Chevron U.S.A. Products Company
2410 Camino Ramon, San Ramon, California • Phone (510) 842-9500
Mail Address: P.O. Box 5004, San Ramon, CA 94583-0804

August 10, 1992 92 AUG 13

Marketing Department

Ms. Jennifer Eberle
Alameda County Health Care Services
80 Swan Way, Room 200
Oakland, CA 94621

STID 478

Re: Former Chevron Service Station #9-4816
301 14th Street, Oakland 94612

Dear Ms. Eberle:

Enclosed we are forwarding the Environmental Assessment Report dated August 3, 1992, prepared by our consultant Groundwater Technology, Inc. (GTI) for the above referenced site. As indicated in the report, three (3) borings were advanced with one being completed off-site into a ground water monitor well designated MW-10 and two (2) on-site completed as vapor extraction wells designated VEW-1 and VEW-2. Monitor well MW-10 was installed to delineate the extent of the hydrocarbon plume. Soil samples collected from the drill cuttings were analyzed for total petroleum hydrocarbons as gasoline (TPH-G) and BTEX. All results reported concentrations below the method detection limits for these constituents with the exception of a sample collected from VEW-1 which reported TPH-G at a concentration of 1,100 ppm at a sample depth of 19-feet below grade. The ground water sample collected from MW-10 was analyzed for the same constituents. The results reported concentrations below the method detection limits. Depth to groundwater was measured at approximately 21-feet below grade.

Based on these findings, it appears that the extent of the hydrocarbon plume has been defined. Chevron will continue to sample this site and report findings on a quarterly basis and monitor the effectiveness of the remediation system.

No 175 not need mws on W side of site.

If you have any questions or comments, please do not hesitate to contact me at (510) 842-9581 .

Very truly yours,
CHEVRON U.S.A. PRODUCTS COMPANY

Nancy Vukelich
Site Assessment and Remediation Engineer

Enclosure

cc: Mr. Rich Hiett, RWQCB
Mr. R.W. Cosby, 225/1936
Mr. Dale Swain, Alton Geoscience
Mr. Thomas Berry, Weiss Associates
Ms B.C. Owen
File (9-4816A1)

Ms. Beth Castleberry
WARE & FREIDENRICH
400 Hamilton Avenue
Palo Alto, CA 94301

AUG 06 '92 PWM

GROUNDWATER TECHNOLOGY, INC.

4057 Port Chicago Highway, Concord, CA 94520 (415) 671-2387
FAX: (415) 685-9148

ENVIRONMENTAL ASSESSMENT REPORT
CHEVRON SERVICE STATION NO. 9-4816
301 14TH STREET
OAKLAND, CALIFORNIA

020202748

August 3, 1992

Prepared for:
Ms. Nancy Vukelich
Chevron U.S.A. Products Company
2410 Camino Ramon
San Ramon, California 94583-0804

Groundwater Technology, Inc.
Written/Submitted by

Gregory A. Mischel
Project Geologist

Sandra L. Lindsey
Project Manager

Groundwater Technology, Inc.
Reviewed/Approved by

David R. Kleesattel
Registered Geologist
No. 5136

For:
John S. Gaines
Vice President,
West Region Manager

REGISTERED GEOLOGIST
DAVID R. KLEESATTEL
NO. 5136
STATE OF CALIFORNIA

R2748A1.GM
(030522)

CONTENTS

Page

1.0 INTRODUCTION 1

2.0 BACKGROUND 1

3.0 SCOPE OF WORK 2
- 3.1 Site-Specific Health and Safety Plan/Permitting 2
- 3.2 Soil Borings 3
- 3.3 Soil Sampling 3
- 3.4 Monitoring Well Installation 3
- 3.5 Groundwater Monitoring 4
- 3.6 Monitoring Well Development 4
- 3.7 Groundwater Sampling 4

4.0 SITE CONDITIONS 5
- 4.1 Hydrogeology 5
- 4.2 Analytical Results for Soil 5
- 4.3 Analytical Results for Groundwater 6

5.0 REFERENCES 6

FIGURES

FIGURE 1 SITE LOCATION MAP

FIGURE 2 SITE PLAN

FIGURE 3 POTENTIOMETRIC SURFACE MAP (06/23/92)

TABLES

TABLE 1 GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA COLLECTED ON JUNE 23, 1992

TABLE 2 ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED ON JUNE 11, 1992

CONTENTS
(continued)

APPENDICES

APPENDIX A WELL INSTALLATION PERMITS

APPENDIX B DRILL LOGS AND WELL CONSTRUCTION SPECIFICATIONS

APPENDIX C GROUNDWATER TECHNOLOGY STANDARD OPERATING PROCEDURES (SOPS)

APPENDIX D LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

ENVIRONMENTAL ASSESSMENT REPORT
CHEVRON SERVICE STATION NO. 9-4816
301 14TH STREET
OAKLAND, CALIFORNIA

AUGUST 3, 1992

1.0 INTRODUCTION

This report summarizes the results of a continuing environmental assessment conducted by Groundwater Technology, Inc. at the Chevron Service Station No. 9-4816 located at 301 14th Street in Oakland, California (Figure 1). The assessment work completed during June 1992 included drilling three soil borings, installing one monitoring well and two vapor extraction wells in the borings, soil and groundwater sampling, analysis of the collected samples, and preparing this report. The objective of the environmental work was to further evaluate the extent of dissolved gasoline hydrocarbons previously encountered in the subsurface at the site.

2.0 BACKGROUND

Former Chevron Service Station No. 9-4816 is currently an unpaved vacant lot. The following site history and background information was summarized from a Well Installation Report prepared by Geostrategies Inc. dated June 13, 1991, and a Quarterly Ground Water Monitoring Report prepared by Alton Geoscience dated December 19, 1991. In April and May 1988, the underground petroleum storage tank system was tested for structural integrity. The 10,000-gallon super unleaded tank failed the integrity tests. In June 1990, eight soil borings were drilled at the site. Analytical results of soil samples collected from on-site soil borings indicate that petroleum hydrocarbons have impacted soil to a depth of approximately 20 feet below ground surface (BGS). Since 1990, a total of nine on- and off-site groundwater monitoring wells have been installed to evaluate the extent of impacted groundwater. Since June 1990, quarterly groundwater monitoring and sampling has been performed

at the site under the supervision of the Alameda County Health Care Services. Separate-phase petroleum hydrocarbons have been detected on the groundwater in the monitoring wells adjacent to the location of the former underground storage tanks (C-2, C-3, and C-5). Analytical results of groundwater samples have shown dissolved total petroleum hydrocarbons (TPH)-as-gasoline concentrations ranging from non-detectable concentrations to 100,000 parts per billion (ppb).

According to a Tank Removal Observation Report prepared by Geostrategies Inc., three underground storage tanks were removed from the site on February 21, 1991. The underground fuel storage system included two 10,000-gallon steel tanks and a 5,000-gallon steel tank containing unleaded, super unleaded and regular gasoline, respectively. Additional soil was removed from the tank excavation and aerated to remove volatile organic hydrocarbons. Other remediation activities conducted at the site have included hand bailing separate-phase petroleum hydrocarbons from monitoring wells, and the operation of a soil vapor extraction system.

3.0 SCOPE OF WORK

3.1 Site-Specific Health and Safety Plan/Permitting

Groundwater Technology prepared a site-specific health and safety plan required by the Occupational Health and Safety Administration (OSHA) Standard "Hazardous Waste Operations and Emergency Response" guidelines (29 CFR 1910.120). The site-specific health and safety plan was prepared by Groundwater Technology following a review of site conditions and any existing Site-Specific Health and Safety Plans for the site. The health and safety plan was reviewed and signed by all of Groundwater Technology's personnel and subcontractors before performing work at the site.

Groundwater Technology reviewed the site history and information with Chevron representatives before beginning work at the site. Drilling permits to install the monitoring wells were obtained from the Alameda County Flood Control and Water Conservation District (Appendix A). Before drilling in the public right of way, encroachment and excavation permits were obtained from the City of Oakland.

3.2 Soil Borings

On June 11, 1992, Groundwater Technology supervised the drilling of one off-site and two on-site soil borings (MW-10, VEW-1 and VEW-2) utilizing a Mobile B-53 drilling rig equipped with 8-inch-diameter, hollow-stem augers. The soil boring for the monitoring well (MW-1) was drilled to 35 feet below surface grade. Both soil borings for the vapor extraction wells were drilled to 20 feet BGS. A field geologist, under the supervision of a California Registered Geologist, logged the materials encountered during drilling using the Unified Soil Classification System (Appendix B).

The hollow-stem augers were steam cleaned between each boring. The steam cleaning water was stored in a labeled 55-gallon drum pending disposal. The soil from the borings was placed on polyethylene plastic.

follow up on this

3.3 Soil Sampling

During drilling, soil samples were collected at 5-foot intervals, from approximately 5 feet below grade to the bottom of each boring. Samples were collected using a 2.5-inch outside diameter (O.D.) split-spoon sampler, lined with three 2-inch-diameter by 6-inch-long brass sample tubes. The sampler was driven 18 inches ahead of the augers at each sample point. Soil samples were field screened using a photo-ionization detector (PID). One sample from every 5-foot interval was sealed with aluminum foil, capped, taped, labeled, placed on ice in an insulated container and delivered to a California-certified laboratory. All sampling was performed according to Groundwater Technology standard operating procedures (SOPs) (Appendix C).

One soil sample from VEW-1 and two soil samples from MW-10 were selected for analysis. Each sample was analyzed for benzene, toluene, ethylbenzene, xylenes (BTEX), and TPH-as-gasoline by Environmental Protection Agency (EPA) Methods 5030/8020/8015.

3.4 Monitoring Well Installation

Monitoring well MW-10 was constructed of 15 feet of 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) casing with flush threads, and 20 feet of 0.020-inch-slot well screen. The well screen was installed from 15 feet to 35 feet below grade. A sand filter was placed around the well screen to a height of approximately two feet above the top of the screen. The well was completed with two feet

of bentonite and a neat-cement seal to grade. The wellhead was protected by a locking cap and a traffic-rated street box with a water-tight bolted lid.

The vapor extraction wells were constructed of 11 feet of 2-inch-diameter, Schedule 40 polyvinyl chloride (PVC) casing with flush threads, and 9 feet of 0.020-inch-slot well screen. The well screen was installed from 11 feet to 20 feet below grade. A sand filter was placed around the well screen to a height of approximately two feet above the top of the screen. The wells were completed with one foot of bentonite and a neat-cement seal to grade. The top of each vapor extraction well was temporarily sealed with a locking cap pending connection to the vapor extraction system. Well construction details are presented on the drill logs (Appendix B). The top of casing elevation of the monitoring well was surveyed to a City of Oakland benchmark by a professional licensed surveyor.

3.5 Groundwater Monitoring

On June 23, 1992, the nine site monitoring wells were monitored to determine the depth to groundwater and the thickness of any separate-phase hydrocarbons. The water levels were measured to surface grade using an ORS Environmental Equipment INTERFACE PROBE™ Well Monitoring System, consisting of a dual optical sensor and electrical conductivity probe, that distinguishes between water and petroleum products. A separate-phase-hydrocarbons thickness of 1.39 feet was detected in monitoring well C-3.

3.6 Monitoring Well Development

Subsequent to monitoring water levels on June 23, 1992, the monitoring well MW-10 was developed by surging and bailing groundwater from each well using a PVC bailer. This technique promotes an even sand filter pack, removes fine-grained sediments from the well screen and filter pack, and improves the hydraulic communication between the well and aquifer. The groundwater from the well was bailed until visibly clear. Approximately four well casing volumes were extracted from the well before sample collection.

3.7 Groundwater Sampling

On June 23, 1992, MW-10 was purged and a groundwater sample was collected using a Teflon sampler. Immediately before collecting each water sample, a distilled water rinsate blank was

collected from the Teflon sampler as a quality control check on the cleanliness of the sampler. A trip/lab blank was also collected for quality control. Each sample was acidified, labeled, placed on ice in an insulated container, and delivered to a California-certified laboratory. The samples were accompanied by a chain-of-custody record during transport. Each sample was analyzed for BTEX and TPH-as-gasoline using EPA Methods 5030/8020/8015. Water generated during the purging and development process was stored in a Department of Transportation (DOT)-approved water trailer and transported to the Chevron refinery in Richmond, California for recycling.

4.0 SITE CONDITIONS

4.1 Hydrogeology

The site is situated on the east side of the San Francisco Bay Plain. The surface elevation at the site is approximately 30 feet above mean sea level. The local land surface slopes gently to the northeast. The site is approximately 2,000 feet west of Lake Merritt and approximately one-mile north of the Oakland Inner Harbor.

The materials encountered during drilling consisted of clayey and/or silty fine sand with a layer of sandy silts and clays at approximately 10 feet below grade. Because vapor extraction well VEW-1 is located adjacent to the former tank excavation, the gravels encountered during drilling appear to be artificial fill or disturbed native soil. On June 23, 1992, the groundwater level at monitoring well MW-10 was 21.72 feet below grade. A potentiometric surface map (Figure 3) was prepared using the water level data collected on June 23, 1992. Figure 3 suggests that groundwater beneath the site is mounded in the vicinity of monitoring wells C-3 and MW-10. Groundwater flow appears to be radial from this mound at a maximum hydraulic gradient of approximately 0.02 foot per foot. The groundwater level data are presented in Table 1.

4.2 Analytical Results for Soil

Two of the soil samples submitted for chemical analyses were collected at 15.5 feet and 20.5 feet below grade from soil boring MW-10. Analytical results for the soil samples collected from boring MW-10 show no BTEX or TPH-as-gasoline concentrations above the method detection limits (MDL).

The soil sample collected at 19 feet below grade from VEW-1 had a TPH-as-gasoline concentration of 1,100 ppm. Results of all soil sample analyses are summarized in Table 2 and the laboratory results are enclosed in Appendix D.

4.3 Analytical Results for Groundwater

One groundwater sample was collected from monitoring well MW-10 on June 23, 1992. Analytical results indicate that dissolved BTEX and TPH-as-gasoline concentrations were below the MDL. Results of the groundwater analyses are summarized in Table 1, and the laboratory reports are enclosed in Appendix D.

5.0 REFERENCES

Alton Geoscience, December 19, 1991, Quarterly Ground Water Monitoring Report, Former Chevron Service Station No. 9-4816, 301 14th Street, Oakland, California (unpublished).

Geostrategies Inc., June 13, 1991, Well Installation Report, Former Chevron Service Station No. 4816, 301 14th Street, Oakland, California (unpublished).

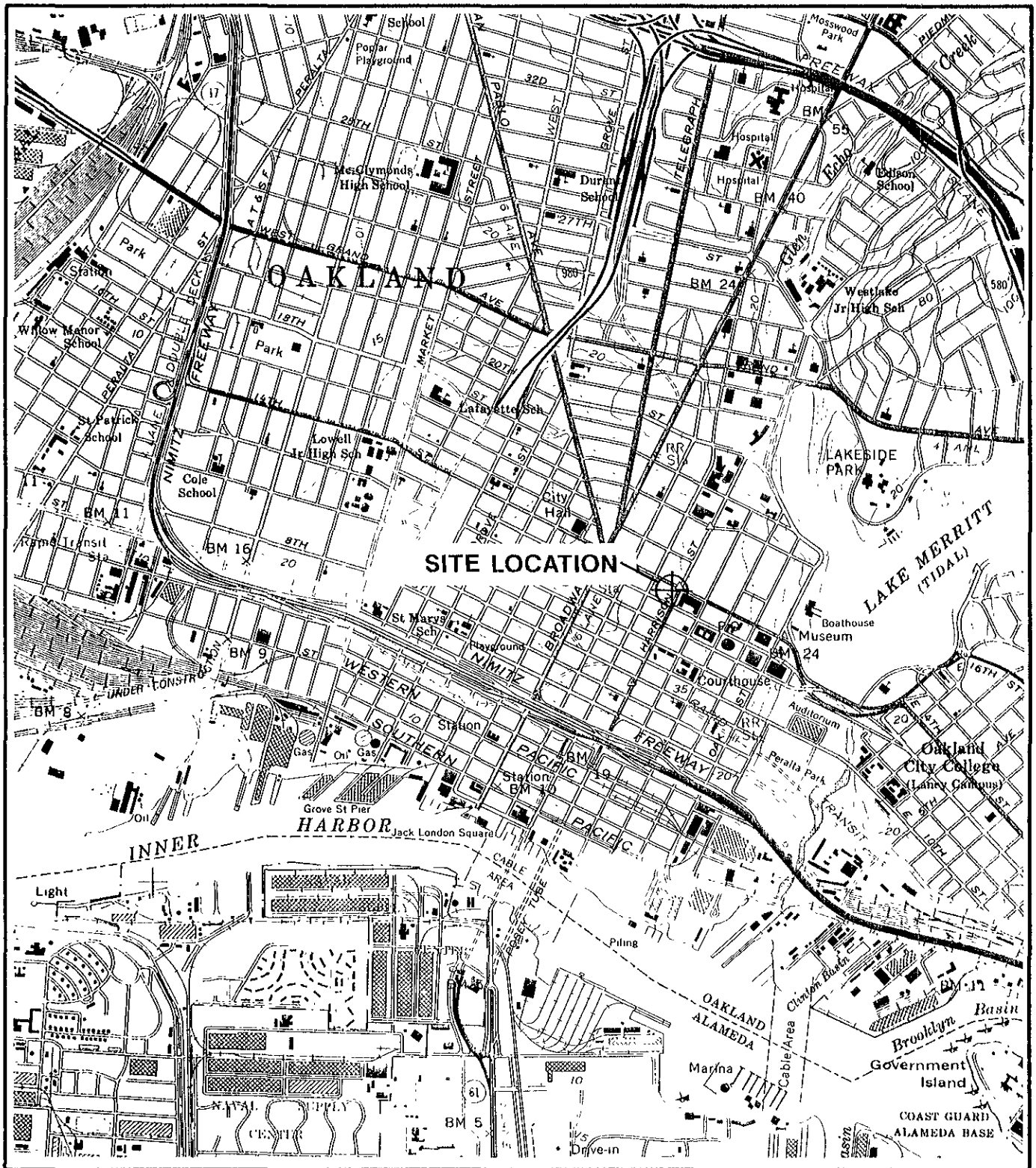
Geostrategies Inc., July 24, 1991, Tank Removal Observation Report, Chevron Service Station No. 4816, 301 14th Street, Oakland, California (unpublished).

FIGURES

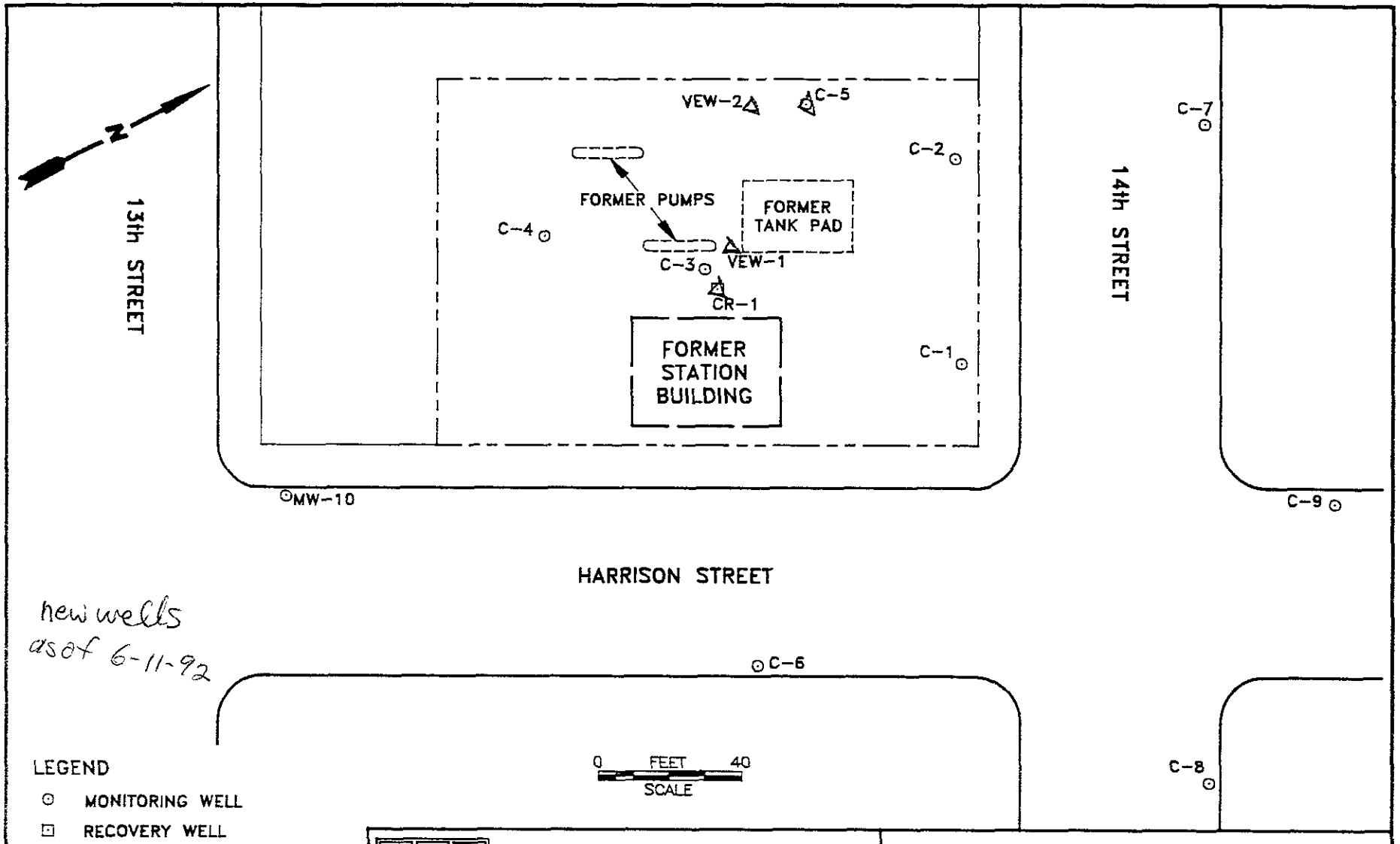
FIGURE 1 SITE LOCATION MAP

FIGURE 2 SITE PLAN

FIGURE 3 POTENTIOMETRIC SURFACE MAP (6/23/92)



GROUNDWATER TECHNOLOGY 4057 PORT CHICAGO HWY CONCORD, CA 94520 (510) 671-2387	N	SCALE: 0 FEET 2000	**SITE LOCATION MAP**
		CLIENT: CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION No. 9-4816	DATE: 7/27/92
		LOCATION: 301 14th STREET OAKLAND, CALIFORNIA	FIGURE: 1



new wells as of 6-11-92

LEGEND

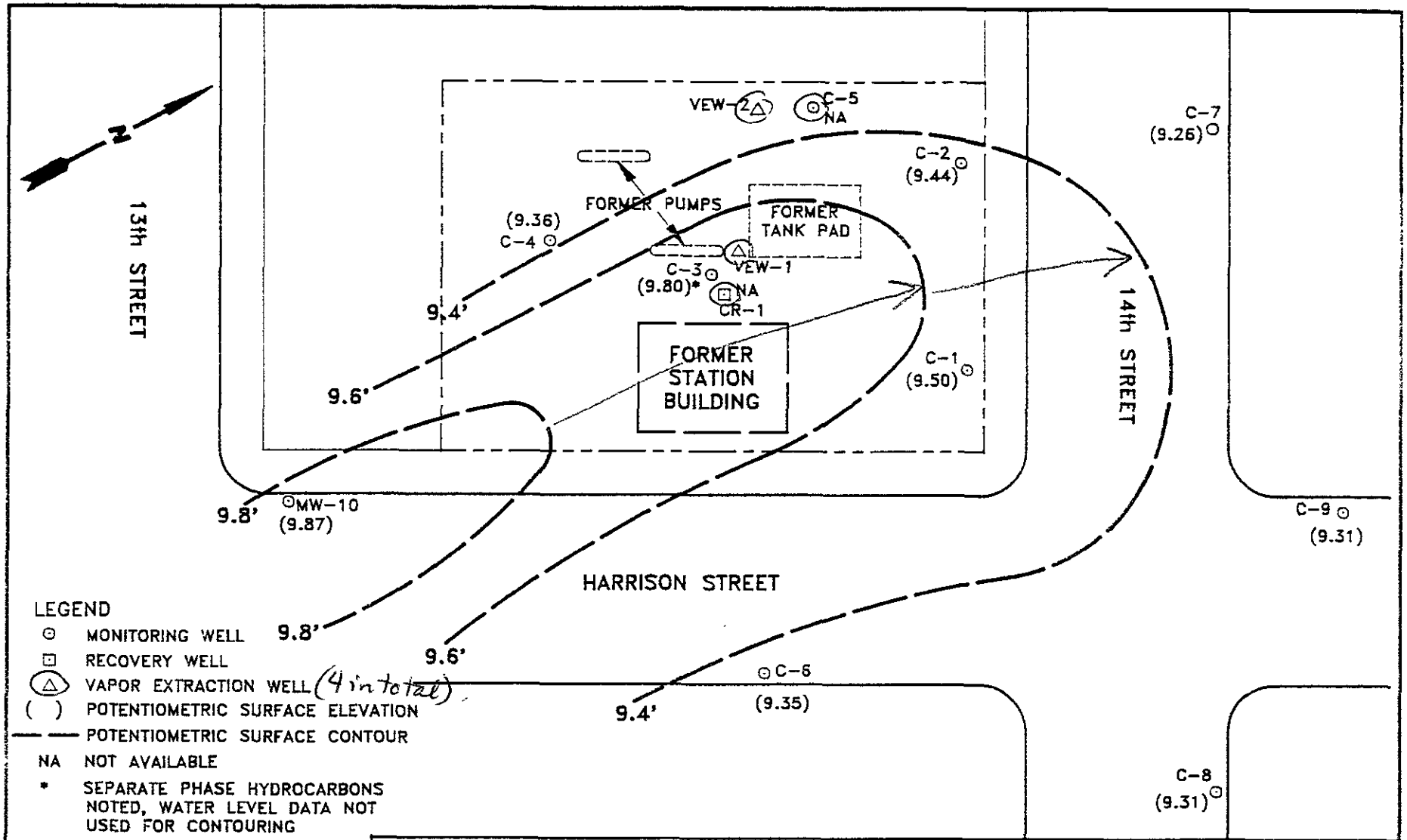
- ⊙ MONITORING WELL
- ⊡ RECOVERY WELL
- △ VAPOR EXTRACTION WELL

GROUNDWATER TECHNOLOGY 4057 PORT CHICAGO HWY CONCORD, CA 94520 (510) 671-2387

SITE PLAN

CLIENT:	LOCATION:	REV. NO.:	DATE:
CHEVRON U.S.A. PRODUCTS Co. SERVICE STATION No. 9-4816	301 14th STREET OAKLAND, CALIFORNIA	0	7/28/92

PM	PE/RG	DESIGNED	DETAILED	ACAD FILE:	PROJECT NO.:	FIGURE:
GAM	DRK	GM	ML	SP792	020202748	2



GROUNDWATER TECHNOLOGY 4057 PORT CHICAGO HWY CONCORD, CA 94520 (510) 671-2387

POTENTIOMETRIC SURFACE MAP (6/23/92)

CLIENT:	LOCATION:	REV. NO.:	DATE:
CHEVRON U.S.A. PRODUCTS Co. SERVICE STATION No. 9-4816	301 14th STREET OAKLAND, CALIFORNIA	0	7/28/92

PM	PE/RG	DESIGNED	DETAILED	ACAD FILE:	PROJECT NO.:	FIGURE:
GM	DKK	GM	ML	PSM62392/SP792	020202748	3

TABLES

TABLE 1 GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA COLLECTED ON JUNE 23, 1992

TABLE 2 ANALYTICAL RESULTS FOR SOIL SAMPLES COLLECTED ON JUNE 11, 1992

TABLE 1
GROUNDWATER ANALYTICAL RESULTS AND MONITORING DATA
COLLECTED ON JUNE 23, 1992
(Concentrations in parts per billion)

free product

SAMPLE ID/ ELEV.	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TPH-AS-GASOLINE	DTW (ft)	SPT (ft)	GWE (ft)
C-1/30.87	--	--	--	--	--	21.37	0.00	9.50
C-2/30.72	--	--	--	--	--	21.28	0.00	9.44
C-3/30.79	--	--	--	--	--	22.10	1.39	9.80
C-4/31.20	--	--	--	--	--	21.84	0.00	9.36
C-5/30.16	--	--	--	--	--	NA	NA	NA
C-6/30.41	--	--	--	--	--	21.06	0.00	9.35
C-7/30.56	--	--	--	--	--	21.30	0.00	9.26
C-8/30.12	--	--	--	--	--	20.81	0.00	9.31
C-9/30.15	--	--	--	--	--	20.84	0.00	9.31
MW-10/31.59	<0.5	<0.5	<0.5	<0.5	<50	21.72	0.00	9.87

$\overline{\text{TPH}}$ = Total petroleum hydrocarbons
DTW = Depth to groundwater
SPT = Separate-phase hydrocarbon thickness
GWE = Groundwater elevation in feet above mean sea level referenced to a City of Oakland benchmark.
-- = Not sampled
NA = Not available (car parked over well)

TABLE 2
ANALYTICAL RESULTS FOR SOIL SAMPLES
COLLECTED ON JUNE 11, 1992
(Concentration in parts per million)

BORING	SAMPLE ID	SAMPLE DEPTH (ft)	BENZENE	TOLUENE	ETHYL-BENZENE	XYLENES	TPH-AS-GASOLINE
MW-10	MW10B	15.5	<0.005	<0.005	<0.005	<0.005	<1
MW-10	MW10C	20.5	<0.005	<0.005	<0.005	<0.005	<1
VEW-1	VEW1B	19	14	56	18	91	1,100

$\overline{TPH}$ = *Total petroleum hydrocarbons*

APPENDIX A

WELL INSTALLATION PERMITS

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
5997 PARKSIDE DRIVE ♦ PLEASANTON, CALIFORNIA 94588 ♦ (510) 484-2600

3 June 1992

Groundwater Technology
4057 Port Chicago Highway
Concord, CA 94520

Gentlemen:

Enclosed are drilling permits 92284, 92285 and 92286 for monitoring well construction projects listed below for Chevron U.S.A.

Permit	Location
92284	301 - 14th Street, Oakland
92285	3701 Broadway, Oakland
92286	1633 Harrison Street, Oakland

Please note that permit condition A-2 requires that a well construction report be submitted for each permit after completion of the work. The reports should include drilling and completion logs, location sketch, and permit number.

If you have any questions, please contact Craig Mayfield or me at 484-2600.

Very truly yours,

Wyman Hong

Wyman Hong
Water Resources Technician

WH:mm
Enc.

ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2600

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT
301 14th Street
Oakland, California

CLIENT
Name Chevron USA Products Company
Address P.O. Box 5004 Phone 842-9581
City San Ramon Zip 94583

APPLICANT
Name Groundwater Technology, Inc.
Address 4057 Port Chicago Hwy. Phone 671-2387
City Concord Zip 94520

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	
Water Supply		Contamination	X
Monitoring	X	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other None
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger X
Cable ___ Other ___

DRILLER'S LICENSE NO. 482390

WELL PROJECTS
Drill Hole Diameter 10 in. (8) Maximum
Casing Diameter 4 in. (2) Depth 20 ft. (35)
Surface Seal Depth 8 ft. (10) Number 2 (1)

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE May 29, 1992
ESTIMATED COMPLETION DATE May 29, 1992

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Gregg A. Martel Date 5-19-92

FOR OFFICE USE

PERMIT NUMBER 92284
LOCATION NUMBER

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 1 Jun 92
Wyman Hong

51991

CITY OF OAKLAND

PERMIT TO EXCAVATE IN STREETS OR OTHER WORK AS SPECIFIED

EXC 150.00
AP FEE 30.00
$ 180.00

X9200884

LOCATION OF WORK: 301 14th Street (on Harrison) (Street or Address) BETWEEN 14th St. (Street/Ave.) AND _____ (Specify)

PERMISSION TO EXCAVATE IN THE PUBLIC RIGHT-OF-WAY IS HEREBY GRANTED TO:

APPLICANT Groundwater Technology, Inc.

ADDRESS 4057 Port Chicago Highway PHONE #: (510) 671-2387

TYPE OF WORK: GAS____ ELECTRIC____ WATER____ TELEPHONE____ CABLE TV____ SEWER____ OTHER Monitoring Well (Specify)

NATURE OF WORK: Installation of one monitoring well

OWNER/BUILDER

I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5 Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to it's issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License Law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than $500):

☐ I, as owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If, however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).

☐ I, as owner of the property, am exempt from the sale requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will be performed prior to sale, (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption in this subdivision on more than two structures more than once during any three-year period (Sec. 7044, Business and Professions Code).

☐ I, as owner of the property, am exclusively contracting with licensed contractors to construct the project (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License Law).

☐ I am exempt under Sec. _____, B&PC for this reason _____

_____
Signature Date

PERMIT VOID 90 DAYS FROM DATE OF ISSUE UNLESS EXTENSION GRANTED BY DIRECTOR OF PUBLIC WORKS.

Approximate Starting Date DATE 6-11-92

Approximate Completion Date DATE 6-11-92

HOLIDAY RESTRICTION (1 NOV — 1 JAN) YES X NO ~~X~~

LIMITED OPERATION AREA (7AM – 9AM / 4PM – 6PM) ~~YES~~ YES X NO ____

DATE STREET LAST RESURFACED DATE 178 06-10-92

SPECIAL PAVING DETAIL REQUIRED YES ____ NO X

24-HOUR EMERGENCY PHONE NUMBER _____
PERMIT NOT VALID WITHOUT 24 HOUR NUMBER.

Telephone 228-3668 Forty-eight (48) HOURS BEFORE ACTUAL CONSTRUCTION

ATTENTION

State law requires that contractor/owner call Underground Service Alert two working days before excavating to have below-ground utilities located. This permit is not valid unless applicant has secured an inquiry identification number issued by Underground Service Alert.

Call Toll Free: 800-642-2444 USA ID Number _____

WORKER'S COMPENSATION

I hereby affirm that I have a certificate of consent to self insure, or a certificate of Workers' Compensation Insurance, or a certified copy thereof (Sec. 3800, Lab C.)

Policy # _____ Company Name _____

☐ Certified copy is hereby furnished

☐ Certified copy is filed with the city building inspection dept

Signature X Gregg A. Merkel Date 6-10-92

(This section need not be completed if the permit is for one hundred dollars ($100) or less.)

I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Workers' Compensation Laws of California.

Signature *Date*

NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Workers' Compensation provisions of the Labor Code, you must forthwith imply with such provisions or this permit shall be deemed revoked.

This permit issued pursuant to all provisions of Chapter 6, Article 2 of the Oakland Municipal Code.

This permit is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance.

CONTRACTOR

I hereby affirm that I am licensed under provisions of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code, and my license is in full force and effect.

LICENSE # AND CLASS _____ CITY BUSINESS TAX # _____

X Gregg A. Merkel Date 6-10-92
Signature of Contractor Owner or Agent

☐ Agent for ☐ Contractor ☐ Owner

OFFICIAL USE ONLY

UTILITY COMPANY REPORT

Supervisor _____

Completion Date _____

Initials _____

Hours _____

Date _____

Concrete _____

Asphalt _____

Sidewalk _____

Size of Cut: Sq. Ft. ____ Inches ____

Paved by _____ Type _____

Bill No. _____

Charges Backfill _____ Paving _____ Paving Insp. _____

Traffic Striping Replaced _____ Date _____

APPROVED

Engineering Services JWO Date 6-10-92

Planning _____ Date _____

Field Services _____ Date _____

Construction _____ Date _____

Traffic Engineering _____ Date _____

Electrical Engineering _____ Date _____

DIRECTOR OF PUBLIC WORKS

APPROVED BY: JWO

DATE: 6-10-92

EXTENSION GRANTED BY: _____

DATE: _____

CITY INSPECTOR'S REPORT

	BACKFILL	PAVING
EXCV		150.00
APPL		30.00
SUBTL		180.00
CASH		180.00
ITEM		2
#2	2CL	7139 14 42T

APPENDIX B

DRILL LOGS AND WELL CONSTRUCTION SPECIFICATIONS

Drilling Log

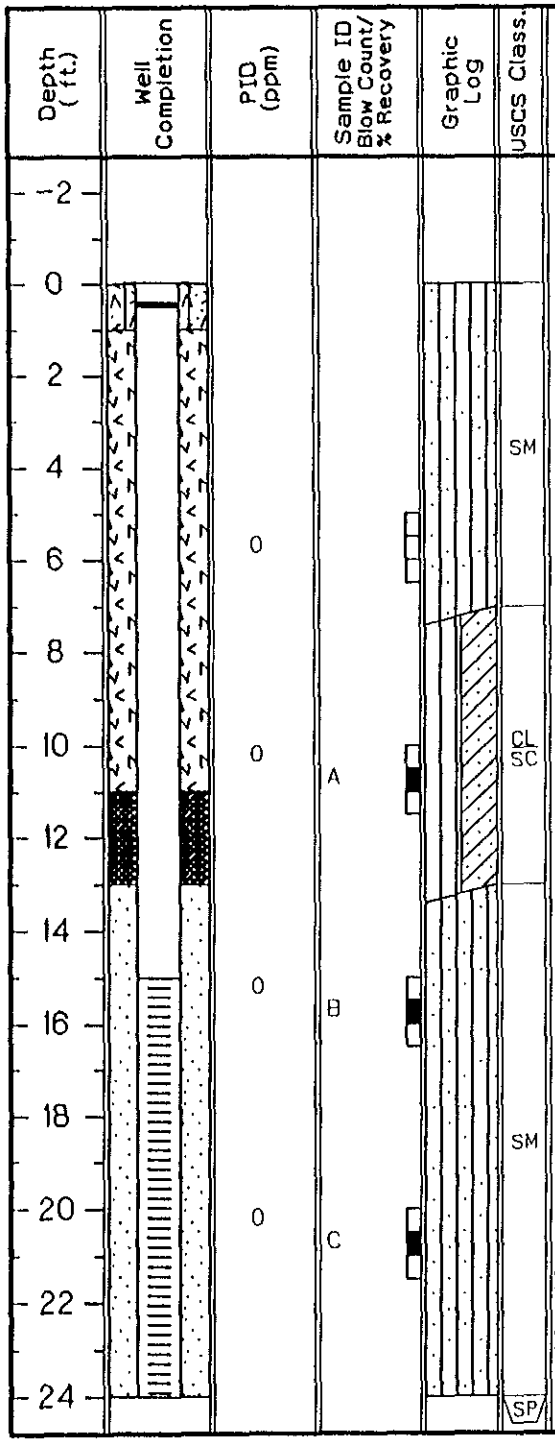
GROUNDWATER TECHNOLOGY

Monitoring Well **MW-10**

Project CHV/301 14th Street — Owner CHEVRON U.S.A. Products Company
Location Oakland, California — Project No. 02020 2748 — Date drilled 06/11/92
Surface Elev. ____ — Total Hole Depth 35 ft. — Diameter 8 inches ft.
Top of Casing 31.59 ft. — Water Level Initial 23 ft. — Static 21.72 ft.
Screen: Dia 2 in. — Length 20 ft. — Type/Size 0.020 in.
Casing: Dia 2 in. — Length 15 ft. — Type SCH 40 PVC
Filter Pack Material Lapis Lustre 2/12 — Rig/Core Type Mobile B-53/split spoon
Drilling Company Kvilhaug Well Drilling — Method Hollow stem auger — Permit # 92284
Driller Mike Crocker — Log By Steve Kranyak
Checked By Dave Kleesattel — License No. RG# 5136

See Site Map For Boring Location

COMMENTS:



Description

(Color, Texture, Structure)
Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%

Brown silty fine SAND with clay (loose, moist, no hydrocarbon odor)

Brown sandy CLAY/clayey SAND with trace silt (soft, moist, no hydrocarbon odor)

Brown silty fine SAND with clay (loose, wet, no hydrocarbon odor)

Brown silty fine SAND (loose, wet, no hydrocarbon odor)

Static water level

Encountered groundwater at 23 feet (06/11/92)

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well **MW-10**

Project *CHV/3011 4th Street* Owner *CHEVRON U.S.A. Products Company*

Location *Oakland, California* Project No. *02020 2748* Date drilled *06/11/92*

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24						Brown fine SAND (loose, wet, no hydrocarbon odor)
26		0	D			
28						
30		0	E		SP	
32						
34		0	F			
36						End of boring at 35 feet. Installed groundwater monitoring well.
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						

Drilling Log

GROUNDWATER TECHNOLOGY

Vapor Point **VEW-1**

Project CHV/3014th Street Owner CHEVRON U.S.A. Products Company
Location Oakland, California Project No. 02020 2748 Date drilled 06/11/92
Surface Elev. ____ Total Hole Depth 20 ft. Diameter 8 inches ft.
Top of Casing ____ Water Level Initial ____ Static ____
Screen: Dia 2 in. Length 9 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 11 ft. Type SCH 40 PVC
Filter Pack Material Lapis Lustre 2/12 Rig/Core Type Mobile B-53/split spoon
Drilling Company Kvilhaug Well Drilling Method Hollow stem auger Permit # 92284
Driller Mike Crocker Log By Steve Kranyak
Checked By Dave Kleesattel License No. RG# 5136

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0						Brown silty fine SAND (loose, moist)
4		0	3, 4, 4		SM	(poor sample recovery)
10		0	A: 5, 6, 10			Brown silty GRAVEL with trace sand and clay (loose, very moist)
14					GM	
16			3, 3, 4			(poor sample recovery)
18		828	B: 15, 20, 27			(becomes medium dense)
20						End of boring at 20 feet. Installed vapor extraction well.

07/27/1992 lithlog-mar92

Drilling Log

GROUNDWATER TECHNOLOGY

Vapor Point **VEW-2**

Project CHV/301 14th Street Owner CHEVRON U.S.A. Products Company
Location Oakland, California Project No. 02020 2748 Date drilled 06/11/92
Surface Elev. ____ Total Hole Depth 20 ft. Diameter 8 inches ft.
Top of Casing ____ Water Level Initial ____ Static ____
Screen: Dia 2 in. Length 9 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 11 ft. Type SCH 40 PVC
Filter Pack Material Lapis Lustre 2/12 Rig/Core Type Mobile B-53/split spoon
Drilling Company Kvilhaug Well Drilling Method Hollow stem auger Permit # 92284
Driller Mike Crocker Log By Steve Kranyak
Checked By Dave Kleesattel License No. RG# 5136

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID / Blow Count / % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
0						
2						
4					SM	Reddish brown silty fine SAND with clay (loose, moist, no hydrocarbon odor)
6		0.4	A 8 12 17			
8						
10		0	B 9 10 14		ML	Brown sandy SILT (stiff, moist, no hydrocarbon odor)
12						
14						Brown silty fine SAND with clay (dense, moist, no hydrocarbon odor)
16		0.4	C 30 35 39		SM	
18						Brown silty fine SAND (medium dense, moist, no hydrocarbon odor)
20		0	D 15 18 19			End of boring at 20 feet. Installed vapor extraction well.
22						
24						

APPENDIX C

GROUNDWATER TECHNOLOGY STANDARD OPERATING PROCEDURES (SOPS)

GROUNDWATER TECHNOLOGY, INC.
STANDARD OPERATING PROCEDURE
CONCERNING GROUNDWATER MONITORING
SOP 8

Groundwater monitoring of wells at the site shall be conducted using an ORS Environmental Equipment (ORS) INTERFACE PROBE ™ and SURFACE SAMPLER™. The INTERFACE PROBE ™ is a hand-held, battery-operated device for measuring depth to petroleum product and depth to water as measured from an established datum (*i.e.*, top of the well casing which has ben surveyed). Separate-phase hydrocarbon (product) thickness is then calculated by subtracting the depth to product from the depth to water. In addition, water elevations are adjusted for the presence of fuel with the following calculation:

(Product Thickness) (0.8) + (Water Elevation) = Corrected Water Elevation

Note: The factor of 0.8 accounts for the density difference between water and petroleum hydrocarbons.

The INTERFACE PROBE ™ consists of a dual-sensing probe which utilizes an optical liquid sensor and electrical conductivity to distinguish between water and petroleum products. A coated steel measuring tape transmits the sensor's signals to the reel assembly where an audible alarm sounds a continuous tone when the sensor is immersed in petroleum product and an oscillating tone when immersed in water. The INTERFACE PROBE ™ is accurate to 1/16th inch.

A SURFACE SAMPLER™ shall be used for visual inspection of the groundwater to note sheens (difficult to detect with the INTERFACE PROBE ™), odors, microbial action, etc.

The SURFACE SAMPLER™ used consists of a 12-inch-long case acrylic tube with a Delrin ball which closes onto a conical surface creating a seal as the sampler is pulled up. The sampler is calibrated in inches and centimeters for visual inspection of product thickness.

To reduce the potential for cross contamination between wells, the monitorings shall take place in order from the least to the most contaminated wells. Wells containing separate-phase hydrocarbons (free product) should be monitored last. Between each monitoring the equipment shall be washed with laboratory-grade detergent and double rinsed with distilled water.

GROUNDWATER TECHNOLOGY, INC.
STANDARD OPERATING PROCEDURE
CONCERNING WATER SAMPLING METHODOLOGY
SOP 9

Before water sampling, each well shall be purged by pumping a minimum of four well volumes or until the discharge water indicates stabilization of temperature conductivity and pH. If the well is evacuated before four well volumes are removed or stabilization is achieved, the sample should be taken when the water level in the well recovers to 80 percent of its initial level.

Retrieval of the water sample, sample handling and sample preservation shall be conducted according to Standard Operating Procedure 10 concerning "Sampling for Volatiles in Water." The sampling equipment used shall consist of a Teflon® and/or stainless steel samplers which meet U.S. Environmental Protection Agency (EPA) regulations. Glass vials with Teflon® lids should be used to store the collected samples.

To ensure sample integrity, each vial shall be filled with the sampled water in such a way that the water stands above the lip of the vial. The cap should then be quickly placed on the vial and tightened securely. The vial should then be checked to ensure that air bubbles are not present prior to labeling of the sample. Label information should include a sample identification number, job identification, date, time, type of analysis requested, and sampler's name. Chain-of-custody records shall be completed according to Standard Operating Procedure (SOP) 11 concerning chain of custody.

The vials should be immediately placed in high quality coolers for shipment to the laboratory. The coolers should be packed with sufficient ice or freezer packs to ensure that the samples are kept below 4° Celsius (C). To minimize sample degradation the prescribed analysis shall take place within seven days of sample collection unless specially prepared acidified vials are used.

To minimize the potential for cross contamination between wells, all the well development and water sampling equipment which contacts the groundwater shall be cleaned between each sampling. As a second precautionary measure, the wells shall be sampled in order of increasing contaminant concentrations (the least contaminated well first, the most contaminated well last) as established by previous analysis.

STANDARD OPERATING PROCEDURE 10
CONCERNING SAMPLING FOR VOLATILES IN WATER
(DISSOLVED GASOLINE, SOLVENTS, ETC.)
SOP 10

1. Use only vials properly washed and baked.

2. Use clean sampling equipment. Scrub with Alconox or equivalent laboratory detergent and water followed by a thorough water rinse. Complete with a distilled water rinse.

   Sampling equipment which has come into contact with liquid hydrocarbons (free product) should be regarded with suspicion. Such equipment should have tubing and cables replaced and all resilient parts washed with laboratory detergent solution as indicated above. Visible deposits may have to be removed with hexane. Solvent washing should be followed by detergent washing, as indicated above.

   This procedure is valid for volatile organic analysis only. For extractable organics (for example, pesticides, or base neutrals for U.S. Environmental Protection Agency [EPA] Method 625 a final rinse with pesticide-grade isopropyl alcohol), followed by overnight or oven drying will be necessary.

3. Take duplicate samples. Mark on forms as a single sample with two containers to avoid duplication of analyses.

4. Take a site blank using distilled water or known uncontaminated source. This sample will be run at the discretion of the project manager.

5. Fill out labels and forms as much as possible ahead of time. Use an indelible marker.

6. Preservatives are required for some types of samples. Use specially prepared vials marked as indicated below, or use the appropriate field procedure (SOP 12 for acidification). Make note on forms that samples were preserved. Always have extra vials in case of problems. Samples for volatile analyses should be acidified below pH 2 upright. Eye protection, foot protection, and disposable vinyl gloves are required for handling. Samples designated for expedited service and analyzed within seven (7) days of sampling will be acceptable without preservation. Acid-causing burns. Glasses or goggles (not contact lenses) are necessary for protection of the eyes. Flush eyes with water for 15 minutes if contact occurs and seek medical attention. Rinse off hands frequently with water during handling.

   For sampling chlorinated drinking water supplies for chlorinated volatiles, samples shall be preserved with sodium thiosulfate. Use vials labeled "CONTAINS THIOSULFATE." No particular cautions are necessary.

7. Fill vial to overflowing with water, avoiding turbulence and bubbling as much as possible. Water should stand above lip of vial.

8. Carefully, but quickly, slip cap onto vial. Avoid dropping the Teflon® septum from cap by not inverting cap until it is in contact with the vial. Disc should have Teflon® face toward the water. Also avoid touching white Teflon® face with dirty fingers.

9. Tighten cap securely, invert vial, and tap against hand to see there are not bubbles inside.

10. Label vial, using indelible ink, as follows:

    A. Sample I.D. No.
    B. Job I.D. No.
    C. Date and Time
    D. Type of analysis required
    E. Your name

11. Unless the fabric-type label is used, place Scotch™ tape over the label to preserve its integrity.

12. For chain-of-custody reasons, sample vial should be wrapped end-for-end with Scotch™ tape or evidence tape and signed with indelible ink where the end of the tape seals on itself. The septum needs to be covered.

13. Chill samples immediately. Samples to be stored should be kept at 4° Celsius (C) (30° Fahrenheit [F]). Samples received at the laboratory above 10°C (as measured at glass surface by a thermocouple probe), after overnight shipping, will be considered substandard, so use a high quality cooler with sufficient ice or freezer packs.

14. Fill out Chain-of-Custody Manifest and Analysis Request Form (see Chain of Custody Procedures, SOP 11).

GROUNDWATER TECHNOLOGY, INC.
STANDARD OPERATING PROCEDURE
CONCERNING CHAIN OF CUSTODY
SOP 11

1. Samples must be maintained under custody until shipped or delivered to the laboratory. The laboratory will then maintain custody. A sample is under custody if:

    a) It is in your possession
    b) It is in your view after being in your possession
    c) You locked it up after it was in your possession
    d) It is in a designated secure area

2. Custody of samples may be transferred from one person to another. Each transferer and recipient must date, sign and note the time on the chain-of-custody form.

3. In shipping, the container must be sealed with tape, and bear the sender's signature across the area of bonding at the ends of the tape to prevent undetected tampering. Each sampling jar should be taped and signed as well. Scotch tape works well.

4. Write "sealed by" and sign in the "Remarks" box at the bottom of the form before sealing the box. Place form in a plastic bag and seal it inside the box.

5. The "REMARKS" section of the form is for documenting details such as:

    a) Correlation of sample numbers if samples are split between labs.
    b) QC numbers when lab is logging in the samples.
    c) Sample temperature and condition when received by lab.
    d) Preservation notation.
    e) pH of samples when opened for analysis (if acidified).
    f) Sampling observation or sampling problem.

6. The chain-of-custody form should be included inside the shipping container. A copy should be sent to the project manager.

7. When the samples are received by the lab, the chain-of-custody form will be dated, signed, and the time noted by a laboratory representative. The form will be retained in the laboratory files along with shipping bills and receipts .

8. At the time of receipt of samples by the laboratory, the shipping container will be inspected and the sealing signature will be checked. The samples will be inspected for condition and bubbles, and the temperature of a representative sample container will be measured externally by a thermocouple probe (held tightly between two samples) and recorded. The laboratory QC numbers will be placed on the labels, in the accession log, and on the chain-of-custody form. If samples are acidified, their pH will be measured by narrow range pH paper at the time of opening for analysis. All comments concerning procedures requiring handling of the samples will be dated and initialed on the form by the laboratory person performing the procedure. A copy of the completed chain-of-custody form with the comments on sample integrity will be returned to the sampler.

GROUNDWATER TECHNOLOGY, INC.
STANDARD OPERATING PROCEDURE
CONCERNING SOIL SAMPLING METHODOLOGY
SOP 14

1. Soil samples should be collected and preserved in accordance with Groundwater Technology Standard Operating Procedure (SOP 15) concerning Soil Sample Collection and Handling when Sampling for Volatile Organics. A hollow stem soil auger should be used to drill to the desired sampling depth. A standard 2 inch diameter split spoon sampler 18 inches in length shall be used to collect the samples. The samples are contained in 2 inch diameter by 6 inch long thin walled brass tube liners fitted into the split spoon sampler (three per sampler).

2. The split spoon sampler should be driven the full depth of the spoon into the soil by a 140 pound hammer. The spoon shall then be extracted from the borehole and the brass tube liners containing the soil sample removed from the sampler. The ends of the liner tubes should be immediately covered with aluminum foil, sealed with a teflon or plastic cap, and taped with duct tape. After being properly identified with sample data entered on a standard chain of custody form the samples shall be placed on dry ice (maintained below 4~C) and transported to the laboratory within 24 hours.

3. One of the three soil samples retrieved at each sample depth shall be analyzed in the field using a photolonization detector and/or explosimeter. The purpose of the field analysis is to provide a means to choose samples to be laboratory analyzed for hydrocarbon concentrations and to enable comparisons between the field and laboratory analyses. The soil sample shall be sealed in a plastic bag and allowed to equilibrate with the air surrounding the soil for approximately 10 minutes. One of the two field vapor instruments shall be used to quantify the amount of hydrocarbon released to the air from the soils. The data shall be recorded on the drill logs at the depth corresponding to the sample point.

GROUNDWATER TECHNOLOGY, INC.
STANDARD OPERATING PROCEDURE
CONCERNING SOIL SAMPLE COLLECTION AND
HANDLING WHEN SAMPLING FOR VOLATILE ORGANICS
SOP 15

1. Use a sampling means which maintains the physical integrity of the samples. The project sampling protocol will designate a preferred sampling tool. A split spoon sampler with liners, or similar tube sampler which can be sealed, is best.

2. The samples should be sealed in the liner, with teflon plugs (The "California Sampler") or plastic caps.

3. For sending whole-core samples (above):

   A. Seal ends of liner with teflon plugs or plastic caps, leaving no free air space inside.

   B. Tape with duct tape.

   C. Label the sample with the following information: sample identification, depth, date and time, project number and required analyses.

   D. Place in plastic bag labeled with indelible marker. Use Well #, depth, date, and job #.

   E. Place inside a second bag and place a labelling tag inside outer bag.

   F. Enclose samples in a cooler with sufficient ice or dry ice to maintain samples at 4 degrees C during shipment.

   G. Seal cooler with a lock, or tape with samplers signature so tampering can be detected.

   H. Package cooler in a box with insulating material. Chain of custody forms can be placed in a plastic bag in this outer box.

   I. If dry ice is used, a maximum of 5 pounds is allowed by Federal Express without special documents(documents are easy to obtain but are not necessary for under 5 pounds). Write "ORM-A dry ice", "_____ pounds, for research" on outside packaging and on regular airbill under classification. UPS does not accept dry ice.

   J. Soil cores kept a 4 degrees C are only viable for up to 7 days when aromatic hydrocarbons are involved. The lab should prepare the samples in methanol once in the lab.

4. Good sampling practice would include preparing 1 out of 5 samples to be prepared in duplicates for analysis. These 4 out of 20 samples will be used for the following purposes:

   A. One in every 20 samples should be analyzed as a field replicate to evaluate the precision of the sampling technique. *A minimum of 1 sample per data set is suggested.*

   B. An additional 1 in 20 samples should be selected by sampler to be prepared in duplicate as alternative to Step (A). *Choose a different soil type if available.*

C. The remaining 2 in 20 samples should be used by lab for spiking with reference materials for internal QC.

Other QC procedures can be specified at the project manager's discretion. See Table 3-2 (reference 2) attached.

5. Decontamination of equipment in the field requires a detergent wash, with a distilled water rinse.

REFERENCES

1. Soil Sampling Quality Assurance Users Guide, U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, NV, EPA 600/4-84-043, May 1984.

2. Preparation of Soil Sampling Protocol. *Techniques and Strategies*, U.S. EPA, Environmental Monitoring Systems Laboratory, Las Vegas, NV, EPA 600/4-83-020, August 1983 (PB83-206979).

3. Test Methods for Evaluating Solid Waste, U.S. EPA, Office of Solid Waste and Emergency Response, Washington, D.C., SW 846, July 1982.

GROUNDWATER TECHNOLOGY, INC.
STANDARD OPERATING PROCEDURE
CONCERNING OPERATION/CALIBRATION OF
PHOTOIONIZATION ANALYZER
SOP 19

1. The Thermo Environmental Instruments Inc. Model 580B OVM Photoionization Analyzer shall be used, using photoionization, to measure the concentration of trace gases over a range of less than 1 ppm to 2,000 ppm. The specific instrument used for investigations related to hydrocarbon contamination should be calibrated for direct readings in parts per million (ppm) volume/volume of isobutylene. Specifics of the detection principle/theory and functions of various components can be found in the manufactures instruction manual.

2. To assure optimum performance, the photoionization analyzer should be calibrated with a standard gas mixture of known concentration from a pressurized container. A daily procedure for calibration involves bringing the probe and readout close to the calibration gas, cracking the valve on the tank and checking the instrument reading. This provides a useful spot check for the instrument.

3. A procedure conducted weekly for more accurate calibration of the instrument from a pressurized container is to connect one side of a "T" to the pressurized container of calibration gas, another side of the "T" to a rotameter and the third side of the "T" directly to the 8" extension to the photoionization probe (see Figure 2). Crack the valve of the pressurized container until a slight flow is indicated on the rotameter. The instrument draws in the volume of sample required for detection, and the flow in the rotameter indicates an excess of sample. Now adjust the span pot so that the instrument reads the exact value of the calibration gas. (If the instrument span setting is changed, the instrument should be turned back to the standby position and the electronic zero should be readjusted, if necessary).

APPENDIX D

LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 ▪ Martinez, California 94553 ▪ (510) 229-1512 / fax (510) 229-1526

GROUNDWATER TECHNOLOGIES INC.
Attn: Sandra Lindsey

Project 020202748
Reported 06/22/92

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
85994- 2	VEW1B	06/11/92	06/19/92	Soil
85994- 8	MW10B	06/11/92	06/19/92	Soil
85994- 9	MW10C	06/11/92	06/22/92	Soil

RESULTS OF ANALYSIS

Laboratory Number:	85994- 2	85994- 8	85994- 9
Gasoline:	1100	ND<1	ND<1
Benzene:	14	ND<.005	ND<.005
Toluene:	56	ND<.005	ND<.005
Ethyl Benzene:	18	ND<.005	ND<.005
Xylenes:	91	ND<.005	ND<.005
Concentration:	mg/kg	mg/kg	mg/kg

Superior Precision Analytical, Inc.
825 Arnold Drive, Suite 114 • Martinez, California 94553 • (510) 229-1512 / fax (510) 229-1526

C E R T I F I C A T E O F A N A L Y S I S

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 85994

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
mg/kg = parts per million (ppm)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Soil: 50mg/kg

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Soil: 1mg/kg

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Soil: 1mg/kg

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Soil: 0.005mg/kg

ANALYTE	SPIKE LEVEL	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	200 ng	95/89	6	70-130
Benzene:	200 ng	102/100	2	70-130
Toluene:	200 ng	95/94	2	70-130
Ethyl Benzene:	200 ng	100/98	2	70-130
Xylenes:	200 ng	90/88	2	70-130

Richard Srna, Ph.D.
Laboratory Director

Fax copy of Lab Report and COC to Chevron Contact: ☐ No

Chain-of-Custody-Record

Chevron U.S.A. Inc.
P.O. BOX 5004
San Ramon, CA 94583
FAX (415)842-9591

Chevron Facility Number: 9-4816
Facility Address: 301 14th Street Oakland Ca
Consultant Project Number: 020202748
Consultant Name: Groundwater Technology
Address: 4057 port Chicago Hwy
Project Contact (Name): Sandra Lindsey
(Phone) 510 671 2337 (Fax Number)

Chevron Contact (Name): Nancy Vukelich
(Phone) 842-9581
Laboratory Name: Superior Analytical
Laboratory Release Number: 7140670
Samples Collected by (Name): Steve Kranyck
Collection Date: 6/1/92
Signature:

Sample Number	Lab Sample Number	Number of Containers	Matrix: S = Soil A = Air W = Water C = Charcoal	Type: G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	Analyses To Be Performed: BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	Hold					Remarks
VEW1A	1	1	S	G	8:00		yes									X					
↓ B	2	↓	↓	↓	↓		↓	X								[redacted]					
VEW2A	3															X					
B	4															X					
C	5															X					
↓ D	6															X					
MW10A	7															X					
B	8							X													
C	9							X													
↓ D	10	↓	↓	↓	9:00		↓														

Please Initial:
Samples stored in ice: 5
Appropriate containers: 4
Samples preserved: 4
VOA's without headspace: NA
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
[signature]	Groundwater	6/2/92			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Recieved For Laboratory By (Signature)		Date/Time
			[signature] Supervisor		6/15/92 1745

Turn Around Time (Circle Choice)
24 Hrs.
48 Hrs.
5 Days
10 Days
As Contracted

COC-3.DWG/03 91/HCH

Superior Precision Analytical, Inc.
835 Arnold Drive, Suite 106 ▪ Martinez, California 94553 ▪ (510) 229-0166 / fax (510) 229-0916

GROUNDWATER TECHNOLOGIES INC.
Attn: Sandra Lindsey

Project 020202748-030503
Reported 07/06/92

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
86087- 2	MW1	06/25/92	06/30/92	Water

RESULTS OF ANALYSIS

Laboratory Number: 86087- 2

Gasoline:	ND<50
Benzene:	ND<0.5
Toluene:	ND<0.5
Ethyl Benzene:	ND<0.5
Xylenes:	ND<0.5
Concentration:	ug/L

Superior Precision Analytical, Inc.
835 Arnold Drive, Suite 106 • Martinez, California 94553 • (510) 229-0166 / fax (510) 229-0916

C E R T I F I C A T E O F A N A L Y S I S

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS

QA/QC INFORMATION
SET: 86087

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT
ug/L = parts per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 5520F:
Minimum Detection Limit in Water: 5000ug/L

Modified EPA SW-846 Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L

EPA SW-846 Method 8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L

EPA SW-846 Method 8020/BTXE
Minimum Quantitation Limit in Water: 0.5ug/L

ANALYTE	SPIKE LEVEL	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	200 ng	96/76	20	70-130
Benzene:	200 ng	101/104	3	70-130
Toluene:	200 ng	98/98	0	70-130
Ethyl Benzene:	200 ng	98/99	1	70-130
Xylenes:	200 ng	102/100	2	70-130

Richard Srna, Ph.D.
Filomina V Tanguilig (for)
Laboratory Director

☐ Yes
Fax copy of Lab Report and COC to Chevron Contact: ☐ No 86087

Chain-of-Custody-Record

Chevron U.S.A. Inc. P.O. BOX 5004 San Ramon, CA 94583 FAX (415)842-9591	Chevron Facility Number 9-0121 Facility Address 3 14th ST OAKLAND CA. Consultant Project Number C20202748-030503 Consultant Name Groundwater Tech, Inc Address 4057 Port Chicago Hwy Concord CA. Project Contact (Name) Sandra Lindsey (Phone) 671-2387 (Fax Number) 685-9148	Chevron Contact (Name) Nancy Vukelich (Phone) 842-9581 Laboratory Name Superior Analytical Laboratory Release Number 440-3170 Samples Collected by (Name) Victor Merino Collection Date 6/23/92 Signature [signature]

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil A = Air W = Water C = Charcoal	Type G = Grab C = Composite D = Discrete	Time	Sample Preservation	Iced (Yes or No)	BTEX + TPH GAS (8020 + 8015)	TPH Diesel (8015)	Oil and Grease (5520)	Purgeable Halocarbons (8010)	Purgeable Aromatics (8020)	Purgeable Organics (8240)	Extractable Organics (8270)	Metals Cd,Cr,Pb,Zn,Ni (ICAP or AA)	Hold				Remarks
RBMW10			W	G		HCl	1									X				
MW10			W	G		HCl	3	X												

Sample initial: BW
Samples stored in ice ✓
Appropriate containers ✓
Samples preserved ✓
VOA's without headspace ✓
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	Turn Around Time (Circle Choice)
[signature]	GTI	6/23/92				24 Hrs. 48 Hrs. 5 Days 10 Days (As Contracted)
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	
Relinquished By (Signature)	Organization	Date/Time	Recieved For Laboratory By (Signature)		Date/Time	
			[signature]		6/26/92 9:50	

COC-3.DWG/03 91/HCH