Chevron U.S.A. Inc.
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Marketing Operations

D. Moller
Manager, Operations
S. L. Patterson
Area Manager, Operations
C. G. Trimbach
Manager, Engineering

July 23, 1990

Mr. Rafat Shahid
Alameda County
Environmental Health
80 Swan Way, Room 200
Oakland, California 94621

Re: Chevron Service Station #9-0338
5500 Telegraph Avenue/55th
Oakland, CA 94609

Dear Mr. Shahid:

Enclosed we are forwarding results of the Groundwater Sampling report dated July 12, 1990, conducted by our consultant Geostrategies, Inc. for the above referenced site. As indicated in the report, no detectable hydrocarbon contaminants were present in any of the monitoring wells. However, levals of ICAP metals were detected in all of the monitoring wells. It is suspected that these metal concentrations exist naturally in the formation as we would expect to see hydrocarbon contaminants if they had come from the used oil tank. Geostrategies, Inc. has been instructed to conduct a literature search for possible metal sources.

I declare under penalty of perjury that the information contained in the attached report is true and correct, and that any recommended actions are appropriate under the circumstances, to the best of my knowledge.

If you have any questions or comments please do not hesitate to call Nancy Vukelich at (415) 842-9581.

Very truly yours,
C. G. Trimbach

By Nancy Vukelich
Nancy Vukelich

NLV/jmr
Enclosures

cc: Mr. Lester Feldman
RWQCB-Bay Area
1800 Harrison Street
Suite # 700
Oakland, CA 94612

GeoStrategies Inc.

SITE UPDATE

Chevron Service Station #0338
5500 Telegraph Avenue
Oakland, California

Report No. 7263-3

July 12, 1990

GeoStrategies Inc.
2140 WEST WINTON AVENUE
HAYWARD, CALIFORNIA 94545
(415) 352-4800

July 12, 1990

Gettler-Ryan Inc.
2150 W. Winton Avenue
Hayward, California 94545

Attn: Mr. Jerry Mitchell

Re: SITE UPDATE
Chevron Service Station #0338
5500 Telegraph Avenue
Oakland, California

Gentlemen:

This site update was prepared to present the results of the March 20, 1990 ground-water sampling and to make recommendations for future work at the above referenced location (Plate 1).

BACKGROUND

Based on the information provided to GeoStrategies Inc. (GSI), the subsurface 1,000 gallon waste oil tank was removed in October, 1988. A soil sample from beneath the tank was collected by Blaine Tech Services, Inc. (Blaine). Blaine presented the results of this sampling event in their report dated October 11, 1988. In this report Blaine inadvertently stated that all constituents analyzed were reported as none detected (ND). GSI reviewed the certified analytical reports which indicated that the chemical analyses revealed Total Oil and Grease (TOG) at a concentration of 81 parts per million (ppm). Total Petroleum Hydrocarbons calculated as Diesel (TPH-Diesel) and Volatile Organic Compounds (VOCs) were reported by the laboratory as ND.

In July 1989, Chevron replaced the subsurface piping associated with the underground gasoline storage tanks. During the removal and replacement of the subsurface piping, contaminated soil was discovered in the western-most pipe trench (closest to Telegraph Avenue). Blaine collected soil samples in the gasoline product line trench on July 11 and 14, 1989. Chemical analyses of soil samples detected Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) ranging from ND to 480 ppm. Blaine issued a report summarizing chemical analytical results and field procedures dated August 9, 1989.

Contaminated soil was excavated and removed from the western-most piping trench in July 1989, in compliance with the Regional Water Quality Control Board (RWQCB) guidelines for investigations associated with leaking underground fuel tanks.

GSI installed three monitoring wells (C-1, C-2 and C-3) at the site during November, 1989. The wells were sampled by Gettler-Ryan Inc. (G-R) on November 21, 1989. The results of this investigation were presented in a Well Installation report dated February 14, 1990.

G-R resampled monitoring wells C-1, C-2 and C-3 on March 20, 1990. The wells were sampled and analyzed for TPH-Gasoline, Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) and priority pollutant metals. In addition, Well C-3 located near the former waste oil tank was analyzed for TOG and TPH-Diesel. The results of this sampling are summarized below.

SITE DESCRIPTION

The site is presently occupied by an operating Chevron Service Station. The station is comprised of two 10,000 gallon tanks and one 7,000 gallon tank containing regular, unleaded and supreme unleaded gasoline, one 1,000 gallon waste oil tank, three fueling islands and the station building. The location of the underground storage complex (UGST) is shown on Plate 2.

CURRENT QUARTERLY SAMPLING RESULTS

Potentiometric Data

Prior to ground-water sampling, depth to ground-water levels were measured in each well using an electronic oil-water interface probe. Static ground-water levels were measured from the surveyed top of well box and recorded to the nearest ±0.01 foot. Groundwater was encountered between 9.44 and 10.39 feet below the top of the well box. The locations of the these monitoring wells are presented on Plate 2.

Ground-water elevation data for this sampling have been plotted and contoured and are presented on (Plate 3) a potentiometric and chemical concentration map. Water-level data indicate an approximate hydraulic gradient of 0.013. Shallow groundwater flows toward the west-southwest. These data appear to be consistent with regional shallow ground-water flow and local topography. A summary of the potentiometric data is presented in Table 1.

Each monitoring well was checked for the presence of separate-phase hydrocarbons using an oil-water interface probe. A clean clear acrylic bailer was used to confirm interface probe results and check for the presence of a product sheen. Separate-phase hydrocarbons were not observed in any of the three wells.

Chemical Analytical Data

Ground-water samples were collected from Wells C-1, C-2 and C-3 by G-R on March 20, 1990. The samples were analyzed for TPH-Gasoline according to EPA Method 8015 (Modified) and BTEX according to EPA Method 8020 and priority pollutant metals using EPA SW 846 3rd Edition, (6000 and 7000 series). In addition, Well C-3 located near the waste oil tank was also analyzed for TPH-Diesel and TOG using EPA Method 503E. The ground-water samples were analyzed by Superior Analytical Laboratory Inc. (Superior), a State-certified environmental laboratory located in San Francisco, California. A copy of the G-R ground-water sampling protocol is presented in Appendix A.

TPH-Gasoline and BTEX were reported as none detected (ND) for all analyzed ground-water samples (Plate 3). Well C-3 located near the waste oil tank was ND for TPH-Diesel and TOG (Table 2). Priority pollutant metals were detected in each of the three wells. Chemical analytical results have been summarized and are presented in Table 2. A comprehensive summary of all the available ground-water analytical data is presented in Table 3. A copy of the G-R ground-water sampling report, Chain-of-Custody form and the Superior analytical report are presented in Appendix B.

HYDROGEOLOGIC CONDITIONS

The site is located on the Bay Plain near the base of the Berkeley Hills. The near surface soils consist of Late Pleistocene alluvium composed of weakly consolidated, slightly weathered, poorly sorted, and irregularly bedded clay, silt, sand and gravel. The primary source of these deposits is the Berkeley Hills to the east. Franciscan Formation rocks outcrop approximately one-half mile to the east. This rock assemblage ranges from Late Jurrasic to Late Cretaceous in age and consists locally of sandstone and shale, Serpentine and greenstone, and occasionally gabbro. The rocks are highly sheared in some areas and the thickness and stratigraphic relationships are obscure to unknown.

The site is located in the Alameda Bay Plain groundwater basin (California Department of Water Resources, 1980). Based on the local topography and surface drainage patterns, shallow groundwater flow in the area is to the west-southwest toward San Francisco Bay. Recharge in the area is by surface infiltration in areas where coarser-grained soils "occur" near the surface.

Lithology beneath the site consists primarily of sandy clays and silts underlain by clayey gravels and silty sand to the total depth explored (approximately 33 feet below ground surface). A clay unit containing varying amounts of sand and gravel was encountered at approximately 28 feet in all three borings. Based on available data, this clay unit may be continuous across the site.

DISCUSSION

Since the installation and sampling of monitoring wells C-1 through C-3 they have not contained detected levels of TPH-Gasoline or BTEX. Analyzed soil samples collected during drilling were also reported ND for hydrocarbons. Concentrations of metals which were found in groundwater samples collected from Well C-3 located near the waste oil tank are suspected to be naturally occurring due to the geology of the nearby source hills and the absence of hydrocarbons in the groundwater in Well C-3. It was initially recommended that all onsite wells be sampled for metals to ascertain whether these concentrations represented background concentrations, or localized contamination from the waste oil tank. The results of this sampling detected the presence of metals in Wells C-1, C-2 and C-3. It is our opinion that these results indicate either 1.) a possible off-site source of metal contamination, or 2.) this is a naturally occurring phenomenon as the result of the composition of the rocks in the East Bay Hills which are located to the east of the site.

RECOMMENDATIONS

GSI recommends quarterly sampling and monitoring of Wells C-1, C-2 and C-3. This is recommended to continue monitoring the wells ND status for TPH-Gasoline and BTEX. In compliance with appropriate RWQCB guidelines, site monitoring and sampling will continue for one year and if after one continuous year of monitoring ND results for TPH-Gasoline and BTEX, site data will be re-evaluated and recommendations will be made for possible site closure.

In addition, GSI recommends that a literature search be conducted at the RWQCB for other sites in the area, particularly upgradient which may represent a possible source area for metals. A literature search should also be conducted to gather geologic and petrologic data regarding the mineralogical composition of the rocks in the East Bay Hills near the site.

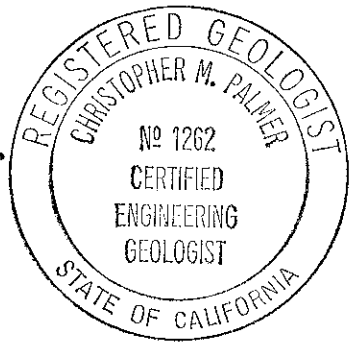
If you have any questions, please call.

GeoStrategies Inc. by,

Melissa L. Wann

Melissa Wann
Project Geologist

Christopher M. Palmer



Christopher M. Palmer
Senior Geologist
C.E.G. 1262, R.E.A. 285

MLW/CMP/mlg

Plate 1. Vicinity Map
Plate 2. Site Plan
Plate 3. Potentiometric and Chemical Concentration Map

Appendix A: Gettler-Ryan Groundwater Sampling Protocol
Appendix B: G-R Groundwater Sampling Report

TABLE 2

GROUND-WATER ANALYSES DATA

WELL NO.	SAMPLE DATE	ALUMINUM (PPM)	ARSENIC (PPM)	BARIUM (PPM)	CADMIUM (PPM)	CHROMIUM (PPM)	COPPER (PPM)	LEAD (PPM)	MERCURY (PPM)	NICKEL (PPM)	SELENIUM (PPM)	SILVER (PPM)	ZINC (PPM)
C-1	20-Mar-90	45	0.014	0.25	<0.005	0.28	0.066	0.016	<0.0004	0.50	<0.003	<0.01	0.18
C-2	20-Mar-90	270	0.11	2.0	<0.005	0.82	0.38	0.12	0.0010	1.4	<0.003	<0.01	1.0
C-3	20-Mar-90	310	0.12	2.5	<0.005	1.0	0.43	0.12	0.0010	1.7	<0.003	<0.01	1.1

Note: 1. All data shown as <x are reported as ND (none detected)

TABLE 3

ANALYTICAL LOG

SAMPLE DATE	SAMPLE POINT	TPH (PPB)	BENZENE (PPB)	TOLUENE (PPB)	E.B. (PPB)	XYLENES (PPB)	ZINC (PPB)	LEAD (PPB)	CHROMIUM (PPB)	CADMIUM (PPB)	DIBROMIDE (PPB)	OIL&GR (PPB)	DIESEL (PPB)
21-Nov-89	C-1	<500.	<0.5	<0.5	<0.5	<0.5	N/A	N/A	N/A	N/A	<0.05	N/A	N/A
20-Mar-90	C-1	<50.	<0.5	<0.5	<0.5	<0.5	0.18	0.016	0.28	<0.005	N/A	N/A	N/A
21-Nov-89	C-2	<500.	<0.5	<0.5	<0.5	<0.5	N/A	N/A	N/A	N/A	<0.05	N/A	N/A
20-Mar-90	C-2	<50.	<0.5	<0.5	<0.5	<0.5	1.0	0.12	0.82	<0.005	N/A	N/A	N/A
21-Nov-89	C-3	<500.	<0.5	<0.5	<0.5	<0.5	1000.	<500.	500.	20.	<0.05	N/A	N/A
12-Jan-90	C-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<5000	<1000
20-Mar-90	C-3	<50.	<0.5	<0.5	<0.5	<0.5	1.1	0.12	1.0	<0.005	N/A	<5000	<50

ALL DATA SHOWN AS <X ARE REPORTED AS ND (NONE DETECTED)

TABLE 1

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYZED DATE	TPH-G (PPB)	BENZENE (PPB)	TOLUENE (PPB)	ETHYLBENZENE (PPB)	XYLENES (PPB)	TPH-D (PPB)	TOG (PPB)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS	DEPTH TO WATER (FT)
C-1	20-Mar-90	23-Mar-90	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	123.88	113.95	----	9.93
C-2	20-Mar-90	23-Mar-90	<50	<0.5	<0.5	<0.5	<0.5	N/A	N/A	124.92	115.48	----	9.44
C-3	20-Mar-90	23-Mar-90	<50	<0.5	<0.5	<0.5	<0.5	<50	<5000	125.64	115.25	----	10.39
TB	20-Mar-90	23-Mar-90	<50	<0.5	<0.5	<0.5	<0.5	<50	N/A	----	----	----	----

CURRENT REGIONAL WATER QUALITY CONTROL BOARD MAXIMUM CONTAMINANT LEVELS

Benzene 1.0 ppb Xylenes 1,750 ppb Ethylbenzene 680 ppb

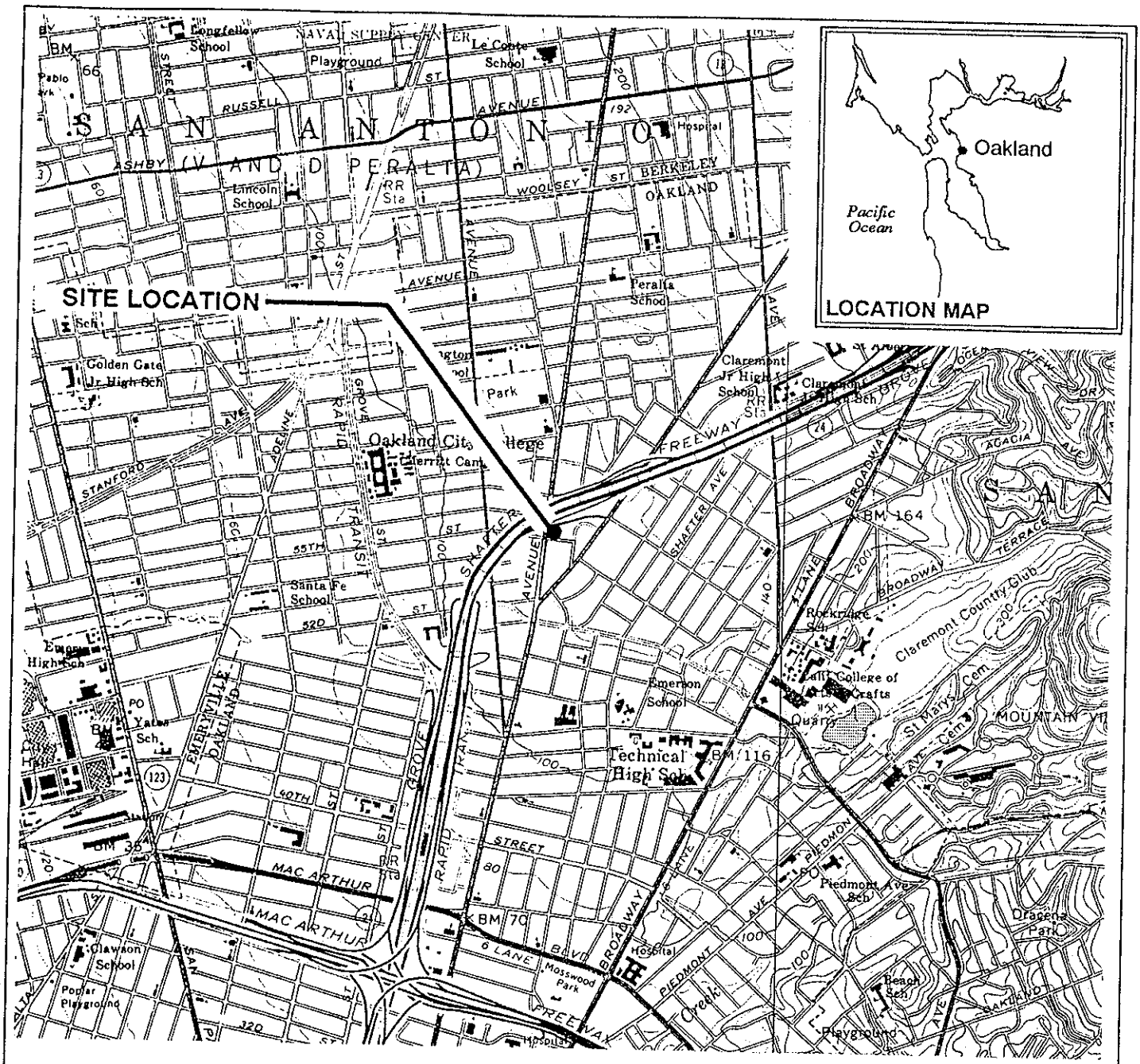
CURRENT DHS ACTION LEVELS

Toluene 100 ppb

TPH-G = Total Petroleum Hydrocarbons as Gasoline
TPH-D = Total Petroleum Hydrocarbons as Diesel
TOG = Total Oil & Grease

PPB = Parts Per Billion
N/A = Not Analyzed
TB = Trip Blank

Note: 1. All data shown as <x are reported as ND (none detected)
2. Water level elevations referenced to mean sea level (MSL)
3. DHS Action Levels and MCLs are subject to change pending State review



Base Map: USGS Topographic Map

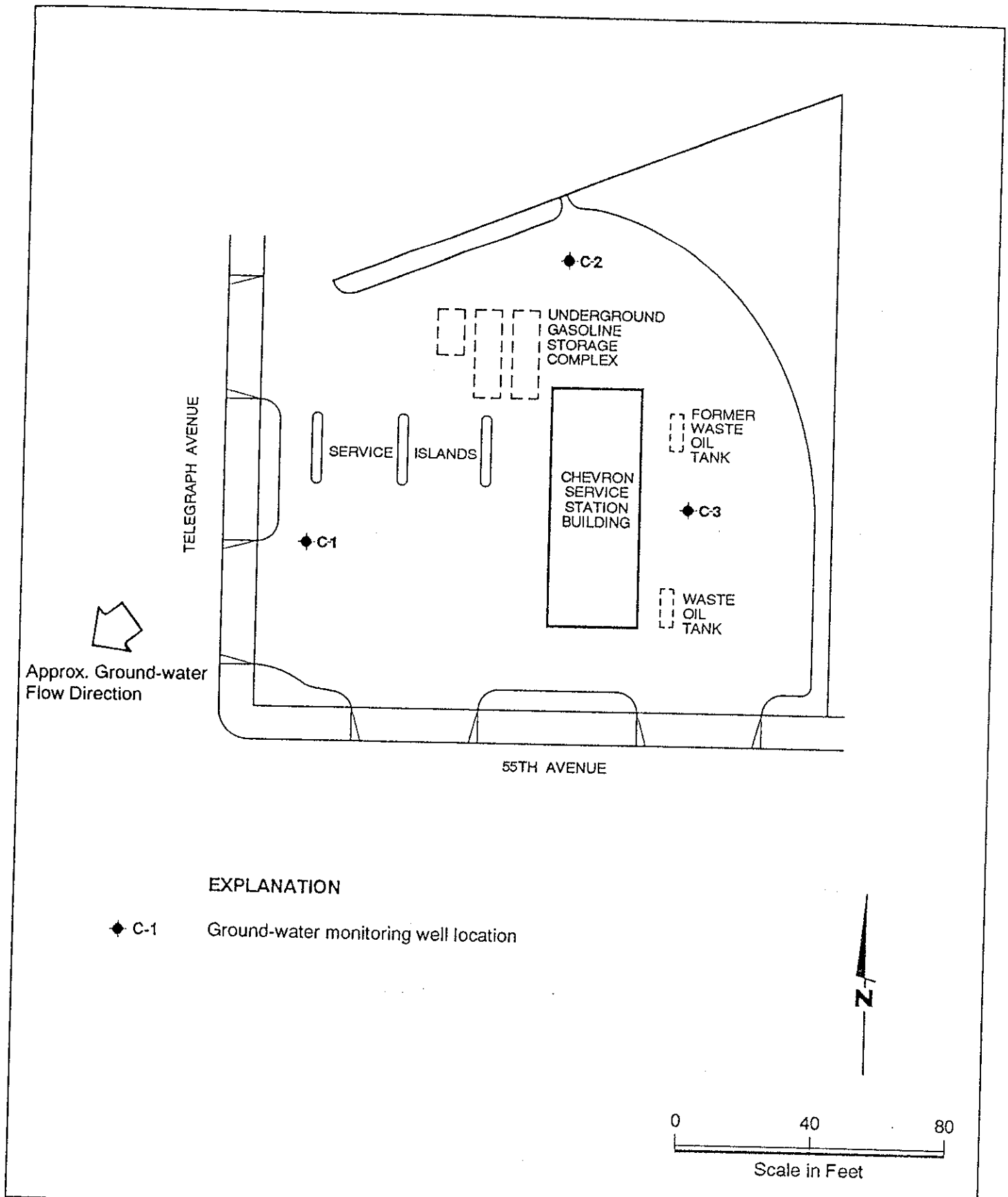
Approximate Scale : 1" = 2000'

GeoStrategies Inc.

Vicinity Map
Chevron Service Station #0338
5500 Telegraph Avenue
Oakland, California

PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7263		1/90		

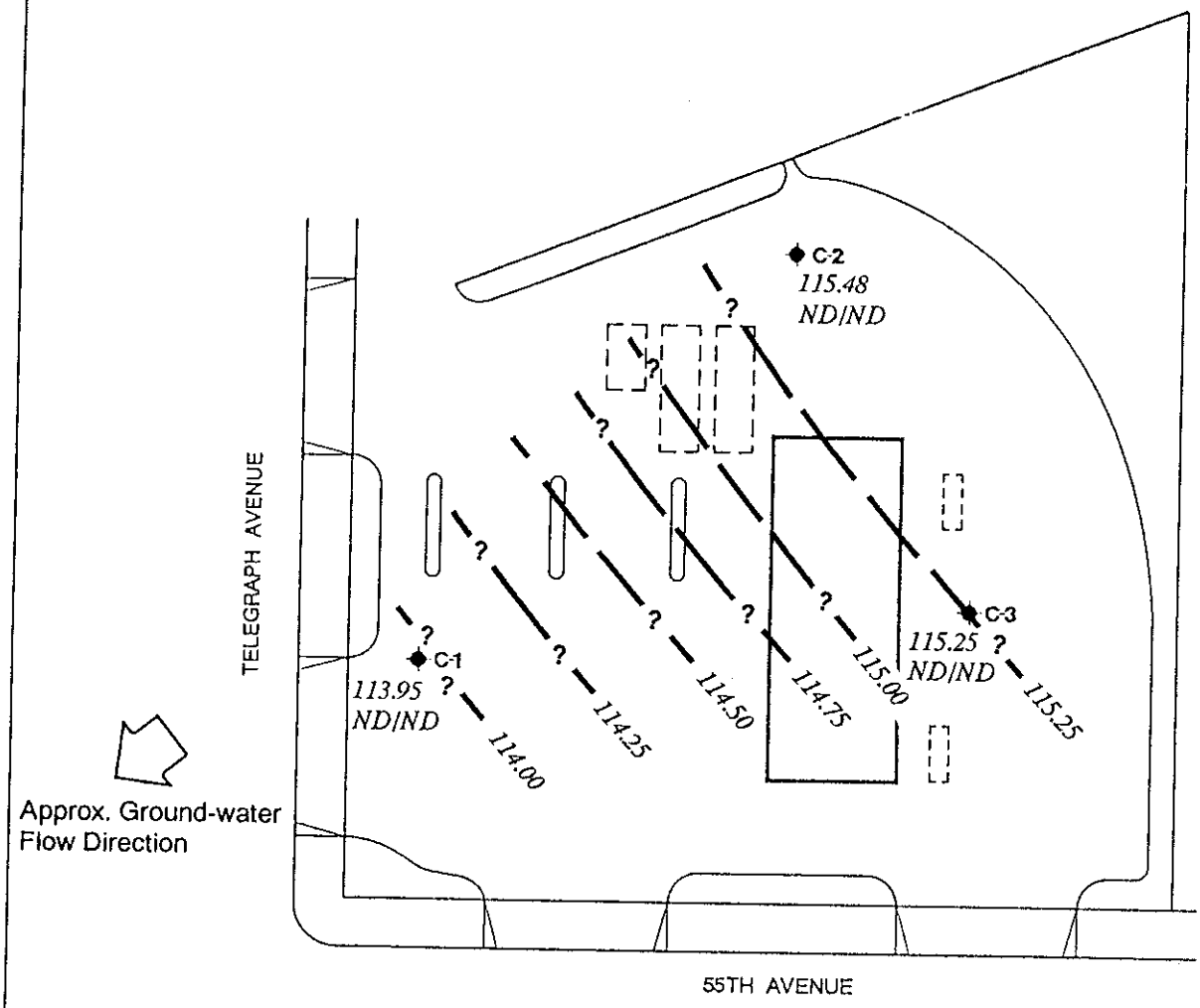


GeoStrategies Inc.

Site Plan
Chevron Service Station #0338
5500 Telegraph Avenue
Oakland, California

PLATE 2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7263		07/90		



EXPLANATION

C-1	Ground-water monitoring well location
114.00	Ground-water elevation contour Approximate Gradient = 0.013
113.95	Ground-water elevation in feet referenced to Mean Sea Level (MSL) measured on March 20, 1990
ND/ND	TPH-G (Total Petroleum Hydrocarbons calculated as Gasoline)/Benzene concentrations in ppb sampled on March 20, 1990
ND	Not Detected (see laboratory reports for detection limits)

N

0 40 80

Scale in Feet

Note: Contours may be influenced by irrigation practices and/or site construction activities

GeoStrategies Inc.

Potentiometric and Chemical Concentration Map
Chevron Service Station #0338
5500 Telegraph Avenue
Oakland, California

PLATE **3**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7263		07/90		

GROUND-WATER SAMPLING AND ANALYSIS

Quality Assurance/Quality Control Objectives

The sampling and analysis procedures employed by Gettler-Ryan Inc. (G-R) for ground-water sampling and monitoring follow specific Quality Assurance/Quality Control (QA/QC) guidelines. Quality Assurance objectives have been established by G-R to develop and implement procedures for obtaining and evaluating water quality and field data in an accurate, precise, and complete manner so that sampling procedures and field measurements provide information that is comparable and representative of actual field conditions. Quality Control (QC) is maintained by G-R by using specific field protocols and requiring the analytical laboratory to perform internal and external QC checks. It is the goal of G-R to provide data that are accurate, precise, complete, comparable, and representative. The definitions for accuracy, precision, completeness, comparability, and representativeness are as follows:

- Accuracy - the degree of agreement of a measurement with an accepted referenced or true value.

- Precision - a measure of agreement among individual measurements under similar conditions. Usually expressed in terms of the standard deviation.

- Completeness - the amount of valid data obtained from a measurement system compared to the amount that was expected to meet the project data goals.

- Comparability - expresses the confidence with which one data set can be compared to another.

- Representativeness - a sample or group of samples that reflects the characteristics of the media at the sampling point. It also includes how well the sampling point represents the actual parameter variations which are under study.

As part of the G-R QA/QC program, applicable federal, state, and local reference guidance documents are followed. The procedures outlined in these regulations, manuals, handbooks, guidance documents, and journals are incorporated into the G-R sampling procedures to assure that; (1) ground-water samples are properly collected, (2) ground-water samples are identified, preserved, and transported in a manner such that they are representative of field conditions, and (3) chemical analysis of samples are accurate and reproducible.

April 20, 1990

Guidance and Reference Documents Used to Collect Groundwater Samples

These documents are used to verify G-R sampling procedures and are consistent with current regulatory guidance. If site specific work and sampling plans are required, those plans will be developed from these documents, and newly received applicable documents.

U.S.E.P.A. - 330/9-51-002	NEIC Manual for Groundwater/Subsurface Investigation at Hazardous Waste Sites
U.S.E.P.A. - 530/SW611	Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities (August, 1977)
U.S.E.P.A. - 600/4-79-020	Methods for Chemical Analysis of Water and Wastes (1983)
U.S.E.P.A. - 600/4-82-029	Handbook for Sampling and Sample Preservation of Water and Wastewater (1982)
U.S.E.P.A. - 600/4-82-057	Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater (July, 1982)
U.S.E.P.A. - SW-846#, 3rd Edition	Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (November, 1986)
40 CFR 136.3e,Table II (Code of Federal Regulations)	Required Containers, Preservation Techniques, and Holding Times
Resources Conservation and Recover Act (OSWER 9950.1)	Groundwater Monitoring Technical Enforcement Guidance Document (September, 1986)
California Regional Water Quality Control Board (Central Valley Region)	A Compilation of Water Quality Goals (September, 1988); Updates (October, 1988)
California Regional Water Quality Control Board (North Coast, San Francisco Bay, and Central Valley)	Regional Board Staff Recommendations for Initial Evaluations and Investigation of Underground Tanks: Tri-Regional Recommendations (June, 1988)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Control Board	Leaking Underground Fuel Tank (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)
State of California Water Resources Control Board	Title 23, (Register #85.#33-8-17-85), Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, Sections 2645, 2646, 2647, and 2648; Article 7, Sections 2670, 2671, and 2672 (October, 1986: including 1988 Amendments)
Alameda County Water District	Groundwater Protection Program: Guidelines for Groundwater and Soil Investigations at Leaking Underground Fuel Tank Sites (November, 1988)
American Public Health Association	Standard Methods for the Examination of Water and Wastewaters, 16th Edition
Analytical Chemistry (journal)	Principles of Environmental Analysis, Volume 55, Pages 2212-2218 (December, 1983)
Napa County	Napa County Underground Storage Tank Program: Guidelines for Site Investigations; February 1989.
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)

Guidance and Reference Documents Used to Collect Groundwater Samples (cont.)

Santa Clara Valley Water District	Investigation and Remediation at Fuel Leak sites: Guidelines for Investigation and Technical Report Preparation (March 1989)
Santa Clara Valley Water District	Revised Well Standards for Santa Clara County (July 18, 1989)
American Petroleum Institute	Groundwater Monitoring & Sample Bias; API Publication 4367, Environmental Affairs Department, June 1983
American Petroleum Institute	A Guide to the Assessment and Remediation of Underground Petroleum Releases; API Publication 1628, February 1989
American Petroleum Institute	Literature Summary: Hydrocarbon Solubilities and Attenuations Mechanisms, API Publication 4414, August 1985
Site Specific (as needed)	General and specific regulatory documents as required.

Because ground-water samples collected by G-R are analyzed to the parts per billion (ppb) range for many compounds, extreme care is exercised to prevent contamination of samples. When volatile or semi-volatile organic compounds are included for analysis, G-R sampling crew members will adhere to the following precautions in the field:

1. A clean pair of new, disposable gloves are worn for each well being sampled.

2. When possible, samples are collected from known or suspected wells that are least contaminated (i.e. background) followed by wells in increasing order of contamination.

3. Ambient conditions are continually monitored to maintain sample integrity.

When known or potential organic compounds are being sampled for, the following additional precautions are taken:

1. All sample bottles and equipment are kept away from fuels and solvents. When possible, gasoline (used in generators) is stored away from bailers, sample bottles, purging pumps, etc.

2. Bailers are made of Teflon or Stainless Steel. Other materials such as plastic may contaminate samples with phthalate esters which interfere with many Gas Chromatography (GC) analyses.

3. Volatile organic ground-water samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples): sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle; the Teflon side of the septum (in cap) is positioned against the meniscus, and the cap screwed on tightly; the sample is inverted and the bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.

4. Extra Teflon seals are brought into the field in case seals are difficult to handle and/or are dropped. Dropped seals are considered contaminated and are not used. When replacing seals or if seals become flipped, care is taken to assure that the Teflon seal faces down.

Sample analysis methods, containers, preservatives and holding times are shown on Table 1.

Laboratory and field handling procedures of samples are monitored by including QC samples for analysis with every submitted sample lot from a project site. QC samples may include any combination of the following:

A. Trip Blank: Used for purgeable organic compounds only; QC samples are collected in 40 milliliter (ml) sample vials filled in the analytical laboratory with organic-free water. Trip blanks are sent to the project site, and travel with project site samples. Trip blanks are not opened, and are returned from a project site with the project site samples for analysis.

B. Field Blank: Prepared in the field using organic-free water. These QC samples accompany project site samples to the laboratory and are analyzed for specific chemical parameters unique to the project site where they were prepared.

C. Duplicates: Duplicated samples are collected "second samples" from a selected well and project site. They are collected as either split samples or second-run samples collected from the same well.

D. Equipment Blank: Periodic QC sample collected from field equipment rinsate to verify decontamination procedures.

The number and types of QC samples are determined as follows:

A. Up to 2 wells - Trip Blank Only

B. 2 to 5 Wells - 1 Field Blank and 1 Trip Blank

C. 5 to 10 Wells - 1 Field blank, 1 Trip Blank, and 1 Duplicate

D. More than 10 Wells - 1 Field Blank, 1 Trip Blank, and 1 Duplicate per each 12 wells

E. If sampling extends beyond one day, quality control samples will be collected for each day.

Additional QC is performed through ongoing and random reviews of duplicate samples to evaluate the precision of the field sampling procedures and analytical laboratory. Precision of QC data is accomplished by calculating the Relative Percent Difference (RPD). The RPD is evaluated to assess whether values are within an acceptable range (typically ± 20% of duplicate sample).

SAMPLE COLLECTION

This section describes the routine procedures followed by G-R while collecting ground-water samples for chemical analysis. These procedures include decontamination, water-level measurements, well purging, physical parameter measurements, sample collection, sample preservation, sample handling, and sample documentation. Critical sampling objectives for G-R are to:

1. Collect ground-water samples that are representative of the sampled matrix and,

2. Maintain sample integrity from the time of sample collection to receipt by the analytical laboratory.

Sample analyses methods, containers, preservation, and holding times are presented in Table 1.

Decontamination Procedures

All physical parameter measuring and sampling equipment are decontaminated prior to sample collection using Alconox or equivalent detergent followed by steam cleaning with deionized water. Any sampling equipment surfaces or parts that might absorb specific contaminants, such as plastic pump valves, impellers, etc., are cleaned in the same manner.

Sample bottles, bottle caps, and septa used for sampling volatile organics are thoroughly cleaned and prepared in the laboratory. Sample bottles, bottle caps, and septa are protected from all potential chemical contact before actual usage at a sample location.

During field sampling, equipment placed in a well are decontaminated before purging or sampling the next well. The equipment are decontaminated by cleaning with Alconox or equivalent detergent followed by steam cleaning with deionized water.

Water-Level Measurements

Prior to purging and sampling a well, the static-water levels are measured in all wells at a project site using an electric sounder and/or calibrated portable oil-water interface probe (Figure 4). Both static water-level and separate-phase product thickness are measured to the nearest ±0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest ±0.01 foot with a decimal scale tape.

Water-Level Measurements (continued)

The monofilament line used to lower the bailer is replaced between wells with new line to preclude the possibility of cross-contamination. Field observations (e.g. well integrity, product color, turbidity, water color, odors, etc.) are noted on the G-R Well Sampling Field Data Sheet shown in Figure 4. Before and after each use, the electric sounder, interface probe and bailer are decontaminated by washing with Alconox or equivalent detergent followed by rinsing with deionized water to prevent cross-contamination.

As mentioned previously, water-levels are measured in wells with known or suspected lowest dissolved chemical concentrations to the highest dissolved concentrations.

Well Purging

Before sampling occurs, well casing storage water and interstitial water in the artificial sand pack will be purged using (1) a positive displacement bladder pump constructed of inert, non-wetting, Teflon and stainless steel, (2) a pneumatic-airlift pumping system, (3) a centrifigal pumping system, or (4) a Teflon or Stainless steel bailer (Figure 5). Methods of purging will be assessed based on well size, location, accessibility, and known chemical conditions. Individual well purge volumes are calculated from borehole volumes which take into account the sand packed interval in the well annular space. As a general rule, a minimum of 3 and a maximum of 10 borehole volumes will be purged. Wells which dewater or demonstrate slow recharge periods (i.e. low-yield wells) during purging activities may be sampled after fewer purging cycles. If a low-yield (low recovery) well is to be sampled, sampling will not take place until at least 80 percent of the previously measured water column has been replaced by recharge, or as per local requirements. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used by the G-R sampling crew as indicators for assessing sufficient purging. Purging is continued until all three physical parameters have stabilized. Specific conductance (conductivity) meters are read to the nearest ± 10 umhos/cm, and are calibrated daily. pH meters are read to the nearest ± 0.1 pH units and are calibrated daily. Temperature is read to the nearest 0.1 degree F. Calibration of physical parameter meters will follow manufacturers specifications. Monitoring wells will be purged according to the protocol presented in Figure 5. Collected field data during purging activities will be entered on the G-R Well Sampling Field Data Sheet shown in Figure 4. Copies of the G-R Field Data Sheets will be reviewed by the G-R Sampling Manager for accuracy and completeness.

DOCUMENTATION

Sample Container Labels

Each sample container will be labeled by an adhesive label, noted in permanent ink immediately after the sample is collected. Label information will include:

Sample point designation (i.e. well number or code)

Sampler's identification

Project number

Date and time of collection

Type of preservation used

Well Sampling Data Forms

In the field, the G-R sampling crew will record the following information on the Well Sampling Data Sheet for each sample collected:

Project number

Client

Location

Source (i.e. well number)

Time and date

Well accessibility and integrity

Pertinent well data (e.g. depth, product thickness, static water-level, pH, specific conductance, temperature)

Calculated and actual purge volumes

Chain-of-Custody

A Chain-of-Custody record (Figure 6) shall be completed and accompany every sample and every shipment of samples to the analytical laboratory in order to establish the documentation necessary to trace sample possession from time of collections. The record will contain the following information:

- Sample or station number or sample identification (ID)
- Signature of collector, sampler, or recorder
- Date and time of collection
- Place of collection
- Sample type
- Signatures of persons involved in chain of possession
- Inclusive dates of possession

Samples shall always be accompanied by a Chain-of-Custody record. When transferring the samples, the individual relinquishing and receiving the samples will sign, date, and note the time on the Chain-of-Custody record. G-R will be responsible for notifying the laboratory coordinator when and how many samples will be sent to the laboratory for analysis, and what types of analyses shall be performed.

TABLE 1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIONS, AND HOLDING TIMES

Parameter	Analytical Method	Reporting Units	Container	Preservation	Maximum Holding Time
Total Petroleum Hydrocarbons (gasoline)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon	cool, 4 C HC1 to pH<2	14 days (maximum)
Benzene Toluene Ethylbenzene Xylenes (BTEX)	EPA 8020	mg/l ug/l mg/l	50 ml. vial glass, Teflon lined septum 1 l glass, Teflon	cool, 4 C HC1 to pH<2	7 days (w/o preservative) 14 days (w preservative)
Oil & Grease	SM 503E	ug/l	lined septum	H2SO4 to pH<2	28 days (maximum)
Total Petroleum Hydrocarbons (Diesel)	EPA 8015 (modified)	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Halogented Volatile Organics (chlorinated solvents)	8010	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Non chlorinated solvents	8020	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C HCl to pH<2	14 days (maximum)
Volatile Organics	8240	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool, 4 C	14 days (maximum)
Semi-Volatile Organics	8270	mg/l ug/l	40 ml. vial glass, Teflon lined septum	cool , 4 C	14 days (maximum)
Specific Conductance (Field test)		umhos/cm			
pH (Field test)		pH units			
Temperature (Field test)		Deg F			

gettler — ryan inc.

April 9, 1990

GROUNDWATER SAMPLING REPORT

Chevron U.S.A. Inc.
Post Office Box 5004
San Ramon, California 94583-0804

Referenced Site: Chevron Service Station #0338
5500 Telegraph Ave/55th St.
Oakland, California

Sampling Date: March 20, 1990

This report presents the results of the quarterly groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on March 20, 1990 at the referenced location. The site is occupied by an operating service station located on the northeast corner of Telegraph Avenue and 55th Avenue. The service station has underground storage tanks containing regular leaded, unleaded and super unleaded gasoline products, diesel and waste oil.

There are currently three groundwater monitoring wells on site at the locations shown on the attached site map. Prior to sampling, the monitoring wells were inspected for total well depth, water levels, and presence of separate phase hydrocarbons using an electronic interface probe. A clean acrylic bailer was used to visually confirm the presence and thickness of separate phase hydrocarbons. Groundwater depths ranged from 9.44 to 10.39 feet below grade. Separate phase hydrocarbons were not observed in any monitoring wells.

The wells were then purged and sampled. The purge water was drummed for proper disposal. Standard sampling procedure calls for a minimum of four case volumes to be purged from each well. The well was purged while pH, temperature, and conductivity measurements were monitored for stability. Details of the final well purging results are presented on the attached Table of Monitoring Data. In cases where a well dewatered or less than four case volumes were purged, groundwater samples were obtained after the physical parameters had stabilized. Under such circumstances the sample may not represent actual formation water due to low flow conditions.

Samples were collected, using Teflon bailers, in properly cleaned and laboratory prepared containers. All sampling equipment was thoroughly cleaned after each well was sampled and steam cleaned upon completion of work at the site. A trip blank, supplied by the laboratory, was included and analyzed to assess quality control. Analytical results for the trip blank are included in the certified analytical report (CARs). The samples were labeled, stored on blue ice, and transported to the laboratory for analysis. Chain of custody records were established noting sample identification numbers, time, date, and custody signatures.

1992 national avenue • hayward, california 94545-1787 • (415) 783-7500

The samples were analyzed at Superior Analytical Laboratory located at 1555 Burke, Unit 1, San Francisco, California. The laboratory is assigned a California DHS-HMTL Certification number of 220. The results are presented as a Certified Analytical Report, a copy of which is attached to this report.

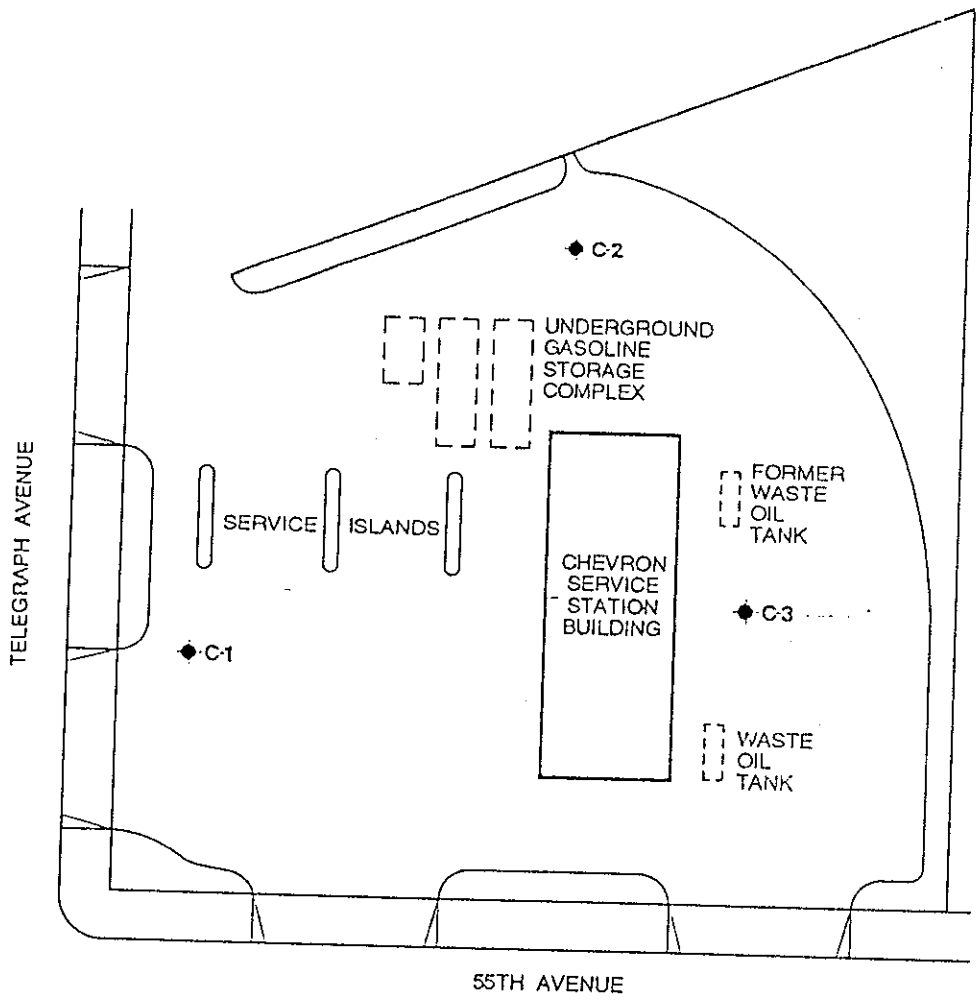
Tom Paulson
Sampling Manager

attachments

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

WELL I.D.	C-1	C-2	C-3
Casing Diameter (inches)	2	2	2
Total Well Depth (feet)	30.2	29.1	28.3
Depth to Water (feet)	9.93	9.44	10.39
Free Hydrocarbons (feet)	none	none	none
Reason Not Sampled	----	----	----
Calculated 4 Case Vol.(gal.)	13.8	13.4	12.2
Did Well Dewater?	no	no	no
Volume Evacuated (gal.)	14	17	15
Purging Device	Bailer	Bailer	Bailer
Sampling Device	Bailer	Bailer	Bailer
Time	15:06	14:19	14:51
Temperature (F)*	68.5	65.3	64.4
pH*	6.98	7.19	6.84
Conductivity (umhos/cm)*	957	812	543

* Indicates Stabilized Value



EXPLANATION

C-1 Ground-water monitoring well location

N

0 40 80

Scale in Feet

GeoStrategies Inc.

Site Plan
Chevron Service Station #0338
5500 Telegraph Avenue
Oakland, California

PLATE

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
263				

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE, UNIT I · SAN FRANCISCO, CA 94124 · PHONE (415) 647-2081

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 10581
CLIENT: Chevron USA
CLIENT JOB NO.: 3203

DATE RECEIVED: 03/21/90
DATE REPORTED: 04/04/90

Lab Number	Customer Sample Identification	Date Sampled	Date Analyzed
10581- 1	C-1	03/20/90	03/23/90
10581- 2	C-2	03/20/90	03/23/90
10581- 3	C-3	03/20/90	03/23/90
10581- 4	Trip Blank	03/20/90	03/23/90

Laboratory Number:	10581 1	10581 2	10581 3	10581 4
ANALYTE LIST	Amounts/Quantitation Limits (ug/l)			
OIL AND GREASE:	NA	NA	ND<5000	NA
TPH/GASOLINE RANGE:	ND<50	ND<50	ND<50	ND<50
TPH/DIESEL RANGE:	NA	NA	ND<50	ND<50
BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
TOLUENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
ETHYL BENZENE:	ND<0.5	ND<0.5	ND<0.5	ND<0.5
XYLENES:	ND<0.5	ND<0.5	ND<0.5	ND<0.5

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE, UNIT I · SAN FRANCISCO, CA 94124 · PHONE (415) 647-2081

CERTIFICATE OF ANALYSIS

ANALYSIS FOR TOTAL PETROLEUM HYDROCARBONS
Diesel by Modified EPA SW-846 Method 8015
Gasoline by Purge and Trap: EPA MEthod 8015/5030
ANALYSIC FOR BENZENE, TOLUENE, ETHYL BENZENE & XYLENES
by EPA SW-840 Methods 5030 and 8020

QA/QC INFORMATION
SET: 10581

NA = ANALYSIS NOT REQUESTED
ND = ANALYSIS NOT DETECTED ABOVE QUANTITATION LIMIT

ug/L = part per billion (ppb)

OIL AND GREASE ANALYSIS By Standard Methods Method 503E:
Duplicate RPD = 0%
Minimum Detection Limit in Water: 5000ug/L

Modified EPA Method 8015 for Extractable Hydrocarbons:
Minimum Quantitation Limit for Diesel in Water: 50ug/L
Daily Standard run at 200mg/L; RPD Diesel = <15%
MS/MSD Average Recovery = 97%: Duplicate RPD = <1%

8015/5030 Total Purgable Petroleum Hydrocarbons:
Minimum Quantitation Limit for Gasoline in Water: 50ug/L
Daily Standard run at 2mg/L; RPD Gasoline = <15%
MS/MSD Average Recovery = 80%: Duplicate RPD = 0%

8020/BTXE
Minimum Quantitation Limit in Water: 0.50ug/L
Daily Standard run at 20ug/L; RPD = <15%
MS/MSD Average Recovery = 100%: Duplicate RPD = <4%

Richard Srna, Ph.D.
Laboratory Director

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE, UNIT I · SAN FRANCISCO, CA 94124 · PHONE (415) 647-2081

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

LABORATORY NO.: 10581-1
CLIENT: Chevron USA

DATE RECIEVED: 03/21/90
DATE REPORTED: 04/04/90
JOB NO: 3203

23 CLP METALS
Methods: EPA SW 846 6000 & 7000 SERIES

SAMPLE: C-1

Compound	Results (mg/l)	(mg/l) Detection limit	EPA METHOD
Aluminum	45	0.05	7020
Antimony	ND	0.03	6010
Arsenic	0.014	0.003	7060
Barium	0.25	0.005	6010
Beryllium	ND	0.002	6010
Cadmium	ND	0.005	6010
Calcium	91	0.01	7140
Chromium (total)	0.28	0.005	6010
Cobalt	0.03	0.01	6010
Copper	0.066	0.006	6010
Iron	84	0.008	7380
Lead	0.016	0.003	6010
Magnesium	73	0.004	7450
Manganese	0.81	0.003	7460
Mercury	ND	0.0004	7470
Nickel	0.50	0.01	6010
Potassium	8.7	0.01	7610
Selenium	ND	0.003	7740
Silver	ND	0.01	6010
Sodium	64	0.1	7770
Thallium	0.005	0.005	7841
Vanadium	0.14	0.01	6010
Zinc	0.18	0.02	6010

mg/l = part per million (ppm)
QA/QC Summary: Spike Recovery Range: 92-117%
Analysis subcontracted to Kennedy/Jenks/Chilton DOHS# 113.

Richard Srna, Ph.D.

Laboratory Director

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE, UNIT I · SAN FRANCISCO, CA 94124 · PHONE (415) 647-2081

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 10581-2
CLIENT: Chevron USA

DATE RECIEVED: 03/21/90
DATE REPORTED: 04/04/90
JOB NO: 3263

23 CLP METALS
Methods: EPA SW 846 6000 & 7000 SERIES

SAMPLE: C-2

Compound	Results (mg/l)	(mg/l) Detection limit	EPA METHOD
Aluminum	270	0.05	7020
Antimony	ND	0.03	6010
Arsenic	0.11	0.003	7060
Barium	2.0	0.005	6010
Beryllium	ND	0.002	6010
Cadmium	ND	0.005	6010
Calcium	100	0.01	7140
Chromium (total)	0.82	0.005	6010
Cobalt	0.20	0.01	6010
Copper	0.38	0.006	6010
Iron	450	0.008	7380
Lead	0.12	0.003	6010
Magnesium	130	0.004	7450
Manganese	9.5	0.003	7460
Mercury	0.0010	0.0004	7470
Nickel	1.4	0.01	6010
Potassium	29	0.01	7610
Selenium	ND	0.003	7740
Silver	ND	0.01	6010
Sodium	47	0.1	7770
Thallium	ND	0.005	7841
Vanadium	0.70	0.01	6010
Zinc	1.0	0.02	6010

mg/l = part per million (ppm)
QA/QC Summary: Spike Recovery Range: 92-117%
Analysis subcontracted to Kennedy/Jenks/Chilton DOHS# 113.

Richard Srna, Ph.D.

Laboratory Director

SUPERIOR ANALYTICAL LABORATORY, INC.
1555 BURKE, UNIT I · SAN FRANCISCO, CA 94124 · PHONE (415) 647-2081

CERTIFICATE OF ANALYSIS

LABORATORY NO.: 10581-3
CLIENT: Chevron USA

DATE RECIEVED: 03/21/90
DATE REPORTED: 04/04/90
JOB NO: 3263

23 CLP METALS
Methods: EPA SW 846 6000 & 7000 SERIES

SAMPLE: C-3

Compound	Results (mg/l)	(mg/l) Detection limit	EPA METHOD
Aluminum	310	0.05	7020
Antimony	ND	0.03	6010
Arsenic	0.12	0.003	7060
Barium	2.5	0.005	6010
Beryllium	0.002	0.002	6010
Cadmium	ND	0.005	6010
Calcium	85	0.01	7140
Chromium (total)	1.0	0.005	6010
Cobalt	0.21	0.01	6010
Copper	0.43	0.006	6010
Iron	530	0.008	7380
Lead	0.12	0.003	6010
Magnesium	130	0.004	7450
Manganese	9.2	0.003	7460
Mercury	0.0010	0.0004	7470
Nickel	1.7	0.01	6010
Potassium	32	0.01	7610
Selenium	ND	0.003	7740
Silver	ND	0.01	6010
Sodium	49	0.1	7770
Thallium	ND	0.005	7841
Vanadium	0.79	0.01	6010
Zinc	1.1	0.02	6010

mg/l = part per million (ppm)
QA/QC Summary: Spike Recovery Range: 92-117%
Analysis subcontracted to Kennedy/Jenks/Chilton DOHS# 113.

Richard Srna, Ph.D.

Laboratory Director

STA # 10581

Chain-of-Custody Record

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

Chevron Facility Number 0338
Consultant Release Number
Consultant Project Number 3263
Consultant Name Gettler-Ryan Inc.
Address 2150 W. Winton Ave Hayward
Fax Number 415 783-1089
Project Contact (Name) ~~Jerry Mitchell~~ Tom Paulsen
(Phone) 783-7500

Chevron Contact (Name) John Kunkel
(Phone)
Laboratory Name Superior
Contract Number 264690
Samples Collected by (Name) P. Dye
Collection Date 3/20/90
Signature Phillip J Dye

Sample Number	Lab Number	Number of Containers	Matrix S = Soil W = Water A = Air C = Charcoal	Type G = Grab C = Composite	Time	Sample Preservation	Iced	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline	Modified EPA 8015 Total Petro. Hydrocarb. as Gasoline + Diesel	503 Oil and Grease	Arom. Volatiles - BTXE Soil: 8020/Wtr.: 602	Arom. Volatiles - BTXE Soil: 8240/Wtr.: 624	Total Lead DHS-Luft	EDB DHS-AB 1803	TCAP metals 13 + 17 priority pollutant		Remarks
C-1		5	W		1506	3-HCl 2-HNO_3	Y	✓			✓				✓		
C-2		4	↓		1419	3-HCl 1-HNO_3	↓	✓			✓				✓		
C-3		8	↓		1451	7-HCl 1-HNO_3	↓		✓	✓	✓				✓		
Tr. Blank		2	↓		—	HCl	↓		✓	✓	✓						

Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	Turn Around Time (Circle Choice)
Phillip J Dye	GR	3-20/90		Gettler Ryan	3/21/90 07:30	24 Hrs
Relinquished By (Signature)	Organization	Date/Time	Received By (Signature)	Organization	Date/Time	48 Hrs
	GR	3/21/90 1:00		Express Mail		5 Days
Relinquished By (Signature)	Organization	Date/Time	Received For Laboratory By (Signature)		Date/Time	10 Days
		3/21/90 13:10			3/21/90 1:10	

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