Shell Oil Company

P.O. Box 4023
Concord, CA 94520

Telephone: (415) 676-1414

7/19/89

July 14, 1989

Mr. Tom Callaghan
Regional Water Quality Control Board
San Francisco Bay Region
1111 Jackson St., Rm. 6040
Oakland, California 94607

SUBJECT: SHELL SERVICE STATION
461 EIGHTH STREET 94607
OAKLAND, CALIFORNIA

Dear Mr. Callaghan:

Enclosed is a copy of the report issued by GeoStrategies Inc., dated July 13, 1989, documenting the quarterly groundwater sampling and site activities conducted between April 1989 through June 1989 at the subject location.

If you should have any questions or comments regarding this project please do not hesitate to call me at (415) 676-1414 ext. 127.

Very truly yours,

Diane M. Lundquist
Environmental Engineer

DML/jw

enclosure

cc: Mr. Rafat Shahid, Alameda County Environmental Health
Mr. John Werfal, Gettler-Ryan Inc.

GeoStrategies Inc.

QUARTERLY GROUND-WATER SAMPLING REPORT

APRIL - JUNE 1989

Shell Service Station
461 8th Street
Oakland, California

Report No. 7644-2

June 13, 1989

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

June 13, 1989

Gettler-Ryan Inc.
1992 National Avenue
Hayward, California 94545

Attn: Mr. John Werfal

Re: QUARTERLY MONITORING REPORT
Shell Service Station
461 8th Street
Oakland, California

Gentlemen:

This quarterly monitoring report has been prepared for the above referenced site, for the April through June, 1989 quarter.

If you have any questions, please call.

GeoStrategies Inc. by,

Jeffrey L. Peterson/cmp

Jeffrey L. Peterson
Senior Hydrogeologist
R.E.A. 1021

Christopher M. Palmer

REGISTERED GEOLOGIST
CHRISTOPHER M. PALMER
№ 1262
CERTIFIED
ENGINEERING
GEOLOGIST
STATE OF CALIFORNIA

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

JLP/CMP/kj

Report No. 7644-2

1.0 INTRODUCTION

This Quarterly Ground-Water Sampling Report has been prepared for the Shell Service Station located at 461 8th Street in Oakland, California (Plate 1).

This report describes the results of the second quarterly ground-water sampling for 1989 performed by Gettler-Ryan Inc. (G-R), in accordance with the current quarterly monitoring plan for the site. Field work and laboratory analysis methods were performed in compliance with current State of California Water Resources Control Board (SWRCB) procedures for conducting environmental investigations related to leaking underground fuel tanks. The field and chemical analytical data discussed in this report were collected between April 1, and June 30, 1989.

2.0 SITE HISTORY

In January 1979, the Bay Area Rapid Transit (BART) discovered gasoline leaking into an underground rail tube near the corner of the former Shell Service Station located at 461 8th Street in Oakland, California. As a result, a total of seven (7) monitoring wells were installed at the site (S-1 through S-7). These wells were installed to evaluate soil and ground-water quality conditions at the site. Monitoring well S-5 was found to contain separate-phase petroleum hydrocarbons (floating product); approximately 0.5 feet in measured thickness.

In 1982, a ground-water recovery system was installed at the site to attenuate known ground-water quality conditions. In 1983, the discharge permit for the recovery system was revoked because gasoline concentrations in effluent water exceeded established discharge requirements. In 1986, EMCON Associates (EMCON) submitted a report addressing the necessary steps to remove the recovery system. In October 1987, separate-phase product was pumped from Well S-5 using a vacuum truck. In November 1987, the BART tube was checked for gasoline seepage. No seepage or vapors were detected at that time.

Quarterly ground-water sampling at the former Service Station began in October 1988. Wells S-4, S-5, and S-6 were sampled and analyzed for Total Petroleum Hydrocarbons (TPH); and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX). Low boiling TPH (gasoline concentrations) in ground-water samples ranged from 0.13 parts per million (ppm) to 110. ppm. Benzene concentrations ranged from 0.0038 ppm to 29. ppm. The results of this sampling effort were reported by G-R (report dated January 9, 1989).

2.0 SITE HISTORY (continued)

The first quarter 1989 ground-water sampling began in January. Monitoring wells S-4, S-5, and S-6 were sampled and identified TPH concentrations ranging from none detected (ND) to 94 ppm. Benzene concentrations ranged from 0.0005 ppm to 18.0 ppm. The results of this sampling effort were reported by G-R (report dated April 14, 1989).

3.0 GROUND-WATER LEVEL MONITORING

3.1 Potentiometric Data

Prior to ground-water sampling, water levels were measured in each monitoring well using an electric well sounder (Table 1). Static water levels were measured from the surveyed top of well box and recorded to the nearest ±0.01 foot. Plate 1 presents the location of each well at the site.

Ground-water elevation data for this quarter have been plotted and are presented on Plate 2. Ground-water elevations may be tidally influenced in the site region. See Appendix B for current water-level measurements for this quarter.

3.2 Floating-Product Measurements

Separate-phase petroleum hydrocarbons (floating product) were measured in each well using a calibrated portable oil-water interface probe. Floating-product thicknesses were measured and recorded to the nearest ±0.01 foot. A heavy separate phase product sheen was observed in monitoring well S-5 on May 1, 1989 (see Appendix B).

4.0 CHEMICAL ANALYTICAL DATA

Ground-water samples were collected from site monitoring wells on May 1, 1989. The ground-water samples were analyzed for Total Petroleum Hydrocarbons (TPH) according to EPA Method 8015 (Modified); and Benzene, Toluene, Ethylbenzene, and Xylenes (BTEX) according to EPA Method 8020. The State-Certified analytical laboratory that performed gas chromatography analysis on the ground-water samples was International Technology Corporation (IT), of San Jose, California.

TABLE 1

GROUND-WATER ANALYSES DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH (PPM)	BENZENE (PPM)	ETHYLBENZENE (PPM)	TOLUENE (PPM)	XYLENES (PPM)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS (FT)	DEPTH TO WATER (FT)
S-1	01-May-89	----	NA	NA	NA	NA	NA	----	----	----	----
S-2	01-May-89	----	NA	NA	NA	NA	NA	----	----	----	----
S-3	01-May-89	----	NA	NA	NA	NA	NA	----	----	----	----
S-4 *	01-May-89	----	----	----	----	----	----	93.51	77.03	----	16.48
S-5	01-May-89	04-May-89	120.	29.	3.1	35.	15.	99.36	78.13	sheen	21.23
S-6	01-May-89	04-May-89	93.	43.	3.	9.9	8.	100.58	80.09	----	20.49
TB	01-May-89	04-May-89	ND	ND	ND	ND	ND	----	----	----	----

TPH = Total Petroleum Hydrocarbons as Gasoline
PPM = parts per million
ND = Non Detected
NA = Not Accesible
* = Insufficient water to sample

CURRENT DEPARTMENT OF HEALTH SERVICES ACTION LEVELS
Benzene 0.0007 ppm
Toluene 0.100 ppm
Xylenes 0.620 ppm
Ethylbenzene 0.68 ppm

Note: 1. For chemical parameter detection limits, refer to I.T. laboratory reports in Appendix B
2. Water level elevations referenced to project site datum

4.0 CHEMICAL ANALYTICAL DATA (continued)

Two (2) wells at the site were found to contain aromatic fractions of petroleum hydrocarbon products above the established action levels set by the State of California Department of Health (DHS). As shown on Table 1, Benzene concentrations were identified in ground-water samples above DHS action levels in monitoring wells S-5 (29. ppm) and S-6 (43. ppm) this quarter. Benzene concentrations in the furthest downgradient monitoring well (S-6) suggests that a plume is migrating towards Interstate 880.

4.1 Quality Control

Quality Control (QC) samples for this quarter ground-water sampling included a trip blank, and a field blank. The trip blank was prepared in the IT Laboratory using organic-free water to evaluate laboratory handling and analytical procedures. The field blank was prepared in the field using organic-free water to evaluate field sampling procedures. G-R Sampling Protocol are presented in Appendix A. The G-R Ground-water Sampling Report, Chain-of-Custody forms and IT Laboratory chemical analytical reports for this quarter's ground-water sampling are presented in Appendix B.

Water-quality data for this quarterly report are summarized in Table 1. TPH and Benzene chemical analytical data were used to prepare concentration maps for this quarter (Refer to Plate 3).

5.0 SUMMARY

A summary of activities and findings associated with this quarterly report are presented below:

- Water levels were measured in selected monitoring wells (Table 1). Static water-level elevations were plotted (Plate 2).
- A petroleum product sheen was observed in Well S-5.
- TPH concentrations detected in ground-water samples obtained from monitoring wells S-5 and S-6 ranged from 93. ppm to 120. ppm.
- Benzene concentrations detected in ground-water samples obtained from monitoring wells S-5 (29. ppm) and S-6 (43. ppm) exceed the DHS action levels.

5.0 SUMMARY (continued)

- As noted in the prior quarterly ground-water sampling report, chemical analytical results for this quarter indicate that the present ground-water monitoring network at the site does not appear to be adequate for petroleum hydrocarbon plume definition. Additional monitoring wells will be required to evaluate the lateral extent of petroleum aromatic fraction (BTEX) migration from the site. Future scopes of work will be proposed under a separate document and implemented under the site-specific work plan.

6.0 PLANNED SITE ACTIVITIES

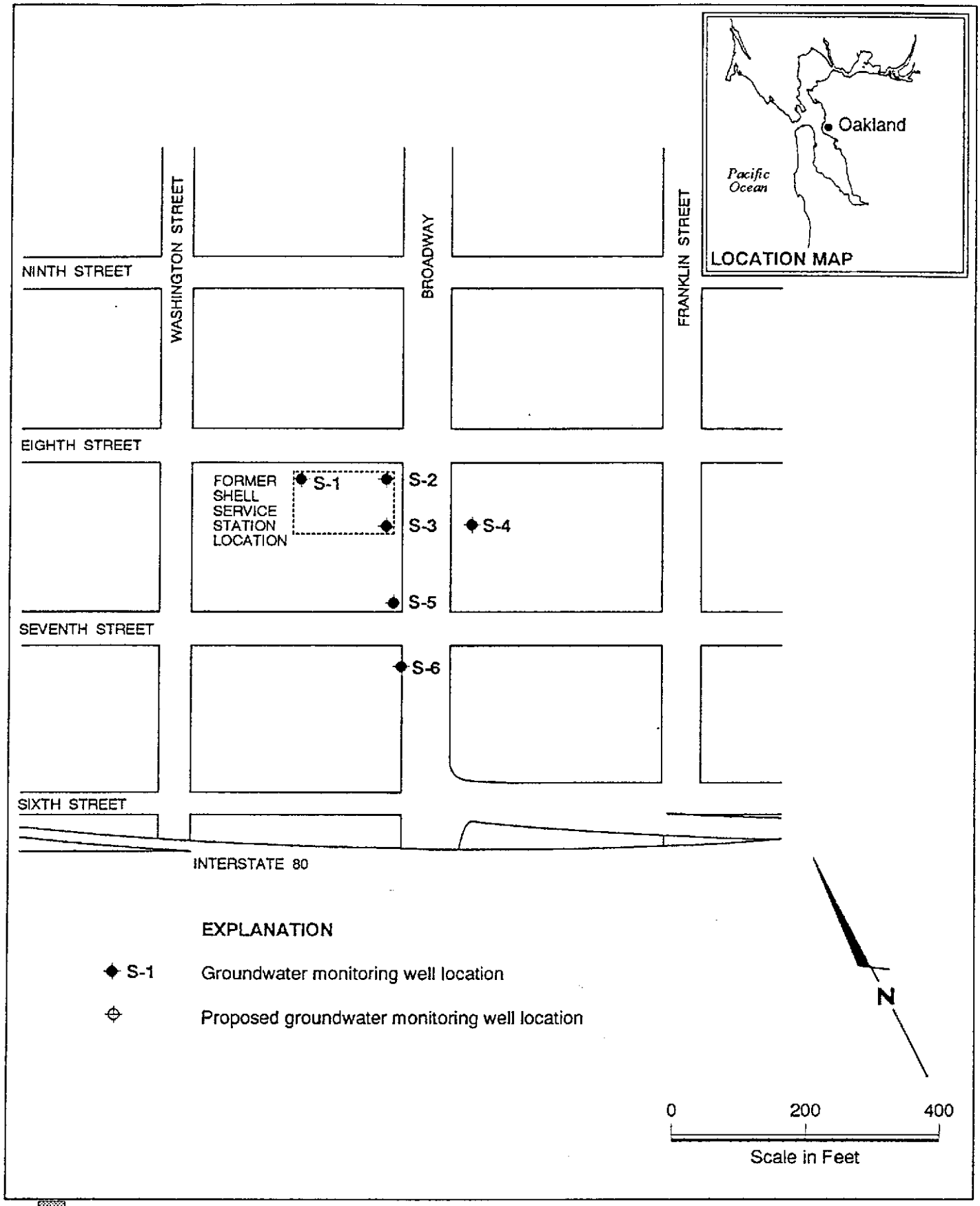
The following activities are planned for the third quarter, July to September 1989, at the site:

- All scheduled wells will be sampled and analyzed for Total Petroleum Hydrocarbons (TPH) according to EPA Method 8015 (Modified); and Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) according to EPA Method 8020.

- Water level will be measured monthly and selected data will be used to prepare a water elevation map. The local ground-water gradient will be calculated.

- Chemical data will be used to construct concentration maps for TPH and Benzene.

- Prepare a site-specific work plan.

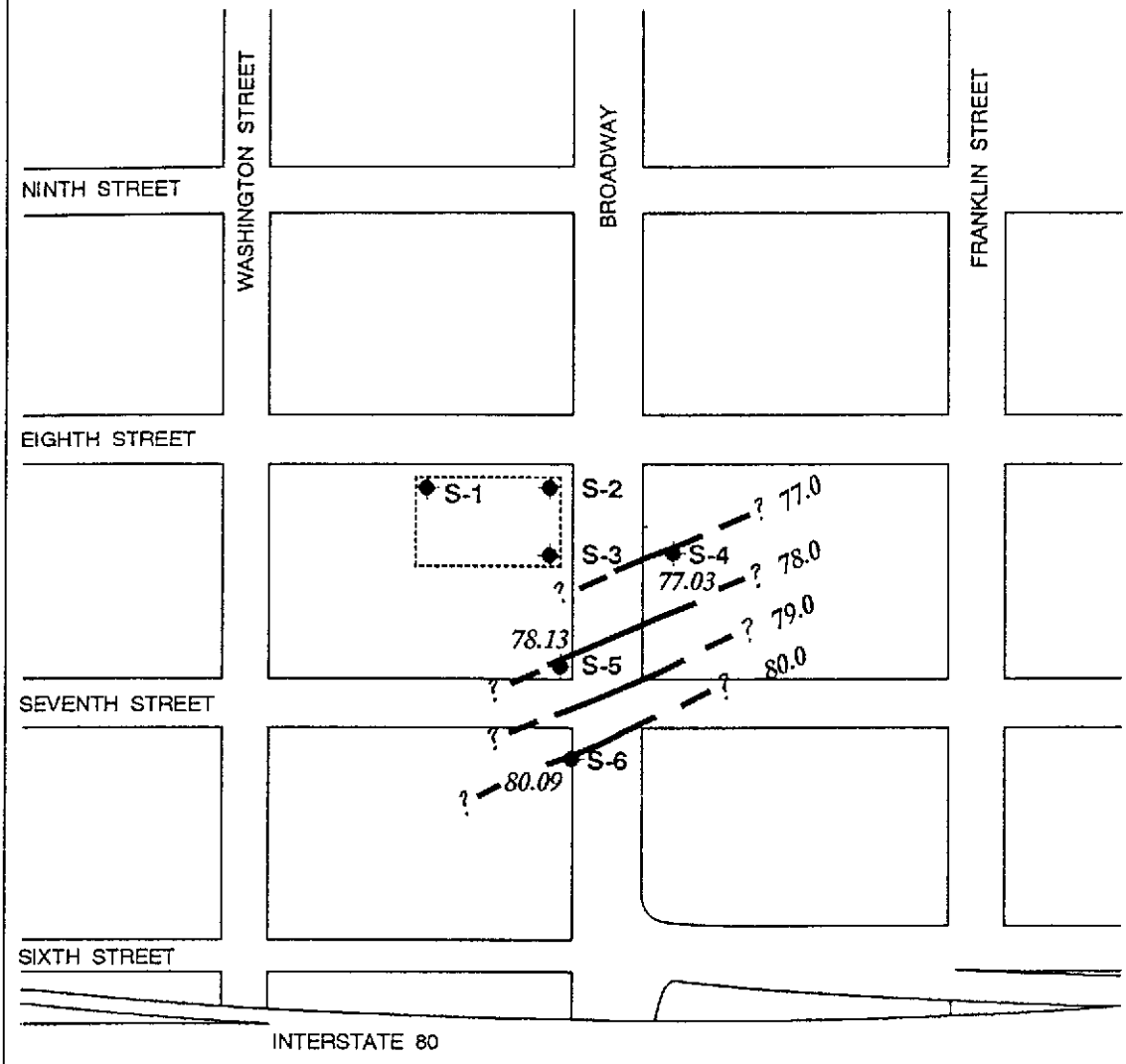


GeoStrategies Inc.

Site Plan
Former Shell Service Station
461 Eighth Street
Oakland, California

PLATE **1**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7644	CWP CEG 1262	6/89		



EXPLANATION

- S-1 — Groundwater monitoring well location
- *80.09* — Groundwater elevation measured on 5/1/89 in feet referenced to project datum
- 80.0 — Groundwater elevation contour (dashed where approximate) Interval = 1.0 feet; Approx. Gradient = 0.09

N

0 200 400

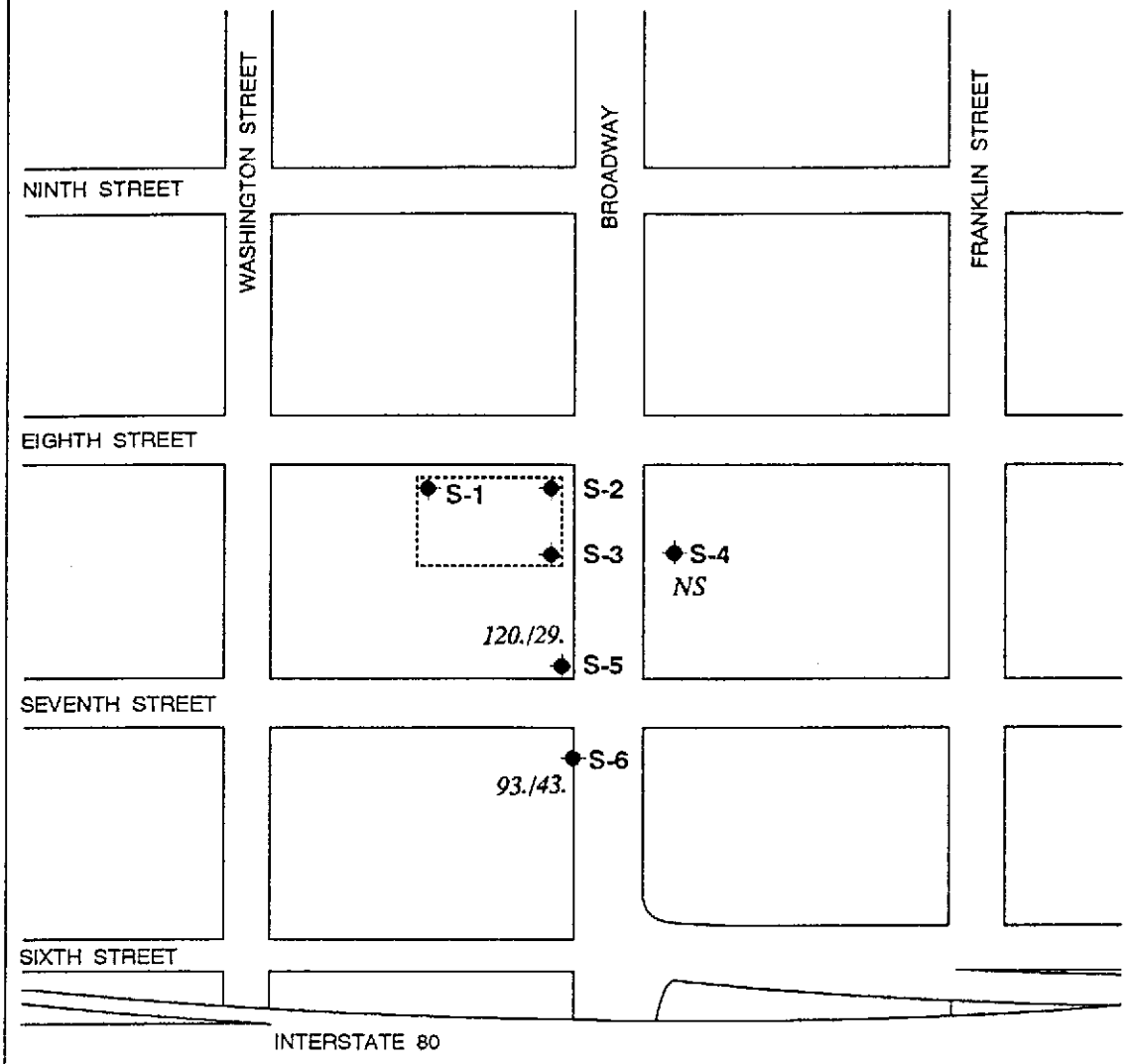
Scale in Feet

GeoStrategies Inc.

Potentiometric Map
Former Shell Service Station
461 Eighth Street
Oakland, California

PLATE **2**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7644	CMP CEG 12/62	6/89		



EXPLANATION

◆ S-1	Groundwater monitoring well location
93./43.	TPH (Total Petroleum Hydrocarbon)/Benzene concentrations measured on 5/1/89 in ppm (parts per million)
NS	Not Sampled due to insufficient water

N

0 200 400

Scale in Feet

GeoStrategies Inc.

TPH/Benzene Concentration Map
Former Shell Service Station
461 Eighth Street
Oakland, California

PLATE **3**

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7644	CMP CEG 1262	6/89		

APPENDIX A

METHODS AND PROCEDURES

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.

Guidance and Reference Documents Used to Collect Groundwater Samples

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

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, Section 2647 (October, 1986)
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)
Santa Clara Valley Water District	Guidelines for Preparing or Reviewing Sampling Plans for Soil and Groundwater Investigation of Fuel Contamination Sites (January, 1989)
American Petroleum Institute	Groundwater Monitoring & Sample Bias; API Publication 4367, Environmental Affairs Department, June 1983

Because many of the ground-water samples collected by G-R are analyzed in 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 glove 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.

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.

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) samples 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 on a rate-specific basis.

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. Both static water-level and separate-phase product thickness are measured to the nearest $\pm$0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest $\pm$0.01 foot with an engineer's 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 A-3. 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. 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 to 5 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 70 percent of the previously measured water column has been replaced by recharge. 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 A-4. Collected field data during purging activities will be entered on the G-R Well Sampling Field Data Sheet shown in Figure A-3. 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 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 A-3) 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.

FIGURE 3

GETTLER–RYAN INC.

General and Environmental Contractors

WELL SAMPLING FIELD DATA SHEET

COMPANY _____ JOB # _____

LOCATION _____ DATE _____

CITY _____ TIME _____

Well ID. _____ Well Condition _____

Well Diameter _____ in. Hydrocarbon Thickness _____ ft.

Total Depth _____ ft.

Depth to Liquid- _____ ft.

Volume Factor (VF)			
	2" = 0.17	6" = 1.50	12" = 5.80
	3" = 0.38	8" = 2.60	
	4" = 0.66	10" = 4.10	

(# of casing volumes) _____ x _____ x(VF) _____ = (Estimated Purge Volume) _____ gal.

Purging Equipment _____

Sampling Equipment _____

Starting Time _____ Purging Flow Rate _____ gpm.

(Estimated Purge Volume) _____ gal. / (Purging Flow Rate) _____ gpm. = (Anticipated Purging Time) _____ min.

Time	pH	Conductivity	Temperature	Volume

Did well dewater? _____ If yes, time _____ Volume _____

Sampling Time _____ Weather Conditions _____

Analysis _____ Bottles Used _____

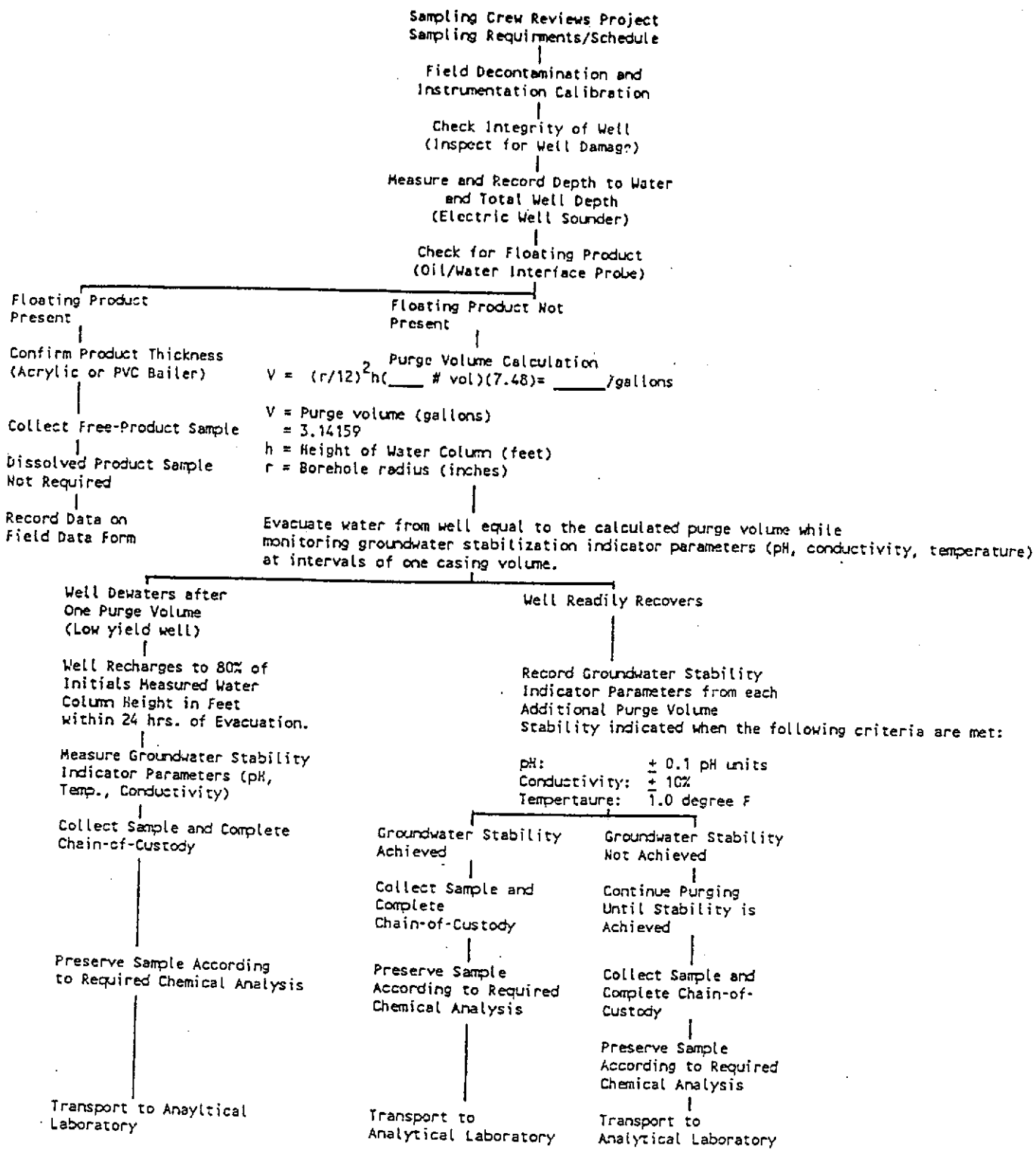
Chain of Custody Number _____

COMMENTS _____

FOREMAN _____ ASSISTANT _____

FIGURE 4

Monitoring Well Sampling Protocol Schematic



Gettler - Ryan Inc. FIGURE 5 **Chain of Custod**

ENVIRONMENTAL DIVISION

COMPANY _____ JOB NO. _____

JOB LOCATION _____

CITY _____ PHONE NO. _____

AUTHORIZED _____ DATE _____ P.O. NO. _____

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY: _____

RELINQUISHED BY: _____ RECEIVED BY LAB: _____

DESIGNATED LABORATORY: _____ DHS #: _____

REMARKS: _____

DATE COMPLETED _____ FOREMAN _____

ORIGINAL

APPENDIX B

CHEMICAL ANALYTICAL REPORTS

GROUNDWATER SAMPLING REPORT

CHEMICAL ANALYTICAL REPORTS

gettler — ryan inc.

May 22, 1989

GROUNDWATER SAMPLING REPORT

Shell Oil Company
Post Office Box 4023
Concord, California 94520

Referenced Site: Former Shell Service Station
461 Eighth Street
Oakland, California

Sampling Date: May 1, 1989

This report presents the results of the quarterly groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on May 1, 1989 at the referenced location. The site, located on the northwest corner of 8th Street and Broadway, is no longer an operating service station. The former station had underground storage tanks which contained petroleum products.

There are currently three groundwater monitoring wells on site and three wells off site at the locations shown on the attached site map. The three on site groundwater monitoring wells were not accessible on the May 1, 1989 sampling event. Prior to sampling, all wells were inspected for total well depth, water levels, and presence of separate phase product using an electronic interface probe. A clean acrylic bailer was used to visually confirm the presence and thickness of separate phase product. Groundwater depths ranged from 16.48 to 21.23 feet below grade. A heavy sheen was observed in Well S-5.

The wells were then purged and sampled. Standard sampling procedure calls for a minimum of four case volumes to be purged from each well. Each well was purged while pH, temperature, and conductivity measurements were monitored for stability. The purge water was contained in drums for proper disposal. Details of the final well purging results are presented on the attached Table of Monitoring Data.

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. The samples were labeled, stored on blue ice, and transported to the laboratory for analysis. A trip blank, supplied by the laboratory was included and analyzed to assess quality control. 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 International Technology Corporation - Santa Clara Valley Laboratory located at 2055 Junction Avenue, San Jose, California. The laboratory is assigned a California DHS-HMTL Certification number of 137. The results are presented as a Certified Analytical Report, a copy of which is attached to this report.

Tom Paulson
Sampling Manager

attachments

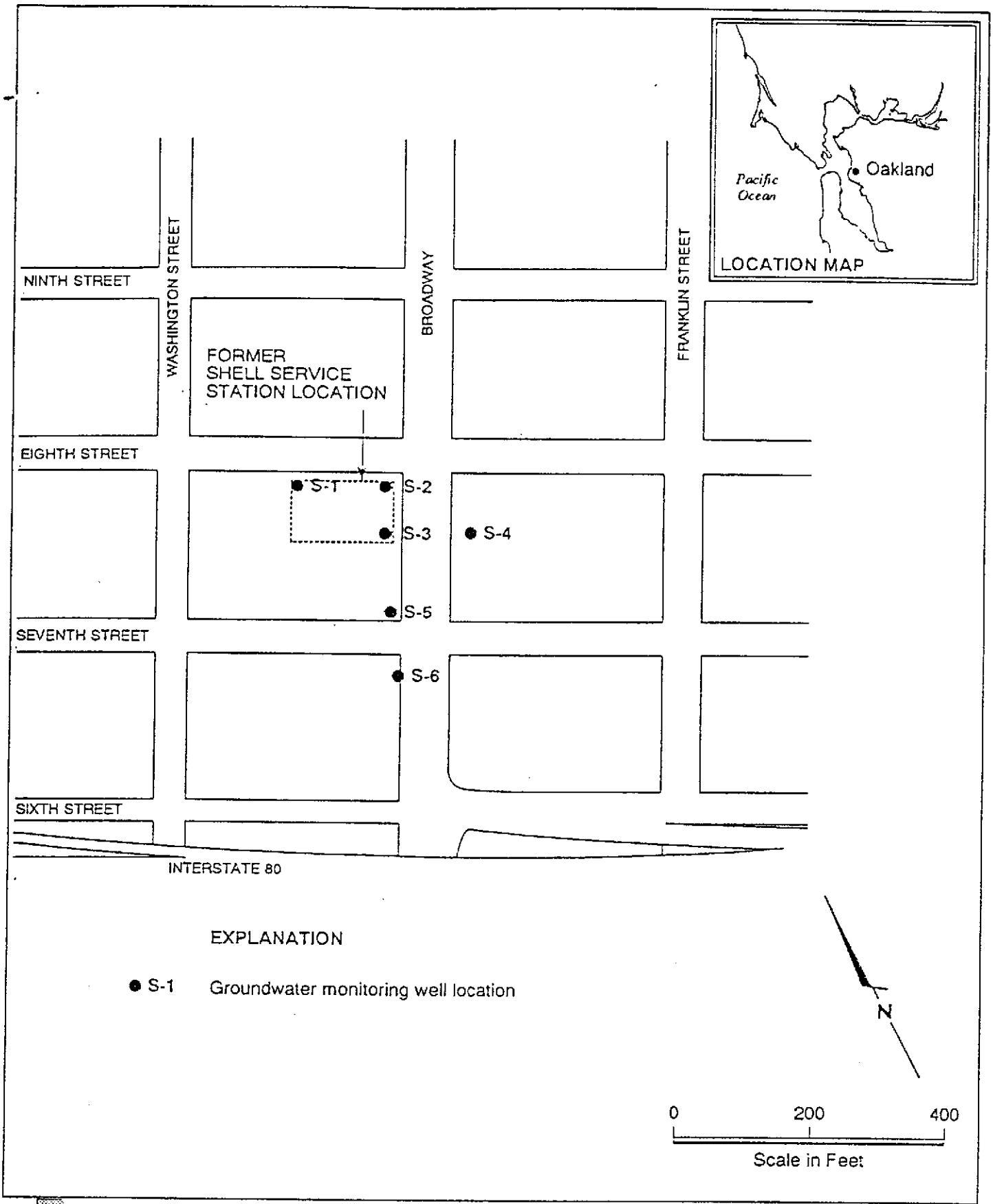
TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

WELL I.D.	S-1	S-2	S-3	S-4	S-5	S-6
Casing Diameter (inches)	4	4	4	4	4	4
Total Well Depth (feet)				16.8	40.0	38.5
Depth to Water (feet)	----	----	----	16.48	21.23	20.49
Free Product (feet)	----	----	----	none	sheen	none
Reason Not Sampled	inaccessible	inaccessible	inaccessible	insufficient water	----	----
Calculated 4 Case Vol.(gal.)	----	----	----	----	49.6	47.2
Did Well Dewater?	----	----	----	----	no	no
Volume Evacuated (gal.)	----	----	----	----	64.0	61.0
Purging Device	----	----	----	----	Airlift	Airlift
Sampling Device	----	----	----	----	Bailer	Bailer
Time	----	----	----	----	15:11	16:13
Temperature (F)*	----	----	----	----	67.5	66.8
pH*	----	----	----	----	6.54	6.48
Conductivity (umhos/cm)*	----	----	----	----	672	1065

* Indicates Stabilized Value

DATE	WELL	DTH	DTW	HT	BAILED	FLOWMETER	PT-LIQ.	PT-H2O	EMP	C.ELEV
07-Apr-89	RW		18.31	0.00						
14-Apr-89	RW		18.40	0.00						
21-Apr-89	RW		18.30	0.00						
26-Apr-89	RW		18.41	0.00						
03-May-89	RW		18.44	0.00						
10-May-89	RW		18.60	0.00						
17-May-89	RW		18.44	0.00						
24-May-89	RW		18.61	0.00						
31-May-89	RW		18.60	0.00						
07-Jun-89	RW		18.61	0.00						
14-Jun-89	RW		18.63	0.00						
21-Jun-89	RW		18.62	0.00						
28-Jun-89	RW		18.75	0.00						
07-Apr-89	4		N/A						DF	
14-Apr-89	4		15.49	0.00					SM	
21-Apr-89	4		N/A						CA	
26-Apr-89	4		N/A						BH	
03-May-89	4		15.62	0.00					CA	
10-May-89	4		N/A						CA	
17-May-89	4		15.60	0.00					BH	
24-May-89	4		15.65	0.00					CA	
31-May-89	4		15.67	0.00					CA	
07-Jun-89	4		15.68	0.00					CA	
14-Jun-89	4		17.74	0.00					SM	
21-Jun-89	4		15.70	0.00					JF	
28-Jun-89	4		N/A						BH	
07-Apr-89	5	19.46	(1.00)	.00						
14-Apr-89	5	20.46	(1.00)	.00						
21-Apr-89	5	19.50	(1.00)	.00						
26-Apr-89	5	19.60	(1.00)	.00						
03-May-89	5	19.63	(1.00)	0.02						
10-May-89	5	19.59	(1.00)	0.01						
17-May-89	5	19.67	(1.00)	.00						
24-May-89	5	19.78	(1.00)	0.01						
31-May-89	5	19.82	(1.00)	0.01						
07-Jun-89	5	19.80	(1.00)	0.01						
14-Jun-89	5	19.83	(1.00)	0.01						
21-Jun-89	5	19.81	(1.00)	0.01						
28-Jun-89	5	19.96	(1.00)	.00						
07-Apr-89	6		20.38	0.00						
14-Apr-89	6		20.46	0.00						
21-Apr-89	6		20.37	0.00						
26-Apr-89	6		20.44	0.00						
03-May-89	6		20.56	0.00						
10-May-89	6		20.42	0.00						
17-May-89	6		20.53	0.00						
24-May-89	6		20.62	0.00						
31-May-89	6		20.60	0.00						
07-Jun-89	6		20.68	0.00						
14-Jun-89	6		20.72	0.00						
21-Jun-89	6		20.66	0.00						

DATE	WELL	DTH	DTW	HT	BAILED	FLOWMETER	PT-LIQ.	PT-H2O	EMP	C.ELEV
28-Jun-89	6		20.83	0.00						



GeoStrategies Inc.

Site Plan
Shell Service Station
461 Eighth Street
Oakland, California

PLATE 1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
544		4/89		

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

Gettler-Ryan
1992 National Avenue
Hayward, CA 94545
ATTN: John Werfal

Date: May 17, 1989

Work Order Number: S9-05-012

P.O. Number: 3644

This is the Certificate of Analysis for the following samples:

Client Project ID:	GR #3644, Shell, 7th and Broadway, Oakland
Date Received by Lab:	5/2/89
Number of Samples:	3
Sample Type:	Water

The method of analysis for low boiling hydrocarbons is taken from EPA Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector as well as a photoionization detector. The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethyl benzene and xylenes.

Reviewed and Approved

David A. Pichette
Project Manager

DAP/an
1 Page Following - Table of Results

Date: May 17, 1989
Client Project ID: GR #3644, Shell,
7th and Broadway, Oakland

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-05-012

Lab Sample ID	Client Sample ID	Sample Date	Date Analysis Completed	Sample Condition on Receipt
S9-05-012-01	S-5	5/1/89	5/4/89	cool pH ≤2
S9-05-012-02	S-6	5/1/89	5/4/89	cool pH ≤2
S9-05-012-03	Trip Blank	5/1/89	5/4/89	cool pH ≤2

Total Petroleum Hydrocarbons - Modified E.P.A. Methods 8015, 8020

ND = None Detected

Results - Milligrams per Liter

Lab Sample ID	Client Sample ID	Low Boiling Hydrocarbons (calculated as Gasoline)	Benzene	Toluene	Ethyl Benzene	Xylenes (total)
S9-05-012-01	S-5	120.	29.	35.	3.1	15.
Detection Limit		20.	0.2	0.3	0.3	1.
S9-05-012-02	S-6	93.	43.	9.9	3.0	8.
Detection Limit		20.	0.2	0.3	0.3	1.
S9-05-012-03	Trip Blank	ND	ND	ND	ND	ND
Detection Limit		0.05	0.0005	0.001	0.001	0.003

Gettler - Ryan Inc. ENVIRONMENTAL DIVISION

Chain of Custody

COMPANY Shell Oil Company JOB NO. 0267

JOB LOCATION 7th & Broadway

CITY Oakland, CA PHONE NO.

AUTHORIZED John Werlal DATE P.O. NO. 3644

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-5	3	Liquid	5-1-89/15:11	TPH (Gas) BTXE	OK/cool
S-6	3	↓	↓ /16:13	↓	↓
Trip	2	↓	4-28-89	↓	↓

RELINQUISHED BY: [signature] 5-2-89 12:00 RECEIVED BY:

RELINQUISHED BY: RECEIVED BY:

RELINQUISHED BY: RECEIVED BY LAB: [signature] 5/2/89 1200

DESIGNATED LABORATORY: I-T/SCC DHS #: 137

REMARKS: Normal TAT Results Due 5-16-89

DATE COMPLETED 5-1-89 FOREMAN [signature]

ORIGINAL