Delta
Environmental
Consultants, Inc.

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July 28, 2000

#103

Mr. Barney Chan
Alameda County Health Care Services
Environmental Health Services
11311 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Subject: *Site Conceptual Model and Risk-Based Corrective Action Plan*
Former Chevron Station No. 9-0076
4265 Foothill Boulevard
Oakland, California
Delta Project No. DG90-076

Dear Mr. Chan:

Delta Environmental Consultants, Inc. has been authorized by Chevron USA Products Company to prepare and forward this Site Conceptual Model and Risk Based Corrective Action Plan addressing the petroleum hydrocarbon concentrations in soil and groundwater at the subject site.

If you have any questions concerning this project, please contact Jim Brownell at (916) 638-2765.

DELTA ENVIRONMENTAL CONSULTANTS, INC.

James R. Brownell, R.G.
California Registered Geologist No. 5078

JRB (Lrp001.0076.doc)

cc: Mr. Tom Bauhs – Chevron U.S.A. Products Company
Ms. Karen Petryna
Mr. Dave De Witt – Tosco Oil Company
Ms.Erica Myan – Albertson's, Inc.
Ms. Barbara Sieminski – Gettler-Ryan, Inc. ← call Barbara re: RSCA

Providing a Competitive Edge

SITE CONCEPTUAL MODEL

and

RISK BASED CORRECTIVE ACTION PLAN

Former Chevron Station No. 9-0076
4265 Foothill Boulevard
Oakland, California
Delta Project No. DG90-076

July 28, 2000

Prepared For:

Mr. Tom Bauhs
Chevron U.S.A. Products Company
P.O. Box 6004
San Ramon, CA 94583

Prepared By:

DELTA ENVIRONMENTAL CONSULTANTS, INC.
3164 Gold Camp Drive, Suite 200
Rancho Cordova, CA 95670
(916) 638-2085

Benjamin I. Heningburg
Project Geologist

James R. Brownell, R.G.
California Registered Geologist No. 5078

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APPENDICIES

1.0 INTRODUCTION

Delta Environmental Consultants, Inc. (Delta) has been authorized by Chevron U.S.A. Product Company (Chevron) to review investigative work conducted at Chevron Station No. 9-0076 and to prepare a Site Conceptual Model (SCM) for Chevron Service Station #9-0076 located at 4265 Foothill Boulevard, Oakland, California (Figure 1 and 2). The purpose of this work was to evaluate whether the implementation of further environmental investigation and/or remediation of soil and groundwater is warranted at the site. This report was prepared based on information supplied by Chevron, and describes site hydrogeological conditions and distribution of contaminants in space and time, identifies potential current and future receptors, and recommends the most appropriate action plan for the site.

This report was prepared in response to a letter issued by Alameda County Health Care Services Agency (ACHCSA) letter dated May 8, 2000, requesting information concerning the following items:

1) Shallow soil contamination in the vadose zone indicated by increased TPHg, BTEX, and MTBE concentrations in groundwater monitoring well samples collected during the period 12/99 to 3/00. During this period groundwater elevation increased significantly in wells.
2) Performance of a Risk-based Corrective Action (RBCA) analysis to evaluate if benzene concentrations in C-4 pose a risk to nearby residences under the volatilization to indoor air exposure pathway.
3) Evaluation of the anticipated natural attenuation rate of TPHG and BTEX in C-7.
4) Evaluation of the effectiveness and process used to employ bioremedial enhancement chemicals.

A copy of the ACHSA letter dated May 8, 2000 is included as Appendix A.

2.0 SITE DESCRIPTION

2.1 General

The subject site is situated on the northwestern corner of Foothill Boulevard and High Streets in Oakland, California (Figure 1). The subject site is currently operated as Loi Le Chevron. The service station facilities include a kiosk, service islands, three 10,000-gallon gasoline underground storage tanks (USTs), and product lines. Locations of the site features are shown on Figure 2.

The site vicinity is used for transportation, commercial, and residential purposes. The subject site is bound by Foothill Boulevard to the northeast, High Street to the southeast, and residential properties to the southwest and northwest. A BP service station is located approximately 80-feet from the northeast boundary of the subject site, across Foothill Boulevard. A Shell service station is located approximately 80-feet from the southeast boundary of the subject site, across High Street. A residence with a basement is located approximately 40-feet from the southwest boundary of the (dg)

subject site. A storage facility is located approximately 40-feet from the southwest boundary of the subject site. An apartment building is located approximately 20-feet from the northwest boundary of the subject site. Other buildings situated across Foothill Boulevard, High Street or Bond Street to the southwest are used for residential and commercial purposes. The site vicinity is shown on Figure 2.

2.2 Previous Environmental Work

- **July 1987** – The station was remodeled and three steel USTs and one fiberglass used oil tank were removed from the site. Soil samples collected beneath these tanks contained low or non-detectable concentrations of hydrocarbons. The excavation, based on available data, included the removal of the fill materials associated with the tanks. Three steel USTs were replaced with 10,000-gallons double – walled fiberglass tanks. The waste oil tank basin was intact and placed back into the excavation. (BP/Unocal)
- **March 1989** – A soil gas survey was conducted at the former Mobile service station #10-H69 located at 4280 Foothill Boulevard, Oakland California. This site is located approximately 80-feet from the northeast boundary of the subject site, across Foothill Boulevard. Concentrations of hydrocarbons were detected in soil samples collected from 12 of the 16 locations. The highest concentrations were reported in samples collected from locations southeast of the former dispenser island along the southeastern property boundary and the sample down gradient to the former underground used oil tank location along the northeast boundary.
- **August 1987** – Five soil borings (C-A and C-1 through C-4) were advanced and C-1 through C-4 were completed as groundwater monitoring wells. Concentrations of hydrocarbons were detected in soil samples collected from four of the five borings, with the highest concentrations being found in samples collected from approximately 10 feet below grade in C-A and C-2. Concentrations of hydrocarbons were detected in all groundwater samples collected. Soil analytical results are shown in Appendix B. Well construction diagrams and soil borings logs are shown in Appendix C.
- **August 1990** – Three groundwater monitoring wells (C-5 through C-7) were installed to further assess the cross gradient and down gradient extent of hydrocarbons. Concentrations of hydrocarbons in soil samples collected were below method detection limits with a few negligible exceptions. Concentrations of hydrocarbons were detected in groundwater samples collected from monitoring wells C-6 and C-7.
- **November 1990** - One groundwater monitoring well (C-8) was installed to further assess the extent of dissolved hydrocarbons in groundwater. Soil and groundwater samples collected and analyzed in the lab did not contain concentrations of hydrocarbons above method detection limits. Well locations are shown on Figure 2.
- **December 1990**- A search of registered wells within ½-mile of the site was conducted in 1990 by the County of Alameda Public Works Agency using their computer database. Forty wells were located within a ½-mile radius of the subject site. Most of these wells are monitoring or cathodic protection wells. No drinking water wells, and only one irrigation well were identified. The irrigation well is located more than ¾ mile northwest (upgradient) of the subject site. The well locations are shown in Appendix D.

will need a more current survey.

- **November 1991** – In an attempt to obtain hydraulic capture of dissolved hydrocarbons, a groundwater extraction system began extracting groundwater from C-2. System operation data are shown in Appendix E. resume ?
- **February 1992** - One used oil tank located west of the station building was removed (*Waste Oil Tank Removal Observation Report*, GeoStrategies Inc., March 26, 1992).
- **September 1993** – Groundwater monitoring wells C-1 through C-8, MW-2 through MW-9, and S-1 through S-3 associated with the Chevron, BP and Shell stations respectively, were surveyed to the City of Oakland Bench Mark #1589.
- **October 1993** – The groundwater extraction system was turned off due to low flow rate and noise complaints from the neighbors. The groundwater extraction system had removed a total of 10,200-gallons of hydrocarbon-impacted groundwater as of July 16, 1993.
- **July 1996** – One groundwater monitoring well (C-9) was installed down gradient in the Lucky's parking lot to further assess the extent of dissolved hydrocarbons in groundwater. Concentrations of hydrocarbons in soil samples collected were below laboratory reporting limits except for TPHg, which was reported at 1.2 ppm at 10 feet below surface grade (bsg). Groundwater samples collected onsite and analyzed in the lab did not contain concentrations of hydrocarbons above laboratory reporting limits.
- **July 1997**- Soil samples (PL1-4 through PL5-4) were collected in product line trenches during EPA upgrade activities. Concentrations of hydrocarbons were detected in soil samples collected from trenches, with the highest concentrations being found in the sample collected from approximately 4 feet below grade at location PL-2. Sample concentrations are shown in Appendix B. Soil sample locations are shown on Figure 3.
- **May 1998** – A Risk Based Corrective Action (RBCA) site assessment was conducted using analytical results from soil and groundwater assessment activities. Output tables from RBCA assessments are included in Appendix F.

2.3 Groundwater Monitoring and Sampling

Monitoring and sampling of site wells was begun in April 1989. During the period of April 1989 to June 2000, depth to shallow groundwater beneath the site fluctuated between 9 and 30 feet bsg. The groundwater flow direction fluctuated between west and southwest, and the gradient was approximately 0.04 to 0.05. Groundwater monitoring and sampling data are summarized in well data and analytical results included in Appendix G.

On-site well C-2 has contained petroleum hydrocarbons at concentrations up to 30,000 ppb of benzene and 3,800ppb of MTBE. Hydrocarbon concentrations in this well have decreased significantly (to current levels of 3,400 and 2,800) since groundwater monitoring began, and especially upon addition of the oxygen release compound (ORC) in June 1998. Hydrocarbon concentrations in groundwater samples from C-5 have not been above laboratory reporting limits except for two dates when low MTBE concentrations were detected. Hydrocarbon concentrations have decreased in on-site wells C-3 and C-4. However, it appears that increased dissolved hydrocarbon concentrations

from hydrocarbon-impacted soil in the vicinity of these wells have occurred during periods of shallow groundwater. Hydrocarbon concentrations have increased in on-site well C-1. It appears that a trend of increased groundwater elevations beneath the site may have contributed to increased dissolved hydrocarbon concentrations from hydrocarbon impacted shallow soil in the vicinity of this well. Historically, downgradient off-site wells C-6 through C-9 have contained hydrocarbon concentrations up to 12,00 ppb of benzene and 590 ppb of MTBE. Hydrocarbon concentrations have decreased significantly (to current levels of 120 and 64) since groundwater monitoring begAn, and especially upon addition of the ORC in June 1998.

MTBE (up to 3,800 ppb by DHS LUFT Method) was reported to be present in wells C-1 through C-9 with the highest concentration reported for on-site well C-2. However, the MTBE presence was not confirmed by EPA Method 8260 analysis, which is more accurate in regards to MTBE detection. The reported MTBE concentrations appear to be false detections due to interference on the EPA 8020 analysis from other gasoline compounds (most likely 2-methyl pentane and 3-methyl pentane).

2.4 Evaluation of Intrinsic Bioremediation

The most recent evaluation of intrinsic bioremediation was performed for the subject site in March 1999 by Chevron Research and Technology Company. The observed trends for indicator parameters of alkalinity, dissolved iron (ferrous), and dissolved oxygen versus total BTEX in the site wells suggested that intrinsic bioremediation is occurring at the subject site. Dissolved oxygen levels were considerably lower near the source areas and sulfate concentrations were considerably higher near non-source areas, which is consistent with the expected consumption of dissolved oxygen and sulfates during the biodegradation of the BTEX compounds. (D.O. is not indicative)

2.5 Geology & Hydrology

The site is located on the nearly flat-lying surface of the East Bay plain, approximately 1-mile northeast of the Oakland Estuary. The Hayward Fault and the Oakland Hills are located approximately 1.5-miles northeast of the site. The regional geology consists primarily of Quaternary deposits (Qu), deposits of alluvial sands, silts, clays, and gravel deposited in the eastern portion of the San Francisco Bay Basin. The geologic map (Radbruch, 1969) indicates that an old stream channel emerges from the moderately sloping area approximately 500 feet northeast of the site. This suggests that former stream deposits may occur near or below the site.

The site is located at approximately 35 feet above mean sea level. The local topography slopes gently to the southwest. The nearest surface water is the Brooklyn Basin Tidal Canal, a channel connecting the Oakland inner harbor on the San Francisco Bay with the San Leandro Bay, about 0.75 miles southwest of the site. The boring logs indicate that the subject site is underlain by clayey sand alluvium interbedded with course sand and silty clays and gravel to the total depth explored of 59.0 feet bsg. Groundwater was encountered beneath the site at a depths ranging from 43 to 26 feet bsg geologic cross section maps and cross sections are included in Appendix H.

3.0 SITE CONCEPTUAL MODEL

The site conceptual model was prepared based on the site assessment and groundwater monitoring and sampling data collected at the site to date. A pictorial representation of the dissolved hydrocarbons in groundwater is shown in Figure 4.

3.1 Release Scenario and Plume Characterization

During station remodeling in 1987, three steel fuel USTs and one fiberglass waste oil tank were removed. The three USTs were replaced with 10,000-gallons double-wall fiberglass tanks. The used oil tank was intact and therefore placed back into its original basin. The site has been used as a Chevron retail fuel station since, 1987. There are several environmental problem sites (potential secondary off-site sources of contamination) in the vicinity of the subject site. Environmental investigations conducted at the site indicated that soil and shallow groundwater beneath the subject site have been impacted by petroleum hydrocarbons. Groundwater beneath the subject site has been impacted by Total Purgable Hydrocarbons (C6-C12), BTEX and MTBE as indicated by the DHS LUFT Method results of monitoring well samples. Hydrocarbon impacted soil (up to 3,600 ppm of TPHg) was present in the vicinity of soil boring C-A and monitoring well C-2 has historically contained over two feet of floating hydrocarbons.

Groundwater beneath the subject site has been monitored and sampled since April 1989 through the network of nine groundwater monitoring wells. During this period of time a groundwater depth ranged from 9 to 30 feet bsg, and a groundwater flow direction was consistently to the west or south west. Hydrocarbon impacted groundwater (up to 22,000 ppb of TPHg, up to 800 ppb benzene) has been present beneath the southeast section of the subject site (well C-2) and south (downgradient) of the site, beneath High and Bond Streets (wells C-4, C-6 and C-7). Hydrocarbon concentrations have decreased in wells C-3 and C-5. Monitoring wells C-5, C-8, and C-9 have reported only low levels of MTBE, with the exception of one anomalous report of from C-5 in September 1993. Hydrocarbon concentrations have been increasing in well C-1 since April 1993. The ORC was installed in wells C-2, C-4, and C-6 in June 1998, a decrease in hydrocarbon concentrations occurred in C-2 and C-4 due to the installation of the ORC. Monitoring well C-6 did not respond to the ORC. The lateral extent of the subject site plume has been generally delineated except to the northeast (vicinity of well C-1). The plume migration appears to be slow to stable and limited by natural processes. A pictorial representation of residual hydrocarbons in soil is shown in Figure 5.

3.2 Potential Receptors

The hydrocarbon plume extends beneath the south and southeastern portions of the subject site (parking lot), beneath High and Bond Streets, and possibly beneath the residential buildings and commercial parking lot on the south side of Bond Street. However, only MTBE at low concentrations is present at the downgradient most part of the plume. Most of this area is paved with asphalt or

concrete. The nearest residential building is located downgradient and inside of the plume. The potential exposure receptors are current and future residents of properties bound by the intersection of High and Bond Streets and possibly in the Lucky's parking lot along the southern side of High Street, and current and future site visitors (clients, motorists, pedestrians). [redacted] (affected soil has not been removed); therefore, hydrocarbon volatilization from soil or direct dermal contact is a valid pathway in the vicinity of C-4. No water producing wells are located at the site or in the immediate site vicinity; therefore, groundwater ingestion is not a valid pathway. Potential exposure medium is indoor air in residential buildings. The major exposure pathway is hydrocarbon volatilization from groundwater to ambient and indoor air. Based on the groundwater depth (9 to 30 feet bsg) and a presence of hydrocarbons in the vadose zone, a dermal contact with hydrocarbon-impacted soil during excavation is a valid pathway for the utility maintenance worker. (also comm/residential) not eval in R.A.

3.3 Other Environmental Issues

The lateral extent of hydrocarbon impacted groundwater has been delineated in the downgradient direction of the subject site. An underground utility survey has not been conducted at the site. The dissolved hydrocarbon plume at the subject site extends beneath the public streets (Hill and Bond), in the area where underground utilities are likely to be present. However, based on the groundwater depth (9 to 30 feet bsg), underground utility trenches do not appear to be a likely factor in plume migration in the subject site vicinity

needs to be done

Foothill

4.0 RISK-BASED CORRECTIVE ACTION (RBCA)

Under Tier 2, Site-Specific Target Levels (SSTLs) for soil and/or groundwater cleanup goals are determined on the basis of site-specific information and/or points of exposure. Simple analytical models are employed in conjunction with additional site data to calculate Tier 2 SSTL values in a manner consistent with EPA-recommended practices. Modeling and calculation procedures are streamlined so as to represent a minor incremental effort relative to Tier 1.

Both the Tier 1 Risk Based Screening Levels (RBSL) and Tier 2 SSTL values represent concentration limits for constituents within the source zone. However, SSTLs differ from RBSLs in three significant ways i) site specific data are used to calculate risk based cleanup goals ii) human exposure to affected media may be assumed to occur not at the source zone, but at a separate point of exposure (POE and iii) the effects of natural attenuation of constituent concentrations during lateral transport from the source to an POE may be considered in the SSTL calculations. If site constituents concentrations exceed SSTL values subsequent actions may involve I) remediation to site specific Tier 2 clean up goals, ii) further evaluation per Tier 3 of the RBCA process, or iii) interim response measures targeted at principal risk sources.

4.1 Site Parameters

The complete exposure pathways are those that could pose a reasonable potential for contaminant contact with a human or environmental receptor. Under Tier 2 RBCA onsite and offsite receptors apply. Based on land usage along the edge of the plume a residential scenario was evaluated for the site. There are no water supply wells within the plume. Therefore, groundwater ingestion or subsurface soil leaching to groundwater as exposure pathways were not considered a complete pathway. The surface soil (< 3-feet) is not impacted. The site is currently paved and will remain paved in the future. Therefore, direct ingestion and dermal contact were not considered a complete pathway. The down gradient edge of the plume extends beneath the residential buildings. Therefore, the only complete exposure pathway identified is volatilization to into of air from the groundwater (residential receptor).

Two separate risk scenarios for residential indoor air inhalation were calculated. One, representing onsite conditions, using soil and groundwater data from wells C-2, C-3, C-4, and C-5; and the second, representing offsite conditions using soil and groundwater data from wells C-6, C-7, C-8, and C-9. Arithmetic averages for soil and groundwater data for the most recent sampling events were used in the RBCA analysis.

4.2 Results of RBCA Analysis

Based on the RBCA analysis, onsite and offsite representative concentrations exceed the SSTLs for benzene. The representative onsite concentration for benzene in soil is 1.2 mg/kg with a SSTL of 0.0063 mg/kg. To pass the indoor air exposure pathway onsite the representative concentrations of benzene in indoor air would have to be reduced below 0.0063 mg/kg. The representative onsite

concentration for benzene in groundwater is 0.79 mg/l with a SSTL of 0.045mg/l. To pass the indoor air exposure pathway onsite the representative onsite concentration for benzene in groundwater would have to be reduced below 0.045mg/l. The representative offsite concentration in soil is 0.021mg/kg with a SSTL of 0.0036 mg/kg. To pass the indoor air exposure pathway offsite the representative concentrations of benzene would have to be reduced below 0.0036 mg/kg. The representative offsite concentration in groundwater is 0.23 mg/l with a SSTL of 0.045mg/l. To pass the indoor air exposure pathway offsite the representative concentrations of benzene would have to be reduced below 0.045 mg/l. Pertinent data used in the RBCA analysis are presented in Appendix E.

benzene

4.3 Discussion

The subject site has been impacted by petroleum hydrocarbons beneath the former product distribution lines. Hydrocarbon impacted soil has not been completely removed from site. Hydrocarbon impacted groundwater has been present in the eastern portion of the site and in the downgradient (eastern and southeastern) vicinity of the subject site. The lateral extent of dissolved hydrocarbon plume has been delineated except upgradient to the northeast). Hydrocarbon concentrations have decreased in well C-3. Monitoring wells C-5, C-8, and C-9 have contained only low levels of MTBE, with the exception of one anomalous report from C-5 in September 1993. Hydrocarbon concentrations have been increasing in well C-1 since April 1993. ORC was installed in wells C-2, C-4, and C-6 in June 1998, a decrease in hydrocarbon concentrations occurred in C-2 and C-4 due to the installation of the ORC. Monitoring well C-6 did not respond to the ORC. Shallow soil contamination in the vadose zone is indicated by increased TPHg, BTEX and MTBE concentrations in groundwater monitoring well samples collected during the period 1999 to March 2000. During this period, groundwater elevation increased in the wells.

Increased concentrations of dissolved hydrocarbons in groundwater beneath the site reflect a trend that is consistent with an increase in groundwater elevation. Historical analyses of soil samples collected onsite support the conclusion that residual hydrocarbons remain in soil approximately 3 to 10 feet bsg. Analyses of soil from locations C-A, C-2, and C-4, and PL-1, PL-2, PL-3 and PL-4 all reported concentrations of TPHG and benzene ranging from 3,600 parts per million (ppm) to 1.8 ppm and benzene ranging from 33 ppm to 0.64 ppm. Benzene was not detected in soil sample PL-4.

Benzene concentrations in C-4 have been evaluated using RBCA analysis to evaluate whether concentrations pose a risk to nearby residences under the exposure pathway, volatilization to indoor air. Using the Tier 2 evaluation it has been determined based on the RBCA analysis, onsite and offsite representative concentrations exceed the SSTLs for benzene. As indicated above, to pass the indoor air exposure pathway offsite, the representative concentrations of benzene would have to be reduced to below 0.0036 mg/kg and the indoor air exposure pathway offsite representative concentrations of benzene would have to be reduced below 0.045 mg/l. Soil vapor samples are needed from subsurface soil adjacent to the residence located immediately down gradient of C-4 to evaluate current soil vapor levels. The RBCA exposure pathway model for exposure to benzene

(shallow)

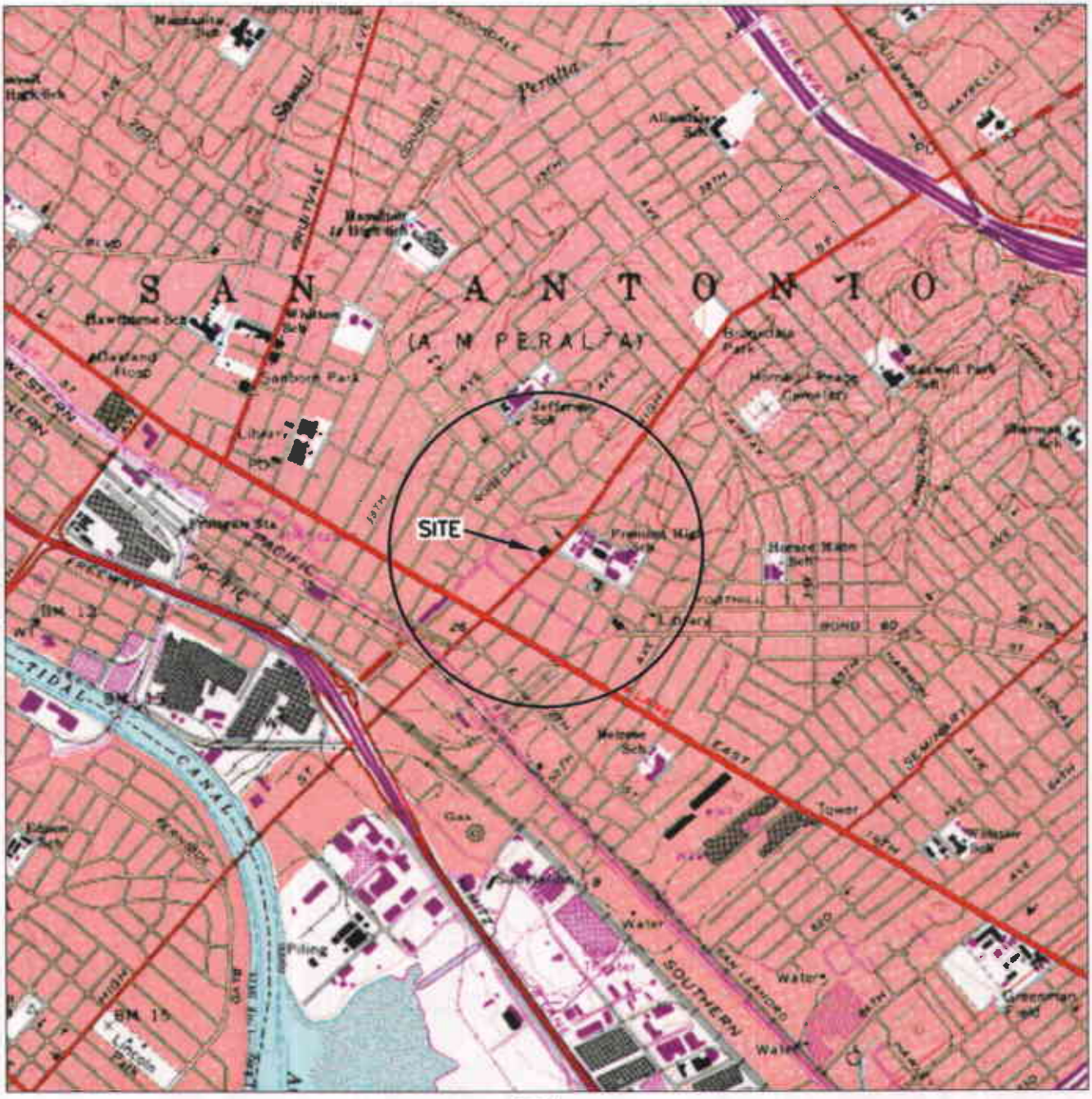
OK

identified this residence to have potential threats to human health and environment based on current use of the site and its vicinity. The intrinsic bioremediation of soil and ground water in the vicinity of wells C-1 through C-4, C-6 and C-7 was evaluated using recent groundwater data. The observed trends for indicator parameters of alkalinity, dissolved iron (ferrous), nitrate, sulfate, dissolved oxygen and oxygen-reduction potential (ORP) versus total BTEX in the site wells suggested that intrinsic bioremediation is occurring at the subject site. Additionally, there has been an anticipated increase in bioremediation parameter values at this site due to increased groundwater elevations.

5.0 RECOMMENDATIONS

The use of ORC as a method of enhanced bioremediation has been effective in wells C-2 and C-3. We propose the use of this compound in the future as part of the overall remediation process of this site. At this time, we propose that the following remediation alternatives be considered at this site in order to remove hydrocarbon source areas and stabilize and reduce offsite migration of the plume.

1. Perform a soil vapor survey in the vicinity of the site to include locations downgradient of wells C-9.
2. Over-purging wells C1- through C-4 periodically.
3. Install ORC in wells C-2 through C-4 and C-6 prior to the next scheduled quarterly monitoring of this site.

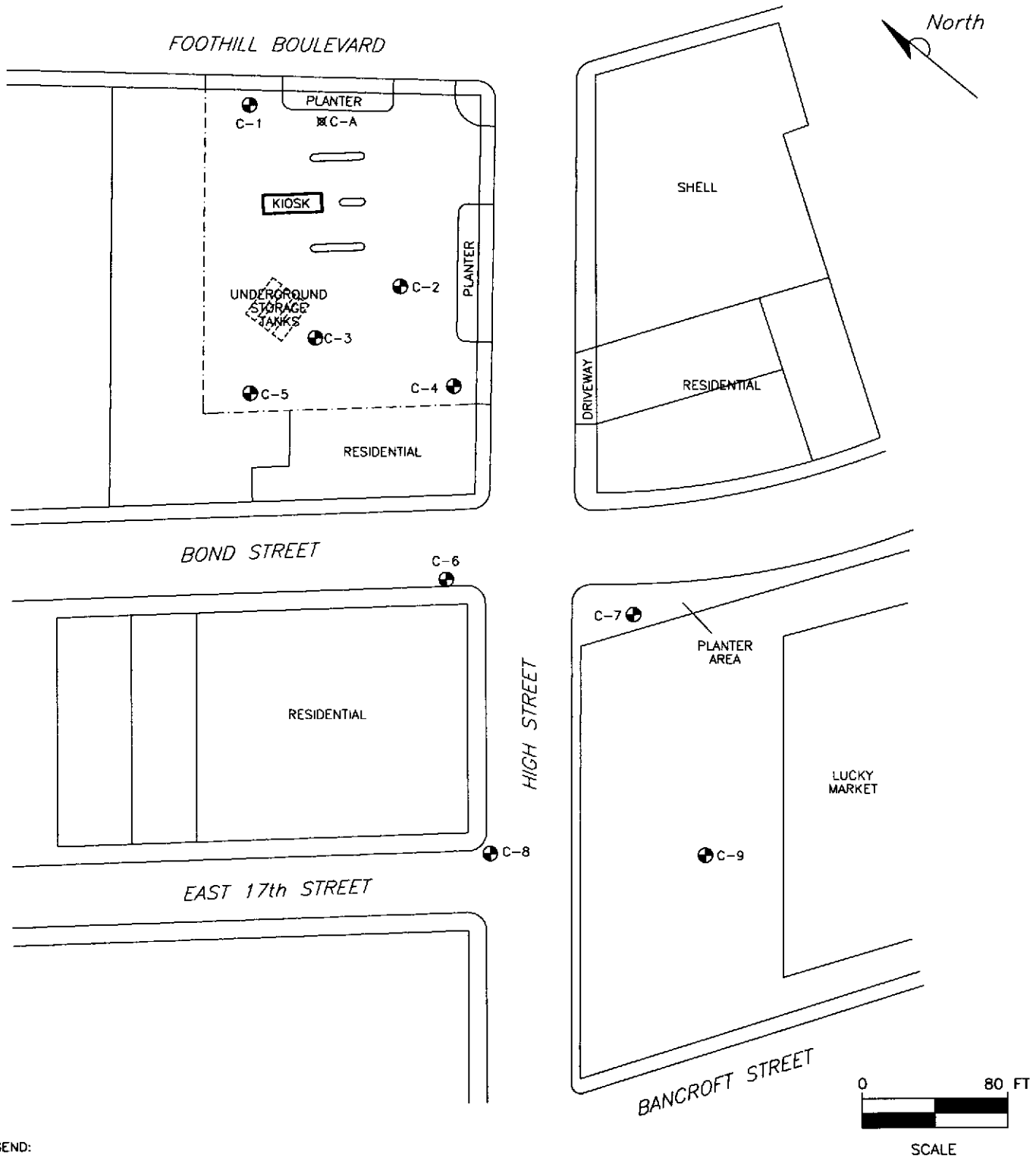


GENERAL NOTES:
BASE MAP FROM U.S.G.S.
OAKLAND EAST, CA
7.5 MINUTE TOPOGRAPHIC
PHOTOREVISED 1980

FIGURE 1
SITE LOCATION MAP
CHEVRON SERVICE STATION NO. 9-0076
4265 FOOTHILL BOULEVARD
OAKLAND, CA.

PROJECT NO. DG90-076	DRAWN BY M.L. 7/20/00
FILE NO. DG90076A	PREPARED BY BIH
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.



LEGEND:

- C-1 MONITORING WELL LOCATION
- C-A PRE-EXISTING SOIL BORING LOCATION

FIGURE 2

SITE VICINITY MAP

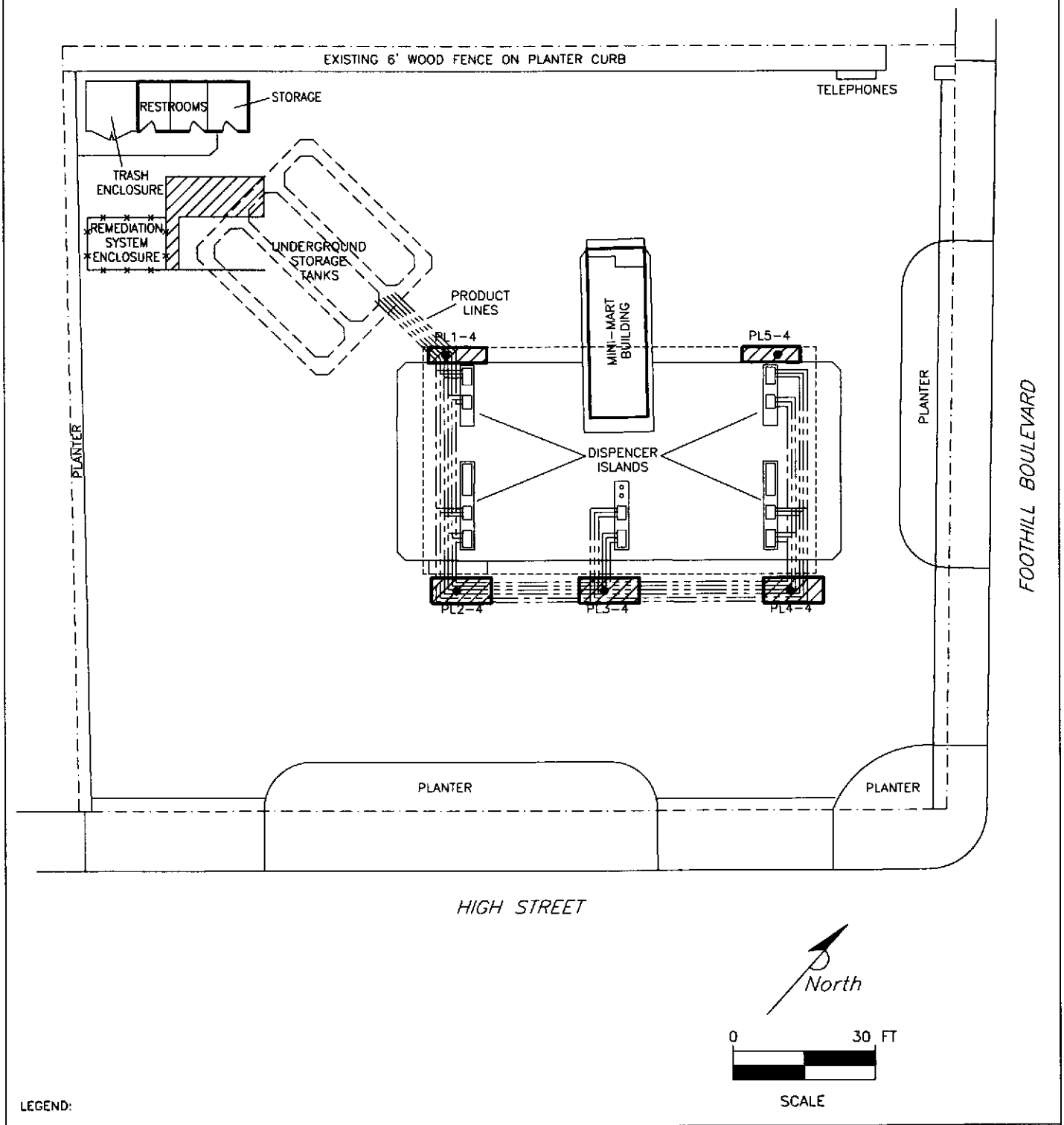
CHEVRON SERVICE STATION NO. 9-0076

4265 FOOTHILL BOULEVARD

OAKLAND, CA.

PROJECT NO. DG90-076	DRAWN BY M.L. 7/28/00
FILE NO. DG90076B	PREPARED BY BIH
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.



LEGEND:

- ● PL1-4 SOIL SAMPLE LOCATION
- AREA OF EXCAVATION

FIGURE 3

PRODUCT LINE SOIL LOCATION MAP

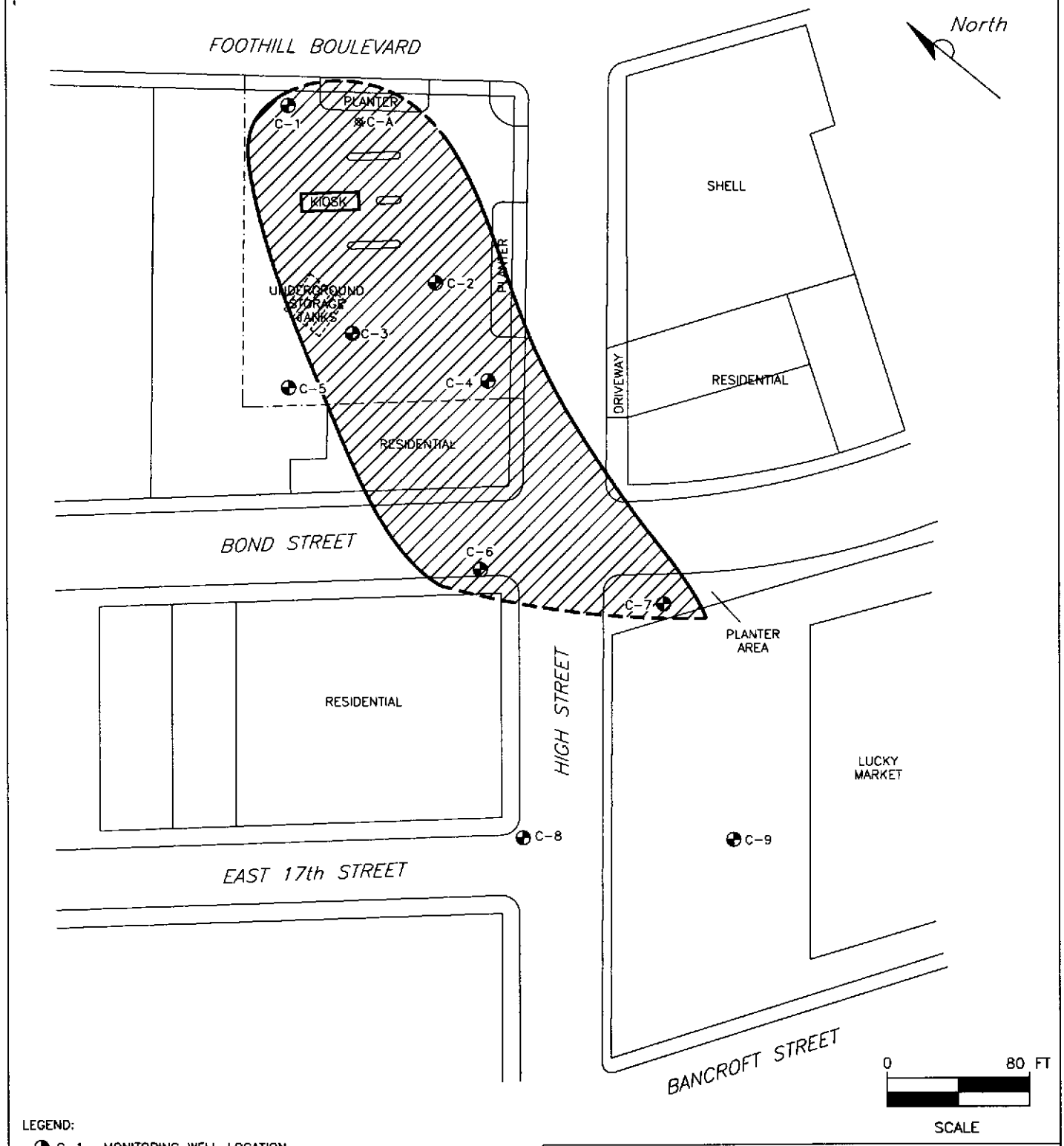
CHEVRON SERVICE STATION NO. 9-0076

4265 FOOTHILL BOULEVARD

OAKLAND, CA.

PROJECT NO. DG90-076	DRAWN BY M.L. 7/28/00
FILE NO. DG90076D	PREPARED BY BIH
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.



LEGEND:

- C-1 MONITORING WELL LOCATION
- C-A PRE-EXISTING SOIL BORING LOCATION
- DISSOLVED BENZENE PLUME (DASHED WHERE INFERRED)

FIGURE 4
DISSOLVED BENZENE PLUME
(DASHED WHERE INFERRED)
CHEVRON SERVICE STATION NO. 9-0076
4265 FOOTHILL BOULEVARD
OAKLAND, CA.

PROJECT NO. DG90-076	DRAWN BY M.L. 7/28/00
FILE NO. DG90076B	PREPARED BY BIH
REVISION NO. 1	REVIEWED BY

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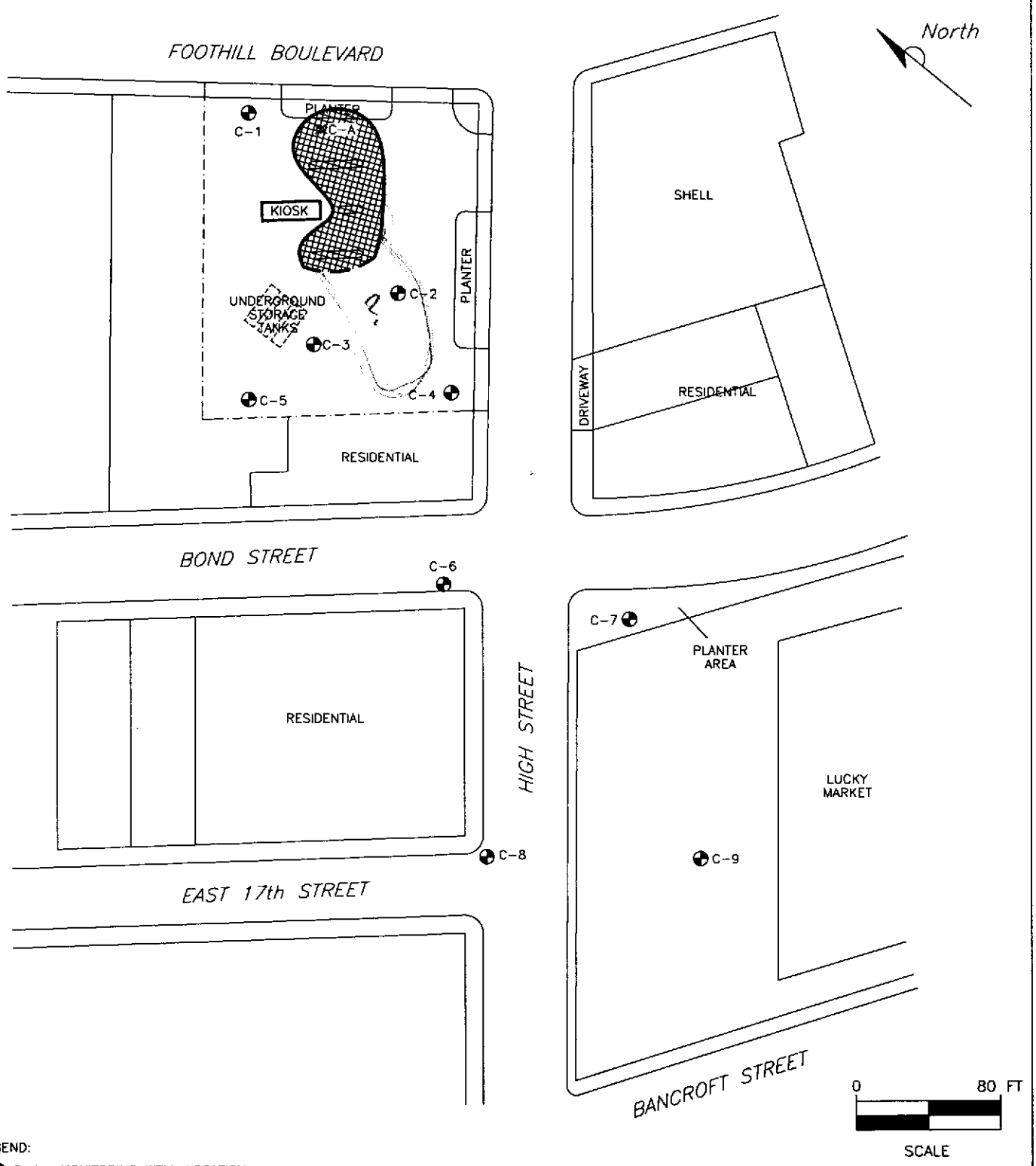

LEGEND:

- C-1 MONITORING WELL LOCATION
- C-A PRE-EXISTING SOIL BORING LOCATION
- RESIDUAL HYDROCARBONS IN SOIL (DASHED WHERE INFERRED)

FIGURE 5

RESIDUAL HYDROCARBONS IN SOIL

CHEVRON SERVICE STATION NO. 9-0076

4265 FOOTHILL BOULEVARD

OAKLAND, CA.

PROJECT NO. DG90-076	DRAWN BY M.L. 7/28/00
FILE NO. DG90076B	PREPARED BY BIH
REVISION NO. 1	REVIEWED BY

Delta Environmental Consultants, Inc.

APPENDIX A

Alameda County Health Care Services Letters

PHONE CONVERSATION RECORD

Date: 7/24/00 Time: 1320

Person Contacted: Barney Chan ACHCSA

Phone: (510) 567-6700 Project No. DG-9#076

Project Name/Location Former Chevron Station #9-0076, 4265 Foothill Blvd. OAKLAND, CA

Contacted By: Ben Hemingberg, Staff Geologist

NOTES: I called Barney Chan concerning his letter to Mr. Brett Hunter, dated May 8, 2000. We (Delta) had been requested to submit a response to that letter NLT 7/21/00.

I informed him about the short lead time we had to evaluate the data and respond to the letter. I told him that we were preparing a Site Conceptual Model and RBCA plan for this site and that we could have the report to him by mid week of 7/24/00. He responded "I will be looking forward to seeing the report before 7/28/00." I told him that he would.

END

Ben Hemingberg

Delta
Environmental
Consultants, Inc.

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U.S.A.
916/638-2085
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June 9, 2000

Mr. Barney Chan
Alameda County Health Care Services Agency
Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

FAXED 6/9/00

Subject: Former Chevron Station #9-0076, 4265 Foothill Boulevard, Oakland, CA.

Mr. Chan:

At the request of Chevron Products Company, Delta Environmental Consultants, Inc. (Delta) and Gettler-Ryan Inc. (GR) have prepared this response to your letter of May 8, 2000. You requested a written response to the observations noted in your letter, including a determination if residential properties near well C-4 are at risk from volatilization to indoor air, and an evaluation for the need to replace Oxygen Releasing Compound (ORC) in wells C-2 and C-4.

Delta and GR will review Chevron's file for this site and prepare a Site Conceptual Model. The Risk-Based Corrective Action (RBCA) Evaluation prepared for this site in May 1999 will be re-evaluated to include the recent monitoring and sampling data. The need to add additional ORC, ORC injection or other types of bioremediation will be evaluated. The revised RBCA and ORC evaluation will be included in the SCM, which will be submitted to you by July 24, 2000.

As you have requested, future quarterly monitoring and sampling reports for this site will be accompanied by a letter that provides an evaluation of the data, and will include conclusions and recommendations.

Please call GR at 916.631.1300 if you have questions or comments.

Sincerely,
Gettler-Ryan Inc.

Stephen J. Carter, R.G.
Senior Geologist

Greg A. Gurss
Sr. Project Manager

cc: Mr. Tom Bauhs, Chevron Products Company, PO Box 6004, San Ramon, CA 94583
Mr. Jim Brownell, Delta Environmental Consultants, Inc., 3164 Gold Camp Drive, Suite 200, Rancho Cordova, CA 95670
Ms. Karen Petryna, Equiva Services LLC, PO Box 7869, Burbank, CA 91501-7869
Mr. Dave DeWitt, Tosco Marketing Company, 2000 Crow Canyon Place, Suite 400, CA 94583
Ms. Erica Myran, Albertons's Inc., PO Box 20, Boise, ID 83726

Oakland, ch #9-0076, letter1

DG90076B.3C01

Greg Gauss
GeoKinetics
(916) 631-1317

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

ENVIF
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

S

May 8, 2000
StID # 103

Mr. Brett Hunter
Chevron USA Products
6001 Bollinger Canyon Rd., Bld L
P.O. Box 6004
San Ramon, CA 94583-0804

Re: Former Chevron Service Station 9-0076, 4265 Foothill Blvd., Oakland CA 94601

Dear Mr. Hunter:

I have received and reviewed the April 28, 2000 1st Quarter 2000 Monitoring report for the above site as prepared by Blaine Tech Services. This report documents the March 9, 2000 sampling event. It appears that conditions at this site have changed from that when our office concurred with groundwater monitoring only as the recommended remedial approach. Significant changes have occurred in groundwater elevation, contaminant concentrations and bio-indicator measurements. This situation may have been recognized had your consultant provided a recommendation and conclusion section within their quarterly reports. Our office has on several occasions requested this information from you to no avail.

The following observations are of particular concern:

- From 12/99 to 3/00, groundwater elevation has increased significantly in wells, no well exhibiting a greater change than C-1, which increased nearly 8'. The resulting increase in TPHg, BTEX and MTBE is indicative of shallow soil contamination.
- There has been an increase in benzene concentration in well C-4, the well closest to the nearby residences. Please determine if this presents a risk to the these residents under the exposure pathway, volatilization to indoor air.
- The concentration of TPHg and BTEX in C-7 increased significantly, indicating that natural attenuation may not be occurring as anticipated.
- The concentration of dissolved oxygen in wells C-2 and C-4, the well with ORC socks, is not any higher than the non-ORC wells, indicating that these socks are spent. Please evaluate the need to add additional ORC socks, ORC injection or other type of enhanced bio-remediation chemical. You are aware that Equiva Services is considering some type of chemical oxidant addition to address their own TPH release, a potential off-site source to this Chevron site.

Please respond to this letter in writing within 30 days or no later than June 9, 2000.

You may contact me at (510) 567-6765 if you have any questions.

Sincerely,

Barney M. Chan
Hazardous Materials Specialist

C: B. Chan, files
Ms. K. Petryna, Equiva Services LLC, P.O. Box 7869, Burbank, CA 91501-7869
Mr. D. Dewitt, Tosco Oil Co., 2000 Crow Canyon Place, Suite 400, San Ramon, CA 94583
Ms. Barbara Russell, American Stores Properties, Inc., 299 South Main St., Salt Lake City, UT 84111-2203
stat4265Foothill

TABLE 1

Summary of Analytical Results

Groundwater Samples (Sample Date: 9/1/87)

Well	Gasoline (ppb)	Benzene (ppb)	Toluene (ppb)	Xylenes (ppb)
C-1	22,000	800	1,000	2,900
C-2	(floating product detected)			
C-3	250	11	8	7
C-4	3,200	520	66	130
Detection Limits	50	1	1	1

Soil Samples

Boring	Depth (feet)	Gasoline (ppm)	Benzene (ppm)	Toluene (ppm)	Xylenes (ppm)
C-A	8.5-10.0	3,600	33	12	350
	19.0-20.5	63	2.0	0.1	2.0
	23.5-25.0	52	1.8	nd	0.4
C-1	9.0-10.5	nd	nd	nd	nd
	19.0-20.5	nd	nd	nd	nd
	29.0-30.5	nd	nd	nd	nd
C-2	9.0-10.5	1,200	16	54	120
	19.0-20.5	nd	0.07	0.8	nd
	29.0-30.5	48	0.93	0.1	3
C-3	9.0-10.5	7	0.05	nd	0.4
	19.0-20.5	nd	nd	nd	nd
	29.0-30.5	nd	nd	nd	nd
C-4	9.0-10.5	580	3.9	23	46
	19.0-20.5	nd	nd	nd	nd
	29.0-30.5	nd	nd	nd	nd
Detection Limits		5	0.05	0.1	0.4

Notes: nd - not detected
ppb - parts per billion
ppm - parts per million

Table 1. Analytical Results - Chevron Service Station #9-0076, 4265 Foothill Boulevard, Oakland, California.

Sample Name	Depth (ft)	Date	TPHg	Benzene	Toluene	Ethylbenzene	Xylenes	MTBE	Lead
			<----------ppm---------->						
PL1-4	4.0	07/21/97	1.8	0.031	0.016	0.023	0.19	2.5	---
PL2-4	4.0	07/21/97	210	0.64	0.90	3.6	11	<2.5	---
PL3-4	4.0	07/21/97	34	0.20	0.15	0.88	4.4	10	---
PL4-4	4.0	07/21/97	45	<0.0050	<0.0050	0.87	3.5	10	---
PL5-4	4.0	07/21/97	130	0.64	0.25	0.71	0.51	6.9	---
SP1-(A-D)*	---	07/21/97	43[1]	0.034	0.045	0.29	0.93	---	220(14[2], 0.67[3])
SP2-(A-D)	---	07/21/97	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	---	36

EXPLANATION:

TPHg = Total Petroleum Hydrocarbons as gasoline
MTBE = Methyl t-Butyl Ether
ppm = Parts per million
--- = Not analyzed/not applicable
[1] = Gasoline and unidentified hydrocarbons >C8
[2] = STLC extract result
[3] = TCLP extract result
* = Sample was also analyzed for Halogenated Volatile Organics by EPA Method 8010 - all compounds were not detected.

ANALYTICAL METHODS:

TPHg = EPA Method 8015 Mod.
Benzene, toluene, ethylbenzene, xylenes, and MTBE = EPA Method 8020
Lead = EPA 6010

ANALYTICAL LABORATORY:

Sequoia Analytical (ELAP #1271)

1219.02

TABLE 2. Results of Soil Analyses - Chevron Service Station #9-0076, 4265 Foothill Boulevard, Oakland, California

Soil Boring (Well ID)	Sample Depth	Date Sampled	Analytical Lab	Analytic Method	Sat/ Unsat	TPH-G	B	E	T	X
						<----------parts per million (mg/kg)---------->				
BH-E	11.0	08/01/90	GTEL	8015/8020	Unsat	54	0.5	0.8	1.7	4.5
(C-5)	16.0	08/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	0.008	0.02
	21.0	08/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
	26.0	08/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
BH-F	16.0	08/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
(C-6)	21.0	08/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
	31.0	08/01/90	GTEL	8015/8020	Unsat	42	0.2	0.1	<0.005	0.3
	41.0	08/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
BH-G	11.0	07/31/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
(C-7)	16.0	07/31/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
	21.0	07/31/90	GTEL	8015/8020	Unsat	<10	0.02	<0.005	<0.005	<0.015
	31.0	07/31/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.015
	41.0	07/31/90	GTEL	8015/8020	Unsat	<10	0.007	<0.005	<0.005	<0.015
BH-H	5.5	11/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.005
(C-8)	40.0	11/01/90	GTEL	8015/8020	Unsat	<10	<0.005	<0.005	<0.005	<0.005
	45.0	11/01/90	GTEL	8015/8020	Sat	<10	<0.005	<0.005	<0.005	<0.005

Abbreviations:

TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
E = Ethylbenzene
T = Toluene
X = Xylenes
Sat = Saturated soil sample
Unsat = Unsaturated soil sample
<n = Not detected at detection limit of n ppm

Analytical Laboratory:

GTEL = GTEL Environmental Laboratories, Concord, California

Analytic Methods:

8015 = Modified EPA Method 8015 for TPH-G
8020 = EPA Method 8020 for BETX

Table 1
Soil Analytical Data
Total Petroleum Hydrocarbons
(TPPH as Gasoline and BTEX Compounds)

Chevron Service Station 9-0076
4265 Foothill Boulevard at High Street
Oakland, California

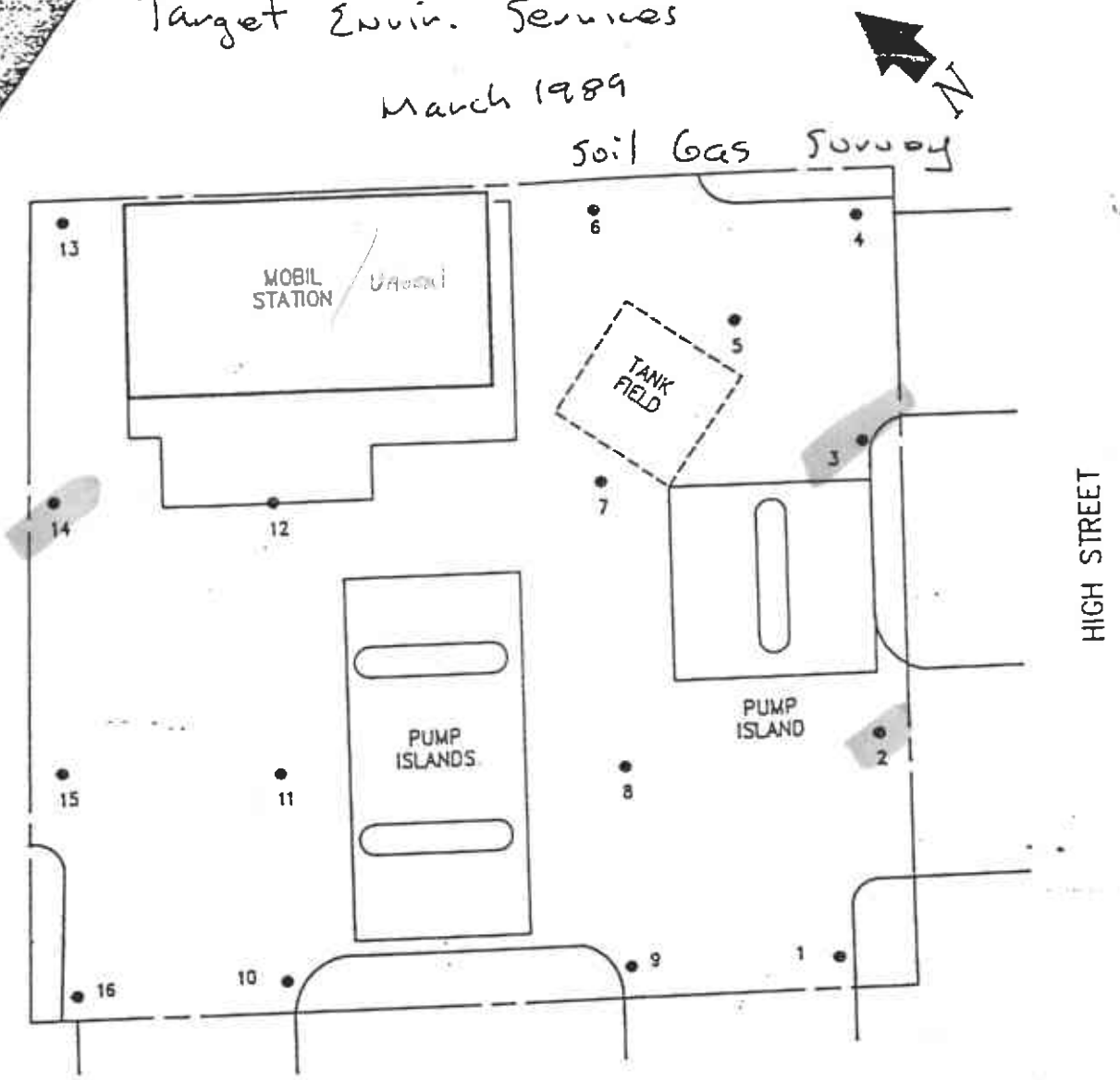
Sample ID	Sample Depth (feet)	Date Sampled	TPPH as Gasoline (ppm)		Benzene (ppm)	Toluene (ppm)	Ethyl-benzene (ppm)	Xylenes (ppm)
C-9	10	07/10/96	1.2	a	ND	ND	ND	ND
	20		ND		ND	ND	ND	ND
	30		1.1	a	ND	ND	ND	ND
	45		ND		ND	ND	ND	ND

TPPH = Total purgeable petroleum hydrocarbons
ppm = Parts per million
ND = Not detected
a. Unidentified hydrocarbons <C8

Target Envir. Services

March 1989

Soil Gas Survey



0 25 50

FEET

• SOIL GAS SAMPLE LOCATION

Chevron Station

FIGURE 1. Sample Locations

TARGET ENVIRONMENTAL SERVICES, INC.

This map is integral to a written report and should be viewed in that context.

(BP)

MOBIL SERVICE STATION #10-H69
4280 FOOTHILL BOULEVARD
OAKLAND, CALIFORNIA

TABLE 1

LABORATORY RESULTS
FLAME IONIZATION DETECTOR ANALYSIS
CONCENTRATIONS IN MICROGRAMS-PER-LITER

SAMPLE	PENTANE/ MTBE[1]	BENZENE	TOLUENE	ETHYL-BENZENE	m- & p-XYLENE	o-XYLENE	TOTAL VOLATILES[2]
1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	7.5
2	573	1.2	21	13	9.6	8.9	4,643
3	5,497	150	291	345	181	63	46,500
4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
5	13	<1.0	4.3	<1.0	<1.0	<1.0	136
6	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7	3.8	<1.0	<1.0	<1.0	<1.0	<1.0	30
8	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
9	2.4	<1.0	3.3	2.4	<1.0	<1.0	119
10	4.5	<1.0	<1.0	<1.0	<1.0	<1.0	89
11	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
12	6.5	<1.0	6.3	<1.0	<1.0	<1.0	128
13	<1.0	<1.0	<1.0	<1.0	1.5	<1.0	19
14	10	3.0	112	64	291	120	1,350
15	2.9	<1.0	<1.0	<1.0	<1.0	<1.0	25
16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
FIELD CONTROL SAMPLES							
17	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
18	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
LABORATORY SYRINGE BLANKS							
BM1-1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
DUPLICATE ANALYSES							
10	4.5	<1.0	<1.0	<1.0	<1.0	<1.0	89
10R	4.1	<1.0	<1.0	<1.0	<1.0	<1.0	84

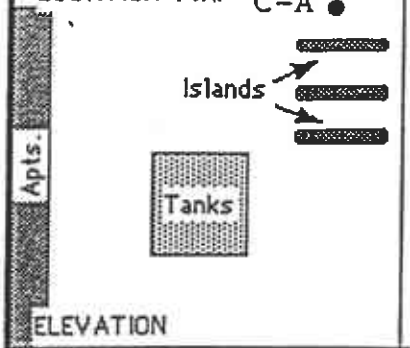
[1]CONCENTRATIONS BASED ON RESPONSE FACTOR OF MTBE

[2]CALCULATED USING THE SUM OF THE AREAS OF ALL INTEGRATED CHROMATOGRAM PEAKS, AND THE INSTRUMENT RESPONSE FACTOR FOR TOLUENE

APPENDIX C

Soil Boring Logs and Well Completion Diagrams

LOCATION MAP C-A



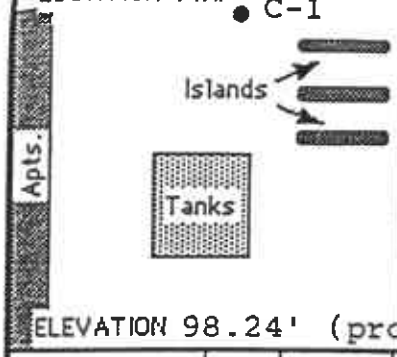
PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / BORING NO. C-A
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: NA
SLOT SIZE:
GRAVEL PACK:

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH:
WELL DIAMETER:

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
Backfilled with Concrete	Dp	12	4			SC	ASPHALT AND BASEROCK. CLAYEY SAND; fill; dark olive; 20-30% fines; fine to coarse grained; trace fine gravel; medium dense; damp; faint product odor to strong product odor starting at 4'. @ 5-1/2': intermixed SW and GW fill materials; some free product; still primarily SC. @7': free product. @8-1/2': free product. @10': nearly saturated with product.
		16	6				
		11	8				
		4	10				
		9					
		10	12				CLAYEY SAND and CLAYEY GRAVEL; interbedded; olive; 20-30% fines; silty; SAND; fine to coarse grained; 0-15% fine to medium gravel; very dense; faint product odor; GRAVEL; 15-25% fine to coarse sand; FeO mottled; fine to coarse grained; very dense; sub-rounded; damp; faint product odor.
	Dp	50	14			SC/ GC	
		24	16				
		28					
		18	18			CL	@16': strong product odor.
	Mst	49	20				CLAY; strong brown; moderate plasticity; FeO mottled; slightly silty; stiff; 0-10% fine to medium sand; faint product odor.
			22				
		64	24				@23-1/2': faint product odor.
			26				Bottom of Boring at 25 feet.
			28				
			30				
			32				
			34				
			36				
			38				
			40				



PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / BORING NO. C-1
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

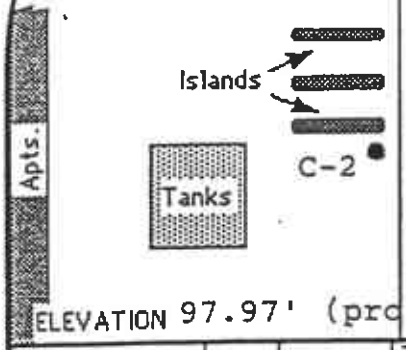
CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
	Dp		2			CL	ASPHALT AND BASEROCK. CLAY; fill; black; silty; 0-10% fine to coarse sand; disturbed; soft; no product odor.
			4			CL	CLAY; olive; silty; 0-10%fine to medium sand; red to black; FeO stained. @ 7': 20-30% fine to coarse sand; trace caliche; occasional pores; FeO mottled; stiff; trace fine to coarse gravel; no product odor.
	Dp	24	6				
	Dp-Mst	28	8				
			10			SC	CLAYEY SAND; yellowish brown; 15-25% fines; fine to coarse grained; 0-10% fine to coarse gravel; sub-rounded; no product odor.
			12				
	Mst	40	14			CL	CLAY; olive to strong brown; 10-20% fine to medium sand; trace coarse sand; FeO stains; very stiff; wet in root holes; no product odor.
			16				
			18				@ 19': 20-30% fine sand intermittently; moderate plasticity; no product odor.
	Mst-Wt	49	20				
			22				
			24				@ 24': 20-30% fine to coarse sand; trace fine gravel; very stiff; moderate plasticity; no product odor.
	Mst-Wt	56	26				
			28				
			30				@ 29': light gray; 0-10% fine sand; moderate plasticity; caliche mottle; very stiff; no product odor.
	Mst-Wt	62	32				
			34			SP-SC	SAND TO CLAYEY SAND; olive to brown; 5-20% fines; fine to coarse grained; 10-25% fine to medium gravel; very dense; faint product odor.
			36				
	Wt	68	38				
			40			CL	CLAY; strong brown; as above; 20-30% fine sand to coarse gravel; stiff; no product odor.
	Wt	70					Bottom of boring at 40-1/2'

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / BORING NO. C-2
PAGE 1 OF 1

LOCATION MAP



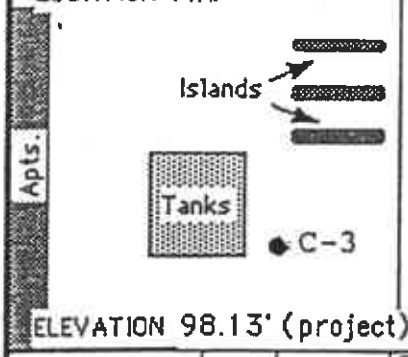
ELEVATION 97.97' (project)

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
			0				ASPHALT AND BASEROCK.
			2			CL	CLAY FILL; black; abundant root fragments; silty; 0-10% fine sand; soft; faint product odor.
	Dp	22	4			CL	CLAY; gray; 5-15% fine to coarse sand; moderate plasticity; silty; trace fine gravel; stiff; no product odor.
			6				
			8			CL-GC	CLAY TO CLAYEY GRAVEL; strong brown; 30-60% fine to coarse sand and gravel; FeO mottled; sub-rounded to sub-angular; very stiff; strong product odor.
	Dp-Mst	42	10				
			12				
			14			CL	CLAY; Yellowish brown; silty; moderate plasticity; occasional root fragments; FeO mottled; very stiff; 10-20% fine to medium sand; no product odor.
	Mst-Wt	50	16				
			18				
	Mst--Wt	not rec.	20				
			22				@ 24': contains up to 25% fine to coarse sand and fine gravel; faint product odor.
	Mst--Wt	70	24				
			26				
			28				@ 29': Strong product odor.
	Wt	42	30				
			32			SC	CLAYEY SAND; dark yellowish brown; 15-20% fines; fine to medium grained; medium dense; no product odor.
	Wt	24	34				
			36				
			38				CLAY; dark yellowish brown; 15-30% fine to coarse sand; silty; 10-15% fine to medium gravel; very stiff; no product odor.
	Wt	57	40			CL	
							Bottom of Boring at 40-1/2'

LOCATION MAP



ELEVATION 98.13' (project)

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / BORING NO. C-3
PAGE 1 OF 1

PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

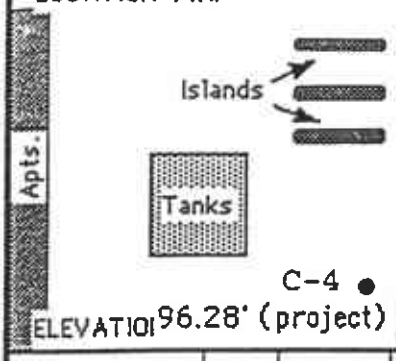
CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
			2			CL	ASPHALT AND BASEROCK. CLAY FILL; olive to black; 0-10% fine sand; silty; soft; no product odor.
			4			CL	CLAY; olive; 5-10% fine to coarse sand; slightly silty; stiff; no product odor.
	Dp	P	6				
			8				
	Dp	79	10				@ 9': yellowish brown; 30-40% fine sand to medium gravel; stiff; faint product odor.
			12				
	Dp	36	14				@ 14': yellowish brown; 5-10% fine to medium sand; FeO mottled; trace root fragments; moderate plasticity; no product odor.
			16				
			18				
	Dp	38	20				@ 19': no product odor.
			22				
	Dp	46	24				@ 24': no product odor.
			26				
			28				
	Wt	59	30			GC	CLAYEY GRAVEL; yellowish brown; 20-30% fines; 20% fine to coarse sand; fine to coarse grained; FeO stained; very stiff; no product odor.
			32				
	Wt	25	34			CL	CLAY; olive to yellowish brown; moderate plasticity; FeO stained; 0-5% fine to coarse sand; very stiff; no product odor.
			36				
			38				
	Wt	70	40				Bottom of Boring at 40-1/2'

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL / BORING NO. C-4
PAGE 1 OF 1

LOCATION MAP

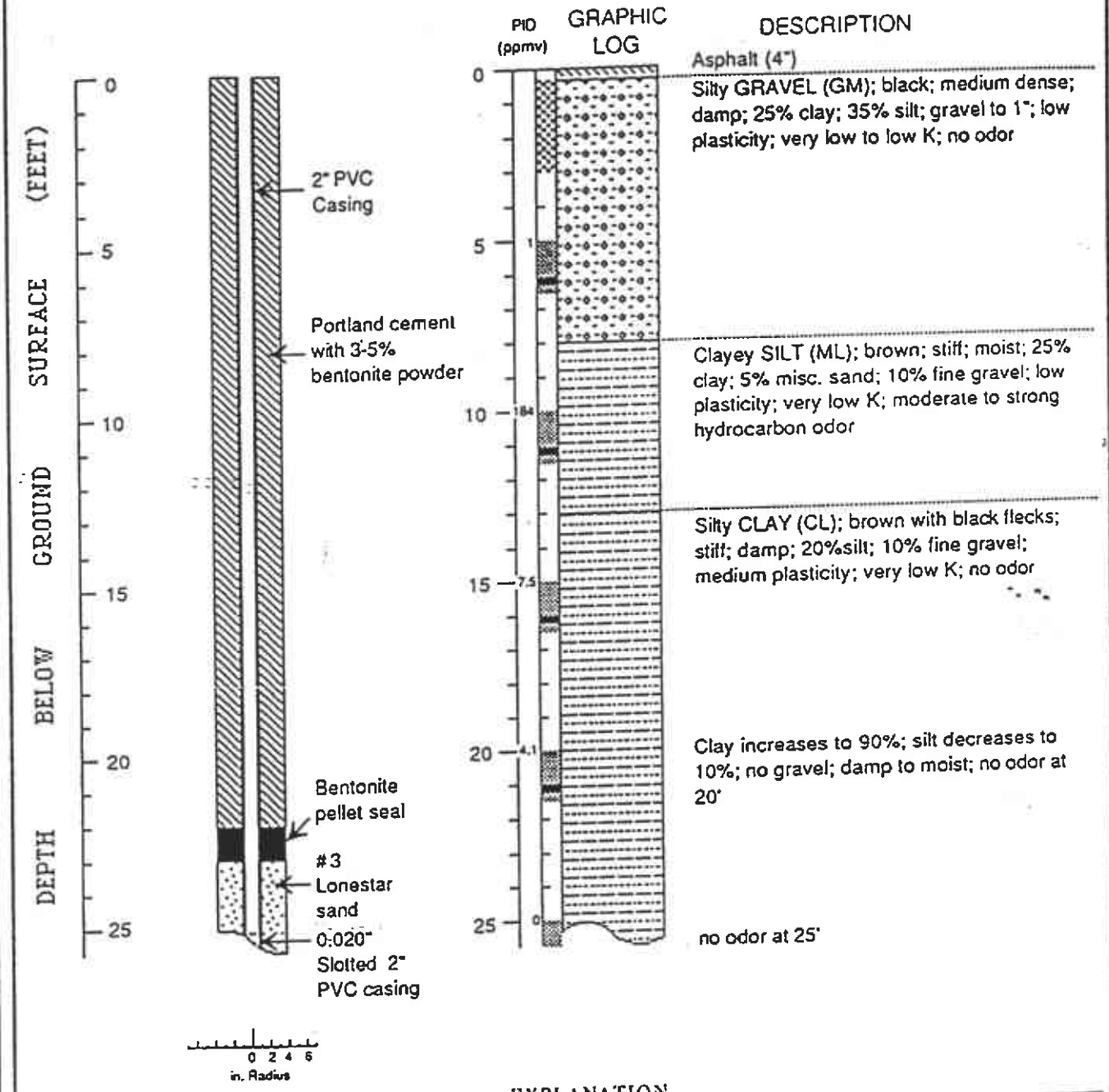


PROJECT NO. 120-57.01
LOGGED BY: E.G.
DRILLED BY: BAYLAND
DRILLING METHOD: HSA
SAMPLING METHOD: CAL. MOD.
CASING TYPE: SCH. 40 PVC
SLOT SIZE: 0.020
GRAVEL PACK: CA

CLIENT: G.R. CHEVRON USA
DATE DRILLED: 8-13-87
LOCATION: HIGH AND FOOTHILL
HOLE DIAMETER: 8"
HOLE DEPTH: 40-1/2'
WELL DEPTH: 40'
WELL DIAMETER: 3"

WELL COMPLETION	MOISTURE CONTENT	PENETRATION RESISTANCE (BLOW/FT)	DEPTH (feet)	SAMPLE	GRAPHIC	SOIL TYPE	LITHOLOGY/REMARKS
			2			CL	ASPHALT AND BASEROCK. CLAY; fill; black; silty; 0-10% fine sand; no product odor.
	Dp	P	4			CL	CLAY; olive; 5-10% fine to coarse sand; slighty silty; stiff; damp; no product odor.
	Dp	39	10			SC	CLAYEY SAND; yellowish brown; 20-40% fines; fine to medium grained; FeO stained; trace root fragments; hard; strong product odor.
	Dp	37	14			CL	CLAY; strong brown; slightly silty; moderate plasticity; 10-30% fine sand to medium gravel; hard; no product odor.
	Dp	49	20				@ 19': no product odor.
	Dp	N/A	24				@ 24': decrease sand; no product odor.
	Mst -Wt	41	30				@ 29': olive; 0-10% fine to medium sand; hard; no product odor.
	Mst -Wt	80	34				@ 34': yellowish brown; 20-25% fine to medium sand; silty; hard; no product odor.
	Mst -Wt	>32	40				@ 39': olive; 0-10% fine to medium sand; slightly silty; hard; no product odor. Bottom of Boring at 40-1/2'

Well C-5 (BH-E)



EXPLANATION

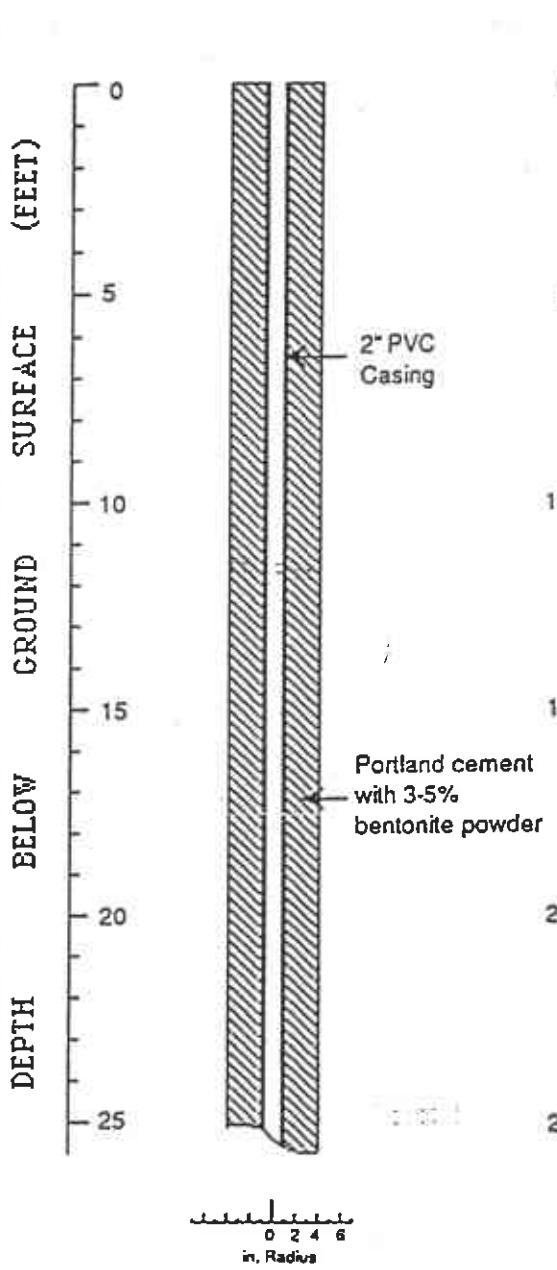
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

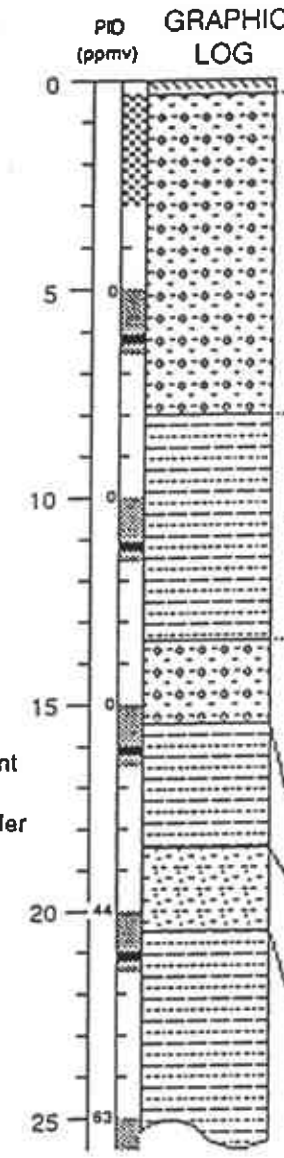
Logged by:	Robert E. Kitay
Supervisor:	James W. Carmody; RG 4872
Drilling Company:	Soils Exploration Services, Vacaville, CA
Driller:	Russ Ellis
Drilling Method:	Hollow stem auger
Date Drilled:	August 1, 1990
Well Head Completion:	2" locking well-plug with traffic-rated vaul
Type of sampler:	Split barrel (2" ID)
Ground surface elevation:	35.83 feet above mean sea level

Well Construction and Boring Log Details - Well C-5 (BH-E)

Chevron Service Station #9-0076
Oakland, California

Well C-6 (BH-F)





DESCRIPTION

Asphalt (5")

Gravelly SILT (MH); tan; very stiff; damp; 30% fine gravel; 20% clay; 5% fine to medium sand; medium plasticity; very low to low K; no odor

Silty CLAY (CL); brown; very stiff; damp; 20% silt; medium plasticity; very low K; no odor

Silty GRAVEL (GM); yellow; medium dense; damp; 30%silt; 10% clay; 5% fine gravel; angular gravel to 1" diameter; low K; no odor; gravel consists of white and dark brown chert

Silty CLAY (CL); brown; very stiff; damp; 20% silt; medium plasticity; very low K; no odor

Silty SAND (SW); green; medium dense; wet; 30% silt; 10% fine gravel; low to moderate K; moderate hydrocarbon odor

Clayey SILT (ML); green; very stiff; wet; 20% clay; 10% sand; 5% fine gravel; low plasticity; low K; moderate hydrocarbon odor

Moist; moderate hydrocarbon odor at 25'

EXPLANATION

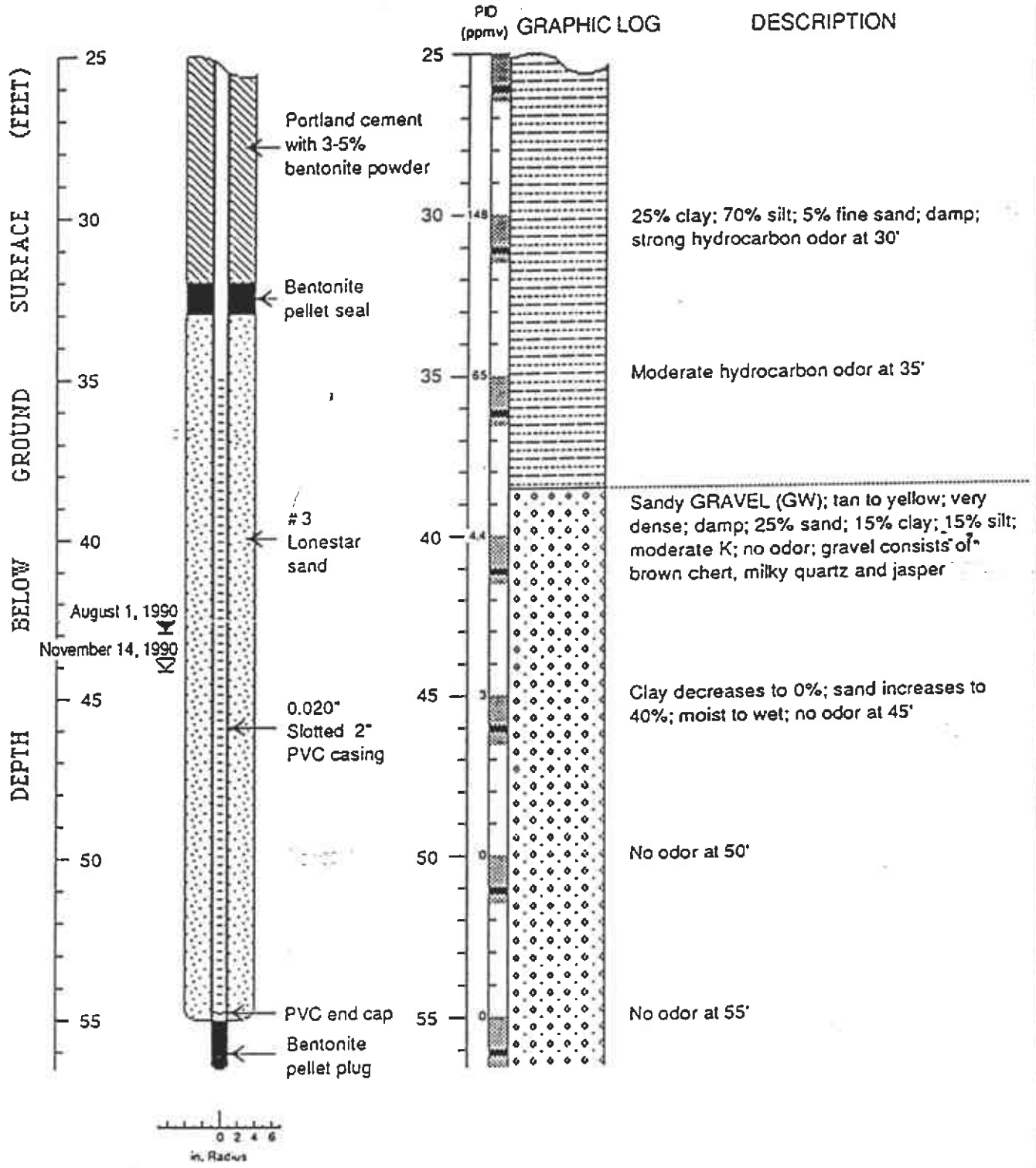
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged by:	Robert E. Kitay
Supervisor:	James W. Carmody; RG 4872
Drilling Company:	Soils Exploration Services, Vacaville, CA
Driller:	Russ Ellis
Drilling Method:	Hollow stem auger
Date Drilled:	August 1, 1990
Well Head Completion:	2" locking well-plug with traffic-ratted vault
Type of sampler:	Split barrel (2" ID)
Ground surface elevation:	

Well Construction and Boring Log Details - Well C-6 (BH-F)

Chevron Service Station #9-0076
Oakland, California

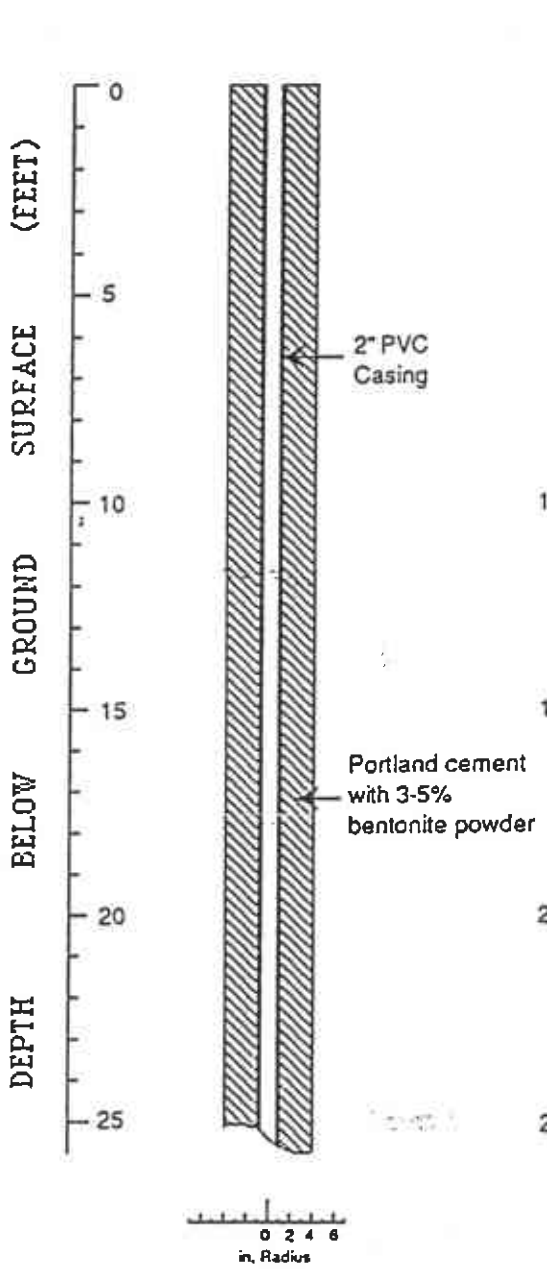
WELL C-6 (BH-F) (cont.)

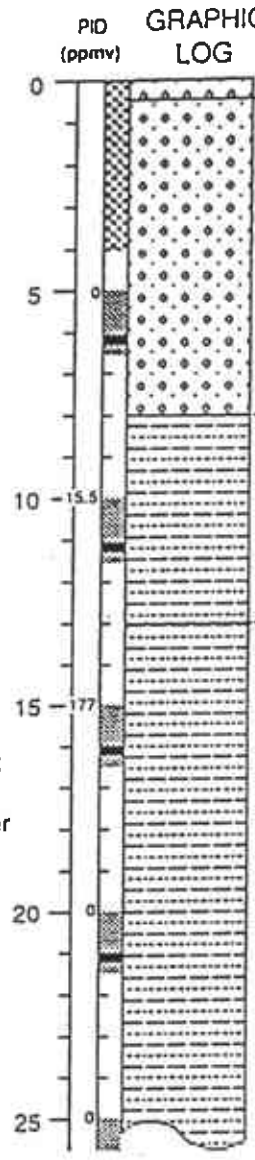


Well Construction and Boring Log Details - Well C-6 (BH-F)

Chevron Service Station #9-0076
Oakland, California

Well C-7 (BH-G)





DESCRIPTION

Topsoil (6")

Sandy GRAVEL (GW); light brown mottled red-brown; medium dense; damp; 20% sand; 10% silt; gravel to 1" diameter; very high K; no odor; FeO staining

Clayey SILT (MH); olive; very stiff; damp; 10% clay; 5-10% fine sand; medium plasticity; low K; no odor

Silty CLAY (CL); brown; very stiff; damp to moist; 35% silt; 5% fine sand; medium plasticity; very low K; strong hydrocarbon odor

Wet; no odor at 20'

Clay increases to 85%; silt decreases to 10%; medium to high plasticity; no odor at 25'

EXPLANATION

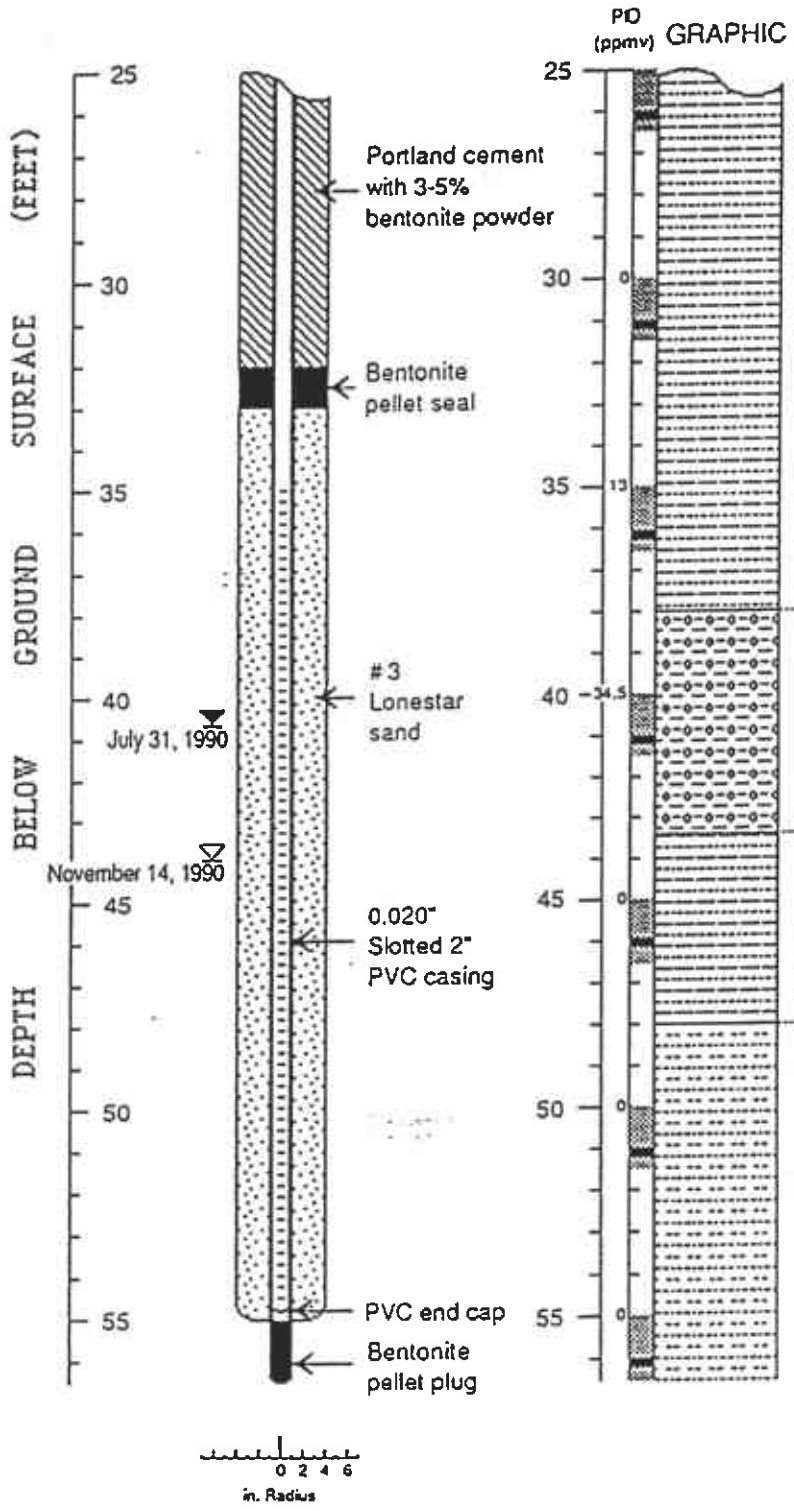
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged by:	Robert E. Kitay
Supervisor:	James W. Carmody; RG 4872
Drilling Company:	Soils Exploration Services, Vacaville, CA
Driller:	Russ Ellis
Drilling Method:	Hollow stem auger
Date Drilled:	July 31, 1990
Well Head Completion:	2" locking well-plug, stovepipe, traffic-rated vault
Type of sampler:	Split barrel (2" ID)
Ground surface elevation:	32.65 feet above mean sea level

Well Construction and Boring Log Details - Well C-7 (BH-G)

Chevron Service Station #9-0076
Oakland, California

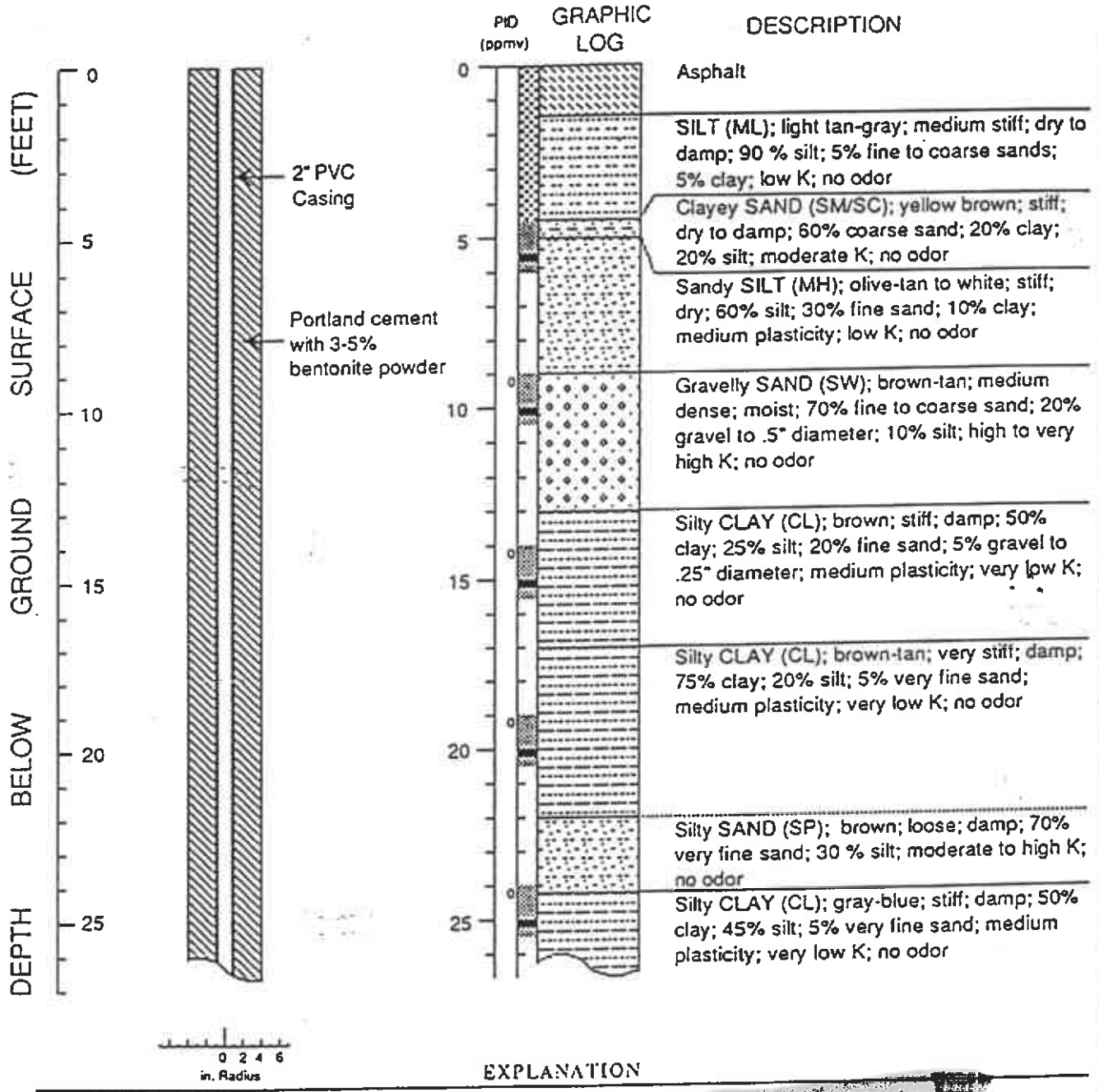
WELL C-7 (BH-G) (cont.)



Well Construction and Boring Log Details - Well C-7 (BH-G)

Chevron Service Station #9-0076
Oakland, California

WELL C-8 (BH-H)



EXPLANATION

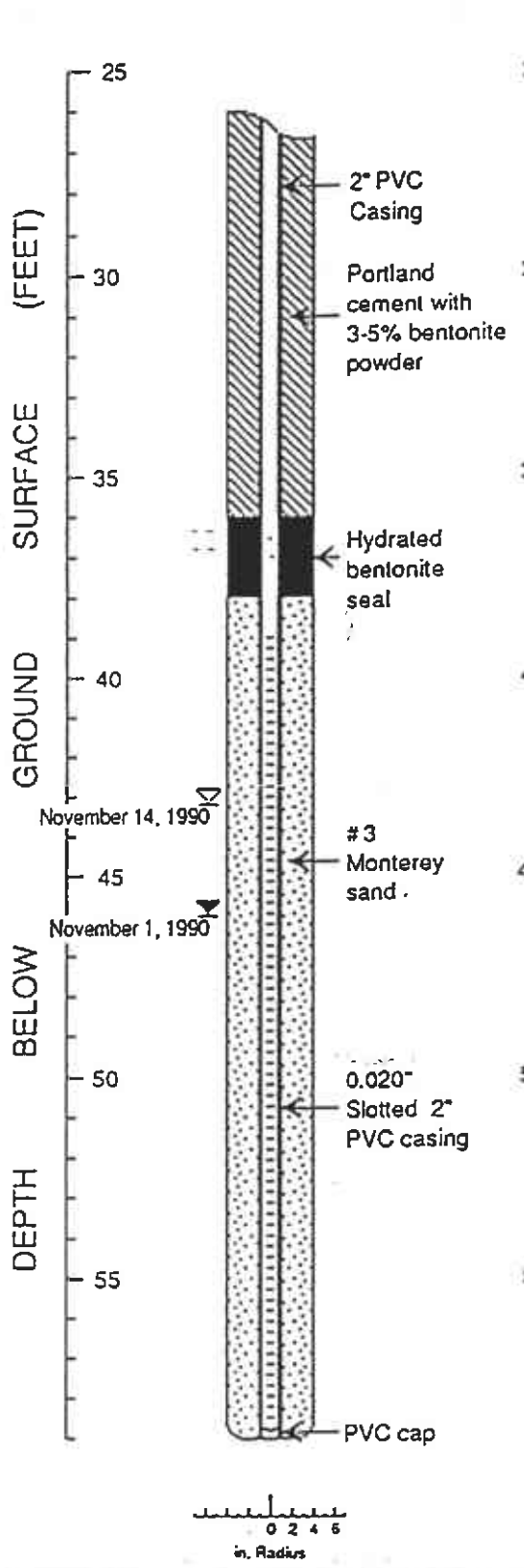
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approx.)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

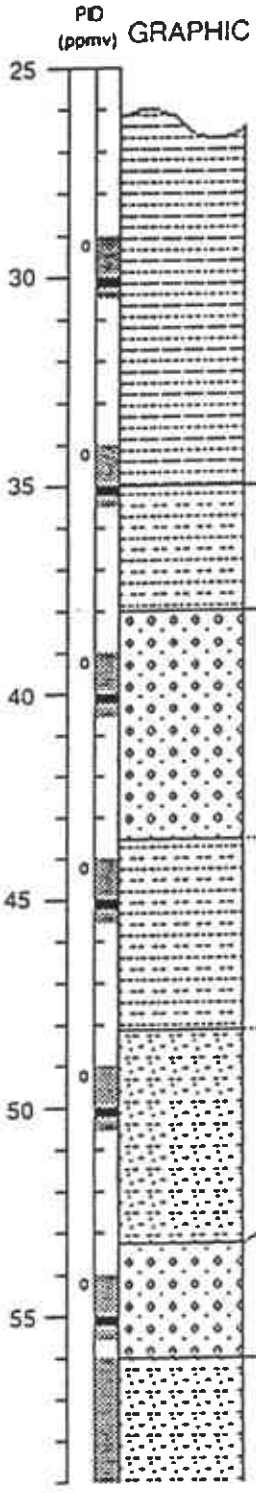
Logged by: Robert Kitay / Mariette Shin
Supervisor: James W. Carmody; RG 4872
Drilling Company: Soils Exploration Services, Vacaville, CA
Driller: Rick Carr
Drilling Method: Hollow-stem auger
Date Drilled: November 1, 1990
Well Head Completion: 2" locking well-plug; traffic rated vault
Type of Sampler: Split barrel (2" ID)
Ground Surface Elevation: 31.17 feet above mean sea level

Boring Log and Well Construction Details - Well C-8 (BH-H)

Chevron Service Station #9-0076
Oakland, California

WELL C-8 (BH-H) (cont.)





DESCRIPTION

Black streaks across sample at 34'

Sandy CLAY/Silty CLAY (CL); light-gray to white; stiff; moist; 50% clay; 30% sand; 20% silt; high plasticity; very low K; no odor (Contact-driller)

Gravelly SAND/ Silty SAND (SW); yellow-brown to orange; medium dense to dense; moist; 50% very fine to coarse sand; 20% gravel to .5" diameter; 20% silt; 10% clay; low to moderate K; no odor

SILT to Sandy SILT (ML); light brown mottled gray-green; medium stiff; 60-100% silt; 0-40% very fine sand; moderate K; no odor Wet at 46'

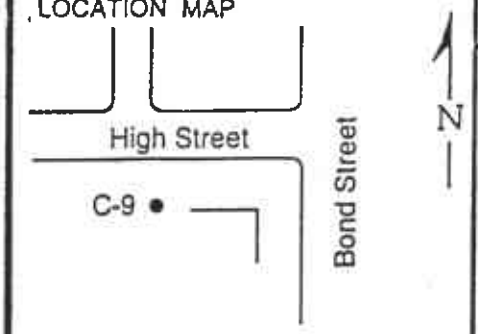
Silty SAND (SW); brown; dense; wet; 90% fine to coarse sand; 10% silt; high K; no odor

Gravelly SAND (SW); tan-brown; dense; very moist to wet; 60% very fine to coarse sand; 25% gravel to .75" diameter; 15% silt; high K ; no odor

Silty SAND (ML); tan-brown; damp to moist; medium dense to dense; 70% fine to coarse sand; 25% silt; 5% gravel to .3" diameter; moderate K; no odor

Boring Log and Well Construction Details - Well C-8 (BH-H)

Chevron Service Station #9-0076
Oakland, California



PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. C-9
PAGE 1 OF 1

PROJECT NO. 325-024.1B
LOGGED BY: CWR
DRILLER: MDE
DRILLING METHOD: HSA
SAMPLING METHOD: CORE
CASING TYPE: SCH 40 PVC
SLOT SIZE: 0.020"
SAND PACK: #3 SAND

CLIENT: CHEVRON
DATE DRILLED: 7-10-96
LOCATION: 4265 Foothill Blvd.
HOLE DIAMETER: 8"
HOLE DEPTH: 45'
WELL DIAMETER: 2"
WELL DEPTH: 45'
CASING STICKUP: NA

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT	Dp			2				GC	ASPHALT 4"
								CL	CLAYEY GRAVEL - FILL: dark yellowish brown; 15-20% clay; 10% medium sand; 70-75% subangular gravel to 2" diameter; wood chips; no product odor.
	Mst-Wt	0		4				CL	CLAY: dark yellowish brown; moderate plasticity; 90% clay with minor silt; 10% medium sand; no product odor.
				6					SANDY CLAY: dark yellowish brown; moderate plasticity; 60-70% clay; 30-40% coarse subangular sand to fine subangular gravel; no product odor.
				8					
	Dp	0		10					@10': as above; yellowish brown with pervasive gray and black mottling in thin horizontal bands; low to moderate plasticity; 60% clay; 20% silt; 20% medium sand; blocky fractures; manganese oxide streaks and specks; no product odor.
				12					
				14				CL	SILTY CLAY: dark yellowish brown; moderate plasticity; 60% clay; 30% silt; 10% fine sand; manganese oxide specks; some fracturing; no product odor.
	Dp	0		16					
	Dp	0		18					@21': as above; yellowish brown with light gray mottling; moderate plasticity; trace manganese oxide specks; blocky fractures; no product odor.
	Mst	0		20					SANDY CLAY: yellowish brown; pervasive orange brown and gray mottling; moderate plasticity; 60% clay; 10% silt; 30% fine sand; manganese oxide specks; some fracturing; no product odor.
	Dp			22					
	Dp			24				CL	
		0		26					@30': gray with yellowish brown; moderate plasticity; manganese oxide specks; 70% clay; 10% silt; 20% fine sand; trace fine gravel; extensive blocky fractures; no product odor.
				28					
	Dp	0		30					@35': as above; yellowish brown with pervasive gray mottling in horizontal bands; low to moderate plasticity; 50% clay; 20% silt; 30% fine sand; trace white mudstone lithic fragments; no product odor.
				32					
	Mst			34					CLAYEY SAND: yellowish brown; 30-40% clay; 20% silt; 40-50% fine sand; gray mottling; no product odor.
		0		36				SC	CLAYEY GRAVEL: yellowish brown; 20-30% clay; 20% medium to coarse sand; 50-60% subangular to subrounded gravel comprised of predominately weathered clastic and volcanic fragments; no product odor.
				38					
	Mst-Wt			40				GC	GRAVEL: black, brown, and white; trace fines; 10% coarse sand; 85% subrounded to subangular gravel to 4" diameter; clastics and volcanic fragments; no product odor.
	Wt	0		42				GW	
				44					BOTTOM OF BORING AT 45'
SAND		0							
BENTONITE									

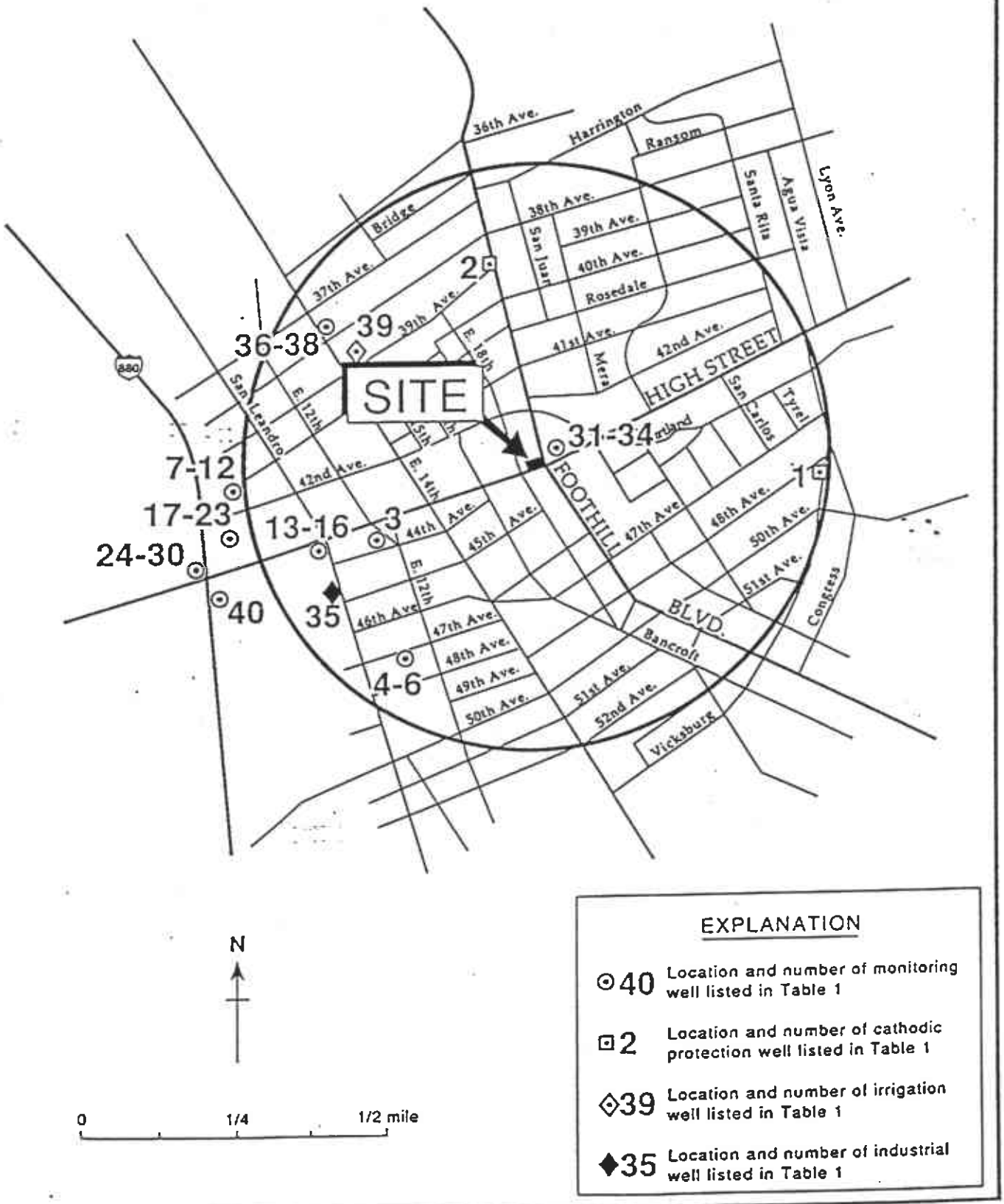


Figure 4. Wells Within Approximately 1/2 Mile of Chevron Service Station #9-0076, 4265 Foothill Boulevard, Oakland, California

12/5/90

TABLE 1. Wells Within a One-half Mile Radius of Chevron SS #90076, 4265 Foothill Blvd., Oakland, California

Well ID	Owner	Well Location	Date Drilled	Well Use
1	PG&E	S/S Vicksburg 38 ft east of 48th	1975	Cathodic Protection
2	PG&E	39th/Foothill Blvd.	Jan. 1975	Cathodic Protection
3	Craig Levitt	1033 44th Ave.	Oct. 1988	Monitoring
4-6	Peterson Properties	1066 47th Ave.	Mar. 1989	Monitoring
7-12	Clorox Co.	860-42nd Ave.	Aug. 1982 - Oct. 1983	Monitoring
13-16	Commercial Fueling Sys.	4301 San Leandro St.	Oct. 1986	Monitoring
17-23	Clorox Co.	850-42nd St.	Sept. 1986	Monitoring
24-30	Exxon Station #7-3006	720 High St.	Sept. 1987	Monitoring
31-34	B.P. Oil	4280 Foothill Blvd.	April 1989	Monitoring
35	Nat'l Lead Co.	4801 San Leandro St.	1923	Industrial
36-38	Shell Oil Co.	3750 E. 14th Avenue	1990	Monitoring
39	Trust for Public Land	1601 39th Avenue	1977	Irrigation
40	Robert Hekeboll	45th/Coliseum/High St.	1989	Monitoring

Table 1. Performance Summary, Chevron Service Station 9-0076, 4265 Fooothill Boulevard, Oakland, California (continued)

DATE	GALLONS IN TANK THIS DATE	GALLONS PUMPED BETWEEN READINGS	DAYS BETWEEN READINGS	AVERAGE GALLONS PUMPED PER DAY	TOTAL GALLONS SINCE START-UP	COMMENTS
01/18/93	0	0	40	0.0	4,300	Tank drained, system resarted.
03/08/93	1,500	1500	49	30.6	5,800	Tank sampled, pump off.
04/07/93	0	0	30	0.0	5,800	Tank drained system restarted.
04/29/93	1,500	1500	22	68.2	7,300	Tank sampled, pump off.
05/25/93	0	0	26	0.0	7,300	Tank drained, system restarted automatically
06/11/93	1,400	1400	17	82.4	8,700	Tank sampled.
06/16/93	1,500	100	5	20.0	8,800	Tank drained, system restarted automatically
07/01/93	750	750	15	50.0	9,550	
07/16/93	1,400	650	15	43.3	10,200	Tank sampled.
08/09/93	0	0	24	0.0	10,200	Tank drained, system restarted automatically
08/24/93	700	700	15	46.7	10,900	
09/08/93	1,100	400	15	26.7	11,300	
09/30/93	1,500	400	22	18.2	11,700	Tank sampled.
10/25/93	0	0	25	0.0	11,700	Tank drained, system restarted automatically

Table 1. Performance Summary, Chevron Service Station #9-0076, 4265 Foothill Boulevard, Oakland, California

DATE	GALLONS IN TANK THIS DATE	GALLONS PUMPED BETWEEN READINGS	DAYS BETWEEN READINGS	AVERAGE GALLONS PUMPED PER DAY	TOTAL GALLONS SINCE START-UP	COMMENTS
11/18/91	0	0	0	0.0	0.0	System start-up
11/19/91	0	0	1	0.0	0.0	Pump not running, restarted.
11/20/91	0	0	1	0.0	0.0	Pump not running, restarted.
11/22/91	160	160	2	80.0	160	Pump not running, restarted.
11/26/91	188	28	4	7.0	188	Pump not running, restarted.
12/03/91	250	62	7	8.9	250	Pump not running, restarted.
12/05/91	250	0	2	0.0	250	Pump not running, restarted.
12/06/91	257	7	1	7.0	257	Pump not running, pulled pump for repair.
01/03/92	281	24	28	0.9	281	Reinstall and restart pump after cleaning.
01/09/92	287	6	6	1.0	287	Pump not running on arrival, restarted.
01/22/92	369	82	13	6.3	369	Pump not running on arrival, restarted.
01/28/92	375	6	6	1.0	375	Pump removed from well.
04/28/92	375	0	91	0.0	375	Pump replaced with QED, system restarted, controller failure.
05/07/92	375	0	9	0.0	375	System restarted
05/18/92	948	573	11	52.1	948	
05/27/92	1,270	322	9	35.8	1,270	System shut-off for draining.
06/05/92	1,300	30	9	3.3	1,300	Tank sampled.
06/24/92	0.0	0	19	0.0	1,300	Tank drained, system restarted.
06/25/92	25	25	29	0.9	1,325	System float switch repaired.
07/06/92	339	314	11	28.5	1,639	
08/04/92	800	461	29	15.9	2,100	
08/27/92	1,500	700	23	30.4	2,800	Tank full, pump off.
09/09/92	1,500	0	13	0.0	2,800	Tank sampled, tank full, pump off.
10/20/92	0	0	41	0.0	2,800	Pump restarted. Compressor tank auto drain valve installed.
11/30/92	1,500	1500	41	36.6	4,300	Tank full, pump off.
12/09/92	1,500	0	9	0.0	4,300	Tank sampled.

--Table 1 continues on next page--

APPENDIX F

Oakland RBCA Eligibility Checklist and Tier I RBSLs Table

ONSITE

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Chevron SS# 9-0076 | Job Identification: 346495 | Software: GSI RBCA Spreadsheet
Site Location: 4265 Foothill Blvd, Oakland | Date Completed: 7/20/00 | Version: 1.0.1
Completed By: Curtis A. Peck 5/98, ~~modified by I.K. 3/99 and B.S. 7/00~~

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	FALSE	FALSE	
GW.v	Volatilization from Groundwater	FALSE	FALSE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	TRUE	FALSE	
GW.b	Vapors from Groundwater	TRUE	FALSE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	FALSE
Groundwater Pathways:				
GW.I	Groundwater Ingestion	FALSE	FALSE	
S.I	Leaching to Groundwater from all Soils	FALSE	FALSE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		FALSE		FALSE
S	Inhalation receptor (cm)		FALSE		FALSE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	2	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	2.2E+06	1.0E+06
W	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
W.gw	Length of affect. soil parallel to groundwater (cm	1.5E+03	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)		
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
Ugw.tr	Groundwater seepage velocity (cm/yr)	6.6E+03
Ks	Saturated hydraulic conductivity(cm/s)	
grad	Groundwater gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
BIO?	Is bioattenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value	capillary	vadose	foundation
hc	Capillary zone thickness (cm)	***6.1E+01***			
hv	Vadose zone thickness (cm)	***5.4E+02***			
rho	Soil density (g/cm^3)	1.7			
foc	Fraction of organic carbon in vadose zone	0.01			
phi	Soil porosity in vadose zone	0.38			
Lgw	Depth to groundwater (cm)	***6.0E+02***			
Ls	Depth to top of affected subsurface soil (cm)	***1.2E+02***			
Lsubs	Thickness of affected subsurface soils (cm)	***4.9E+02***			
pH	Soil/groundwater pH	6.5			
phi.w	Volumetric water content		0.342	0.12	0.12
phi.a	Volumetric air content		0.038	0.26	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients In air (cm2/s) Dair	ref	In water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3) mol	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A			
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5			
1634-04-4	Methyl t-Butyl Ether	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A			
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29			
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5			

Site Name: Chevron SS# 9-0076 Site Location: 4265 Foothill Blvd, Oakl Completed By: Curtis A. Peck 5/98, mo Date Completed: 7/20/2000

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-2	Benzene	-		1.70E-03	R	~~2.90E-02~~ 1E-1	A	1.00E-01	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-		-		D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-		-			FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	A,R	-		-		D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-		-		D	FALSE

Site Name: Chevron SS# 9-0076 Site Location: 4265 Foothill Blvd, Oa Completed By: Curtis A. Peck 5/98, Date Completed: 7/20/2000

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
100-41-4	Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
1634-04-4	Methyl t-Butyl Ether			1.44E+02	ACGIH	1	0.5					360	180	H
108-88-3	Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: Chevron SS# 9-0076 Site Location: 4265 Foothill Blvd, Oakland Completed By: Curtis A. Peck 5/9 Date Completed: 7/20/2000

Software version: 1.0.1

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration in Groundwater value (mg/L)	note	in Surface Soil value (mg/kg)	note	in Subsurface Soil value (mg/kg)	note
Benzene	7.9E-1	Arith			1.2E+0	Arith
Ethylbenzene	2.0E-1	Arith			6.5E-1	Arith
Methyl t-Butyl Ether	6.3E-1	Arith			6.4E+0	Arith
Toluene	1.0E-1	Arith			4.5E+0	Arith
Xylene (mixed isomers)	6.6E-1	Arith			1.1E+1	Arith

Site Name: Chevron SS# 9-0076
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K.
Date Completed: 7/20/2000

Site Name: Chevron SS# 9-0076 Site Location: 4265 Foothill Blvd, Oakland Completed By: Curtis A. Peck 5/ Date Completed: 7/20/2000

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR INHALATION EXPOSURE PATHWAY — PATHWAY IS ACTIVE

SUBSURFACE SOILS: VAPOR INTRUSION TO BUILDINGS Constituents of Concern	Exposure Concentration 1) Source Medium Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor On-Site Residential		3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) On-Site Residential	
Benzene	1.2E+0	3.2E+1		3.8E-2		8.8E-2		3.3E-3	
Ethylbenzene	6.5E-1	3.2E+1		2.0E-2		2.1E-1		4.2E-3	
Methyl t-Butyl Ether	6.4E+0	5.9E+1		1.1E-1		2.1E-1		2.2E-2	
Toluene	4.5E+0	3.8E+1		1.2E-1		2.1E-1		2.4E-2	
Xylene (mixed isomers)	1.1E+1	7.0E+1		1.6E-1		2.1E-1		3.2E-2	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequencey (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: Chevron SS# 9-0076 Site Location: 4265 Foothill Blvd, Oakland Completed By: Curtis A. Peck 5/98, modifie Date Completed: 7/20/2000

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAY ☐ INCOMPLETE ☐ INCREMENT PATHWAY IS ACTIVE

GROUNDWATER: VAPOR INTRUSION TO BUILDINGS Constituents of Concern	Exposure Concentration 1) Source Medium Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor On-Site Residential		3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) *(Sum intake values from subsurface & groundwater routes.)* On-Site Residential	
Benzene	7.9E-1	3.9E+2		2.0E-3		8.8E-2		1.8E-4		3.5E-3	
Ethylbenzene	2.0E-1	3.9E+2		5.2E-4		2.1E-1		1.1E-4		4.3E-3	
Methyl t-Butyl Ether	6.3E-1	4.8E+2		1.3E-3		2.1E-1		2.7E-4		2.2E-2	
Toluene	1.0E-1	4.0E+2		2.6E-4		2.1E-1		5.4E-5		2.4E-2	
Xylene (mixed isomers)	6.6E-1	4.3E+2		1.5E-3		2.1E-1		3.2E-4		3.3E-2	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Chevron SS# 9-0076 Site Location: 4265 Foothill Blvd, Oakland Completed By: Curtis A. Peck 5/98, modified b Date Completed: 7/20/2000

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAY | GROUNDWATER PATHWAYS AND ACTIVITIES

Constituents of Concern	(1) EPA Carcinogenic Classification	CARCINOGENIC RISK: (2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		TOXIC EFFECTS: (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene	A	3.5E-3		1.0E-1	3.5E-4		8.1E-3		1.7E-3	4.8E+0	
Ethylbenzene	D						4.3E-3		2.9E-1	1.5E-2	
Methyl t-Butyl Ether							2.2E-2		8.6E-1	2.6E-2	
Toluene	D						2.4E-2		1.1E-1	2.1E-1	
Xylene (mixed isomers)	D						3.3E-2		2.0E+0	1.6E-2	
		Total Pathway Carcinogenic Risk =			3.5E-4	0.0E+0	***Total Pathway Hazard Index =***			5.1E+0	0.0E+0

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.3**

Site Name: Chevron SS# 9-0076
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00
Date Completed: 7/20/2000

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	3.5E-4	1.0E-6	3.5E-4	N/A	■	4.8E+0	1.0E+0	5.1E+0	N/A	■
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
SOIL EXPOSURE PATHWAYS (GROUNDWATER Complete Pathways)										
	3.5E-4	1.0E-6	3.5E-4	N/A	■	4.8E+0	1.0E+0	5.1E+0	N/A	■

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 9.2**

Site Name: Chevron SS# 9-0076
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00
Date Completed: 7/20/2000

SUBSURFACE SOIL SSTL VALUES (> 0 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration		Soil Leaching to Groundwater			X	Soil Volatilization to Indoor Air			Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)		Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-2	Benzene	1.2E+0	NA	NA	NA		3.6E-3	NA		NA	NA	3.6E-3	■	3.3E+02
100-41-4	Ethylbenzene	6.5E-1	NA	NA	NA		4.4E+1	NA		NA	NA	4.4E+1	☐	<1
1634-04-4	Methyl t-Butyl Ether	6.4E+0	NA	NA	NA		2.5E+2	NA		NA	NA	2.5E+2	☐	<1
108-88-3	Toluene	4.5E+0	NA	NA	NA		2.1E+1	NA		NA	NA	2.1E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	1.1E+1	NA	NA	NA		>Res	NA		NA	NA	>Res	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet Serial: G-225-ZRX-486
Version: 1.0.1

Site Name: Chevron SS# 9-0076
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00
Date Completed: 7/20/2000

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration		Groundwater Ingestion			X	Groundwater Volatilization to Indoor Air			Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)		Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-2	Benzene	7.9E-1	NA	NA	NA		4.5E-2	NA		NA	NA	4.5E-2	■	1.8E+01
100-41-4	Ethylbenzene	2.0E-1	NA	NA	NA		>Sol	NA		NA	NA	>Sol	☐	<1
1634-04-4	Methyl t-Butyl Ether	6.3E-1	NA	NA	NA		2.0E+3	NA		NA	NA	2.0E+3	☐	<1
108-88-3	Toluene	1.0E-1	NA	NA	NA		2.2E+2	NA		NA	NA	2.2E+2	☐	<1
1330-20-7	Xylene (mixed isomers)	6.6E-1	NA	NA	NA		>Sol	NA		NA	NA	>Sol	☐	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-225-ZRX-486

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SCREEN 7.1 GROUNDWATER CONCENTRATION CALCULATOR

offsite

Choose UCL Percentile

[redacted]

Analytical Data (Up to 50 Data Points)

	1	2	3	4	5	6	7	8	9	10	11
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Well Name	C6	C6	C6	C6	C7	C7	C7	C7	C8	C8	C8
Date Sampled	9/30/99	12/22/99	3/9/00	6/23/00	9/30/00	12/22/99	3/9/00	6/23/00	6/11/97	3/12/98	3/31/99
	0.0927	0.152	0.12	0.21	0.282	0.162	2.7	0.0034	ND	ND	ND
	0.00369	0.0055	0.005	ND	0.12	0.0447	0.7	ND	ND	ND	ND
	0.0329	0.113	0.036	0.064	0.126	0.141	ND	0.0073	ND	0.0026	0.0118
	ND	0.00216	0.00074	ND	0.0263	0.0181	0.11	ND	ND	ND	ND
	ND	0.00141	0.0025	0.0058	0.236	0.0853	1.5	0.0016	ND	ND	ND

Calculated Distribution of Data	Default Detection Limit (mg/L)
Lognormal	0.5
Normal	0.5
Lognormal	2.5
Normal	0.5
Lognormal	0.5

$\bar{c} \quad \frac{3.78}{16} \quad \frac{.23}{}$ ✓

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
C8	C9	C9	C9	C9											
3/9/00	6/11/97	3/12/98	3/31/99	3/9/00											
ND	ND	ND	ND	ND											
ND	ND	ND	ND	ND											
ND	ND	ND	0.0125	ND											
ND	ND	ND	ND	ND											
0.0018	ND	ND	ND	0.00075											

28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)

44	45	46	47	48	49	50
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)

Calculations

Data			Transformed Data	
Mean	Std. Dev.	Coeff. Variation	Mean	Std. Dev.
3.58E-01	6.29E-01	1.76E+00	-1.68E+00	1.29E+00
2.11E-01	1.67E-01	7.90E-01	-2.22E+00	1.65E+00
5.03E-01	5.99E-01	1.19E+00	-2.13E+00	2.15E+00
1.82E-01	1.07E-01	5.90E-01	-2.40E+00	1.87E+00
2.24E-01	3.60E-01	1.61E+00	-3.18E+00	2.57E+00

ONSITE RISK-BASED LEVEL AND SITE SPECIFIC TARGET LEVEL SUMMARY

Chevron Station No. 9-0076
4265 Foothill Boulevard Oakland, California

Chemical of Concern	Exposure Pathway	Representative Concentrations (mg/kg)	SSTL (mg/kg)	SSTL Exceed?	CRF
SOIL					
Benzene	Volatilization to indoor air (residential)	1.2	0.0036	Yes	330
Toluene	Volatilization to indoor air (residential)	4.5	21	No	NA
Ethylbenzene	Volatilization to indoor air (residential)	0.65	44	No	NA
Total Xylenes	Volatilization to indoor air (residential)	11	>Res	No	NA
MTBE	Volatilization to indoor air (residential)	6.4	250	No	NA
GROUNDWATER		(mg/L)	(mg/L)		
Benzene	Volatilization to indoor air (residential)	0.79	0.045	Yes	18
Toluene	Volatilization to indoor air (residential)	0.1	220	No	NA
Ethylbenzene	Volatilization to indoor air (residential)	0.2	>Sol	No	NA
Total Xylenes	Volatilization to indoor air (residential)	0.66	>Sol	No	NA
MTBE	Volatilization to indoor air (residential)	0.63	2,000	No	NA

CRF = Constituent reduction factor.

SSTL = Site specific target level.

mg/kg = Milligrams per kilogram.

mg/L = Milligrams per liter.

>Sol = indicates risk-based target concentration greater than solubility.

>Res = indicates risk-based target concentrtion grater than consituents residual saturation value.

NA = Not Applicable.

OFFSITE

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Chevron SS# 9-0076 offsite Job Identification: 346495 Software: GSI RBCA Spreadsheet
Site Location: 4265 Foothill Blvd, Oakland Date Completed: 7/20/00 Version: 1.0.1
Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.In	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	FALSE	FALSE	
GW.v	Volatilization from Groundwater	FALSE	FALSE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	TRUE	FALSE	
GW.b	Vapors from Groundwater	TRUE	FALSE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	FALSE
Groundwater Pathways:				
GW.I	Groundwater Ingestion	FALSE	FALSE	
S.l	Leaching to Groundwater from all Soils	FALSE	FALSE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		FALSE		FALSE
S	Inhalation receptor (cm)		FALSE		FALSE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	2	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	2.2E+06	1.0E+06
W	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
W.gw	Length of affect. soil parallel to groundwater (cm	1.5E+03	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)		
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
Ugw.tr	Groundwater seepage velocity (cm/yr)	6.6E+03
Ks	Saturated hydraulic conductivity(cm/s)	
grad	Groundwater gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
BIO?	Is bioattenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value		
hc	Capillary zone thickness (cm)	***6.1E+01***		
hv	Vadose zone thickness (cm)	***5.4E+02***		
rho	Soil density (g/cm^3)	1.7		
foc	Fraction of organic carbon in vadose zone	0.01		
phi	Soil porosity in vadose zone	0.38		
Lgw	Depth to groundwater (cm)	***6.0E+02***		
Ls	Depth to top of affected subsurface soil (cm)	***1.2E+02***		
Lsubs	Thickness of affected subsurface soils (cm)	***4.9E+02***		
pH	Soil/groundwater pH	6.5		
		capillary	vadose	foundation
phi.w	Volumetric water content	0.342	0.12	0.12
phi.a	Volumetric air content	0.038	0.26	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3/mol)	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A			
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5			
1634-04-4	Methyl t-Butyl Ether	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A			
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29			
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5			

Site Name: Chevron SS# 9-0076 offsite Site Location: 4265 Foothill Blvd, Oakl Completed By: Curtis A. Peck 5/98, mo Date Completed: 7/20/2000

Software version: 1.0.1

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-2	Benzene	-		1.70E-03	R	2.90E-02	A	1.00E-01	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-		-		D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-		-			FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	A,R	-		-		D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-		-		D	FALSE

Site Name: Chevron SS# 9-0076 offsite Site Location: 4265 Foothill Blvd, Oa Completed By: Curtis A. Peck 5/98, Date Completed: 7/20/2000

Software version: 1.0.1

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	Maximum Contaminant Level reference	Permissible Exposure Limit PEL/TLV (mg/m3)	PEL/TLV ref	Relative Absorption Factors Oral	Relative Absorption Factors Dermal	Detection Limits Groundwater (mg/L)	Groundwater ref	Detection Limits Soil (mg/kg)	Soil ref	Half Life (First-Order Decay) (days) Saturated	Half Life (First-Order Decay) (days) Unsaturated	ref
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
100-41-4	Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
1634-04-4	Methyl t-Butyl Ether			1.44E+02	ACGIH	1	0.5					360	180	H
108-88-3	Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: Chevron SS# 9-0076 offsite Site Location: 4265 Foothill Blvd, Oakland Completed By: Curtis A. Peck 5/9 Date Completed: 7/20/2000

Software version: 1.0.1

RBCA SITE ASSESSMENT | Input Screen 7

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene	2.3E-1	Arith			2.1E-2	Arith
Ethylbenzene	5.5E-2	Arith			1.1E-2	Arith
Methyl t-Butyl Ether	3.4E-2	Arith				Arith
Toluene	9.8E-3	Arith			2.5E-3	ND's
Xylene (mixed isomers)	1.1E-1	Arith			2.7E-2	Arith

Site Name: Chevron SS# 9-0076 offsite
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K.
Date Completed: 7/20/2000

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.3**

Site Name: Chevron SS# 9-0076 offsite
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00
Date Completed: 7/20/2000

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.1E-5	1.0E-6	1.1E-5	N/A	■	1.5E-1	1.0E+0	1.5E-1	N/A	□
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	1.1E-5	1.0E-6	1.1E-5	N/A	■	1.5E-1	1.0E+0	1.5E-1	N/A	□

Site Name: Chevron SS# 9-0076 offsite | Site Location: 4265 Foothill Blvd, Oakland | Completed By: Curtis A. Peck 5/98, modifie | Date Completed: 7/20/2000 |

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAY ■ INCLUDED PATHWAY ☐ NOT ACTIVE

GROUNDWATER: VAPOR INTRUSION TO BUILDINGS Constituents of Concern	Exposure Concentration 1) Source Medium Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor On-Site Residential		3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) *(Sum intake values from subsurface & groundwater routes.)* On-Site Residential	
Benzene	2.3E-1	3.9E+2		5.9E-4		8.8E-2		5.2E-5		1.1E-4	
Ethylbenzene	5.5E-2	3.9E+2		1.4E-4		2.1E-1		2.9E-5		1.0E-4	
Methyl t-Butyl Ether	3.4E-2	4.8E+2		7.2E-5		2.1E-1		1.5E-5		1.5E-5	
Toluene	9.8E-3	4.0E+2		2.5E-5		2.1E-1		5.1E-6		1.8E-5	
Xylene (mixed isomers)	1.1E-1	4.3E+2		2.7E-4		2.1E-1		5.5E-5		1.3E-4	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Chevron SS# 9-0076 offsite Site Location: 4265 Foothill Blvd, Oakland Completed By: Curtis A. Peck 5/98, modified b Date Completed: 7/20/2000

TIER 2 PATHWAY RISK CALCULATION

INDOOR INHALATION EXPOSURE PATHWAYS ■ = CHECKED IF PATHWAYS ARE ACTIVE

Constituents of Concern	CARCINOGENIC RISK (1) EPA Carcinogenic Classification	(2) Total Carcinogenic Intake Rate (mg/kg/day) On-Site Residential		(3) Inhalation Slope Factor (mg/kg-day)^-1	(4) Individual COC Risk (2) x (3) On-Site Residential		TOXIC EFFECTS (5) Total Toxicant Intake Rate (mg/kg/day) On-Site Residential		(6) Inhalation Reference Dose (mg/kg-day)	(7) Individual COC Hazard Quotient (5) / (6) On-Site Residential	
Benzene	A	1.1E-4		1.0E-1	1.1E-5		2.6E-4		1.7E-3	1.5E-1	
Ethylbenzene	D						1.0E-4		2.9E-1	3.5E-4	
Methyl t-Butyl Ether							1.5E-5		8.6E-1	1.7E-5	
Toluene	D						1.8E-5		1.1E-1	1.6E-4	
Xylene (mixed isomers)	D						1.3E-4		2.0E+0	6.7E-5	
Total Pathway Carcinogenic Risk =					1.1E-5	0.0E+0	***Total Pathway Hazard Index =***			1.5E-1	0.0E+0

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.3**

Site Name: Chevron SS# 9-0076 offsite
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00
Date Completed: 7/20/2000

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	1.1E-5	1.0E-6	1.1E-5	N/A	■	1.5E-1	1.0E+0	1.5E-1	N/A	□
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A	■	NC	1.0E+0	NC	N/A	■
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	1.1E-5	1.0E-6	1.1E-5	N/A	■	1.5E-1	1.0E+0	1.5E-1	N/A	□

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: Chevron SS# 9-0076 offsite
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00
Date Completed: 7/20/2000

SUBSURFACE SOIL SSTL VALUES (> 0 FT BGS)

Target Risk (Class A & B) 1.0E-6 ☐ MCL exposure limit?
Target Risk (Class C) 1.0E-5 ☐ PEL exposure limit?
Target Hazard Quotient 1.0E+0

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration		Soil Leaching to Groundwater			X	Soil Volatilization to Indoor Air			Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)		Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)		Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-2	Benzene	? 2.1E-2		NA	NA	NA		3.6E-3	NA		NA	NA	3.6E-3	■	6.0E+00
100-41-4	Ethylbenzene	1.1E-2		NA	NA	NA		4.4E+1	NA		NA	NA	4.4E+1	☐	<1
1634-04-4	Methyl t-Butyl Ether	0.0E+0		NA	NA	NA		2.5E+2	NA		NA	NA	2.5E+2	☐	<1
108-88-3	Toluene	2.5E-3		NA	NA	NA		2.1E+1	NA		NA	NA	2.1E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	2.7E-2		NA	NA	NA		>Res	NA		NA	NA	>Res	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet Serial: G-225-2RX-486
Version: 1.0.1

Site Name: Chevron SS# 9-0076 offsite
Site Location: 4265 Foothill Blvd, Oakland

Completed By: Curtis A. Peck 5/98, modified by U.K. 3/99 and B.S. 7/00
Date Completed: 7/20/2000

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" If Complete)

CONSTITUENTS OF CONCERN		Representative Concentration		Groundwater Ingestion			X	Groundwater Volatilization to Indoor Air			Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)		Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-2	Benzene	2.3E-1	NA	NA	NA		4.5E-2	NA		NA	NA	4.5E-2	■	5.0E+00
100-41-4	Ethylbenzene	5.5E-2	NA	NA	NA		>Sol	NA		NA	NA	>Sol	☐	<1
1634-04-4	Methyl t-Butyl Ether	3.4E-2	NA	NA	NA		2.0E+3	NA		NA	NA	2.0E+3	☐	<1
108-88-3	Toluene	9.8E-3	NA	NA	NA		2.2E+2	NA		NA	NA	2.2E+2	☐	<1
1330-20-7	Xylene (mixed isomers)	1.1E-1	NA	NA	NA		>Sol	NA		NA	NA	>Sol	☐	<1

>Sol Indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-225-ZRX-486

ified

SCREEN 7.1 GROUNDWATER CONCENTRATION CALCULATOR

offsite

Choose UCL Percentile

95%

Analytical Data (Up to 50 Data Points)

	1	2	3	4	5	6	7	8	9	10	11
	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
Well Name	C6	C6	C6	C6	C7	C7	C7	C7	C8	C8	C8
Date Sampled	9/30/99	12/22/99	3/9/00	6/23/00	9/30/00	12/22/99	3/9/00	6/23/00	6/11/97	3/12/98	3/31/99
	0.0927	0.152	0.12	0.21	0.282	0.162	2.7	0.0034	ND	ND	ND
	0.00369	0.0055	0.005	ND	0.12	0.0447	0.7	ND	ND	ND	ND
	0.0329	0.113	0.036	0.064	0.126	0.141	ND	0.0073	ND	0.0026	0.0118
	ND	0.00216	0.00074	ND	0.0263	0.0181	0.11	ND	ND	ND	ND
	ND	0.00141	0.0025	0.0058	0.236	0.0853	1.5	0.0016	ND	ND	ND

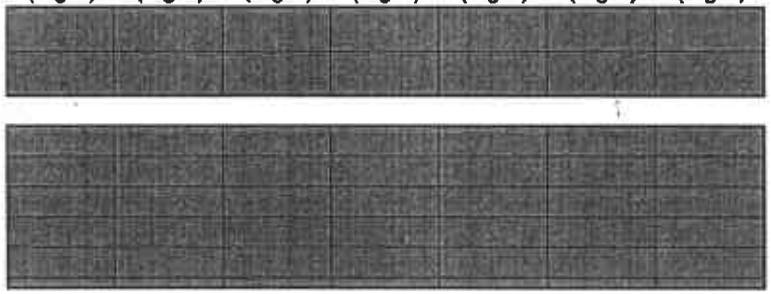
Calculated Distribution of Data	Default Detection Limit (mg/L)
Lognormal	0.5
Normal	0.5
Lognormal	2.5
Normal	0.5
Lognormal	0.5

$\bar{C} = \frac{3.78}{16} = .23$ ✓

12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
C6	C9	C9	C9	C9											
3/9/00	6/11/97	3/12/98	3/31/99	3/9/00											
ND	ND	ND	ND	ND											
ND	ND	ND	ND	ND											
ND	ND	ND	0.0125	ND											
ND	ND	ND	ND	ND											
0.0018	ND	ND	ND	0.00075											

28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)

44	45	46	47	48	49	50
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)



Calculations

Data			Transformed Data	
Mean	Std. Dev.	Coeff. Variation	Mean	Std. Dev.
3.58E-01	6.29E-01	1.76E+00	-1.68E+00	1.29E+00
2.11E-01	1.67E-01	7.90E-01	-2.22E+00	1.65E+00
5.03E-01	5.99E-01	1.19E+00	-2.13E+00	2.15E+00
1.82E-01	1.07E-01	5.90E-01	-2.40E+00	1.87E+00
2.24E-01	3.60E-01	1.61E+00	-3.18E+00	2.57E+00

OFFSITE RISK-BASED SCREENING LEVEL AND SITE SPECIFIC TARGET LEVEL SUMMARY

Chevron Station No. 9-0076
4265 Foothill Boulevard
Oakland, California

Chemical of Concern	Exposure Pathway	Representative Concentrations (mg/kg)	SSTL (mg/kg)	SSTL Exceed?	CRF
SOIL					
Benzene	Volatilization to indoor air (residential)	0.021	0.0036	Yes	6
Toluene	Volatilization to indoor air (residential)	0.0025	21	No	NA
Ethylbenzene	Volatilization to indoor air (residential)	0.011	44	No	NA
Total Xylenes	Volatilization to indoor air (residential)	0.027	>Res	No	NA
MTBE	Volatilization to indoor air (residential)	0	250	No	NA
GROUNDWATER		(mg/L)	(mg/L)		
Benzene	Volatilization to indoor air (residential)	0.23	0.045	Yes	5
Toluene	Volatilization to indoor air (residential)	0.0098	220	No	NA
Ethylbenzene	Volatilization to indoor air (residential)	0.055	>Sol	No	NA
Total Xylenes	Volatilization to indoor air (residential)	0.11	>Sol	No	NA
MTBE	Volatilization to indoor air (residential)	0.034	2,000	No	NA

CRF = Constituent reduction factor.
SSTL = Site specific target level.
mg/kg = Milligrams per kilogram.
mg/L = Milligrams per liter.
>Sol = indicates risk-based target concentration greater than solubility.
>Res = indicates risk-based target concentrtion grater than consituents residual saturation value.
NA = Not Applicable.

1008 → Tier 1

March 31, 1999
Richmond, California

Response to Comments
RBCA Evaluation
Indoor Inhalation from Soil and Groundwater
Chevron Service Station #9-0076
4265 Foothill Boulevard
Oakland, California

Mr. Phil Briggs:
San Ramon, California

This letter serves to respond to Mr. Barney Chan's, Alameda County Health Care Services Department, request for further clarification on the previously submitted risk assessment for the above site.

Regarding the RBCA, the concerns that where recounted for County risk assessor, Ms Madhulla Logan are addressed with the attached revised ASTM RBCA calculations. Specifically:

- The California slope factor of 0.1, not the default of 0.029 is used in these calculations.
- Two separate risk scenarios for residential indoor air inhalation were calculated. One, representing onsite conditions, using soil and groundwater data from wells C-2, C-3, C-4 and C5, the other, representing offsite conditions, using soil and groundwater data from wells C-6, C-7, C-8 and C-9.
- The estimated risk associated with residential exposure to indoor air inhalation for the onsite data set is 4.1e-4. The estimated risk associated with residential exposure to indoor air inhalation for the offsite data set is 9.0e-6. Both values are above the 1e-6 estimated risk value considered acceptable for residential exposure. These results show a higher risk value than the previously submitted assessment primarily because an arithmetic average of the soil and groundwater concentration data was used (rather than a 95% upper confidence limited geometric mean of the data). Using the arithmetic mean rather than the geometric mean for log normally distributed data such as this is not an entirely appropriate use of the tool. The use of California slope factor also raises the risk values but to a lesser degree.
- The two spoils samples, SP1A-D and SP2-A-D were removed from screen 7.3.
- Arithmetic averages for soil and groundwater data for the four quarters of 1997 and the first quarter of 1998 where used in the GSI evaluation.

Regarding the charts of bio-parameters versus BTEX concentrations, I would agree that a chart of BTEX vrs dissolved oxygen and RED-OX potential would be a useful tool and I will plot these when more DO data is available.

The concentrations for the specific parameters used in the graphs were derived from the 3/12/98 sampling event. They are the actual measured values except for the BTEX values, which are the sum of the B, T, E, and X value for the particular well.

Please contact me at 242-5953 with any questions or comments.

Sincerely,

Urmas Kelmser

RBCA TIER 1/TIER 2 EVALUATION

Output Table 1

Site Name: Chevron #9-0076 Onsite (Arit[illegible] Identification: #9-0076
Site Location: 4265 Foothill Blvd, Oakland CA Date Completed: 5/21/1998
Completed By: Curtis A. Peck modified by U.K. 3/99

Software: GSI RBCA Spreadsheet
Version: 1.0.1

NOTE: values which differ from Tier 1 default values are shown in bold italics and underlined.

Exposure Parameter	Definition (Units)	Residential Adult	Residential (1-6yrs)	Residential (1-16 yrs)	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
ATc	Averaging time for carcinogens (yr)	70				
ATn	Averaging time for non-carcinogens (yr)	30	6	16	25	1
BW	Body Weight (kg)	70	15	35	70	
ED	Exposure Duration (yr)	30	6	16	25	1
t	Averaging time for vapor flux (yr)	30			25	1
EF	Exposure Frequency (days/yr)	350			250	180
EF.Derm	Exposure Frequency for dermal exposure	350			250	
IRgw	Ingestion Rate of Water (L/day)	2			1	
IRs	Ingestion Rate of Soil (mg/day)	100	200		50	100
IRadj	Adjusted soil ing. rate (mg-yr/kg-d)	1.1E+02			9.4E+01	
IRa.in	Inhalation rate indoor (m^3/day)	15			20	
IRa.out	Inhalation rate outdoor (m^3/day)	20			20	10
SA	Skin surface area (dermal) (cm^2)	5.8E+03		2.0E+03	5.8E+03	5.8E+03
SAadj	Adjusted dermal area (cm^2-yr/kg)	2.1E+03			1.7E+03	
M	Soil to Skin adherence factor	1				
AAFs	Age adjustment on soil ingestion	FALSE			FALSE	
AAFd	Age adjustment on skin surface area	FALSE			FALSE	
tox	Use EPA tox data for air (or PEL based)?	TRUE				
gwMCL?	Use MCL as exposure limit in groundwater?	FALSE				

Matrix of Exposed Persons to Complete Exposure Pathways		Residential	Commercial/Industrial Chronic	Commercial/Industrial Constrctn
Outdoor Air Pathways:				
SS.v	Volatiles and Particulates from Surface Soils	FALSE	FALSE	FALSE
S.v	Volatilization from Subsurface Soils	FALSE	FALSE	
GW.v	Volatilization from Groundwater	FALSE	FALSE	
Indoor Air Pathways:				
S.b	Vapors from Subsurface Soils	TRUE	FALSE	
GW.b	Vapors from Groundwater	TRUE	FALSE	
Soil Pathways:				
SS.d	Direct Ingestion and Dermal Contact	FALSE	FALSE	FALSE
Groundwater Pathways:				
GW.i	Groundwater Ingestion	FALSE	FALSE	
S.l	Leaching to Groundwater from all Soils	FALSE	FALSE	

Matrix of Receptor Distance and Location On- or Off-Site		Residential Distance	Residential On-Site	Commercial/Industrial Distance	Commercial/Industrial On-Site
GW	Groundwater receptor (cm)		FALSE		FALSE
S	Inhalation receptor (cm)		FALSE		FALSE

Matrix of Target Risks		Individual	Cumulative
TRab	Target Risk (class A&B carcinogens)	1.0E-06	
TRc	Target Risk (class C carcinogens)	1.0E-05	
THQ	Target Hazard Quotient	1.0E+00	
Opt	Calculation Option (1, 2, or 3)	2	
Tier	RBCA Tier	2	

Surface Parameters	Definition (Units)	Residential	Constrctn
A	Contaminated soil area (cm^2)	2.2E+06	1.0E+06
W	Length of affect. soil parallel to wind (cm)	1.5E+03	1.0E+03
W.gw	Length of affect. soil parallel to groundwater (cm)	1.5E+03	
Uair	Ambient air velocity in mixing zone (cm/s)	2.3E+02	
delta	Air mixing zone height (cm)	2.0E+02	
Lss	Thickness of affected surface soils (cm)	1.0E+02	
Pe	Particulate areal emission rate (g/cm^2/s)	6.9E-14	

Groundwater	Definition (Units)	Value
delta.gw	Groundwater mixing zone depth (cm)	2.0E+02
I	Groundwater infiltration rate (cm/yr)	3.0E+01
Ugw	Groundwater Darcy velocity (cm/yr)	2.5E+03
Ugw.tr	Groundwater seepage velocity (cm/yr)	6.6E+03
Ks	Saturated hydraulic conductivity(cm/s)	
grad	Groundwater gradient (cm/cm)	
Sw	Width of groundwater source zone (cm)	
Sd	Depth of groundwater source zone (cm)	
phi.eff	Effective porosity in water-bearing unit	3.8E-01
foc.sat	Fraction organic carbon in water-bearing unit	1.0E-03
BIO?	Is bioattenuation considered?	FALSE
BC	Biodegradation Capacity (mg/L)	

Soil	Definition (Units)	Value
hc	Capillary zone thickness (cm)	***6.1E+01***
hv	Vadose zone thickness (cm)	***5.4E+02***
rho	Soil density (g/cm^3)	1.7
foc	Fraction of organic carbon in vadose zone	0.01
phi	Soil porosity in vadose zone	0.38
Lgw	Depth to groundwater (cm)	***6.0E+02***
Ls	Depth to top of affected subsurface soil (cm)	***1.2E+02***
Lsubs	Thickness of affected subsurface soils (cm)	***4.9E+02***
pH	Soil/groundwater pH	6.5

		capillary	vadose	foundation
phi.w	Volumetric water content	0.342	0.12	0.12
phi.a	Volumetric air content	0.038	0.26	0.26

Building	Definition (Units)	Residential	Commercial
Lb	Building volume/area ratio (cm)	2.0E+02	3.0E+02
ER	Building air exchange rate (s^-1)	1.4E-04	2.3E-04
Lcrk	Foundation crack thickness (cm)	1.5E+01	
eta	Foundation crack fraction	0.01	

Transport Parameters	Definition (Units)	Residential	Commercial
Groundwater			
ax	Longitudinal dispersivity (cm)		
ay	Transverse dispersivity (cm)		
az	Vertical dispersivity (cm)		
Vapor			
dcy	Transverse dispersion coefficient (cm)		
dcz	Vertical dispersion coefficient (cm)		

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	Diffusion Coefficients in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3/mol)	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A			
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5			
1634-04-4	Methyl t-Butyl Ether	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A			
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29			
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5			

Site Name: Chevron #9-0076 Onsite (Arith Av Site Location: 4265 Foothill Blvd, Oakla Completed By: Curtis A. Peck modifiedDate Completed: 5/21/1998

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-2	Benzene	-		1.70E-03	R	2.90E-02	A	1.00E-01	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-		-		D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-		-			FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	A,R	-		-		D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-		-		D	FALSE

Site Name: Chevron #9-0076 Onsite (ArSite Location: 4265 Foothill Blvd, OakCompleted By: Curtis A. Peck modifDate Completed: 5/21/1998

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
100-41-4	Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
1634-04-4	Methyl t-Butyl Ether			1.44E+02	ACGIH	1	0.5					360	180	H
108-88-3	Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: Chevron #9-0076 Onsite (ArSite Location: 4265 Foothill Blvd, Oakland CA

Completed By: Curtis A. Peck mcDate Completed: 5/21/1998

Software version: 1.0.1

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration					
	in Groundwater		in Surface Soil		in Subsurface Soil	
	value (mg/L)	note	value (mg/kg)	note	value (mg/kg)	note
Benzene	3.1E+0	Arith			1.2E+0	Arith
Ethylbenzene	7.9E-1	Arith			6.5E-1	Arith
Methyl t-Butyl Ether	1.6E+0	Arith			6.4E+0	Arith
Toluene	1.5E+0	Arith			4.5E+0	Arith
Xylene (mixed isomers)	2.1E+0	Arith			1.1E+1	Arith

Site Name: Chevron #9-0076 Onsite (Arith Avg)
Site Location: 4265 Foothill Blvd, Oakland CA

Completed By: Curtis A. Peck modified by U.K. 3/99
Date Completed: 5/21/1998

Site Name: Chevron #9-0076 Onsite (Arith Avg) Site Location: 4265 Foothill Blvd, Oakland CA Completed By: Curtis A. Peck mDate Completed: 5/21/1998

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS: Exposure Concentration

VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	1) Source Medium: Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor: On-Site Residential		3) Exposure Medium: Indoor Air: POE Conc. (mg/m^3) (1) / (2): On-Site Residential		4) Exposure Multiplier: (IRxEFxED)/(BWxAT) (m^3/kg-day): On-Site Residential		5) Average Daily Intake Rate: (mg/kg-day) (3) X (4): On-Site Residential	
Benzene	1.2E+0	3.2E+1		3.9E-2		8.8E-2		3.4E-3	
Ethylbenzene	6.5E-1	3.2E+1		2.0E-2		2.1E-1		4.2E-3	
Methyl t-Butyl Ether	6.4E+0	5.9E+1		1.1E-1		2.1E-1		2.2E-2	
Toluene	4.5E+0	3.8E+1		1.2E-1		2.1E-1		2.4E-2	
Xylene (mixed isomers)	1.1E+1	7.0E+1		1.5E-1		2.1E-1		3.2E-2	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequency (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Chevron #9-0076 Onsite (Arith Avg) Site Location: 4265 Foothill Blvd, Oakland C Completed By: Curtis A. Peck modified by Date Completed: 5/21/1998

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER: VAPOR INTRUSION TO BUILDINGS Constituents of Concern	Exposure Concentration 1) Source Medium Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor On-Site Residential		3) Exposure Medium Indoor Air: POE Conc. (mg/m^3) (1) / (2) On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day) On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) *(Sum intake values from subsurface & groundwater routes.)* On-Site Residential	
Benzene	3.1E+0	3.9E+2		7.8E-3		8.8E-2		6.9E-4		4.1E-3	
Ethylbenzene	7.9E-1	3.9E+2		2.0E-3		2.1E-1		4.2E-4		4.6E-3	
Methyl t-Butyl Ether	1.6E+0	4.8E+2		3.4E-3		2.1E-1		7.0E-4		2.3E-2	
Toluene	1.5E+0	4.0E+2		3.7E-3		2.1E-1		7.7E-4		2.5E-2	
Xylene (mixed isomers)	2.1E+0	4.3E+2		4.8E-3		2.1E-1		9.9E-4		3.3E-2	

NOTE: ABS = Dermal absorption factor (dim); AF = Adherance factor (mg/cm^2); AT = Averaging time (days); BW = Body weight (kg); CF = Units conversion factor; ED = Exposure duration (yrs); EF = Exposure frequency (days/yr); ET = Exposure time (hrs/day); IR = Inhalation rate (m^3/day); POE = Point of exposure; SA = Skin exposure area (cm^2/day)

Site Name: Chevron #9-0076 Onsite (Arith A Site Location: 4265 Foothill Blvd, Oakland CA Completed By: Curtis A. Peck modified by U.KDate Completed: 5/21/1998

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS				
	(1) EPA	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Inhalation Slope Factor	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Inhalation Reference Dose	(7) Individual COC Hazard Quotient (5) / (6)	
Constituents of Concern	Carcinogenic Classification	On-Site Residential		(mg/kg-day)^-1	On-Site Residential		On-Site Residential		(mg/kg-day)	On-Site Residential	
Benzene	A	4.1E-3		1.0E-1	4.1E-4		9.6E-3		1.7E-3	5.7E+0	
Ethylbenzene	D						4.6E-3		2.9E-1	1.6E-2	
Methyl t-Butyl Ether							2.3E-2		8.6E-1	2.7E-2	
Toluene	D						2.5E-2		1.1E-1	2.2E-1	
Xylene (mixed isomers)	D						3.3E-2		2.0E+0	1.6E-2	
Total Pathway Carcinogenic Risk =					4.1E-4	0.0E+0	*Total Pathway Hazard Index =*			5.9E+0	0.0E+0

RBCA SITE ASSESSMENT	Tier 2 Worksheet 8.3

Site Name: Chevron #9-0076 Onsite (Arith Avg) Completed By: Curtis A. Peck modified by U.K. 3/99
Site Location: 4265 Foothill Blvd, Oakland CA Date Completed: 5/21/1998

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	4.1E-4	1.0E-6	4.1E-4	N/A	■	5.7E+0	1.0E+0	5.9E+0	N/A	■
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	4.1E-4	1.0E-6	4.1E-4	N/A	■	5.7E+0	1.0E+0	5.9E+0	N/A	■

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: Chevron #9-0076 Onsite (Arith Avg)
Site Location: 4265 Foothill Blvd, Oakland CA

Completed By: Curtis A. Peck modified by U.K. 3/99
Date Completed: 5/21/1998

SUBSURFACE SOIL SSTL VALUES (> 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			X Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" If yes	Only if "yes" left
71-43-2	Benzene	1.2E+0	NA	NA	NA	3.6E-3	NA	NA	NA	3.6E-3	■	3.4E+02
100-41-4	Ethylbenzene	6.5E-1	NA	NA	NA	4.4E+1	NA	NA	NA	4.4E+1	☐	<1
1634-04-4	Methyl t-Butyl Ether	6.4E+0	NA	NA	NA	2.5E+2	NA	NA	NA	2.5E+2	☐	<1
108-88-3	Toluene	4.5E+0	NA	NA	NA	2.1E+1	NA	NA	NA	2.1E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	1.1E+1	NA	NA	NA	>Res	NA	NA	NA	>Res	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-303-YDX-938

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Chevron #9-0076 Onsite (Arith Avg)
Site Location: 4265 Foothill Blvd, Oakland CA

Completed By: Curtis A. Peck modified by U.K. 3/99
Date Completed: 5/21/1998

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion			X	Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-2	Benzene	3.1E+0	NA	NA	NA		4.5E-2	NA	NA	NA	4.5E-2	■	6.9E+01
100-41-4	Ethylbenzene	7.9E-1	NA	NA	NA		>Sol	NA	NA	NA	>Sol	☐	<1
1634-04-4	Methyl t-Butyl Ether	1.6E+0	NA	NA	NA		2.0E+3	NA	NA	NA	2.0E+3	☐	<1
108-88-3	Toluene	1.5E+0	NA	NA	NA		2.2E+2	NA	NA	NA	2.2E+2	☐	<1
1330-20-7	Xylene (mixed isomers)	2.1E+0	NA	NA	NA		>Sol	NA	NA	NA	>Sol	☐	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-303-YDX-938

SCREEN 7.1 GROUNDWATER CONCENTRATION CALCULATOR

Choose UCL Percentile

95%

Analytical Data (Up to 50 Data Points)

		1	2	3	4	5	6	7	8	9	10	11	12	13
Default Detection Limit (mg/L)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	Well Name	C-6	C-6	C-6	C-6	C-6	C-7	C-7	C-7	C-7	C-7	C-8	C-8	C-8
	Date Sampled	########	########	########	########	########	########	########	########	########	########	########	6/1/1997	########
0.0005		0.5	0.57	0.33	0.23	0.3	0.31	0.015	0.12	0.01	ND	ND	ND	
0.0005		0.025	0.029	0.005	0.0073	0.015	0.11	0.0033	0.031	0.00097	ND	ND	ND	
0.0025		0.05	0.22	0.076	0.046	0.049	0.098	ND	0.054	ND	ND	ND	ND	
0.0005		0.01	0.005	0.005	0.005	0.005	0.046	ND	0.011	ND	ND	ND	ND	
0.0005		0.01	0.01	0.005	0.0064	0.012	0.31	0.0051	0.084	0.0016	ND	ND	ND	

14	15	16	17	18	19	20
(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
C-8	C-8	C-9	C-9	C-9	C-9	C-9
########	########	########	########	########	########	########
	ND	ND	ND			ND
	ND	ND	ND			ND
	0.0026	ND	ND			ND
	ND	ND	ND			ND
	ND	ND	ND			ND

SCREEN 7.1 GROUNDWATER CONCENTRATION CALCULATOR

Choose UCL Percentile

95%

Analytical Data (Up to 50 Data Points)

		1	2	3	4	5	6	7	8
Default Detection Limit (mg/L)		(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
	Well Name	C-6	C-6	C-6	C-6	C-6	C-7	C-7	C-7
	Date Sampled	########	########	########	########	########	########	########	########
0.0005		0.5	0.57	0.33	0.23	0.3	0.31	0.015	0.12
0.0005		0.025	0.029	0.005	0.0073	0.015	0.11	0.0033	0.031
0.0025		0.05	0.22	0.076	0.046	0.049	0.098	ND	0.054
0.0005		0.01	0.005	0.005	0.005	0.005	0.046	ND	0.011
0.0005		0.01	0.01	0.005	0.0064	0.012	0.31	0.0051	0.084

RBCA CHEMICAL DATABASE

Physical Property Data

CAS Number	Constituent	type	Molecular Weight (g/mole) MW	ref	Diffusion Coefficients in air (cm2/s) Dair	ref	Diffusion Coefficients in water (cm2/s) Dwat	ref	log (Koc) or log(Kd) (@ 20 - 25 C) log(l/kg)	ref	Henry's Law Constant (@ 20 - 25 C) (atm-m3/mol)	(unitless)	ref	Vapor Pressure (@ 20 - 25 C) (mm Hg)	ref	Solubility (@ 20 - 25 C) (mg/L)	ref	acid pKa	base pKb	ref
71-43-2	Benzene	A	78.1	5	9.30E-02	A	1.10E-05	A	1.58	A	5.29E-03	2.20E-01	A	9.52E+01	4	1.75E+03	A			
100-41-4	Ethylbenzene	A	106.2	5	7.60E-02	A	8.50E-06	A	1.98	A	7.69E-03	3.20E-01	A	1.00E+01	4	1.52E+02	5			
1634-04-4	Methyl t-Butyl Ether	O	88.146	5	7.92E-02	6	9.41E-05	7	1.08	A	5.77E-04	2.40E-02		2.49E+02		4.80E+04	A			
108-88-3	Toluene	A	92.4	5	8.50E-02	A	9.40E-06	A	2.13	A	6.25E-03	2.60E-01	A	3.00E+01	4	5.15E+02	29			
1330-20-7	Xylene (mixed isomers)	A	106.2	5	7.20E-02	A	8.50E-06	A	2.38	A	6.97E-03	2.90E-01	A	7.00E+00	4	1.98E+02	5			

Site Name: Chevron #9-0076 Offsite Site Location: 4265 Foothill Blvd, Oakla Completed By: C.A Peck, U.Kelmser Date Completed: 3/30/1999

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Toxicity Data

CAS Number	Constituent	Reference Dose (mg/kg/day) Oral RfD_oral	ref	Inhalation RfD_inhal	ref	Slope Factors 1/(mg/kg/day) Oral SF_oral	ref	Inhalation SF_inhal	ref	EPA Weight of Evidence	Is Constituent Carcinogenic ?
71-43-2	Benzene	-		1.70E-03	R	2.90E-02	A	1.00E-01	A	A	TRUE
100-41-4	Ethylbenzene	1.00E-01	A	2.86E-01	A	-		-		D	FALSE
1634-04-4	Methyl t-Butyl Ether	5.00E-03	R	8.57E-01	R	-		-			FALSE
108-88-3	Toluene	2.00E-01	A,R	1.14E-01	A,R	-		-		D	FALSE
1330-20-7	Xylene (mixed isomers)	2.00E+00	A,R	2.00E+00	A	-		-		D	FALSE

Site Name: Chevron #9-0076 Offsite Site Location: 4265 Foothill Blvd, OakCompleted By: C.A.Peck, U.Kelmser Date Completed: 3/30/1999

Software version: 1.0.1

RBCA CHEMICAL DATABASE

Miscellaneous Chemical Data

CAS Number	Constituent	Maximum Contaminant Level MCL (mg/L)	reference	Permissible Exposure Limit PEL/TLV (mg/m3)	ref	Relative Absorption Factors Oral	Dermal	Detection Limits Groundwater (mg/L)	ref	Soil (mg/kg)	ref	Half Life (First-Order Decay) (days) Saturated	Unsaturated	ref
71-43-2	Benzene	5.00E-03	52 FR 25690	3.20E+00	OSHA	1	0.5	0.002	C	0.005	S	720	720	H
100-41-4	Ethylbenzene	7.00E-01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.002	C	0.005	S	228	228	H
1634-04-4	Methyl t-Butyl Ether			1.44E+02	ACGIH	1	0.5					360	180	H
108-88-3	Toluene	1.00E+00	56 FR 3526 (30 Jan 91)	1.47E+02	ACGIH	1	0.5	0.002	C	0.005	S	28	28	H
1330-20-7	Xylene (mixed isomers)	1.00E+01	56 FR 3526 (30 Jan 91)	4.34E+02	ACGIH	1	0.5	0.005	C	0.005	S	360	360	H

Site Name: Chevron #9-0076 Offsite Site Location: 4265 Foothill Blvd, Oakland CA Completed By: C.A.Peck, U.Kelms Date Completed: 3/30/1999

Software version: 1.0.1

REPRESENTATIVE COC CONCENTRATIONS IN SOURCE MEDIA

(Complete the following table)

CONSTITUENT	Representative COC Concentration in Groundwater value (mg/L)	note	in Surface Soil value (mg/kg)	note	in Subsurface Soil value (mg/kg)	note
Benzene	1.5E-1	Arith			2.1E-2	Arith
Ethylbenzene	1.4E-2	Arith			1.1E-2	Arith
Methyl t-Butyl Ether	3.8E-2	Arith				
Toluene	5.6E-3	Arith			2.5E-3	ND's
Xylene (mixed isomers)	2.8E-2	Arith			2.7E-2	Arith

Site Name: Chevron #9-0076 Offsite
Site Location: 4265 Foothill Blvd, Oakland CA

Completed By: C.A.Peck, U.Kelmser
Date Completed: 3/30/1999

Site Name: Chevron #9-0076 Offsite | Site Location: 4265 Foothill Blvd, Oakland CA | Completed By: C.A.Peck, U.KelmDate Completed: 3/30/1999 |

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

SUBSURFACE SOILS:
VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration: 1) Source Medium — Subsurface Soil Conc. (mg/kg)	2) NAF Value (m^3/kg) Receptor — On-Site Residential		3) Exposure Medium — Indoor Air: POE Conc. (mg/m^3) (1) / (2) — On-Site Residential		4) Exposure Multiplier (fRxEFxED)/(BWxAT) (m^3/kg-day) — On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) — On-Site Residential	
Benzene	2.1E-2	3.2E+1		6.5E-4		8.8E-2		5.7E-5	
Ethylbenzene	1.1E-2	3.2E+1		3.3E-4		2.1E-1		6.8E-5	
Methyl t-Butyl Ether	0.0E+0	5.9E+1		0.0E+0		2.1E-1		0.0E+0	
Toluene	2.5E-3	3.8E+1		6.5E-5		2.1E-1		1.3E-5	
Xylene (mixed isomers)	2.7E-2	7.0E+1		3.9E-4		2.1E-1		8.0E-5	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Chevron #9-0076 Offsite | Site Location: 4265 Foothill Blvd, Oakland C | Completed By: C.A.Peck, U.Kelmser | Date Completed: 3/30/1999 |

TIER 2 EXPOSURE CONCENTRATION AND INTAKE CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAY IS ACTIVE)

GROUNDWATER:
VAPOR INTRUSION TO BUILDINGS

Constituents of Concern	Exposure Concentration: 1) Source Medium — Groundwater Conc. (mg/L)	2) NAF Value (m^3/L) Receptor — On-Site Residential		3) Exposure Medium — Indoor Air: POE Conc. (mg/m^3) (1) / (2) — On-Site Residential		4) Exposure Multiplier (IRxEFxED)/(BWxAT) (m^3/kg-day) — On-Site Residential		5) Average Daily Intake Rate (mg/kg-day) (3) X (4) — On-Site Residential		TOTAL PATHWAY INTAKE (mg/kg-day) (Sum intake values from subsurface & groundwater routes.) — On-Site Residential	
Benzene	1.5E-1	3.9E+2		3.8E-4		8.8E-2		3.3E-5		9.0E-5	
Ethylbenzene	1.4E-2	3.9E+2		3.7E-5		2.1E-1		7.6E-6		7.6E-5	
Methyl t-Butyl Ether	3.8E-2	4.8E+2		8.0E-5		2.1E-1		1.6E-5		1.6E-5	
Toluene	5.6E-3	4.0E+2		1.4E-5		2.1E-1		2.9E-6		1.6E-5	
Xylene (mixed isomers)	2.8E-2	4.3E+2		6.5E-5		2.1E-1		1.3E-5		9.3E-5	

NOTE:
ABS = Dermal absorption factor (dim)
AF = Adherance factor (mg/cm^2)
AT = Averaging time (days)
BW = Body weight (kg)
CF = Units conversion factor
ED = Exposure duration (yrs)
EF = Exposure frequencey (days/yr)
ET = Exposure time (hrs/day)
IR = Inhalation rate (m^3/day)
POE = Point of exposure
SA = Skin exposure area (cm^2/day)

Site Name: Chevron #9-0076 Offsite | Site Location: 4265 Foothill Blvd, Oakland CA | Completed By: C.A.Peck, U.Kelmser | Date Completed: 3/30/1999 | 2 OF 4

TIER 2 PATHWAY RISK CALCULATION

INDOOR AIR EXPOSURE PATHWAYS ■ (CHECKED IF PATHWAYS ARE ACTIVE)

	CARCINOGENIC RISK						TOXIC EFFECTS				
	(1) EPA	(2) Total Carcinogenic Intake Rate (mg/kg/day)		(3) Inhalation Slope Factor	(4) Individual COC Risk (2) x (3)		(5) Total Toxicant Intake Rate (mg/kg/day)		(6) Inhalation Reference Dose	(7) Individual COC Hazard Quotient (5) / (6)	
Constituents of Concern	Carcinogenic Classification	On-Site Residential		(mg/kg-day)^-1	On-Site Residential		On-Site Residential		(mg/kg-day)	On-Site Residential	
Benzene	A	9.0E-5		1.0E-1	9.0E-6		2.1E-4		1.7E-3	1.2E-1	
Ethylbenzene	D						7.6E-5		2.9E-1	2.7E-4	
Methyl t-Butyl Ether							1.6E-5		8.6E-1	1.9E-5	
Toluene	D						1.6E-5		1.1E-1	1.4E-4	
Xylene (mixed isomers)	D						9.3E-5		2.0E+0	4.7E-5	

Total Pathway Carcinogenic Risk = 9.0E-6 | 0.0E+0

Total Pathway Hazard Index = 1.2E-1 | 0.0E+0

RBCA SITE ASSESSMENT | **Tier 2 Worksheet 8.3**

Site Name: Chevron #9-0076 Offsite
Site Location: 4265 Foothill Blvd, Oakland CA

Completed By: C.A.Peck, U.Kelmser
Date Completed: 3/30/1999

TIER 2 BASELINE RISK SUMMARY TABLE

	BASELINE CARCINOGENIC RISK					BASELINE TOXIC EFFECTS				
	Individual COC Risk		Cumulative COC Risk		Risk Limit(s) Exceeded?	Hazard Quotient		Hazard Index		Toxicity Limit(s) Exceeded?
EXPOSURE PATHWAY	Maximum Value	Target Risk	Total Value	Target Risk		Maximum Value	Applicable Limit	Total Value	Applicable Limit	
OUTDOOR AIR EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
INDOOR AIR EXPOSURE PATHWAYS										
Complete:	9.0E-6	1.0E-6	9.0E-6	N/A	■	1.2E-1	1.0E+0	1.2E-1	N/A	☐
SOIL EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
GROUNDWATER EXPOSURE PATHWAYS										
Complete:	NC	1.0E-6	NC	N/A		NC	1.0E+0	NC	N/A	
CRITICAL EXPOSURE PATHWAY (Select Maximum Values From Complete Pathways)										
	9.0E-6	1.0E-6	9.0E-6	N/A	■	1.2E-1	1.0E+0	1.2E-1	N/A	☐

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.2

Site Name: Chevron #9-0076 Offsite
Site Location: 4265 Foothill Blvd, Oakland CA

Completed By: C.A.Peck, U.Kelmser
Date Completed: 3/30/1999

SUBSURFACE SOIL SSTL VALUES (> 3.3 FT BGS)

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Soil Leaching to Groundwater			X Soil Volatilization to Indoor Air		Soil Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/kg)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)	Residential: (on-site)	Commercial: (on-site)	Residential: (on-site)	Commercial: (on-site)	(mg/kg)	"■" if yes	Only if "yes" left
71-43-2	Benzene	2.1E-2	NA	NA	NA	3.6E-3	NA	NA	NA	3.6E-3	■	6.0E+00
100-41-4	Ethylbenzene	1.1E-2	NA	NA	NA	4.4E+1	NA	NA	NA	4.4E+1	☐	<1
1634-04-4	Methyl t-Butyl Ether	0.0E+0	NA	NA	NA	2.5E+2	NA	NA	NA	2.5E+2	☐	<1
108-88-3	Toluene	2.5E-3	NA	NA	NA	2.1E+1	NA	NA	NA	2.1E+1	☐	<1
1330-20-7	Xylene (mixed isomers)	2.7E-2	NA	NA	NA	>Res	NA	NA	NA	>Res	☐	<1

>Res indicates risk-based target concentration greater than constituent residual saturation value

Software: GSI RBCA Spreadsheet Serial: G-303-YDX-938
Version: 1.0.1

RBCA SITE ASSESSMENT

Tier 2 Worksheet 9.3

Site Name: Chevron #9-0076 Offsite
Site Location: 4265 Foothill Blvd, Oakland CA

Completed By: C.A.Peck, U.Kelmser
Date Completed: 3/30/1999

GROUNDWATER SSTL VALUES

Target Risk (Class A & B) 1.0E-6
Target Risk (Class C) 1.0E-5
Target Hazard Quotient 1.0E+0

☐ MCL exposure limit?
☐ PEL exposure limit?

Calculation Option: 2

SSTL Results For Complete Exposure Pathways ("x" if Complete)

CONSTITUENTS OF CONCERN		Representative Concentration	Groundwater Ingestion			X	Groundwater Volatilization to Indoor Air		Groundwater Volatilization to Outdoor Air		Applicable SSTL	SSTL Exceeded ?	Required CRF
CAS No.	Name	(mg/L)	Residential: (on-site)	Commercial: (on-site)	Regulatory(MCL): (on-site)		Residential: (on-site)	Commercial: (on-site)	Residential (on-site)	Commercial: (on-site)	(mg/L	"■" If yes	Only if "yes" left
71-43-2	Benzene	1.5E-1	NA	NA	NA		4.5E-2	NA	NA	NA	4.5E-2	■	3.0E+00
100-41-4	Ethylbenzene	1.4E-2	NA	NA	NA		>Sol	NA	NA	NA	>Sol	☐	<1
1634-04-4	Methyl t-Butyl Ether	3.8E-2	NA	NA	NA		2.0E+3	NA	NA	NA	2.0E+3	☐	<1
108-88-3	Toluene	5.6E-3	NA	NA	NA		2.2E+2	NA	NA	NA	2.2E+2	☐	<1
1330-20-7	Xylene (mixed isomers)	2.8E-2	NA	NA	NA		>Sol	NA	NA	NA	>Sol	☐	<1

>Sol indicates risk-based target concentration greater than constituent solubility

Software: GSI RBCA Spreadsheet
Version: 1.0.1

Serial: G-303-YDX-938

OFF SITE

SCREEN 7.3 SUBSURFACE SOILS CONCENTRATION CALCULATOR

UCL Percentile: 95%

Analytical Data (Up to 50 Data Points)

Default Detection Limit (mg/kg)		1	2	3	4	5	6	7	8	9	10	11	12
		(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)	(mg/kg)
	Sample Name	c-6-16	c-6-21	c-6-31	c-6-41	c-7-11	c-7-16	c-7-21	c-7-31	c-7-41	c-8-5.5	c-8-40	c-8-45
	Date Sampled												
0.005	B	nd	nd	0.2	nd	nd	nd	0.02	nd	0.007	nd	nd	nd
0.005	E	nd	nd	0.1	nd	nd	nd	nd	nd	nd	nd	nd	nd
2.5	MTBE												
0.005	T	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
0.0015	X	nd	nd	0.3	nd	nd	nd	nd	nd	nd	nd	nd	nd

APPENDIX F

Oakland RBCA Eligibility Checklist and Tier I RBSLs Table

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-1													
04/28/89	35.42	15.37	20.05	--	--	--	--	940	30	1.3	11	13	--
08/08/89	35.42	11.35	24.07	--	--	--	--	820	45	2.0	13	13	--
12/21/89	35.42	12.61	22.81	--	--	--	--	--	--	--	--	--	--
08/27/90	35.42	13.30	22.12	--	--	--	--	440	15	1.0	6.0	13	--
11/04/90	35.42	9.86	25.56	--	--	--	--	--	--	--	--	--	--
06/18/91	35.42	13.78	21.64	--	--	--	--	74	5.6	0.6	1.9	1.3	--
09/19/91	35.42	10.84	24.58	--	--	--	--	150	7.1	<0.5	2.3	3.0	--
12/20/91	35.42	9.25	26.17	--	--	--	--	250	10	<0.5	3.7	1.6	--
03/18/92	35.42	17.17	18.25	--	--	--	--	190	16	<0.5	8.5	2.9	--
07/14/92	35.42	7.81	27.61	--	--	--	--	20,000	480	2200	510	2900	--
10/08/92	35.42	10.98	24.44	--	--	--	--	360	34	4.6	19	12	--
01/08/93	35.42	15.74	19.68	--	--	--	--	120	9.1	0.5	5.1	1.8	--
04/14/93	35.42	19.04	16.38	--	--	--	--	190	74	0.6	1.0	2.0	--
07/16/93	35.42	--	--	--	--	--	--	--	--	--	--	--	--
07/27/93	35.42	26.03	9.39	--	--	--	--	300	12	<0.5	5.0	2.0	--
09/21/93	38.41	16.99	21.42	--	--	--	--	360	12	1.2	5.8	3.7	--
01/28/94	38.41	18.84	19.57	--	--	--	--	370	24	1.0	13	4.0	--
03/17/94	38.41	21.56	16.85	--	--	--	--	460	42	<0.5	6.7	3.7	--
06/16/94	38.41	20.58	17.83	--	--	--	--	320	20	0.7	8.7	3.0	--
09/22/94	38.41	18.15	20.26	--	--	--	--	380	24	0.6	8.8	1.9	--
12/15/94	38.41	22.59	15.82	--	--	--	--	280	23	7.6	7.8	13	--
03/30/95	38.41	26.39	12.02	--	--	--	--	2200	890	8.9	15	<5.0	--
06/20/95	38.41	24.01	14.40	--	--	--	--	690	140	<2.0	9.4	2.8	--
09/20/95	38.41	24.59	13.82	--	--	--	--	730	27	78	26	130	--
12/06/95	38.41	17.81	20.60	--	--	--	--	220	16	<0.5	7.2	1.7	11
03/21/96	38.41	26.76	11.65	--	--	--	--	640	170	<2.0	6.7	<2.0	35
06/21/96	38.41	24.16	14.25	--	--	--	--	640	140	<1.2	8.7	2.0	23
09/06/96	38.41	21.66	16.75	--	--	--	--	460	24	0.56	10	2.4	43
12/19/96	38.41	24.43	13.98	--	--	--	--	790	120	22	13	19	<25
03/17/97	38.41	25.63	12.78	--	--	--	--	2200	660	<10	15	<10	110
06/11/97	38.41	23.25	15.16	--	--	--	--	1500	130	<2.0	16	3.4	130
09/17/97	38.41	21.47	16.94	--	--	--	*	910	160	23	13	49	180
12/11/97	38.41	25.23	13.18	--	--	--	--	2000	270	7.0	53	7.4	460

CONTINUED ON NEXT PAGE

* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-1 (CONT'D)													
03/12/98	38.41	28.92	9.49	--	--	--	*	3100	1300	<20	42	<20	760
06/23/98	38.41	28.19	10.22	--	--	--	--	1300	650	6.9	22	6.5	290
09/01/98	38.41	21.43	16.98	--	--	--	--	270	6.0	<2.5	<2.5	<2.5	950
12/30/98	38.41	22.29	16.12	--	--	--	--	2020	578	<5.0	<5.0	<5.0	1720
03/31/99	38.41	24.53	13.88	--	--	--	*	2140	776	5.89	<5.0	5.15	1170
06/14/99	38.41	23.09	15.32	--	--	--	--	1450	524	<5.0	<5.0	<5.0	1150
06/14/99	38.41	23.09	15.32	--	--	--	Confirmation run	--	--	--	--	--	1360**
09/30/99	38.41	22.30	16.11	--	--	--	--	79	1.12	<0.5	1.07	<0.5	677
12/22/99	38.41	23.37	15.04	--	--	--	*	501	157	4.45	<2.5	4.81	744

* See Table of Additional Analyses.
** Samples were analyzed past hold-time, the results should be considered as estimated.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-2													
04/28/89	35.18	8.74	26.44	--	--	--	--	120,000	30,000	22,000	3000	17,000	--
08/08/89	35.18	5.29	29.90	0.01	--	--	--	--	--	--	--	--	--
12/21/89	35.18	5.86	29.32	--	--	--	--	--	--	--	--	--	--
08/27/90	35.18	5.77	29.55	0.17	--	--	--	--	--	--	--	--	--
11/04/90	35.18	4.71	30.47	--	--	--	--	--	--	--	--	--	--
06/18/91	35.18	6.90	28.33	0.06	--	--	--	--	--	--	--	--	--
09/19/91	35.18	5.84	29.39	0.06	--	--	--	--	--	--	--	--	--
12/20/91	35.18	5.95	29.23	--	--	--	--	170,000	20,000	10,000	2800	19,000	--
03/18/92	35.18	21.58	13.60	0.09	--	--	--	--	--	--	--	--	--
07/14/92	35.18	--	--	--	--	--	--	--	--	--	--	--	--
10/08/92	35.18	--	--	--	--	--	--	--	--	--	--	--	--
01/08/93	35.18	10.98	24.20	Sheen	--	--	--	79,000	14,000	7200	3500	16,000	--
04/14/93	35.18	--	--	--	--	--	--	--	--	--	--	--	--
07/16/93	35.18	5.03	30.15	--	--	--	--	2200	440	73	24	350	--
09/21/93	37.47	11.18	26.29	--	--	--	--	11,000	2300	300	270	910	--
01/28/94	37.47	13.51	23.96	--	--	--	--	49,000	11,000	3900	1600	12,000	--
03/17/94	37.47	11.48	25.99	--	--	--	--	16,000	3300	1000	220	3500	--
06/16/94	37.47	13.55	23.92	--	--	--	--	20,000	4800	1500	520	4300	--
09/22/94	37.47	11.85	25.62	--	--	--	--	35,000	5600	850	1700	7300	--
12/15/94	37.47	16.31	21.16	--	--	--	--	96,000	9000	3500	3300	13,000	--
03/30/95	37.47	20.29	17.18	--	--	--	--	100,000	9400	3700	3900	14,000	--
06/20/95	37.47	18.52	18.95	--	--	--	--	93,000	6400	1900	2900	11,000	--
09/20/95	37.47	19.27	18.20	--	--	--	--	58,000	6600	330	1600	5500	--
12/06/95	37.47	12.71	24.76	--	--	--	--	40,000	5000	86	1800	3700	<500
03/21/96	37.47	21.30	16.17	0.00	0.132	0.130	--	--	--	--	--	--	--
06/21/96	37.47	19.34	18.15	0.02	0.026	0.156	--	--	--	--	--	--	--
09/06/96	37.47	16.36	21.14	0.04	0.079	0.235							
12/19/96	37.47	19.94	17.55	0.03	0.050	0.285	--	--	--	--	--	--	--
03/17/97	37.47	18.88	18.59	--	--	0.285	--	58,000	4800	1200	1800	6300	3400
06/11/97	37.47	16.17	21.30	--	--	0.285	--	40,000	5500	720	1400	4100	3100
09/17/97	37.47	14.33	23.14	--	--	0.285	*	30,000	4800	220	1200	1800	3200
12/11/97	37.47	20.26	17.21	--	--	0.285	--	76,000	6100	1300	2200	8000	3800

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* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-2 (CONT'D)													
03/12/98	37.47	23.30	14.17	--	--	0.285	*	45,000	6000	1400	1800	5900	2700
06/23/98	37.47	22.65	14.82	--	--	0.285	ORC Installed	1,100,000	6800	5100	13,000	38,000	<1000
09/01/98	37.47	15.69	21.78	--	--	0.285	--	9700	300	8.2	6.2	250	3700
12/30/98	37.47	15.61	21.86	--	--	0.285	--	110,000	4790	1300	841	5570	2420
03/31/99	37.47	20.57	16.90	--	--	0.285	*	48,000	4800	1110	1520	5450	2160
06/14/99	37.47	17.32	20.15	--	--	0.285	Sheen	56,400	5380	671	1300	3960	2480
06/14/99	37.47	17.32	20.15	--	--	0.285	Confirmation run	--	--	--	--	--	2630**
09/30/99	37.47	14.50	22.97	--	--	0.285	--	22,100	623	<100	529	1250	2430
12/22/99	37.47	16.47	21.00	--	--	0.285	*	10,200	1750	102	222	963	1980

* See Table of Additional Analyses.

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Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH- Gasoline	Benzene	Toluene	Ethyl- Benzene	Xylene	MTBE
C-3													
04/28/89	35.28	7.28	28.00	--	--	--	--	<500	1.7	<0.5	<0.5	<0.5	--
08/08/89	35.28	5.28	30.00	--	--	--	--	<500	1.0	<0.5	<0.5	<0.5	--
12/21/89	35.28	4.75	30.53	--	--	--	--	--	--	--	--	--	--
08/27/90	35.28	5.60	29.68	--	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--
11/04/90	35.30	4.94	30.36	--	--	--	--	--	--	--	--	--	--
06/18/91	35.30	6.84	28.46	--	--	--	--	52	1.1	<0.5	<0.5	1.2	--
09/19/91	35.30	5.97	29.33	--	--	--	--	73	1.2	<0.5	<0.5	<0.5	--
12/20/91	35.30	5.53	29.77	--	--	--	--	<50	0.7	<0.5	<0.5	<0.5	--
03/18/92	35.30	9.55	25.75	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/14/92	35.30	7.43	27.87	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
10/08/92	35.30	6.75	28.55	--	--	--	--	<50	<0.5	<0.5	<0.5	0.5	--
01/08/93	35.30	9.45	25.85	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
04/14/93	35.30	11.34	23.96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/16/93	35.30	9.66	25.64	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/21/93	38.37	12.15	26.22	--	--	--	--	<50	0.7	<0.5	<0.5	<0.8	--
01/28/94	38.37	12.71	25.66	--	--	--	--	<50	2.0	<0.5	<0.5	1.0	--
03/17/94	38.37	13.42	24.95	--	--	--	--	<50	2.8	<0.5	0.6	1.5	--
06/16/94	38.37	14.06	24.31	--	--	--	--	<50	1.4	<0.5	<0.5	<0.5	--
09/22/94	38.37	13.33	25.04	--	--	--	--	<50	0.6	<0.5	<0.5	<0.5	--
12/15/94	38.37	16.15	22.22	--	--	--	--	<50	2.6	1.7	0.82	4.5	--
03/30/95	38.37	19.95	18.42	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
06/20/95	38.37	18.58	19.79	--	--	--	--	110	2.2	<0.5	<0.5	1.2	--
09/20/95	38.37	19.42	18.95	--	--	--	--	560	21	80	23	120	--
12/06/95	38.37	14.21	24.16	--	--	--	--	<50	0.73	<0.5	<0.5	0.67	<2.5
03/21/96	38.37	20.52	17.85	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/21/96	38.37	18.59	19.78	--	--	--	--	57	<0.5	<0.5	<0.5	<0.5	<2.5
09/06/96	38.37	16.74	21.63	--	--	--	--	<50	0.9	<0.5	<0.5	<0.5	<2.5
12/19/96	38.37	16.07	22.30	--	--	--	--	310	36	33	6.5	28	<2.5
03/17/97	38.37	19.42	18.95	--	--	--	--	54	1.1	<0.5	<0.5	0.76	<2.5
06/11/97	38.37	17.22	21.15	--	--	--	--	120	1.1	<0.5	<0.5	<0.5	<2.5
09/17/97	38.37	15.96	22.41	--	--	--	*	240	19	19	6.6	40	13
12/11/97	38.37	16.11	22.26	--	--	--	--	<50	1.8	<0.5	<0.5	0.5	<2.5

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* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-3 (CONT'D)													
03/12/98	38.37	20.02	18.35	--	--	--	*	72	6.3	<0.5	0.64	3.1	2.6
06/23/98	38.37	19.33	19.04	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/01/98	38.37	18.40	19.97	--	--	--	--	200	6.8	0.31	0.52	2.0	<2.5
12/30/98	38.37	17.06	21.31	--	--	--	*	<50	<0.5	<0.5	<0.5	<0.5	<2.0
03/31/99	38.37	20.60	17.77	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	12.6
06/14/99	38.37	20.12	18.25	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/30/99	38.37	17.18	21.19	--	--	--	--	79.2	3.04	0.794	<0.5	1.04	6.17
12/22/99	38.37	16.05	22.32	--	--	--	*	<50	1.53	1.08	<0.5	0.66	12

* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-4													
01/12/89	33.45	3.96	29.49	--	--	--	--	--	--	--	--	--	--
04/12/89	33.45	6.01	27.44	--	--	--	--	--	--	--	--	--	--
04/28/89	33.45	3.96	29.49	--	--	--	--	20,000	6300	550	230	1500	--
08/08/89	33.45	3.90	29.55	--	--	--	--	8000	7500	340	88	1000	--
12/21/89	33.45	3.43	30.02	--	--	--	--	--	--	--	--	--	--
08/27/90	33.48	4.46	29.02	--	--	--	--	26,000	10,000	280	410	1400	--
11/04/90	33.48	3.67	29.81	--	--	--	--	--	--	--	--	--	--
06/18/91	33.48	6.03	27.45	--	--	--	--	34,000	14,000	410	450	1300	--
09/19/91	33.48	4.83	28.65	--	--	--	--	16,000	7400	90	110	460	--
12/20/91	33.48	4.64	28.84	--	--	--	--	24,000	12,000	120	260	740	--
03/18/92	33.48	11.05	24.43	--	--	--	--	48,000	6000	1300	1300	2400	--
07/14/92	33.48	6.59	26.89	--	--	--	--	40,000	14,000	920	550	2400	--
10/08/92	33.48	5.69	27.79	--	--	--	--	29,000	13,000	190	110	1400	--
01/08/93	33.48	9.98	23.50	--	--	--	--	25,000	7000	630	860	1800	--
04/14/93	33.48	12.35	21.13	--	--	--	--	27,000	6300	1000	900	1400	--
07/16/93	33.48	9.52	23.96	--	--	--	--	28,000	7800	1100	830	2100	--
09/21/93	36.49	10.98	25.51	--	--	--	--	30,000	9600	130	390	1300	--
01/28/94	36.49	13.18	23.31	--	--	--	--	18,000	7800	440	260	1200	--
03/17/94	36.49	15.14	21.35	--	--	--	--	32,000	7800	820	820	1800	--
06/16/94	36.49	13.99	22.50	--	--	--	--	25,000	7600	710	600	1800	--
09/22/94	36.49	12.56	23.93	--	--	--	--	25,000	7800	140	600	1100	--
12/15/94	36.49	17.47	19.02	--	--	--	--	38,000	7600	460	1200	2000	--
03/30/95	36.49	21.63	14.86	--	--	--	--	41,000	8700	1600	1800	3000	--
06/20/95	36.49	19.59	16.90	--	--	--	--	29,000	6000	890	960	1800	--
09/20/95	36.49	20.29	16.20	--	--	--	--	12,000	6900	510	290	1300	--
12/06/95	36.49	13.37	23.12	--	--	--	--	13,000	3900	42	30	250	<250
03/21/96	36.49	22.39	14.10	--	--	--	--	39,000	4800	640	1000	1800	<1000
06/21/96	36.49	19.54	16.95	--	--	--	--	26,000	4400	640	960	1800	2000
09/06/96	36.49	16.36	20.13	--	--	--	--	23,000	500	200	230	1000	3100
12/19/96	36.49	19.57	16.92	--	--	--	--	23,000	4900	320	1100	2000	<250
03/17/97	36.49	19.09	17.40	--	--	--	--	30,000	5800	700	1400	2200	1700
06/11/97	36.49	18.15	18.34	--	--	--	--	29,000	4400	520	790	1800	2000
09/17/97	36.49	15.03	21.46	--	--	--	*	17,000	4300	140	940	1100	4600
12/11/97	36.49	19.84	16.65	--	--	--	--	12,000	2500	130	300	1000	1400

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* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

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DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-4 (CONT'D)													
03/12/98	36.49	19.90	16.59	--	--	--	*	46,000	11,000	1500	2300	5000	3400
06/23/98	36.49	19.47	17.02	--	--	--	ORC Installed	27,000	1600	160	180	690	100
09/01/98	36.49	15.04	21.45	--	--	--	--	520	14	2.3	<0.5	4.8	61
12/30/98	36.49	15.07	21.42	--	--	--	--	122	14.1	1.86	<1.0	3.61	349
03/31/99	36.49	21.29	15.20	--	--	--	*	20,300	4450	443	1000	2130	1320
06/14/99	36.49	14.69	21.80	--	--	--	--	1820	183	7.14	36.7	56.5	291
06/14/99	36.49	14.69	21.80	--	--	--	Confirmation run	--	--	--	--	--	280**
09/30/99	36.49	16.68	19.81	--	--	--	--	1030	11.6	2.14	29.2	68.7	91.5
12/22/99	36.49	16.22	20.27	--	--	--	*	217	4.45	0.765	2.82	8.21	70.2

* See Table of Additional Analyses.

** Samples were analyzed past hold-time, the results should be considered as estimated.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-5													
08/27/90	35.50	5.67	29.83	--	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--
11/14/90	35.50	4.94	30.56	--	--	--	--	--	--	--	--	--	--
06/18/91	35.50	6.98	28.52	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/19/91	35.50	5.99	29.51	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/20/91	35.50	5.54	29.96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/18/92	35.50	9.58	25.92	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/14/92	35.50	7.50	28.00	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
10/08/92	35.50	6.85	28.65	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
01/08/93	35.50	9.48	26.02	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
04/14/93	35.50	11.46	24.04	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/16/93	35.50	10.29	25.21	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/21/93	38.50	12.14	26.36	--	--	--	--	60	10	8.1	1.9	9.4	--
01/28/94	38.50	12.60	25.90	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/17/94	38.50	14.00	24.50	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
06/16/94	38.50	14.10	24.40	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/22/94	38.50	13.34	25.16	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/15/94	38.50	15.61	22.89	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/30/95	38.50	19.96	18.54	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
06/20/95	38.50	18.37	20.13	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/20/95	38.50	14.16	24.34	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/06/95	38.50	14.40	24.10	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
03/21/96	38.50	20.10	18.40	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/21/96	38.50	18.23	20.27	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	8.7
06/06/96	38.50	16.60	21.90	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
12/19/96	38.50	17.35	21.15	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
03/17/97	38.50	18.66	19.84	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/11/97	38.50	16.90	21.60	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/17/97	38.50	10.67	27.83	--	--	--	Sampled annually	--	--	--	--	--	--
12/11/97	38.50	17.50	21.00	--	--	--	--	--	--	--	--	--	--
03/12/98	38.50	22.08	16.42	--	--	--	*	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/23/98	38.50	21.52	16.98	--	--	--	--	--	--	--	--	--	--
09/01/98	38.50	18.08	20.42	--	--	--	--	--	--	--	--	--	--
12/30/98	38.50	17.71	20.79	--	--	--	--	--	--	--	--	--	--

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* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-5 (CONT'D)													
03/31/99	38.50	21.45	17.05	--	--	--	*	<50	<0.5	<0.5	<0.5	<0.5	15
06/14/99	38.50	21.02	17.48	--	--	--	--	--	--	--	--	--	--
09/30/99	38.50	19.77	18.73	--	--	--	--	--	--	--	--	--	--
12/22/99	38.50	16.32	22.18	--	--	--	--	--	--	--	--	--	--

* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-6													
08/27/90	32.40	-11.71	44.11	--	--	--	--	7200	2100	6.0	41	300	--
11/14/90	32.40	-11.63	44.03	--	--	--	--	--	--	--	--	--	--
06/18/91	32.40	-11.09	43.49	--	--	--	--	4400	2500	18	160	77	--
09/19/91	32.40	-1.92	34.32	--	--	--	--	3100	1600	8.3	73	8.0	--
12/20/91	32.40	-8.95	41.35	--	--	--	--	4400	1300	3.2	74	10	--
03/18/92	32.40	-8.29	40.69	--	--	--	--	9800	3200	34	250	500	--
07/14/92	32.40	-6.49	38.89	--	--	--	--	6500	2200	100	96	240	--
10/08/92	32.40	-6.27	38.67	--	--	--	--	1800	1000	3.1	15	41	--
01/08/93	32.40	-5.41	37.81	--	--	--	--	5200	1600	6.8	63	120	--
04/14/93	32.40	-2.30	34.70	--	--	--	--	11,000	1800	13	110	200	--
07/16/93	32.40	-1.47	33.87	--	--	--	--	4800	820	10	41	57	--
09/21/93	35.40	1.42	33.98	--	--	--	--	4100	1200	<50	75	130	--
01/28/94	35.40	1.54	33.86	--	--	--	--	3100	930	14	40	34	--
03/17/94	35.40	3.09	32.31	--	--	--	--	5100	950	18	61	83	--
06/16/94	35.40	3.90	31.50	--	--	--	--	3800	970	6.4	52	62	--
09/22/94	35.40	4.18	31.22	--	--	--	--	4100	980	7.8	43	48	--
12/15/94	35.40	4.00	31.40	--	--	--	--	5000	1400	<20	73	61	--
03/30/95	35.40	9.02	26.38	--	--	--	--	5500	1700	<13	120	97	--
06/20/95	35.40	10.39	25.01	--	--	--	--	1700	470	<10	29	16	--
09/20/95	35.40	11.35	24.05	--	--	--	--	3500	770	<5.0	45	17	--
12/06/95	35.40	7.28	28.12	--	--	--	--	3100	710	<10	41	20	<50
03/21/96	35.40	12.28	23.12	--	--	--	--	1400	330	<2.5	15	8.1	19
06/21/96	35.40	11.90	23.50	--	--	--	--	2200	560	<5.0	18	<5.0	77
09/06/96	35.40	10.57	24.83	--	--	--	--	2800	720	<10	13	<10	160
12/19/96	35.40	10.90	24.50	--	--	--	--	830	320	<2.5	<2.5	<2.5	14
03/17/97	35.40	12.81	22.59	--	--	--	--	2200	500	<10	25	<10	<50
06/11/97	35.40	11.64	23.76	--	--	--	--	3000	570	<5.0	29	10	220
09/17/97	35.40	10.66	24.74	--	--	--	*	1400	330	<5.0	<5.0	<5.0	76
12/11/97	35.40	10.75	24.65	--	--	--	--	1600	230	<5.0	7.3	6.4	46
03/12/98	35.40	8.28	27.12	--	--	--	*	980	300	<5.0	15	12	49
06/23/98	35.40	7.48	27.92	--	--	--	ORC Installed	220	35	<0.5	2.5	1.1	<2.5
09/01/98	35.40	3.80	31.60	--	--	--	--	1800	370	2.8	19	4.8	44
12/30/98	35.40	3.58	31.82	--	--	--	--	1600	244	<1.0	8.53	<1.0	54.9

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* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-6 (CONT'D)													
03/31/99	35.40	9.34	26.06	--	--	--	*	741	92.2	<1.0	6.60	<1.0	27.9
06/14/99	35.40	5.72	29.68	--	--	--	--	434	110	<1.0	5.76	1.46	13
06/14/99	35.40	5.72	29.68	--	--	--	Confirmation run	--	--	--	--	--	6.96**
09/30/99	35.40	12.34	23.06	--	--	--	--	481	92.7	<1.0	3.69	<1.0	32.9
12/22/99	35.40	12.85	22.55	--	--	--	*	1310	158	2.16	5.5	1.41	113

* See Table of Additional Analyses.
** Samples were analyzed past hold-time, the results should be considered as estimated.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-7													
08/27/90	32.17	-12.06	44.23	--	--	--	--	110	26	0.8	4.0	6.0	--
11/14/90	32.17	-11.94	44.11	--	--	--	--	--	--	--	--	--	--
06/18/91	32.17	-9.88	42.05	--	--	--	--	23,000	5700	420	1000	2800	--
09/19/91	32.17	-9.55	41.72	--	--	--	--	26,000	4600	330	970	2400	--
12/20/91	32.17	-9.50	41.67	--	--	--	--	33,000	5500	270	1000	2100	--
03/18/92	32.17	-9.03	41.20	--	--	--	--	27,000	5800	410	1300	3300	--
07/14/92	32.17	-7.60	39.77	--	--	--	--	46,000	12,000	720	1700	4600	--
10/08/92	32.17	-6.97	39.14	--	--	--	--	22,000	6800	370	1300	3200	--
01/08/93	32.17	-6.33	38.50	--	--	--	--	36,000	7600	540	1700	4200	--
04/14/93	32.17	-3.76	35.93	--	--	--	--	23,000	3100	450	670	1900	--
07/16/93	32.17	-3.21	35.38	--	--	--	--	19,000	3200	330	550	1800	--
09/21/93	35.19	-0.27	35.46	--	--	--	--	17,000	2700	160	410	760	--
01/28/94	35.19	-0.26	35.45	--	--	--	--	14,000	1800	210	390	1000	--
03/17/94	35.19	1.95	33.24	--	--	--	--	17,000	1600	210	410	1200	--
06/16/94	35.19	2.12	33.07	--	--	--	--	12,000	1600	180	410	1200	--
09/22/94	35.19	2.45	32.74	--	--	--	--	10,000	1700	110	320	580	--
12/15/94	35.19	3.27	31.92	--	--	--	--	10,000	1200	120	280	710	--
03/30/95	35.19	7.59	27.60	--	--	--	--	4600	460	73	160	460	--
06/20/95	35.19	7.32	27.87	--	--	--	--	26,000	4400	450	900	2400	--
09/20/95	35.19	7.11	28.08	--	--	--	--	9400	610	81	250	800	--
12/06/95	35.19	4.57	30.62	--	--	--	--	1200	110	12	25	71	34
03/21/96	35.19	7.34	27.85	--	--	--	--	17,000	1300	160	410	1300	<100
06/21/96	35.19	7.77	27.42	--	--	--	--	14,000	1300	210	500	1700	590
09/06/96	35.19	6.84	28.35	--	--	--	--	15,000	3400	<50	460	850	<250
12/19/96	35.19	6.08	29.11	--	--	--	--	530	8.6	0.5	0.85	3.4	<2.5
03/17/97	35.19	8.05	27.14	--	--	--	--	4600	310	46	110	310	98
06/11/97	35.19	7.14	28.05	--	--	--	--	420	15	<0.5	3.3	5.1	<2.5
09/17/97	35.19	6.19	29.00	--	--	--	*	1400	120	11	31	84	54
12/11/97	35.19	5.93	29.26	--	--	--	--	210	10	<0.5	0.97	1.6	<2.5
03/12/98	35.19	10.27	24.92	--	--	--	*	68	<0.5	<0.5	<0.5	<0.5	<2.5
06/23/98	35.19	9.89	25.30	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/01/98	35.19	8.92	26.27	--	--	--	--	570	24	1.4	8.4	22	24
12/30/98	35.19	8.67	26.52	--	--	--	--	<50	4.85	1.26	<0.5	1.29	167

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* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-7 (CONT'D)													
03/31/99	35.19	10.43	24.76	--	--	--	*	53.1	<0.5	<0.5	<0.5	<0.5	<2.0
06/14/99	35.19	9.75	25.44	--	--	--	--	109	4.43	<0.5	<0.5	<0.5	<2.5
06/14/99	35.19	9.75	25.44	--	--	--	Confirmation run	--	--	--	--	--	<2.0**
09/30/99	35.19	8.32	26.87	--	--	--	--	2400	282	26.3	120	236	126
12/22/99	35.19	7.42	27.77	--	--	--	*	3840	162	18.1	44.7	85.3	141

* See Table of Additional Analyses.
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Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-8													
11/14/90	30.68	-12.61	43.29	--	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--
06/18/91	30.68	-11.94	42.62	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/19/91	30.68	-11.04	41.72	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/20/91	30.68	-10.30	40.98	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/18/92	30.68	-9.34	40.02	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/14/92	30.68	-8.34	39.02	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
10/08/92	30.68	-8.00	38.68	--	--	--	--	<50	<0.5	<0.5	<0.5	1.1	--
01/08/93	30.68	-7.39	38.07	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
04/14/93	30.68	-5.31	35.99	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/16/93	30.68	-4.64	35.32	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/21/93	34.68	-0.62	35.30	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.8	--
01/28/94	34.68	-0.93	35.61	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/17/94	34.68	0.31	34.37	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
06/16/94	34.68	1.32	33.36	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/22/94	34.68	1.86	32.82	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/15/94	34.68	2.32	32.36	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/30/95	34.68	5.44	29.24	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
06/20/95	34.68	6.34	28.34	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/20/95	34.68	5.20	29.48	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/06/95	34.68	3.76	30.92	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
03/21/96	34.68	6.03	28.65	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/21/96	34.68	6.78	27.90	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/06/96	34.68	5.98	28.70	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
12/19/96	34.68	4.98	29.70	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
03/17/97	34.68	6.92	27.76	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/11/97	34.68	5.87	28.81	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/17/97	34.68	5.32	29.36	--	--	--	Sampled annually	--	--	--	--	--	--
12/11/97	34.68	4.88	29.80	--	--	--	--	--	--	--	--	--	--
03/12/98	34.68	8.95	25.73	--	--	--	*	<50	<0.5	<0.5	<0.5	<0.5	2.6
06/23/98	34.68	8.38	26.30	--	--	--	--	--	--	--	--	--	--
09/01/98	34.68	8.17	26.51	--	--	--	--	--	--	--	--	--	--
12/30/98	34.68	7.79	26.89	--	--	--	--	--	--	--	--	--	--

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* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-8 (CONT'D)													
03/31/99	34.68	8.32	26.36	--	--	--	*	<50	<0.5	<0.5	<0.5	<0.5	11.8
06/14/99	34.68	8.65	26.03	--	--	--	--	--	--	--	--	--	--
09/30/99	34.68	7.40	27.28	--	--	--	--	--	--	--	--	--	--
12/22/99	34.68	6.48	28.20	--	--	--	--	--	--	--	--	--	--

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
C-9													
08/13/96	--	--	28.27	--	--	--	--	ND	ND	ND	ND	ND	ND
09/06/96	--	--	28.47	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
12/19/96	30.68	1.39	29.29	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
03/17/97	30.68	3.11	27.57	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/11/97	30.68	2.41	28.27	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/17/97	30.68	2.05	28.63	--	--	--	Sampled annually	--	--	--	--	--	--
12/11/97	30.68	1.25	29.43	--	--	--	--	--	--	--	--	--	--
03/12/98	30.68	5.06	25.62	--	--	--	*	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/23/98	30.68	4.53	26.15	--	--	--	--	--	--	--	--	--	--
09/01/98	30.68	4.30	26.38	--	--	--	--	--	--	--	--	--	--
12/30/98	30.68	3.93	26.75	--	--	--	--	--	--	--	--	--	--
03/31/99	30.68	5.35	25.33	--	--	--	*	<50	<0.5	<0.5	<0.5	<0.5	12.5
06/14/99	30.68	4.16	26.52	--	--	--	--	--	--	--	--	--	--
09/30/99	30.68	3.89	26.79	--	--	--	--	--	--	--	--	--	--
12/22/99	30.68	2.99	27.69	--	--	--	--	--	--	--	--	--	--

* See Table of Additional Analyses.

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
TRIP BLANK													
04/28/89	--	--	--	--	--	--	--	<500	<0.5	<0.5	<0.5	<0.5	--
08/08/89	--	--	--	--	--	--	--	<500	<0.5	<0.5	<0.5	<0.5	--
08/27/90	--	--	--	--	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--
11/14/90	--	--	--	--	--	--	--	<50	<0.3	<0.3	<0.3	<0.6	--
06/18/91	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/19/91	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/20/91	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/18/92	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/14/92	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
10/08/92	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
01/08/93	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
04/14/93	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
07/16/93	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/21/93	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.8	--
01/28/94	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/17/94	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
06/16/94	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/22/94	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/15/94	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/30/95	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
06/20/95	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
09/20/95	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/06/95	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
03/21/96	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/21/96	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/06/96	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--
12/19/96	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
03/17/97	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/11/97	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/17/97	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
12/11/97	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5

CONTINUED ON NEXT PAGE

Cumulative Table of Well Data and Analytical Results

Vertical Measurements are in feet. Volumetric Measurements are in gallons. Analytical results are in parts per billion (ppb)

DATE	Well Head Elev.	Ground Water Elev.	Depth To Water	SPH Thickness	SPH Removed	Total SPH Removed	Notes	TPH-Gasoline	Benzene	Toluene	Ethyl-Benzene	Xylene	MTBE
TRIP BLANK (CONT'D)													
03/12/98	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
06/23/98	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
09/01/98	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
12/30/98	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.0
03/31/99	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.0
06/14/99	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5
12/22/99	--	--	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5

ADDITIONAL ANALYSES

Analytical values are in parts per million (ppm) unless otherwise noted

DATE	Notes	Total Alkalinity mg $CaCO_3$/L	Ferrous Iron	Nitrate as Nitrate	Sulfate	D.O. Pre-Purge	D.O. Post-Purge	ORP Pre-Purge	ORP st-Purge
C-1									
09/17/97	--	2.0	1.1	<1.0	12	1.4	8.8	101	104
03/12/98	--	550	3.0	<1.0	6.6	1.7	3.6	171	171
03/31/99	--	382	2520*	0.418	8.23	6.5	1.8	99	89
12/22/99	--	568	0.19	<0.1	11	0.95	2.0	-95	-128
C-2									
09/17/97	--	560	4.7	<1.0	<1.0	1.3	--	150	--
03/12/98	--	420	3.5	<1.0	<1.0	1.1	1.1	176	174
03/31/99	--	456	2100*	0.118	19.7	1.5	1.6	151	157
12/22/99	--	782	1.0	5.34	5.38	0.6	0.65	-90	-84
C-3									
09/17/97	--	340	0.012	100	33	2.1	0.8	59	67
03/12/98	--	260	0.14	88	32	2.8	2.5	165	163
03/31/99	--	256	<500*	18.4	72	4.1	3.3	101	89
12/22/99	--	402	0.013	67.7	37.6	0.98	1.48	69	107
C-4									
09/17/97	--	540	5.9	<1.0	<1.0	0.6	0.2	102	107
03/12/98	--	550	1.3	<1.0	2.7	1.5	2.6	173	175
03/31/99	--	492	1560*	0.191	<1.0	1.8	2.2	170	176
12/22/99	--	739	0.87	1.85	39.6	6.8	5.68	-25	14
C-5									
03/12/98	--	210	0.074	69	74	1.7	1.9	70	169
03/31/99	--	254	<500*	16.7	69.7	12.8	6.7	92	97

* (ppb) Parts per billion.

ADDITIONAL ANALYSES

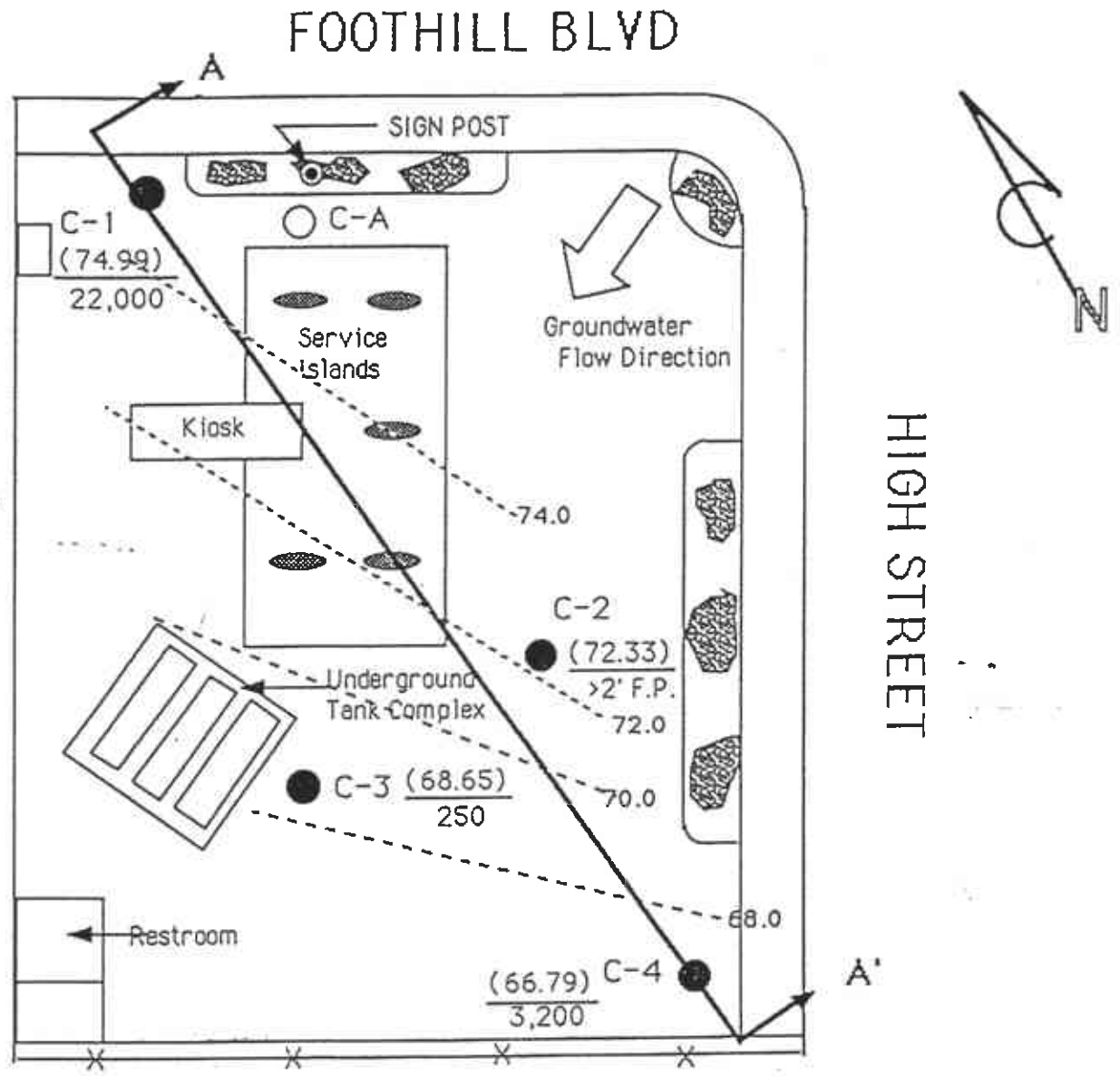
Analytical values are in parts per million (ppm) unless otherwise noted

DATE	Notes	Total Alkalinity mg $CaCO_3$/L	Ferrous Iron	Nitrate as Nitrate	Sulfate	D.O. Pre-Purge	D.O. Post-Purge	ORP Pre-Purge	ORP st-Purge
C-6									
09/17/97	--	620	1.1	<1.0	18	1.5	1.2	-57	-48
03/12/98	--	200	0.11	14	14	14.1	11.3	173	174
03/31/99	--	534	<500*	0.849	45.3	9.8	8.4	162	168
12/22/99	--	614	0.36	0.421	32	1.02	1.22	-65	-60
C-7									
09/17/97	--	600	4.8	<1.0	18	0.6	0.4	126	115
03/12/98	--	460	0.16	<1.0	29	2.2	2.1	167	167
03/31/99	--	486	<500*	<0.1	29.4	2.0	1.8	137	135
12/22/99	--	400	1.6	0.434	16.9	1.8	1.5	20	-60
C-8									
03/12/98	--	110	0.16	7.4	8.2	1.0	1.1	171	169
03/31/99	--	264	<500*	17	71	1.8	1.5	149	132
C-9									
03/12/98	--	230	0.048	59	58	2.5	2.5	172	168
03/31/99	--	236	<500*	18	72.7	2.1	2.3	154	142

* (ppb) Parts per billion.

Note: Blaine Tech Services, Inc. began routine monitoring of the groundwater wells at this site on November 1, 1994. Earlier field data and analytical results are drawn from the September 27, 1994 Groundwater Technology, Inc. report.

ABBREVIATIONS:
TPH = Total Petroleum Hydrocarbons
MTBE = Methyl t-Butyl Ether
ND = Not detected at or above the minimum quantitation limit. See laboratory reports for minimum quantitation limits.
D.O. = Dissolved Oxygen
O.R.P. = Oxydation Reduction Potential



LEGEND

C-4 ● GROUNDWATER MONITORING WELL

(66.79) GROUNDWATER ELEVATION (9/1/87, PROJECT DATUM)

3,200 HYDROCARBON CONCENTRATION (PPB) (F.P. = FLOATING PRODUCT)

74.0 GROUNDWATER ELEVATION CONTOUR LINE

C-A ○ EXPLORATORY BORING LOCATION

SCALE

0 30 60 90 FEET

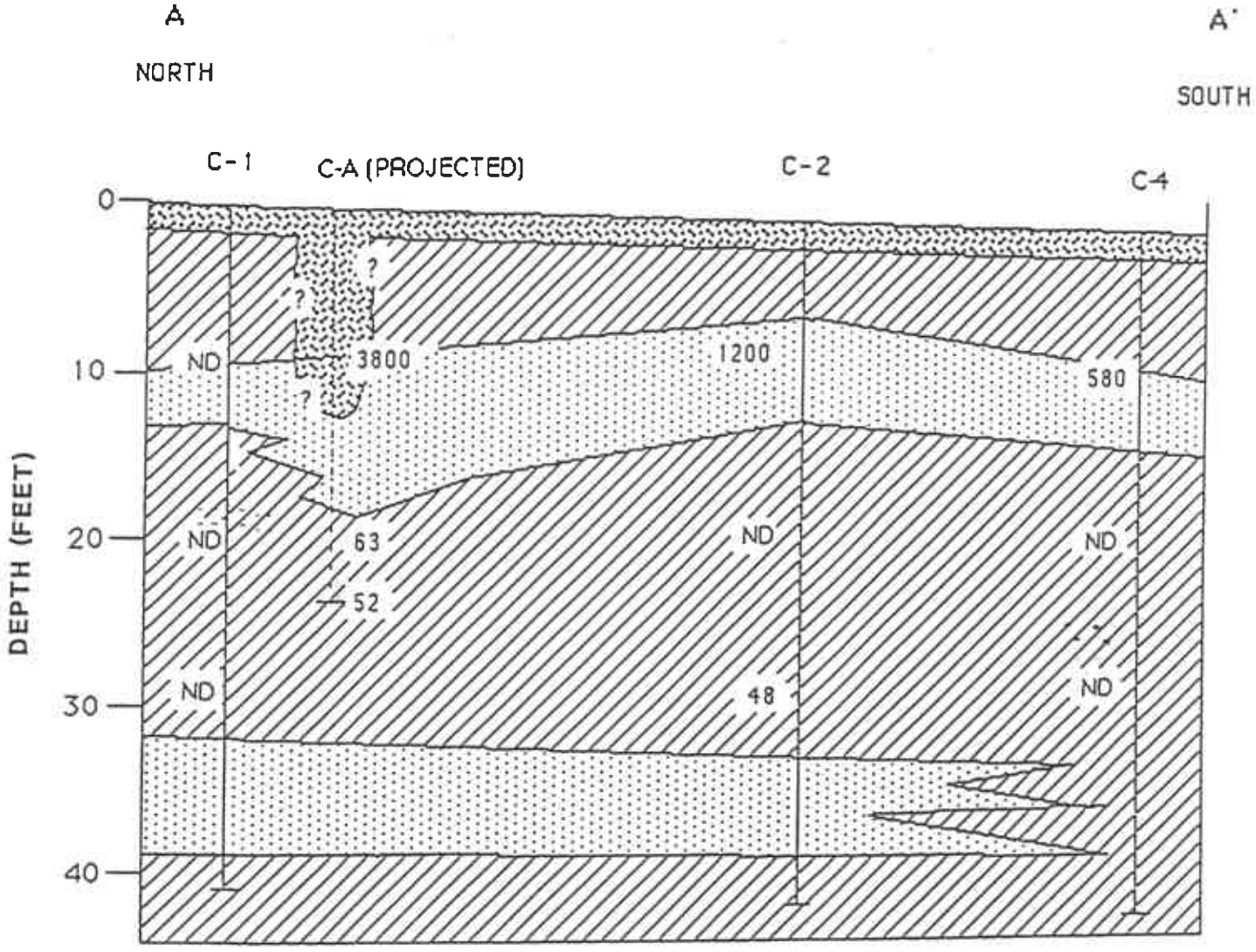
PACIFIC ENVIRONMENTAL GROUP, INC.

CHEVRON USA SERVICE STATION #0076
FOOTHILL BOULEVARD & HIGH STREET
OAKLAND, CALIFORNIA

GROUNDWATER CONTOUR MAP

FIGURE 3

PROJECT NO. 120-57.01



NOTE: SEE FIGURE 3 FOR LOCATION OF SECTION

APPROXIMATE SCALE: 1" = 30' HORIZONTAL
1" = 10' VERTICAL
(3X EXAGGERATION)

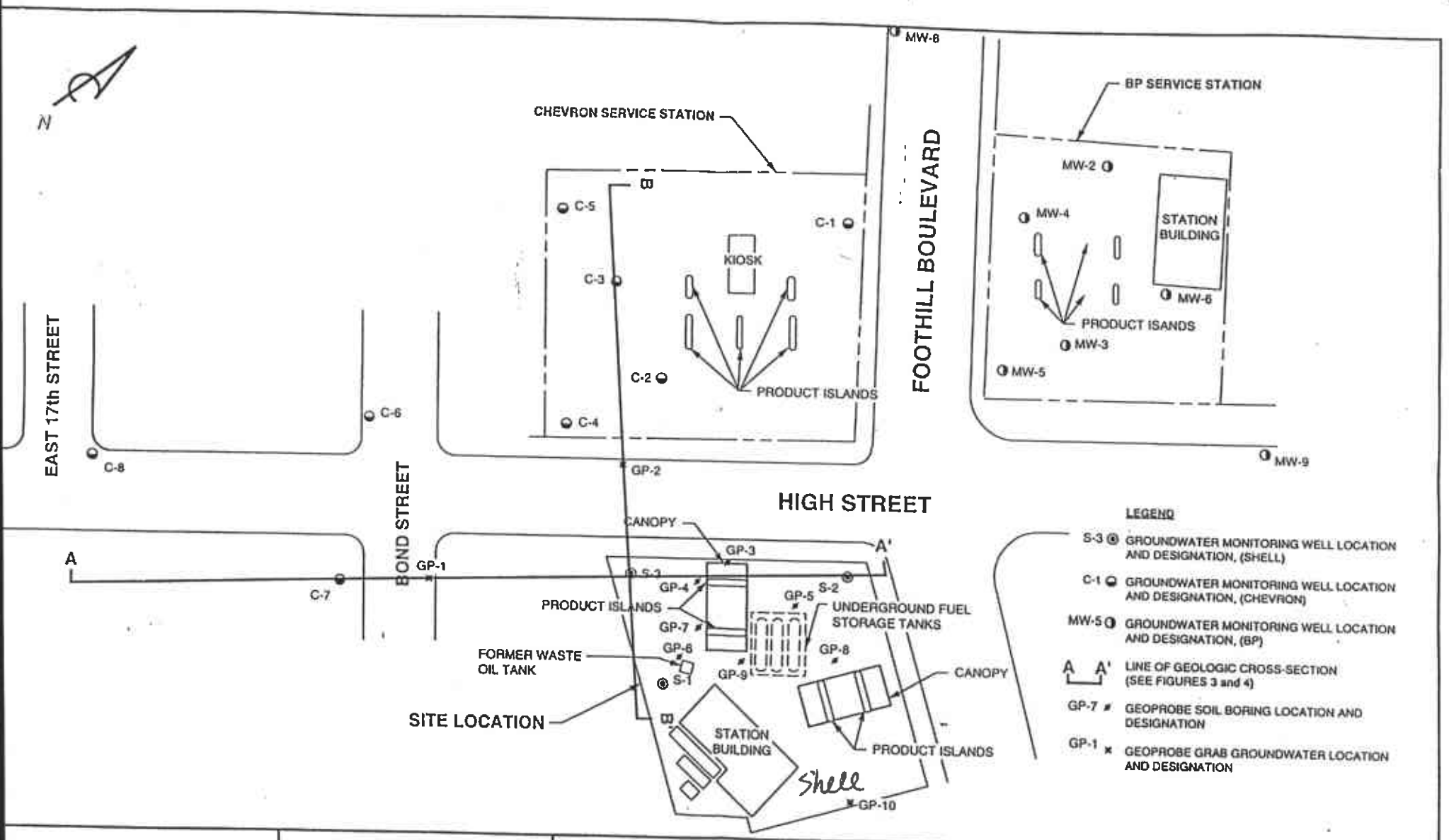
FILL

CLAY

SAND, GRAVEL, CLAYEY SAND AND GRAVEL

HYDROCARBON CONCENTRATIONS (PPM) ARE SHOWN AT THE APPROXIMATE DEPTH INTERVAL ANALYZED.

PACIFIC ENVIRONMENTAL GROUP, INC.	CHEVRON USA SERVICE STATION #0076 FOOTHILL BOULEVARD AND HIGH STREET OAKLAND, CALIFORNIA CROSS-SECTION A-A'	FIGURE 4 PROJECT NO. 120-57.01



PACIFIC ENVIRONMENTAL GROUP, INC.

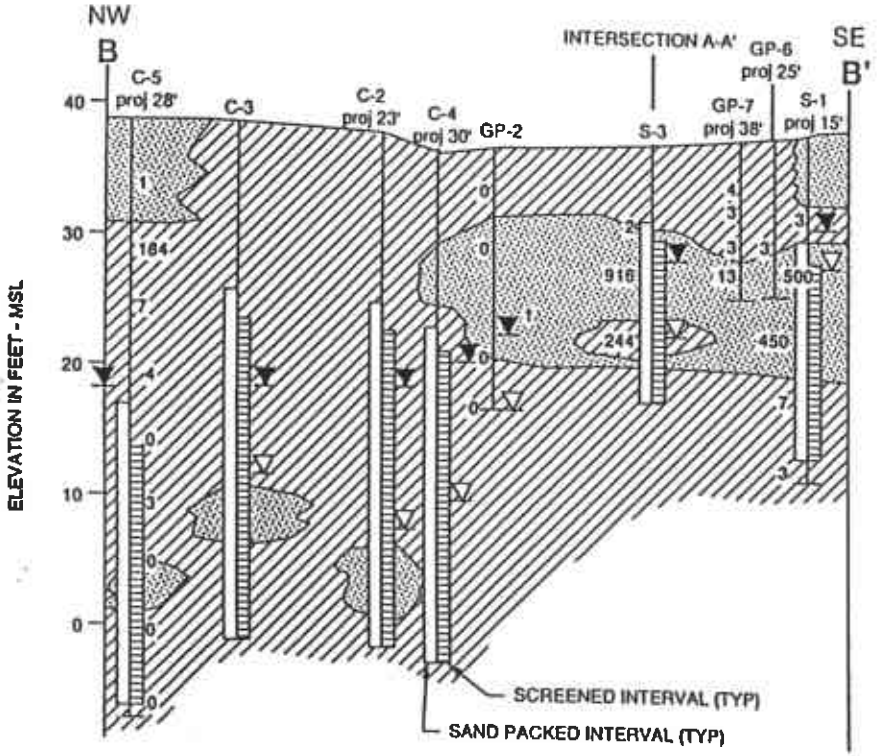
SCALE
0 50 100 FEET

SHELL SERVICE STATION
4411 Foothill Boulevard at High Street
Oakland, California

GEOPROBE LOCATION MAP

FIGURE: 2
PROJECT: 305-131.18

97 / 11 / 5



LEGEND

- PRIMARILY FINE-GRAINED DEPOSITS - CL and SM
- PRIMARILY COARSE-GRAINED DEPOSITS - SC, SW, SP, GC and GM
- S-3 GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION (SHELL)
- C-2 GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION (CHEVRON)
- GP-2 GEOPROBE SOIL BORING LOCATION AND DESIGNATION
- proj PROJECTED ONTO LINE OF SECTION IN FEET
- ▽ FIRST ENCOUNTERED WATER LEVEL AT TIME OF DRILLING
- ▼ STATIC WATER LEVEL, 6-20-94
- 916 PHOTO IONIZATION DETECTOR LEVEL IN PARTS PER MILLION
- † APPROXIMATE LEVEL OF GROUNDWATER PRIOR TO GRAB SAMPLING, 6-27-95

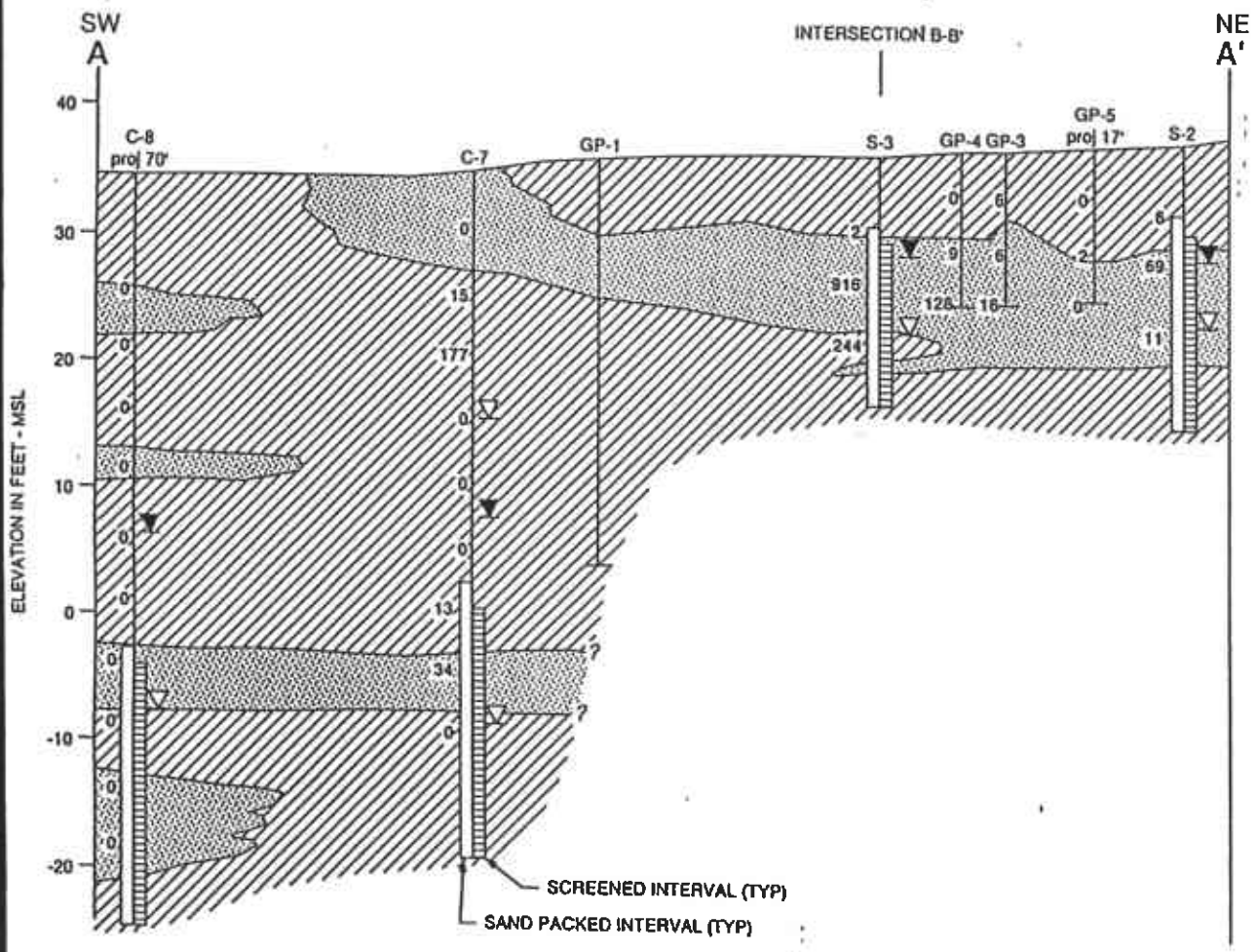
PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
HORIZONTAL : 1" = 50'
VERTICAL : 1" = 10'

SHELL SERVICE STATION
4411 Foothill Boulevard at High Street
Oakland, California

GEOLOGIC CROSS-SECTION B-B'

FIGURE: 4
PROJECT: 305-131.1B



LEGEND

- PRIMARILY FINE-GRAINED DEPOSITS - CL and SM
- PRIMARILY COARSE-GRAINED DEPOSITS - SC, SW, SP, GC, GW and GP
- S-2 GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION (SHELL)
- C-7 GROUNDWATER MONITORING WELL LOCATION AND DESIGNATION (CHEVRON)
- GP-1 GEOPROBE SOIL BORING LOCATION AND DESIGNATION
- proj PROJECTED ONTO LINE OF SECTION IN FEET
- ▽ FIRST ENCOUNTERED WATER LEVEL AT TIME OF DRILLING
- ▼ STATIC WATER LEVEL, 6-20-94
- 916 PHOTO IONIZATION DETECTOR LEVEL IN PARTS PER MILLION

PACIFIC ENVIRONMENTAL GROUP, INC.

SCALE
HORIZONTAL : 1" = 50'
VERTICAL : 1" = 10'

SHELL SERVICE STATION
4411 Foothill Boulevard at High Street
Oakland, California

GEOLOGIC CROSS-SECTION A-A'

FIGURE: 3
PROJECT: 305-131.1B