler: Tom Ghigliotto	Page 1 of 1
Project Name: Cavanaugh	Project Address: 1700 Park St. Alameda CA	Turnaround Time: days	

LAB ID NO.	DATE	TIME	SOIL	WATER	SAMPLE LABEL	TPH GAS BTEX	TEH-DIESEL	BTEX	EPA 8240	EPA 8270	EPA 8010	TOG 55208F	REMARKS ADDITIONAL ANALYSIS
	3-19-96	1324		X	EQB-3	X	X				X	X	HOLD
	3-19-96	1330		X	MW-3	X	X				X	X	
	3-19-96	1341		X	MW-5	X	X				X	X	
	3-19-96	1352		X	MW-6	X	X				X	X	
	3-19-96	1405		X	MW-7	X	X	per	mark	by	phone		

Relinquished by, Print Name: Tom Ghigliotto Signature: Tom Ghigliotto	Date: 3/20/96 Time:	Received by, Print name: Signature: [Signature]	Date: 3/20/96 Time: 10:40
Relinquished by, Print name: Signature:	Date: Time:	Received by, Print name: Signature:	Date: Time:
Relinquished by, Print name: Signature:	Date: Time:	Received by, Print name: Signature:	Date: Time:

By signature the laboratory accepts the listed samples in good condition with appropriate containers, temperatures, and intact custody seals.

Received by Laboratory, Print Name of Laboratory: \_\_\_\_\_ Laboratory Certification Number: \_\_\_\_\_

Received by Laboratory personnel, Print Name: \_\_\_\_\_ Signature: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

ATTACHMENT 2  
RECORD OF WATER SAMPLE COLLECTION

ATTACHMENT 3  
GROUNDWATER GRADIENT WORKSHEET



# RECORD OF WATER SAMPLE COLLECTION

WELL LABEL: <b>MW-2</b>	DATE COLLECTED: <b>3-19-96</b>	JOB NUMBER: <b>95009</b>
JOB NAME: <b>CAVANAUGH MOTORS</b>		SAMPLER(S) NAME: <b>T. GHIGLIOTTO and M. EDWARDS</b>
LOCATION: <b>1700 PARK STREET, ALAMEDA, CALIFORNIA</b>		

WELL HEAD CONDITIONS	<input checked="" type="checkbox"/> CAPPED	<input checked="" type="checkbox"/> LOCKED	<input checked="" type="checkbox"/> DRY	<input type="checkbox"/> WATER	<input type="checkbox"/> DEBRIS	<input type="checkbox"/> REPLACE CAP
	<input type="checkbox"/> REPLACE LOCK		<input type="checkbox"/> OTHER:			

TIME MEASURED	1232	1258				
DEPTH TO WATER (MEASURE TO .01 FEET)	5.18'	5.18'				

## WELL PURGING METHOD

TOTAL DEPTH OF WELL:	DEPTH TO WATER: <b>7.74'</b>	DIAMETER OF WELL: <b>2"</b>
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VOLUME FACTOR = 0.17 FOR 2" CASING; 0.65 FOR 4" CASING; 1.47 FOR 6" CASING

PURGE VOLUME = <b>0</b> gallons	
PURGE METHOD: <b>N/A</b>	OVA -FID VAPOR READING, ppm:

## WELL PURGING PARAMETERS

GALLONS	TIME	TEMPERATURE degrees F	CONDUCTIVITY X 1000	pH	VISUAL TURBIDITY

SAMPLING METHOD:	SAMPLE TURBIDITY:	TIME COLLECTED:
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PURGE WATER DESCRIPTION:	<input type="checkbox"/> SHEEN	<input type="checkbox"/> ODOR	<input type="checkbox"/> SILTY	<input type="checkbox"/> OTHER:
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# RECORD OF WATER SAMPLE COLLECTION

WELL LABEL: <b>MW-3</b>	DATE COLLECTED: <b>3-19-96</b>	JOB NUMBER: <b>95009</b>
JOB NAME: <b>CAVANAUGH MOTORS</b>		SAMPLER(S) NAME: <b>T. GHIGLIOTTO and M. EDWARDS</b>
LOCATION: <b>1700 PARK STREET, ALAMEDA, CALIFORNIA</b>		

WELL HEAD CONDITIONS:  CAPPED  LOCKED  DRY  WATER  DEBRIS  REPLACE CAP  
 REPLACE LOCK  OTHER:

TIME MEASURED	1243	1303				
DEPTH TO WATER (MEASURE TO .01 FEET)	5.96'	5.96'				

## WELL PURGING METHOD

TOTAL DEPTH OF WELL: <b>14.55'</b>	DEPTH TO WATER: <b>5.96'</b>	DIAMETER OF WELL: <b>4"</b>
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VOLUME FACTOR = 0.17 FOR 2" CASING; 0.65 FOR 4" CASING; 1.47 FOR 6" CASING

PURGE VOLUME = <b>16.7 gallons</b>	
PURGE METHOD: <b>DISPOSABLE BAILER</b>	OVA -FID VAPOR READING, ppm:

## WELL PURGING PARAMETERS

GALLONS	TIME	TEMPERATURE degrees F	CONDUCTIVITY X 1000	pH	VISUAL TURBIDITY
0	1307	68.3	0.38	7.55	Clear
5.5	1310	69.3	0.41	7.80	Clear
11.0	1314	70.3	0.43	8.01	Clear
16.5	1318	71.2	0.41	7.65	Clear
17.0	1321	71.5	0.39	7.69	Clear

SAMPLING METHOD: <b>NEW DISPOSABLE BAILER</b>	SAMPLE TURBIDITY: <b>33.6 NTU</b>	TIME COLLECTED: <b>1330</b>
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PURGE WATER DESCRIPTION:  SHEEN  ODOR  SILTY  OTHER:

# RECORD OF WATER SAMPLE COLLECTION

WELL LABEL: <b>MW-4</b>	DATE COLLECTED: <b>3-19-96</b>	JOB NUMBER: <b>95009</b>
JOB NAME: <b>CAVANAUGH MOTORS</b>		SAMPLER(S) NAME: <b>T. GHIGLIOTTO and M. EDWARDS</b>
LOCATION: <b>1700 PARK STREET, ALAMEDA, CALIFORNIA</b>		

WELL HEAD CONDITIONS     CAPPED     LOCKED     DRY     WATER     DEBRIS     REPLACE CAP  
     REPLACE LOCK                                     OTHER:

TIME MEASURED	1235	1301				
DEPTH TO WATER (MEASURE TO .01 FEET)	603'	6.03'				

## WELL PURGING METHOD

TOTAL DEPTH OF WELL:	DEPTH TO WATER: <b>7.74'</b>	DIAMETER OF WELL: <b>2"</b>
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VOLUME FACTOR = 0.17 FOR 2" CASING; 0.65 FOR 4" CASING; 1.47 FOR 6" CASING

PURGE VOLUME = 0 gallons	
PURGE METHOD: <b>N/A</b>	OVA -FID VAPOR READING, ppm:

## WELL PURGING PARAMETERS

GALLONS	TIME	TEMPERATURE degrees F	CONDUCTIVITY X 1000	pH	VISUAL TURBIDITY

SAMPLING METHOD:	SAMPLE TURBIDITY:	TIME COLLECTED:
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PURGE WATER DESCRIPTION:     SHEEN     ODOR     SILTY     OTHER:

# RECORD OF WATER SAMPLE COLLECTION

WELL LABEL: <b>MW-5</b>	DATE COLLECTED: <b>3-19-96</b>	JOB NUMBER: <b>95009</b>
JOB NAME: <b>CAVANAUGH MOTORS</b>		SAMPLER(S) NAME: <b>T. GHIGLIOTTO AND M. EDWARDS</b>
LOCATION: <b>1700 PARK STREET, ALAMEDA, CALIFORNIA</b>		

WELL HEAD CONDITIONS	<input checked="" type="checkbox"/> CAPPED	<input checked="" type="checkbox"/> LOCKED	<input checked="" type="checkbox"/> DRY	<input type="checkbox"/> WATER	<input type="checkbox"/> DEBRIS	<input type="checkbox"/> REPLACE CAP
	<input type="checkbox"/> REPLACE LOCK		<input type="checkbox"/> OTHER:			

TIME MEASURED	1240	1305	1318			
DEPTH TO WATER (MEASURE TO .01 FEET)	6.62'	6.54'	6.54'			

## WELL PURGING METHOD

TOTAL DEPTH OF WELL: <b>19.19'</b>	DEPTH TO WATER: <b>6.54'</b>	DIAMETER OF WELL: <b>2"</b>
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VOLUME FACTOR = 0.17 FOR 2" CASING; 0.65 FOR 4" CASING; 1.47 FOR 6" CASING

PURGE VOLUME = <b>6.4 gallons</b>	
PURGE METHOD: <b>DISPOSABLE BAILER</b>	OVA -FID VAPOR READING, ppm:

## WELL PURGING PARAMETERS

GALLONS	TIME	TEMPERATURE degrees F	CONDUCTIVITY X 1000	pH	VISUAL TURBIDITY
0	1322	69.8	0.28	6.38	Slightly Turbid/ Grey
2.0	1325	70.1	0.32	6.54	Slightly Turbid/ Brown
4.0	1328	69.5	0.29	6.72	Turbid/ Brown
6.0	1331	68.4	0.29	6.90	Turbid/ Brown
6.5	1333	67.8	0.30	6.91	Turbid/ Brown

SAMPLING METHOD: <b>DISPOSABLE BAILER</b>	SAMPLE TURBIDITY: <b>180.4 NTU</b>	TIME COLLECTED: <b>1341</b>
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PURGE WATER DESCRIPTION:	<input type="checkbox"/> SHEEN	<input type="checkbox"/> ODOR	<input checked="" type="checkbox"/> SILTY	<input type="checkbox"/> OTHER:
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# RECORD OF WATER SAMPLE COLLECTION

WELL LABEL: <b>MW-6</b>	DATE COLLECTED: <b>3-19-96</b>	JOB NUMBER: <b>95009</b>
JOB NAME: <b>CAVANAUGH MOTORS</b>		SAMPLER(S) NAME: <b>T. GHIGLIOTTO AND M. EDWARDS</b>
LOCATION: <b>1700 PARK STREET, ALAMEDA, CALIFORNIA</b>		

WELL HEAD CONDITIONS	<input checked="" type="checkbox"/> CAPPED	<input checked="" type="checkbox"/> LOCKED	<input checked="" type="checkbox"/> DRY	<input type="checkbox"/> WATER	<input type="checkbox"/> DEBRIS	<input type="checkbox"/> REPLACE CAP
	<input type="checkbox"/> REPLACE LOCK		<input type="checkbox"/> OTHER:			

TIME MEASURED	1245	1308	1322			
DEPTH TO WATER (MEASURE TO .01 FEET)	5.26'	5.26'	5.26'			

## WELL PURGING METHOD

TOTAL DEPTH OF WELL: <b>19.28'</b>	DEPTH TO WATER: <b>5.26'</b>	DIAMETER OF WELL: <b>2"</b>
VOLUME FACTOR = 0.17 FOR 2" CASING; 0.65 FOR 4" CASING; 1.47 FOR 6" CASING		
PURGE VOLUME = <b>7.1 gallons</b>		
PURGE METHOD: <b>DISPOSABLE BAILER</b>	OVA -FID VAPOR READING, ppm:	

## WELL PURGING PARAMETERS

GALLONS	TIME	TEMPERATURE degrees F	CONDUCTIVITY X 1000	pH	VISUAL TURBIDITY
0	1326	67.6	2.70	7.00	Turbid/ Brown
2.0	1329	67.4	2.68	6.97	Turbid/ Dark Brown
4.0	1331	66.8	2.67	6.88	Turbid/ Dark Brown
6.0	1335	66.4	2.67	6.85	Turbid/ Dark Brown
7.5	1339	66.2	2.67	6.79	Turbid/ Dark Brown

SAMPLING METHOD: <b>DISPOSABLE BAILER</b>	SAMPLE TURBIDITY: <b>138.8 NTU</b>	TIME COLLECTED: <b>1352</b>
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PURGE WATER DESCRIPTION:	<input type="checkbox"/> SHEEN	<input type="checkbox"/> ODOR	<input checked="" type="checkbox"/> SILTY	<input type="checkbox"/> OTHER:
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# RECORD OF WATER SAMPLE COLLECTION

WELL LABEL: <b>MW-7</b>	DATE COLLECTED: <b>3-19-96</b>	JOB NUMBER: <b>95009</b>
JOB NAME: <b>CAVANAUGH MOTORS</b>		SAMPLER(S) NAME: <b>T. GHIGLIOTTO AND M. EDWARDS</b>
LOCATION: <b>1700 PARK STREET, ALAMEDA, CALIFORNIA</b>		

WELL HEAD CONDITIONS	<input checked="" type="checkbox"/> CAPPED	<input type="checkbox"/> LOCKED	<input checked="" type="checkbox"/> DRY	<input type="checkbox"/> WATER	<input type="checkbox"/> DEBRIS	<input type="checkbox"/> REPLACE CAP
	<input type="checkbox"/> REPLACE LOCK		<input type="checkbox"/> OTHER:			

TIME MEASURED	1247	1309	1325			
DEPTH TO WATER (MEASURE TO .01 FEET)	5.30'	5.30'	5.30'			

## WELL PURGING METHOD

TOTAL DEPTH OF WELL: <b>15.21'</b>	DEPTH TO WATER: <b>5.30'</b>	DIAMETER OF WELL: <b>2"</b>
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VOLUME FACTOR = 0.17 FOR 2" CASING; 0.65 FOR 4" CASING; 1.47 FOR 6" CASING

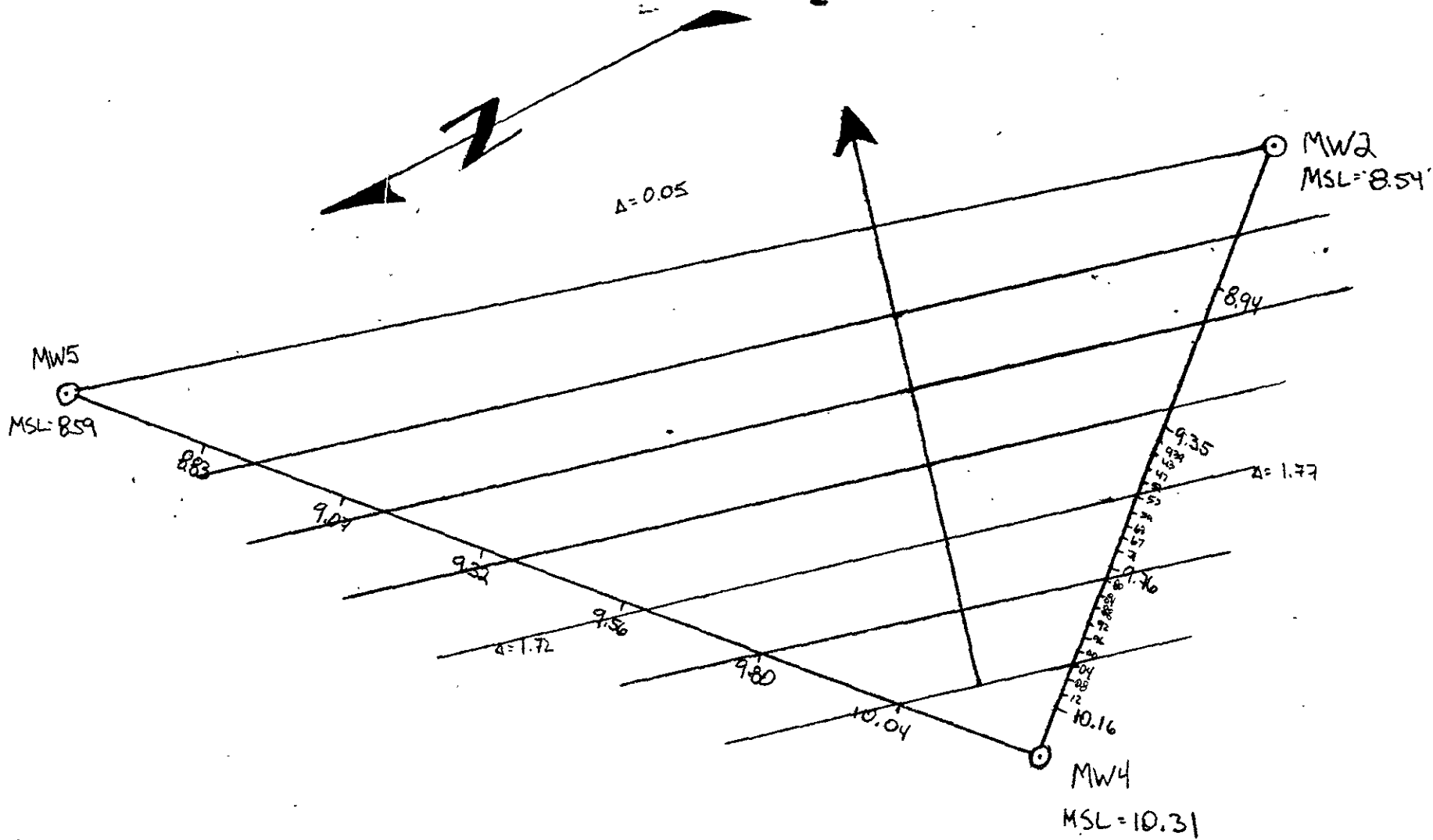
PURGE VOLUME = <b>5.0 gallons</b>	
PURGE METHOD: <b>DISPOSABLE BAILER</b>	OVA -FID VAPOR READING, ppm:

## WELL PURGING PARAMETERS

GALLONS	TIME	TEMPERATURE degrees F	CONDUCTIVITY X 1000	pH	VISUAL TURBIDITY
0	1340	69.5	0.47	7.85	Clear
1.5	1343	68.8	0.43	7.89	Turbid/Brown
3.0	1346	68.9	0.43	9.08	Turbid/Brown
5.0	1349	67.8	0.43	9.10	Sl. Turbid

SAMPLING METHOD: <b>DISPOSABLE BAILER</b>	SAMPLE TURBIDITY: <b>178.4 NTU</b>	TIME COLLECTED: <b>1405</b>
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PURGE WATER DESCRIPTION:	<input type="checkbox"/> SHEEN	<input type="checkbox"/> ODOR	<input checked="" type="checkbox"/> SILTY	<input type="checkbox"/> OTHER:
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Average Gradient =  
 0.076 FT/FT @ N107W

**GROUNDWATER GRADIENT WORKSHEET**  
 Cavanaugh Motors  
 1700 Park Street, Alameda, CA  
 Wells Measured 3/19/96  
 Map Drawn 3/29/96 By: Tom Ghigliotto  
 Scale: 1" = 20'