APR 14 '93 J.M.M.

GROUNDWATER TECHNOLOGY, INC.

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ADDITIONAL ENVIRONMENTAL ASSESSMENT REPORT
CHEVRON SERVICE STATION NO. 9-4612
3616 SAN LEANDRO BOULEVARD
OAKLAND, CALIFORNIA

020202892

APRIL 12, 1993

Prepared for:
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ADDITIONAL ENVIRONMENTAL ASSESSMENT REPORT
CHEVRON SERVICE STATION NO. 9-4612
3616 SAN LEANDRO BOULEVARD
OAKLAND, CALIFORNIA

APRIL 12, 1993

1.0 INTRODUCTION

This report summarizes the additional environmental assessment work conducted by Groundwater Technology, Inc. at Chevron U.S.A. Products Company (Chevron) Service Station No. 9-4612 located at 3616 San Leandro Boulevard in Oakland, California (Figure 1). The objective of this work was to further evaluate the lateral extent of petroleum hydrocarbons in the soil and groundwater at the site. The assessment was performed during February 1993 and included installing two 2-inch-diameter groundwater monitoring wells, sampling soil and groundwater, submitting the collected samples for chemical analyses, conducting a well survey within a 0.5-mile radius of the site, evaluating the data, and preparing this report.

2.0 BACKGROUND

The site is located in Alameda County, South Oakland on the northwest corner of the San Leandro Street and 37th Avenue intersection (Figure 2). Commercial businesses are located east, west, and south of the site. Bay Area Rapid Transit (BART) tracks are to the north and the Fruitvale Avenue BART station is to the north-northwest. Currently, the site is a fenced, unpaved lot with a commercial building on the eastern portion of the lot. The surface elevation at the site is approximately 28 feet above mean sea level (MSL). The Inner Harbor Waterway linking San Francisco Bay to San Leandro Bay is approximately 0.5 miles east of the site.

On August 9, 1988, one groundwater monitoring well (VH-1) was installed to a depth of 30 feet by Vonder Haar Hydrogeology (Berkeley, California). Analytical results of soil samples collected from

monitoring well VH-1 reported total petroleum hydrocarbons-as-gasoline (TPH-G) of less than 0.5 parts per million (ppm) at 20.5 and 25.5 feet below grade. Analytical results of water samples collected from monitoring well VH-1 reported TPH-G and benzene concentrations of 11 ppm and 3.3 ppm, respectively (Vonder Haar Hydrogeology, September 16, 1988). The underground storage tanks have apparently been removed from the site and the locations of three soil borings (B-1, B-2, and B-3) were noted in the Vonder Haar Hydrogeology Report. **Details of the tank removal and information of the three soil borings were not available to Groundwater Technology for review.**

Monitoring well VH-1 has been sampled eight times since August 8, 1988. The most recent monitoring and sampling event prior to March 1993, occurred on April 20, 1992. Benzene and TPH-G analyses performed on April 20, 1992, were reported at 670 parts per billion (ppb) and 7,400 ppb, respectively (Pacific Environmental Group, Inc., May 18, 1992).

3.0 WORK SCOPE

3.1 Site-Specific Health and Safety Plan and Permits

Groundwater Technology prepared a site-specific Health and Safety Plan required by the Occupational Health and Safety Administration Standard "Hazardous Waste Operations and Emergency Response" guidelines (29 CFR 1910.120). The site-specific Health and Safety Plan was prepared after a review of site conditions and existing available site-specific health and safety plans for the site. The Health and Safety Plan was reviewed and signed by Groundwater Technology personnel and subcontractors working at the site before field operations began.

Groundwater Technology reviewed the site history and site information with Chevron representatives before beginning work at the site. Drilling permits to install two monitoring wells were obtained from Zone 7 Alameda County Flood Control and Water Conservation District. Copies of the permits are included in Appendix A.

3.2 Soil Borings

On February 1, 1993, Groundwater Technology supervised the drilling of two soil borings for the construction of two groundwater monitoring wells (MW-2 and MW-3). The soil borings were drilled

using a Mobile B-53 drill rig. The augers were steam cleaned after drilling each of the soil borings. A Groundwater Technology field geologist, under the supervision of a California Registered Geologist, logged the materials encountered during drilling using the Unified Soil Classification System. Drilling was completed on February 1, 1993.

The steam cleaning water was stored in labeled 55-gallon drums pending disposal. The soil cuttings generated during the drilling activities were placed on and covered with plastic sheets. Soil cuttings were then characterized and profiled. **Because the analytical results of composited soil samples collected from the soil pile were reported below the method detection limits (MDLs) for benzene, toluene, ethylbenzene, and xylenes (BTEX) and TPH-G, the soil was spread evenly around the site.** Water generated from steam cleaning, purging, and sampling activities was removed and transported to the Chevron Terminal in Richmond.

3.3 Soil Sampling

During drilling, soil samples were collected from the soil borings for monitoring wells MW-2 and MW-3 at 5-foot intervals from approximately 5 to 20 feet below grade. Soil samples were collected using a 2-inch-outside-diameter split-spoon sampler, lined with three 2-inch-diameter by 6-inch-long brass sample tubes. At each sample point, the sampler was driven 18 inches ahead of the hollow-stem augers into undisturbed soil. Soil samples could not be collected at 20 feet below grade from the soil boring for MW-3 because the split-spoon sampler was unable to recover the saturated soil. One soil sample from each 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, which are included in Appendix B.

Two soil samples collected while drilling the soil borings for each monitoring well were submitted to a California-certified laboratory and analyzed for BTEX and TPH-G using EPA Methods 5030/8020 and modified EPA Method 8015.

3.4 Monitoring Well Installation

Monitoring wells MW-2 and MW-3 were constructed of 5 feet of 2-inch-diameter Schedule 40 polyvinylchloride (PVC) casing with flush threads and 15 feet of 0.020-inch-slot well screen. A sand filter pack was placed around the well screen in the monitoring wells to approximately 1 foot above the slotted well screen. The monitoring wells were completed with 1 foot of hydrated bentonite and a neat-cement seal to grade. The wellhead was protected by a locking cap and a traffic-rated street box with a watertight bolted lid. Well construction details are included with the drill log (Appendix C). The top-of-casing elevation of each monitoring well was surveyed by a professional licensed surveyor. The elevations are relative to a United States Geologic Survey brass disc (Q148 Reset 1950) in a flagpole base at the American Can Company plant near 8th Street and 37th Avenue. The brass disc is located at 19.17 feet above MSL.

3.5 Monitoring Well Development

On February 12, 1993, monitoring wells MW-2 and MW-3 were developed by surging and bailing groundwater using a PVC bailer. This technique promotes a uniform sand filter pack, removes fine-grain 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 the fine-grain sediments were removed. During development activities approximately 55 and 45 gallons of water were removed from monitoring wells MW-2 and MW-3, respectively.

3.6 Groundwater Monitoring

On March 26, 1993, monitoring wells VH-1, MW-2, and MW-3 were monitored to measure the depth to groundwater and the thickness of separate-phase hydrocarbons, if present. The water levels were measured 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. Separate-phase hydrocarbons were not detected in the monitoring wells.

3.7 Groundwater Sampling

On February 16, 1993, groundwater monitoring wells MW-2 and MW-3 were purged of approximately 8 gallons, respectively. Conductivity, pH, and temperature measurements indicated that the groundwater had stabilized and formation water was entering the well. Groundwater samples were collected from monitoring wells MW-2 and MW-3. On March 26, 1993, approximately 42 gallons of water were purged from groundwater monitoring well VH-1 and groundwater samples were collected. 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 prepared 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. The samples were analyzed for BTEX and TPH-G using EPA Methods 5030/8020 and modified EPA Method 8015. Water generated during the purging and sampling process was stored in Department of Transportation-approved steel drums. The water was then pumped to a water trailer and transported for recycling to the Chevron Refinery in Richmond, California.

4.0 SITE CONDITIONS

4.1 Analytical Results for Soil

Laboratory results of soil samples collected on February 1, 1993, from monitoring wells MW-2 and MW-3 at 5 and 10 feet below grade reported nondetectable concentrations of BTEX and TPH-G. The results of the soil analyses are summarized in Table 1 and laboratory reports are included in Appendix D.

4.2 Analytical Results for Groundwater

Analytical results of groundwater samples collected from monitoring wells MW-2 and MW-3 on February 16, 1993, reported benzene concentrations of 720 ppb and less than MDLs, respectively, and TPH-G concentrations of 9,200 ppb and 3,500 ppb, respectively. Analytical results of groundwater samples collected from monitoring well VH-1 on March 26, 1993, reported benzene concentrations of 600 ppb and TPH-G concentrations of 4,900 ppb. Figures 3 and 4 illustrate the

benzene and TPH-G concentrations in groundwater based on the groundwater samples collected on February 16 and March 26, 1993. A summary of the groundwater sample analytical results is presented in Table 2. Copies of the laboratory reports are included in Appendix D.

4.3 Hydrogeology

According to Western Alameda County Water Resources, 1984, the site is located on the Bay Plain in western Alameda County separated from the older nonwater-bearing bedrock of the East Bay hills by the Hayward Fault. The alluvial sediments in the Bay Plain consist of a mixture of gravels, sands, and clays that are Pliocene-Pleistocene to Late Pleistocene in age and were deposited on the alluvial cones west of the foothills. Groundwater in these sediments can be either confined or unconfined. The major groundwater-producing area in the East Bay region of Alameda County is the Bay Plain. Regional groundwater flow is generally to the southwest and toward San Francisco Bay. (Alameda County Flood Control and Water Conservation District, June 1988).

The materials encountered during drilling consisted of clays, silty clays, silts, sands, and gravels. Figure 5 shows the location of cross section A-A' (Figure 6). Groundwater levels measured on March 26, 1993, ranged from 7.62 feet below grade in monitoring well MW-2 to 6.71 feet below grade in monitoring well VH-1. A potentiometric surface map (Figure 7) was prepared using the water-level data collected on March 26, 1993. Figure 7 shows a northeast groundwater flow direction with a gradient of 0.01 foot per foot (ft/ft). Groundwater-level data are presented in Table 2.

4.4 Well Survey

On February 11, 1993, a survey of the Department of Water Resources records of Well Drillers Reports revealed that there are 52 monitoring and test wells located within a 0.5-mile radius of the site. A copy of the well survey data, which include the owner, location, type of well, and date the wells were drilled, is presented in Appendix E.

5.0 SUMMARY

- On February 1, 1993, Groundwater Technology supervised the drilling of two soil borings using a Mobile B-53 drilling rig for the construction of two groundwater monitoring wells MW-2 and MW-3.
- Analytical results of soil samples collected at 5 and 10 feet below grade during drilling activities for monitoring wells MW-2 and MW-3 reported benzene and TPH-G concentrations below MDLs.
- On March 26, 1993, groundwater levels were measured in each of the monitoring wells at the site. The depth to water ranged from 7.62 to 6.71 feet below grade. Analysis of the monitoring data indicated a groundwater flow direction toward the northeast with a gradient of 0.01 ft/ft.
- Analytical results of groundwater samples collected from monitoring wells MW-2 and MW-3 on February 16, 1993, reported TPH-G concentrations of 9,200 ppb and 3,500 ppb, respectively and benzene concentrations of 720 ppb and less than 0.5 ppb, respectively. Analytical results of groundwater samples collected from monitoring well VH-1 on March 26, 1993, reported TPH-G concentrations of 4,900 ppb and benzene concentrations of 600 ppb.

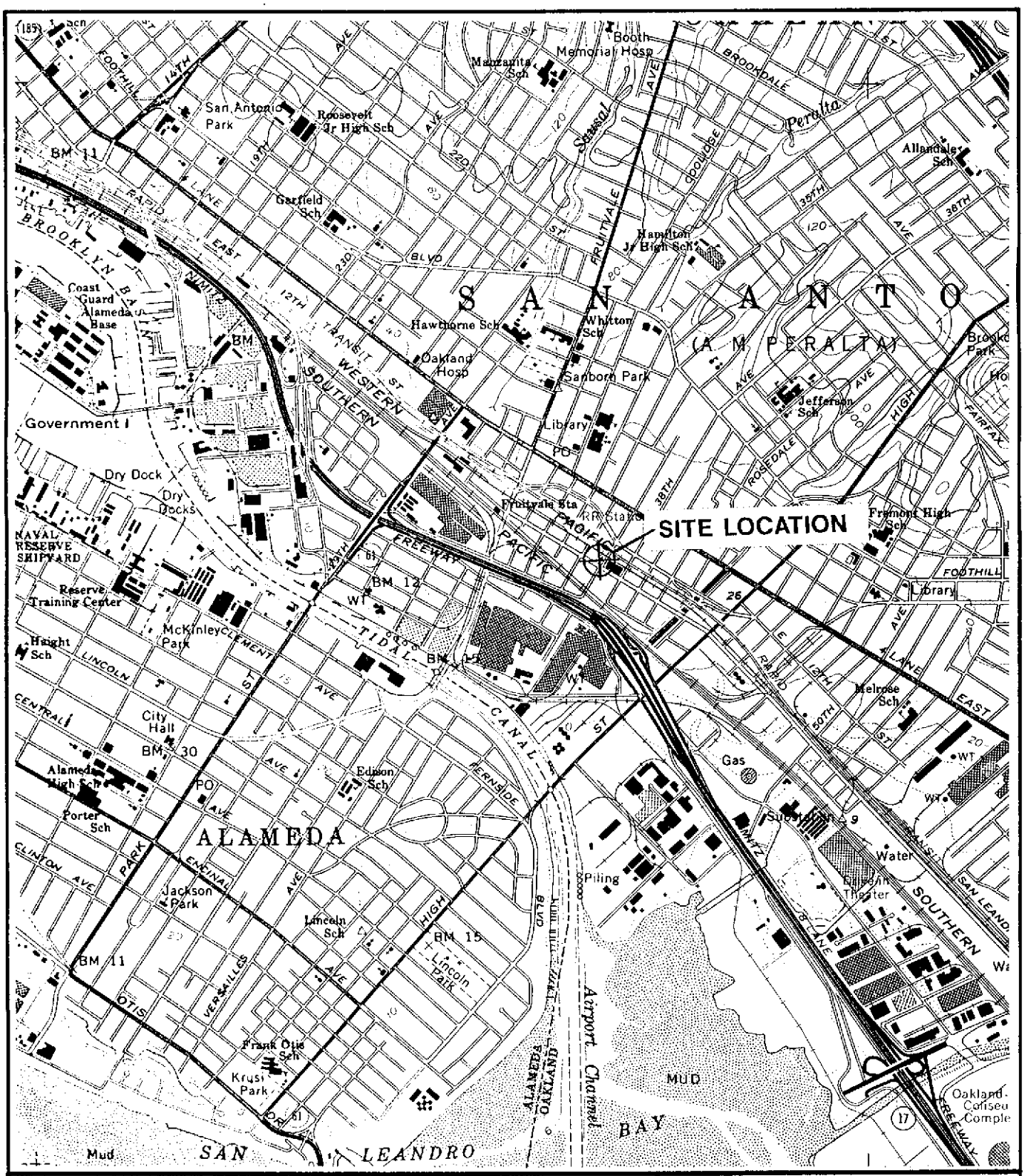
6.0 REFERENCES

Alameda County Flood Control and Water Conservation District; June 1988; Geohydrogeology and Groundwater--Quality Overview, East Bay Plain Area, Alameda County, California, 205(J) Report.

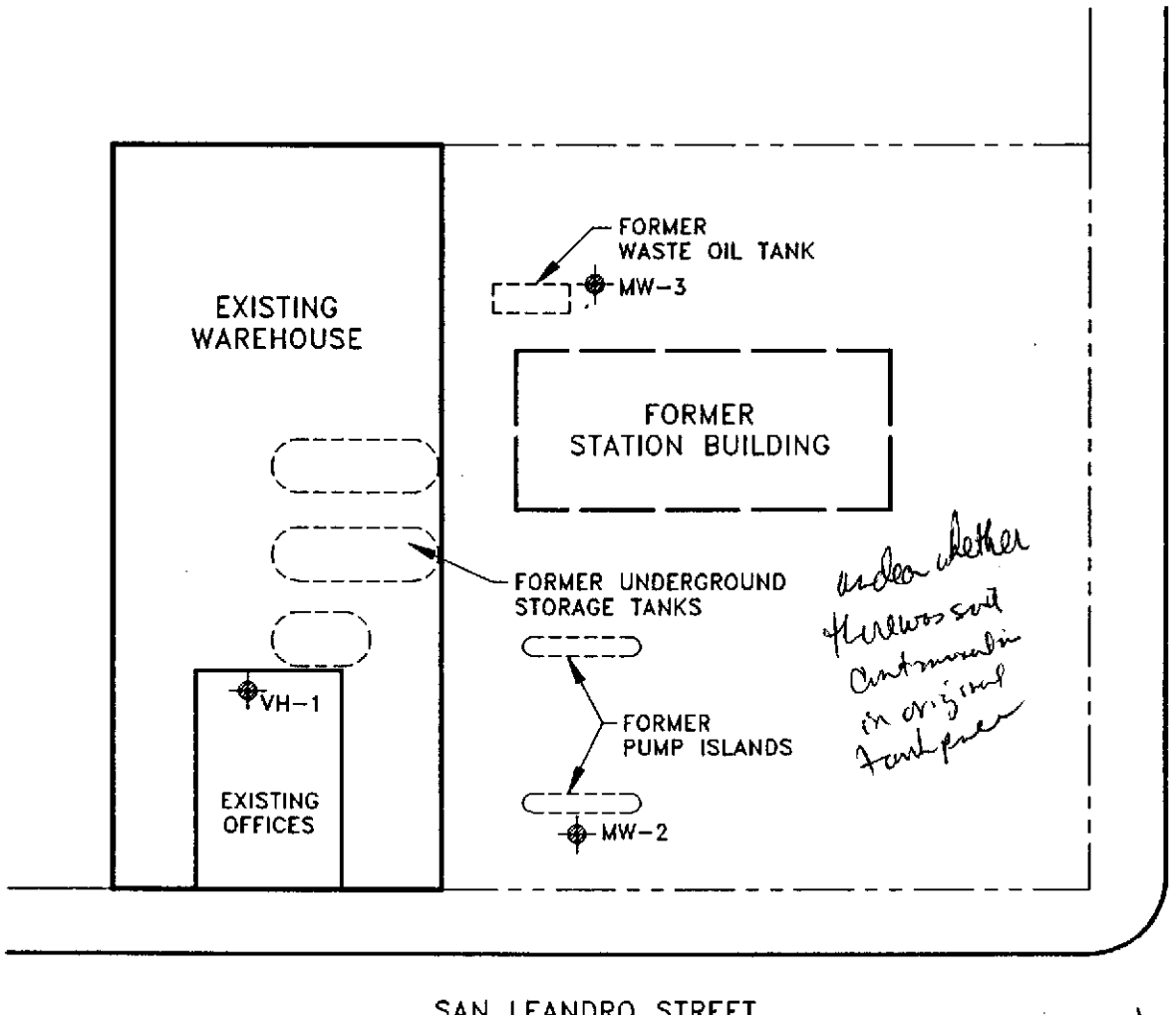
Pacific Environmental Group, Inc.; May 18, 1992; Former Chevron Service Station 9-4612, 3616 San Leandro St., Oakland, California.

Vonder Haar Hydrogeology; September 16, 1988; Former Chevron Service Station No. 9-4612, San Leandro St. at 37th, Oakland, California, VH Job No. 88-114.

FIGURES



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. 9-4612	DATE: 4/12/93
		LOCATION: 3616 SAN LEANDRO STREET OAKLAND, CALIFORNIA	FIGURE: 1



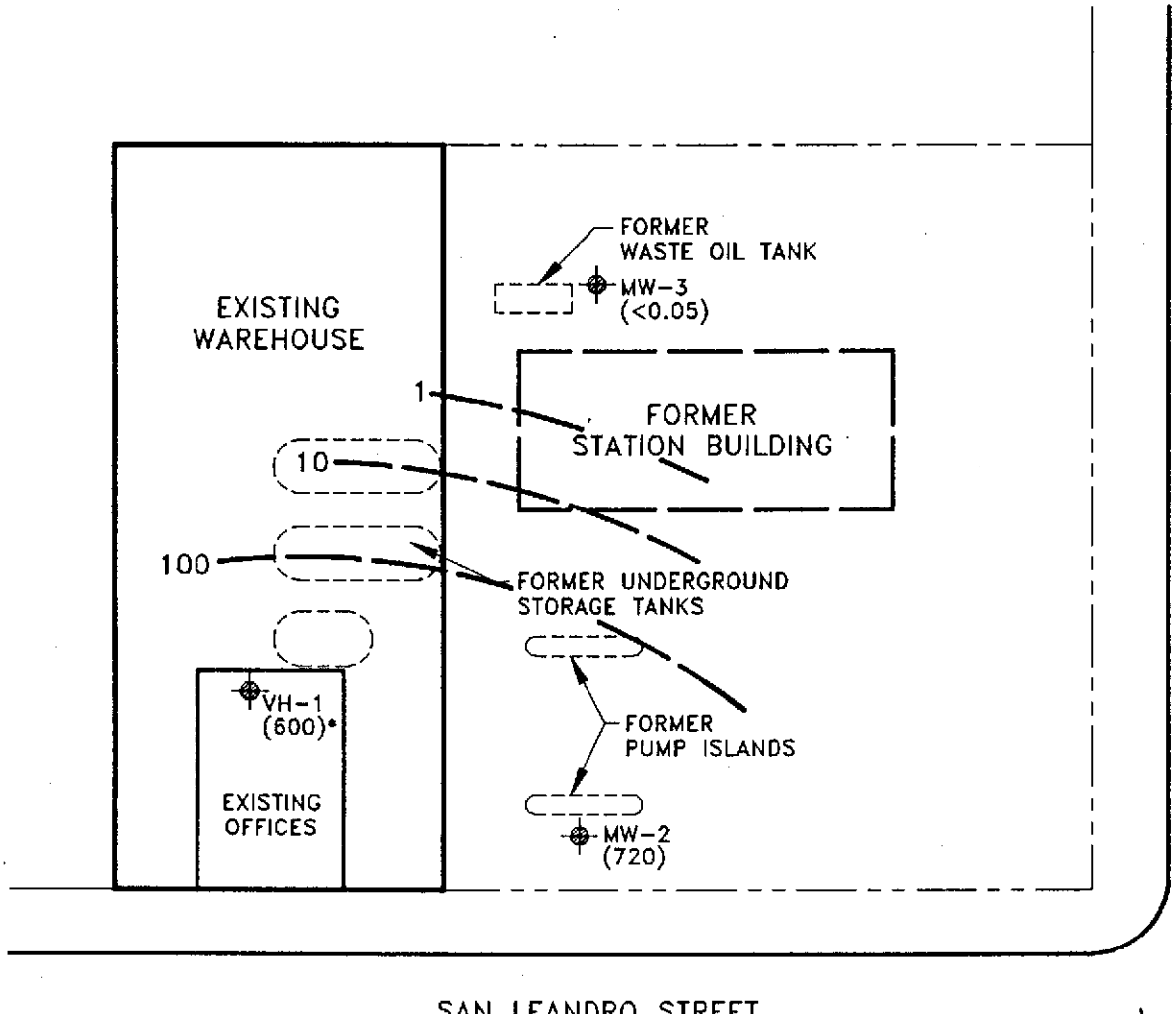
under shelter of walkway with continuation in original footprint

LEGEND

⊕ MONITORING WELL

0 FEET 30
SCALE

GROUNDWATER TECHNOLOGY 4057 PORT CHICAGO HWY. CONCORD, CA 94520 (510) 671-2387				**SITE PLAN**		
CLIENT: CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION No. 9-4612				LOCATION: 3616 SAN LEANDRO STREET OAKLAND, CALIFORNIA	REV. NO.: 0	DATE: 4/8/93
PM: IAW	PE/RG: DRK	DESIGNED: TW	DETAILED: ML	ACAD FILE: SP493	PROJECT NO.: 020202892	FIGURE: 2



LEGEND

- MONITORING WELL
- ( ) BENZENE CONCENTRATION (ug/l)
- BENZENE CONCENTRATION CONTOUR
- * SAMPLE COLLECTED ON 3/26/93

N

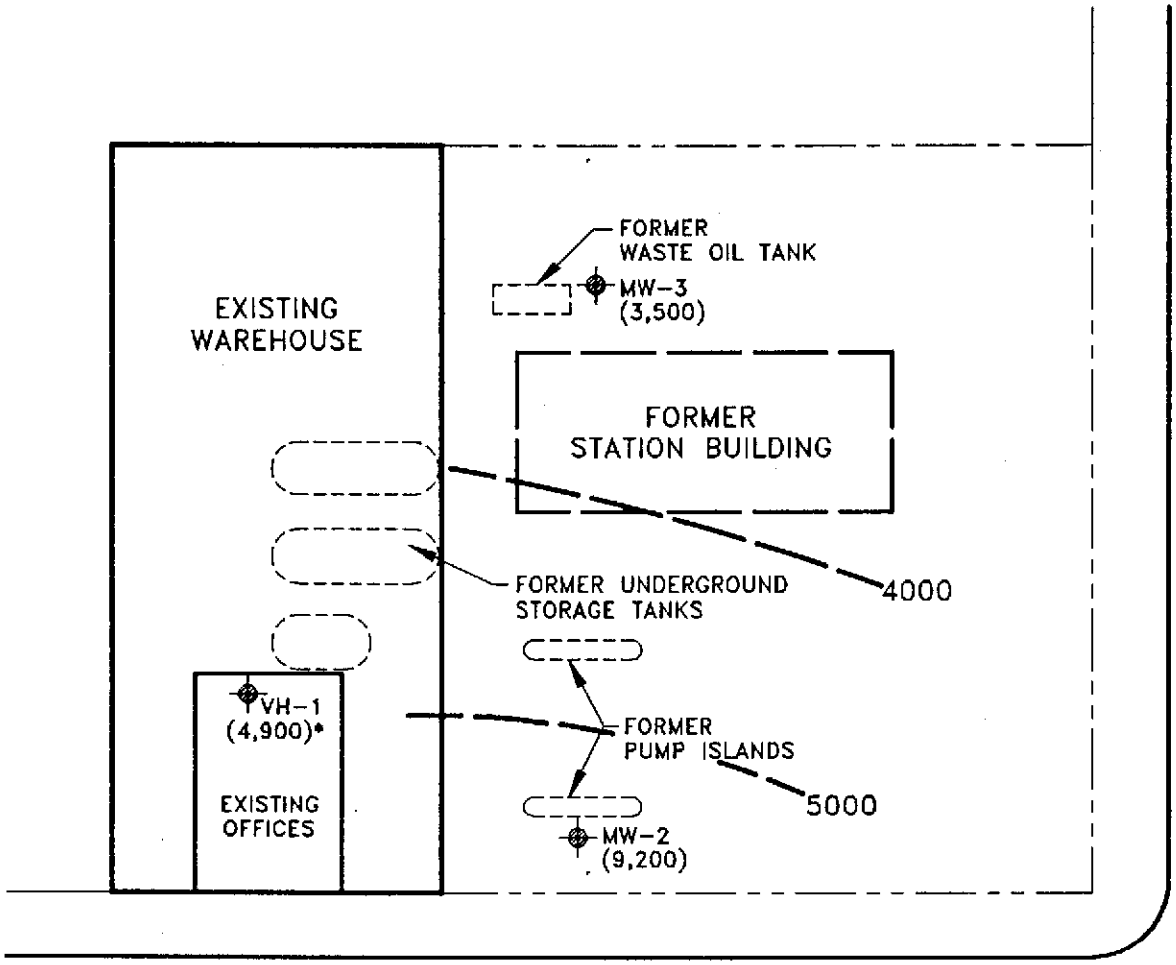
0 FEET 30
SCALE

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

BENZENE CONCENTRATIONS IN GROUNDWATER (2/16/93)

CLIENT:	LOCATION:	REV. NO.:	DATE:
CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION No. 9-4612	3616 SAN LEANDRO STREET OAKLAND, CALIFORNIA	0	4/8/93

PM	PE/RG	DESIGNED	DETAILED	ACAD FILE:	PROJECT NO.:	FIGURE:
JAS	DRK	TW	ML	BNZ21693/SP493	020202892	3



LEGEND

- ⊕ MONITORING WELL
- ( ) TPH-G CONCENTRATION (ug/l)
- —— TPH-G CONCENTRATION CONTOUR
- * SAMPLE COLLECTED ON 3/26/93

N

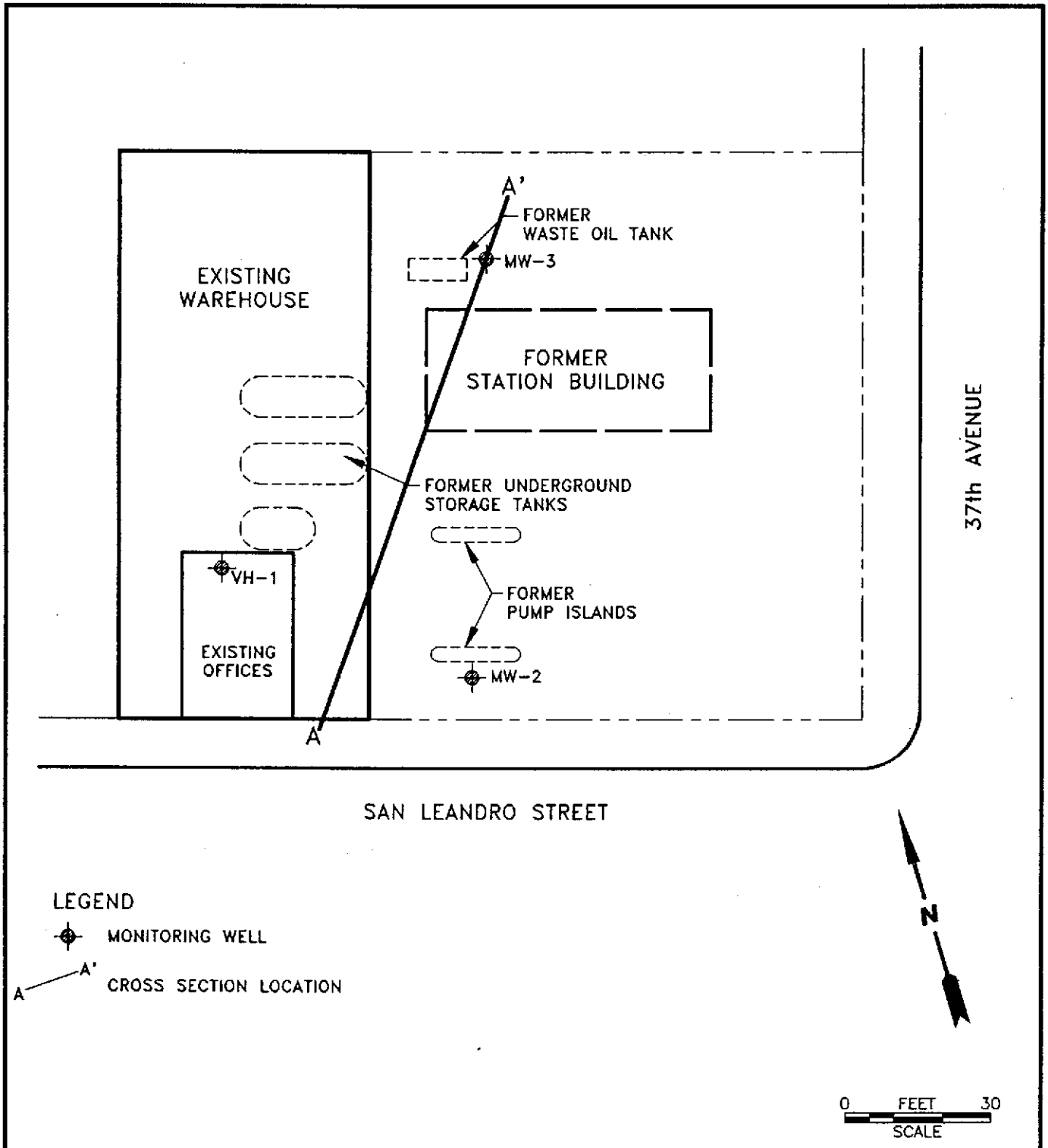
0 FEET 30
SCALE

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

TPH-G CONCENTRATIONS IN GROUNDWATER (2/16/93)

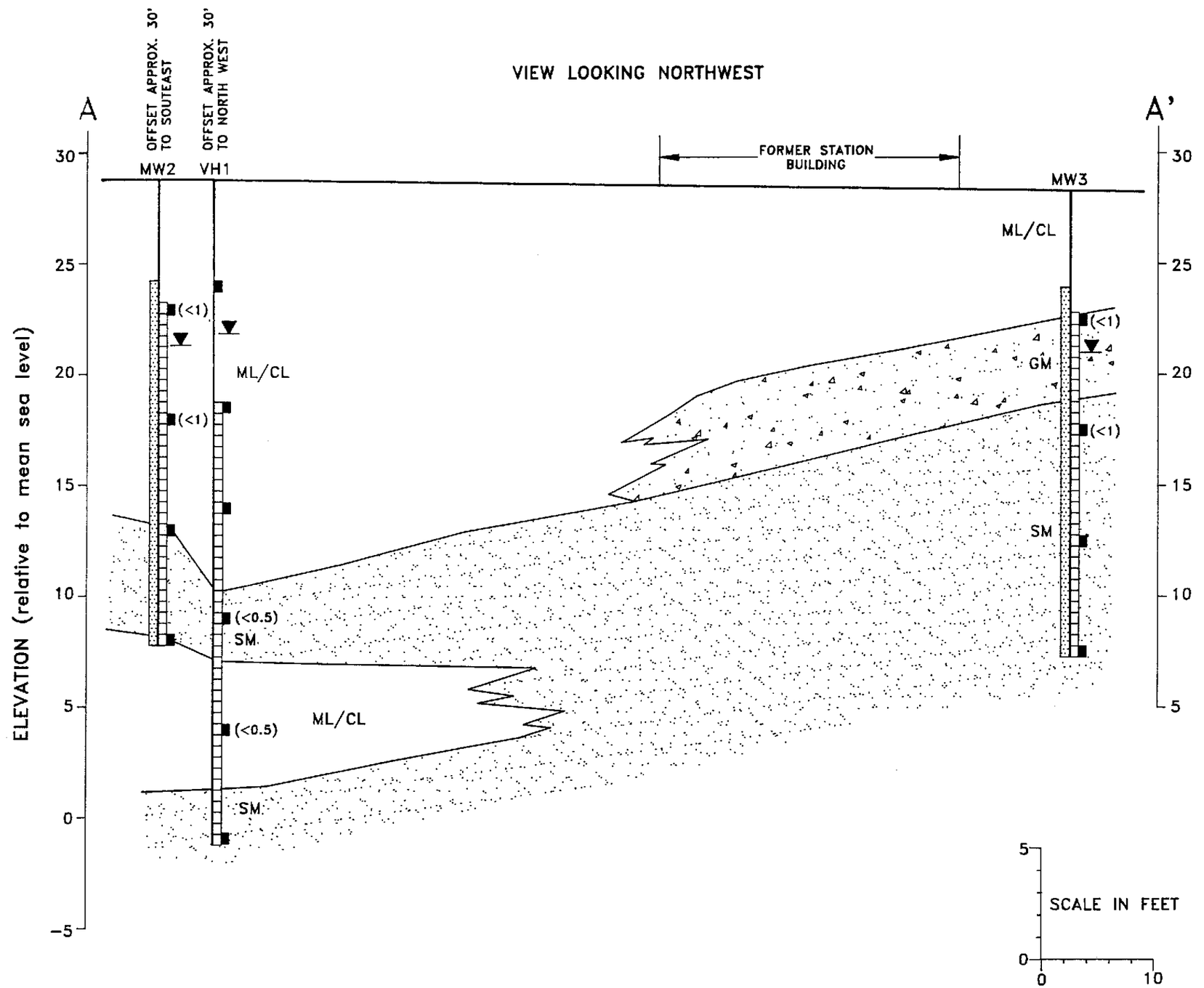
CLIENT:	LOCATION:	REV. NO.:	DATE:
CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION No. 9-4612	3616 SAN LEANDRO STREET OAKLAND, CALIFORNIA	0	4/8/93

PM	PE/RG	DESIGNED	DETAILED	ACAD FILE:	PROJECT NO.:	FIGURE:
JAW	DRK	TW	ML	TPH21693/SP493	020202892	4



GROUNDWATER TECHNOLOGY 4057 PORT CHICAGO HWY. CONCORD, CA 94520 (510) 671-2387				**CROSS SECTION LOCATION MAP**		
CLIENT: CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION No. 9-4612				LOCATION: 3616 SAN LEANDRO STREET OAKLAND, CALIFORNIA	REV. NO.: 0	DATE: 4/8/93
PM: JAW	PE/RG: DRF	DESIGNED: TW	DETAILED: ML	ACAD FILE: CSECLOC/SP493	PROJECT NO.: 020202892	FIGURE: 5

VIEW LOOKING NORTHWEST



LEGEND

- SILT AND CLAY DOMINATED LITHOLOGY (CL,ML)
- SAND DOMINATED LITHOLOGY (SM)
- GRAVEL DOMINATED LITHOLOGY (GM)
- MONITORING WELL
- FILTER PACK
- SOIL SAMPLE LOCATION
- (<1) TPH-AS-GASOLINE CONCENTRATION (ppm)
- SCREENED INTERVAL
- GROUNDWATER ELEVATION (3/26/93)

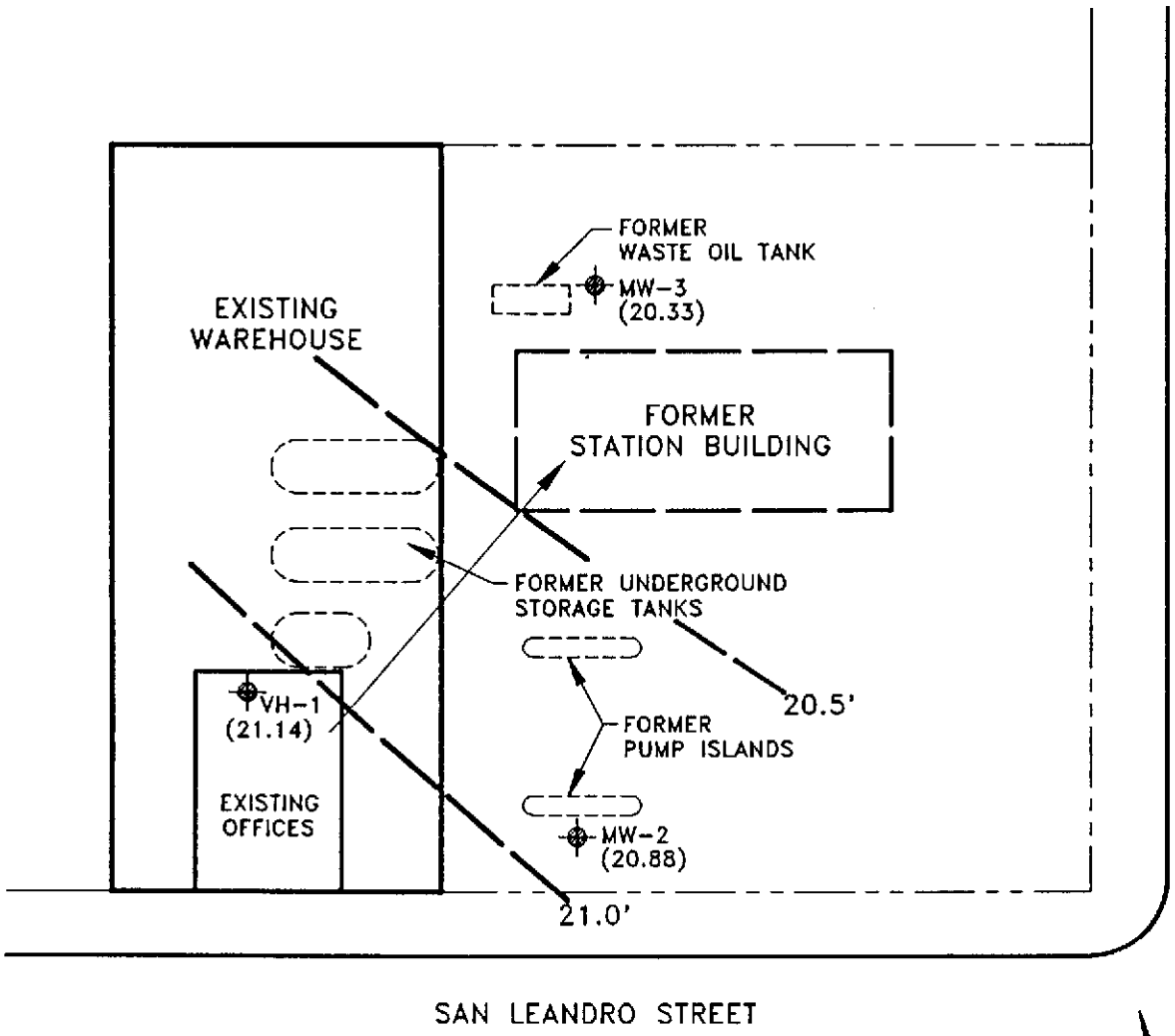
GROUNDWATER TECHNOLOGY
4057 PORT CHICAGO HWY
CONCORD, CA 94520
(510) 671-2387

REV. NO.:	DATE:	ACAD FILE:
0	4/8/93	GEOXSEC

GEOLOGIC CROSS SECTION

CLIENT: CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION No. 9-4612	PM: JHW
LOCATION: 3616 SAN LEANDRO STREET OAKLAND, CALIFORNIA	PE/RG: DRK

DESIGNED	DETAILED	PROJECT NO.:	FIGURE:
TW	ML	020202892	6



LEGEND

- MONITORING WELL
- ( ) POTENTIOMETRIC SURFACE ELEVATION
- POTENTIOMETRIC SURFACE CONTOUR
- GROUNDWATER FLOW DIRECTION

N

0 FEET 30
SCALE

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

POTENTIOMETRIC SURFACE MAP (3/26/93)

CLIENT:	LOCATION:	REV. NO.:	DATE:
CHEVRON U.S.A. PRODUCTS CO. SERVICE STATION No. 9-4612	3616 SAN LEANDRO STREET OAKLAND, CALIFORNIA	0	4/8/93

PM	PE/RG	DESIGNED	DETAILED	ACAD FILE:	PROJECT NO.:	FIGURE:
JDW	DRK	TW	ML	PSM32693/SP493	020202892	7

TABLES

TABLE 1
ANALYTICAL RESULTS FOR SOIL SAMPLES
(Concentrations in parts per million)

Date	Sample ID	Sample Depth (ft)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-as-Gasoline	Total Lead
08/10/88	VH-1	20.5 25.5	0.042 0.036	<0.005 <0.005	<0.005 <0.005	<0.005 <0.005	<0.5 <0.5	6 6 & 7
02/01/93	MW-2	5 10	<0.005 <0.005	<0.005 <0.005	<0.005 <0.005	<0.005 <0.005	<1 <1	NA NA
02/01/93	MW-3	5 10	<0.005 <0.005	<0.005 <0.005	<0.005 <0.005	<0.005 <0.005	<1 <1	NA NA

TPH = Total petroleum hydrocarbons
NA = Not applicable
MW = Monitoring well

Data for VH-1 from Vonder Haar Hydrogeology Report, September 16, 1988.

TABLE 2
MONITORING DATA AND ANALYTICAL RESULTS
OF GROUNDWATER
(Concentrations in parts per billion)

Well ID	Sample Date	TOC Elevation (msl)	Benzene	Toluene	Ethyl-benzene	Total Xylenes	TPH-as-Gasoline	DTW (ft)	SPT (ft)	GWE (ft)
VH-1	08/10/88		3,300	200	520	540	11,000	13.00		
	06/01/89		2,200	120	540	310	15,000	10.32		
	09/15/89		1,900	90	350	160	5,600	15.69		
	12/08/89		1,900	69	270	99	11,000	14.77		
	03/07/91		820	39	120	77	4,500	11.26		
	09/24/91		520	19	39	27	3,300	12.98		
	01/08/92		600	34	81	76	5,000	13.77		
	04/20/92		670	60	110	140	7,400	8.18		
	03/26/93	27.85	600	40	72	94	4,900	6.71	0.00	21.14
MW-2	02/16/93		720	110	250	170	9,200			
	03/26/93	28.50						7.62	0.00	20.88
MW-3	02/16/93		<0.05	8.1	4.6	7.7	3,500			
	03/26/93	27.51						7.18	0.00	20.33

5/B0.5

TPH = Total petroleum hydrocarbons
DTW = Depth to water
SPT = Separate-phase hydrocarbons
GWE = Groundwater elevation in feet above mean sea level relative to United States Geological Survey brass disc
MSL = Mean sea level
TOC = Top of casing

Data for VH-1 (August 10, 1988 to April 20, 1992) from Pacific Environmental Group Inc. Report, May 18, 1992.

APPENDIX A

WELL INSTALLATION PERMITS

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 3616 San Leandro Street
Oakland, CA

CLIENT
Name Chevron USA Products Company
Address 2410 Camino Ramon Phone 510-842-9500
City San Ramon Zip 94583-0804

APPLICANT
Name Groundwater Technology Inc.
Address 4057 Port Chicago HWY Phone 510-671-2387
City Concord Zip 94520

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ (Other) observation
Municipal ___ Irrigation ___

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

DRILLER'S LICENSE NO. 482390

WELL PROJECTS

Drill Hole Diameter	8	in.	Maximum		
Casing Diameter	2	in.	Depth	30	ft.
Surface Seal Depth	10	ft.	Number	2	

GEOTECHNICAL PROJECTS

Number of Borings	___		Maximum		
Hole Diameter	___	in.	Depth	~~35~~	ft.

ESTIMATED STARTING DATE 8-11-92
ESTIMATED COMPLETION DATE 8-11-92

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

APPLICANT'S SIGNATURE Gregg A. Markel Date 7-24-92

FOR OFFICE USE

PERMIT NUMBER 92366
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 27 Jul 92
Wyman Hong

31992

APPENDIX B

GROUNDWATER TECHNOLOGY'S STANDARD OPERATING PROCEDURES

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.

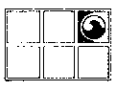
6. Preservatives are required for some types of samples. Use specially prepared vials marked as indicated below, or use the appropriate field procedure (SOP 12 for acidification). Make note on forms that samples were preserved. Always have extra vials in case of problems. Samples for volatile analyses 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 transferrer 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 photoionization 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 C

DRILL LOGS AND WELL CONSTRUCTION SPECIFICATIONS

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well MW-2

Project Chev/3616 San Leandro Street Owner Chevron U.S.A. Products Co.
Location Oakland, California Project No. 02020 2892 Date drilled 02/01/93
Surface Elev. 28.80 ft. Total Hole Depth 20.5 ft. Diameter 8.5 in.
Top of Casing 28.5 ft. Water Level Initial 8.5 ft. Static 03/26/93 7.62 ft.
Screen: Dia 2 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 5 ft. Type SCH 40 PVC
Filter Pack Material #3 sand Rig/Core Type Mobile B-53/Split Spoon
Drilling Company Kvilhaug Well Drilling Method Hollow Stem Auger Permit # 92366
Driller Rod Furlow Log By S.C. Hurley
Checked By David Kleesattel License No. RG# 5136

See Site Map For Boring Location

COMMENTS:

The well was set at approximately 20.5 feet below grade. the soil cuttings were placed on plastic and was left on site until it could be analyzed and disposed of properly.

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						Surface material-grass and soil
2					CL	Brown silty CLAY
4		146	16 35 50		ML	Light brown clayey SILT (10% silt, slightly moist)
8						Static water level - 3/26/93
						Encountered groundwater at 12:30PM 02/01/93
10		9.1	16 20 23		CL	
14		2800	22 28 45			Greenish silty SAND (about 50% sand, about 35% silt, about 15% clay (saturated, strong hydrocarbon odor)
18					SM	
20		1050	13 25 48		ML	Light brown sandy SILT (10% clay, saturated, slight petroleum hydrocarbon odor)
						End of boring at 20.5 feet. Installed groundwater monitoring well.

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well MW-3

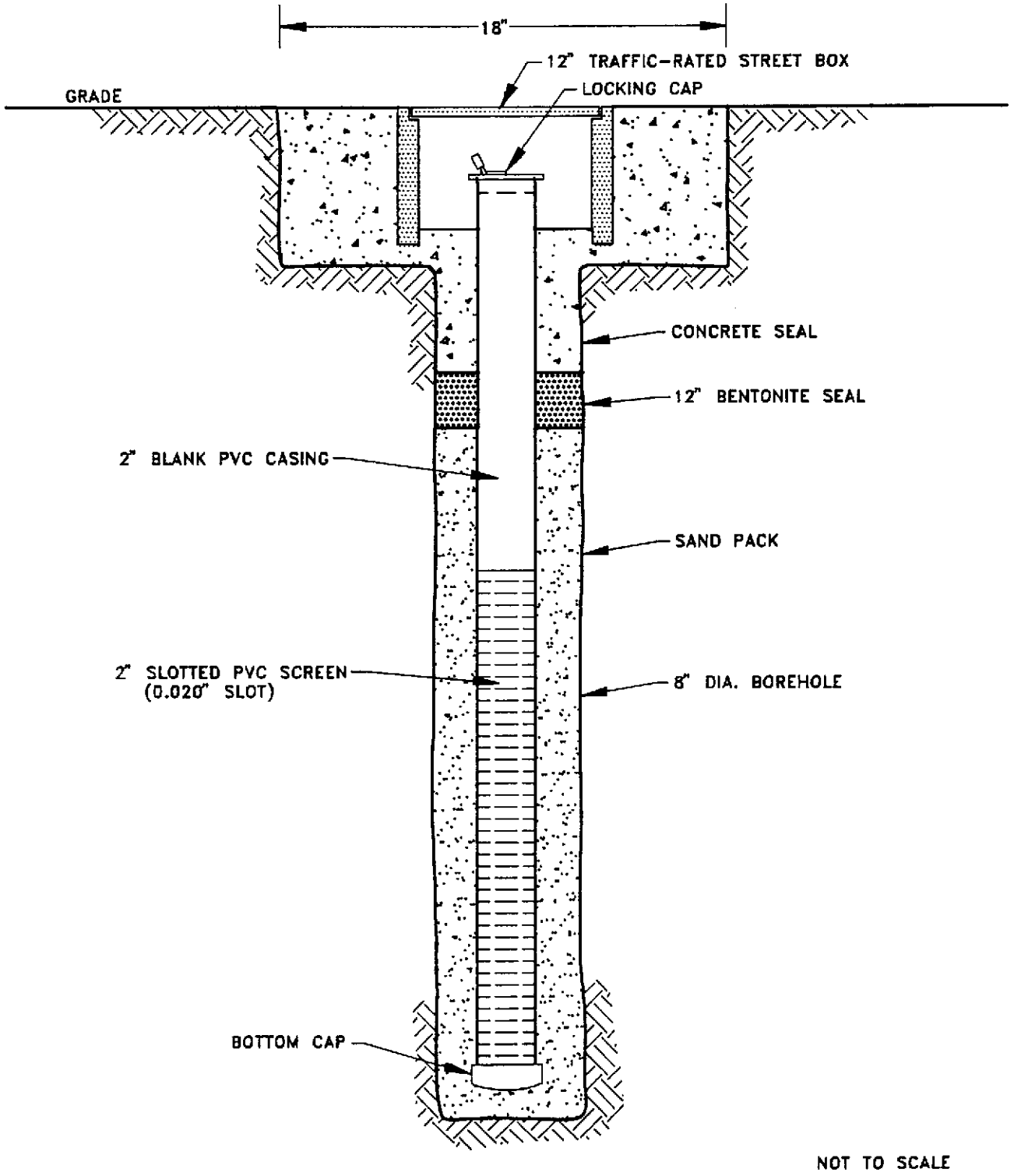
Project Chev/3616 San Leandro St. Owner Chevron U.S.A. Products Co.
Location Oakland, California Project No. 02020 2892 Date drilled 02/01/93
Surface Elev. 28.30 ft. Total Hole Depth 20.5 ft. Diameter 8.5 in.
Top of Casing 27.51 ft. Water Level Initial 8.5 ft. Static 03/26/93 7.18 ft.
Screen: Dia 2 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 5 ft. Type SCH 40 PVC
Filter Pack Material #3 sand Rig/Core Type Mobile B-53/Split Spoon
Drilling Company Kvilhaug Well Drilling Method Hollow Stem Auger Permit # 92363
Driller Rod Furlow Log By S.C. Hurley
Checked By David Kleesattel License No. RG# 5136

See Site Map For Boring Location

COMMENTS:

The well wa set at approximately 20.5 feet below grade. The soil cuttingswere placed on plastic and was left on site until it could be analyzed and disposed of properly.

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						Surface material- grass and soil
2					CL	Brown silty CLAY (moist)
4						
6		12.3	35 50		ML	Brown clayey SILT (10% fine sand, slightly moist)
8						Static level - 3/26/93
						Encountered groundwater at 9:30AM 02/01/93
10		8.6	38 50		GP	Brown sandy GRAVEL (about 75% gravel, about 20% course sand, about 5% silt, water saturated, no hydrocarbon odor).
12						
14						
16		186	25 38 45		SW	Brown silty SAND (50% coarse sand, 30% fine sand, 20% silt, saturated)
18						
20			22 25 45			No recovery
						End of boring at 20.5 feet. Installed groundwater monitoring well.
22						
24						



NOT TO SCALE

GROUNDWATER TECHNOLOGY 4057 PORT CHICAGO HWY CONCORD, CA 94520 (510) 671-2387	**TYPICAL MONITORING WELL CONSTRUCTION**

CLIENT: CHEVRON U.S.A. PRODUCTS CO.	LOCATION:	REV. NO.:	DATE:

PM	PE/RG	DESIGNED	DETAILED	ACAD FILE:	PROJECT NO.:	FIGURE:
			ML	FMONWELL		

APPENDIX D

LABORATORY REPORTS AND CHAIN-OF-CUSTODY RECORDS

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

Groundwater Technology Inc.
Attn: TIM WATCHERS

Project 020202892
Reported 02/10/93

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
14100- 1	MW1-5	02/01/93	02/09/93	Soil
14100- 2	MW2-5	02/01/93	02/09/93	Soil
14100- 3	MW1-10	02/01/93	02/09/93	Soil
14100- 4	MW2-10	02/01/93	02/09/93	Soil
14100- 8	C-1	02/01/93	02/09/93	Soil

RESULTS OF ANALYSIS

Laboratory Number:	14100- 1	14100- 2	14100- 3	14100- 4	14100- 8
Gasoline:	ND<1	ND<1	ND<1	ND<1	ND<1
Benzene:	ND<.005	ND<.005	ND<.005	ND<.005	ND<.005
Toluene:	ND<.005	ND<.005	ND<.005	ND<.005	ND<.005
Ethyl Benzene:	ND<.005	ND<.005	ND<.005	ND<.005	ND<.005
Xylenes:	ND<.005	ND<.005	ND<.005	ND<.005	ND<.005
Concentration:	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg

Superior Precision Analytical, Inc.
1555 Burke, Unit I ▪ San Francisco, California 94124 ▪ (415) 647-2081 / fax (415) 821-7123

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: 14100

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	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	86/84	2%	75-111
Benzene:	83/86	4%	75-114
Toluene:	86/89	3%	78-114
Ethyl Benzene:	89/91	2%	76-120
Xylenes:	85/86	1%	71-117

Richard Srna, Ph.D.
Laboratory Director

Fax copy of Lab Report and COC to Chevron Contact: ☐ Yes ☐ 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: 9-4612
Facility Address: 3616 San Leandro St.
Consultant Project Number: 020202892
Consultant Name: Groundwater Technology Inc.
Address: 4057 Port Chicago Hwy, Concord CA
Project Contact (Name): Tim Watchers
(Phone) 510-671-2387 (Fax Number)

Chevron Contact (Name): Mark Miller
(Phone)
Laboratory Name: Superior
Laboratory Release Number: 763-3640
Samples Collected by (Name): S. E. Hurley
Collection Date: 2-1-93
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
MW1-5	1	1	S	G		Ice	Yes	X													
MW2-5	2							X													
MW1-10	3							X													
MW2-10	4							X													
MW1-15	5																X				
MW2-15	6																X				
~~MW3~~																					
MW2-20	7																X				
C-1	8	↓	↓	↓		↓	↓	X													

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
	GTI	2-3-93 10 AM			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
	MTC1	2/4/93 3:00 PM			
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			Francisco		2-3-93

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

2/4/93 1630 10:00 AM

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

Groundwater Technology Inc.
Attn: TIM WATCHERS

Project 020202892-030503
Reported 02/23/93

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
14172- 1	TB-LB	02/16/93	02/22/93	Water
14172- 3	MW-3	02/16/93	02/19/93	Water
14172- 5	MW-2	02/16/93	02/19/93	Water

RESULTS OF ANALYSIS

Laboratory Number:	14172- 1	14172- 3	14172- 5
Gasoline:	ND<50	3500	9200
Benzene:	ND<0.5	ND<0.5	720
Toluene:	ND<0.5	8.1	110
Ethyl Benzene:	ND<0.5	4.6	250
Xylenes:	ND<0.5	7.7	170
Concentration:	ug/L	ug/L	ug/L

Superior Precision Analytical, Inc.
1555 Burke, Unit I • San Francisco, California 94124 • (415) 647-2081 / fax (415) 821-7123

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: 14172

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	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	81/92	13%	76-111
Benzene:	84/84	0%	78-110
Toluene:	85/93	9%	78-111
Ethyl Benzene:	84/92	9%	78-118
Xylenes:	76/82	8%	73-113

Richard Srna, Ph.D.
Cecilia G. Joaquin (for)
Laboratory Director

Fax copy of Lab Report and COC to Chevron Contact: ☐ Yes ☐ 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: 9-4612
Facility Address: 3616 San Leandro St., Oakland
Consultant Project Number: 020202892-030503
Consultant Name: GTI
Address: 4057 Port Chicago Highway, Concord, Ca.
Project Contact (Name): Tim Watchers
(Phone) (510) 671-2387 (Fax Number)

Chevron Contact (Name): Mark Miller
(Phone): 842-8134
Laboratory Name: Superior
Laboratory Release Number: 763-3640
Samples Collected by (Name): Randy Ray Phillips
Collection Date: 2/16/93
Signature: Randy Ray Phillips

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air 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	Run TBLB as contracted	NO CHARGE			Remarks
								Analyses To Be Performed													Hold RBMW-3 RB MW-2
TBLB		1v	W	G		HCl	Y	X									X				
RBMW-3		1v	↓	↓	2:17	↓	↓	↓								X					
MW-3		3v	↓	↓	2:17	↓	↓	↓													
RBMW-2		1v	↓	↓	2:27	↓	↓	↓								X					
MW-2		3v	↓	↓	2:27	↓	↓	↓													

Please initial:
Samples stored in ice. KC
Appropriate containers. hand delivered
Samples preserved.
VOA's without headspace
Comments:

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Randy Ray Phillips	GTI	2/17/93 AM 9:05	K. Carlson	Superior	2/17/93 905
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			Carla Joaquin		2/18/93 1502

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

6.C

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

GROUNDWATER TECHNOLOGY, INC.
Attn: TIM WATCHERS

Project 020202892.030503
Reported 04/02/93

TOTAL PETROLEUM HYDROCARBONS

Lab #	Sample Identification	Sampled	Analyzed	Matrix
88163- 2	VH-1	03/26/93	04/01/93	Water

RESULTS OF ANALYSIS

Laboratory Number: 88163- 2

Gasoline:	4900
Benzene:	600
Toluene:	48
Ethyl Benzene:	72
Xylenes:	94
Concentration:	ug/L

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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: 88163

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	MS/MSD RECOVERY	RPD	CONTROL LIMIT
Gasoline:	97/100	3%	70-130
Benzene:	113/107	5%	70-130
Toluene:	108/102	6%	70-130
Ethyl Benzene:	110/104	6%	70-130
Xylenes:	109/102	7%	70-130

Richard Srna, Ph.D.
Jelomina V Sanguenza (for)
Laboratory Director

Fax copy of Lab Report and COC to Chevron Contact: ☐ Yes ☐ 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: 9-4612
Facility Address: 3616 San Leandro St. Oakland
Consultant Project Number: 020202892.030503
Consultant Name: Groundwater Tech. Inc.
Address: 4057 Port Chicago Hwy. Concord, Calif.
Project Contact (Name): Tim Watchers
(Phone) (510) 671-2387 (Fax Number)

Chevron Contact (Name): Mark Miller
(Phone): 842-8134
Laboratory Name: Superior
Laboratory Release Number: 763-3640
Samples Collected by (Name): Ramsey Ray Phillips
Collection Date: 3/26/93
Signature:

Sample Number	Lab Sample Number	Number of Containers	Matrix S = Soil W = Water A = Air 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
RBVH-1		1v	W	G	12:30	Hcl	Yes									X					
VH-1		3v	W	G	12:30	Hcl	Yes	X													
~~TB~~ TBLB		1v	W	G	12:30	Hcl	Yes				PM										

Comments: [illegible] containers [illegible] ice

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
	GTI	PM 3/26/93 2:00			
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time
			[illegible]		3/26/93 2:00p

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

APPENDIX E

WELL SURVEY DATA

CP = Cathodic Protection M = Monitoring
O = Oakland I = Irrigation
NG = Not given N = Industrial

020202892 030522
Po# 120653

Inventory of Wells Located in Township 2S Range 3W Section 5, County Alameda

Owner	Owner's Address	Well Location	Year Drilled	Use
PG+E	4801 Oakport, Oakland	18th S/o 34th St.	76	CP
		Section 6		
There are no wells logged for subsection R				
		Section 7		
Coca Cola	3001 Chapman, O.	Subsection H	NG	NG
State Shingle	880 Fruitvale, O.	Same (3 wells)	90	other
U.S. Army Corps of Engineers	650 Capitol Mall, Sacramento	Fruitvale	87	Destroyed
Wickland Oil	1765 Challenge, Sa. Co	1725 Park St. (3 wells)	88	M
		Section 8		
Trust for Public Land	82 2nd St. SF	1601 39th St.	77	I
PG+E	4801 Oakport, O.	39th + Foothill	75	CP
"	"	37th N/o E. 12	73	CP
Vernon McIlraith	1990 N. CA. Blvd., Walnut Creek	Bart-Fruitvale Station	88	M
I.E.S.	499 High, O.	Same	87	Destroyed
Shell Oil	PO Box 4848, Anaheim	3750 E. 14th	90	M
I.E.S.	499 High, O.	Same	87	N
Mobil Oil	3800 W. Alameda, Burbank	4280 Foothill (6 wells)	89	Test
Chevron	PO Box 5004, San Ramon	4265 Foothill (2 wells)	90	M
Unocal Corp.	2000 Crow Cyn Pl. (?) #400, San Ramon	4251 E 14th	90	M
Peterson Corp.	1939 Harrison #605, O.	1066 47th (3 wells)	89	Test

3616 San Leandro

Inventory of Wells Located in Township 2S Range 3W Section 8, County Alameda

Owner	Owner's Address	Well Location	Year Drilled	Use
Clorox	PO Box 493, Pleasanton	860 42nd (13 wells)	82	Ind
Exxon	1676 N. CA., Walnut Cr.	High St. 7 wells+/- destroyed	87	M
Exxon	PO Box 4415, Houston, TX	720 High (15 wells)	88-90	M
Information is only as accurate as DWR's current files - 2/11/93				