DB

**Shell Oil Company**

P.O. Box 4023
Concord, CA 94520

Telephone: (415) 676-1414

March 28, 1989

5/2/89

ALAMEDA COUNTY
DEPT. OF ENVIRONMENTAL HEALTH
HAZARDOUS MATERIALS

Mr. Rafat Shahid
County of Alameda
Department of Environmental Health
470 27th Street, Room 324
Oakland, California 94612

SUBJECT: FORMER SHELL SERVICE STATION
2800 TELEGRAPH AVENUE
OAKLAND, CALIFORNIA

Dear Mr. Shahid:

Enclosed is a copy of the interim report issued by Woodward-Clyde Consultants, dated March 20, 1989, presenting the findings of the soil and groundwater investigation conducted at the subject location. The investigation involved the installation of four groundwater monitoring wells, the analysis of soil samples collected during drilling, and the analysis of groundwater samples collected from all project monitoring wells.

The enclosed report recommends the installation of three addition groundwater monitoring wells to further define the extent of contamination. This additional work will be performed once the necessary permits and property access approvals have been obtained.

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

Diane M. Lundquist
Environmental Engineer

DML/jw

enclosure

cc: Ms. Lisa McCann, Regional Water Quality Control Board

Oakland City Center
500 12th Street
Suite 100
Oakland, CA 94607 4014
(415) 893-3600

**Woodward-Clyde Consultants**



March 20, 1989
8820011A/0099

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

Attention: Mr. Jeff Ryan

**Subject: Interim Environmental Assessment Report**
**Former Shell Service Station**
**2800 Telegraph Avenue**
**Oakland, California**

This interim report summarizes the results of the second phase of investigation of the shallow soils and groundwater performed by Woodward-Clyde Consultants at the former Shell service station at 2800 Telegraph Avenue in Oakland, California. The results of an earlier phase of investigation performed by WCC at this site were transmitted to Gettler-Ryan in a letter report dated June 17, 1988. There had also been an earlier investigation by Pacific Environmental Group (1988).

## PURPOSE AND SCOPE OF INVESTIGATION

The purpose of this investigation was to define the lateral and downgradient limits of petroleum contamination at the site. To complete this task, four additional soil borings, designated S-4 through S-7, were advanced around the periphery of the site at locations specified by Gettler-Ryan Inc. (Figure 1). Borings S-4, S-5, and S-7 were advanced to depths of 30.5 feet below grade. Boring S-6 was advanced to a depth of 22 feet below grade. All borings were subsequently converted to monitoring wells. This work was performed on October 31 and November 1, 1988.

Selected soil samples from the borings were sent to the IT Corporation environmental laboratory for analysis for low boiling hydrocarbons (calculated as gasoline) and benzene, toluene, ethyl benzene, and xylenes (BTEX). Results of the soil sample laboratory analysis are summarized in Table 1.

On November 8, 1988, Gettler-Ryan developed the wells and collected groundwater samples from this site. All four wells from the present investigation and Wells S-1 and S-2, constructed during the previous investigation, were sampled. The groundwater samples were sent to the IT laboratory for analysis for low boiling hydrocarbons (calculated as gasoline) and BTEX. Results of the groundwater laboratory analysis are summarized in Table 2.

RESULTS AND RECOMMENDATIONS

Groundwater contaminant concentrations are shown on Figure 1, and groundwater elevations are shown on Figure 2. As shown, the highest levels of both gasoline and BTEX were detected in Monitoring Wells S-6 and S-7, which lie downgradient to the south of the former service station. As shown in Table 1, high levels of gasoline and BTEX were also detected in soil samples from these two borings.

In order to further assess the extent of contamination, one additional soil boring should be drilled on the south side of 28th Street east of Well S-7, and two soil borings should be drilled farther downgradient to the south of the site. All three borings should be converted into groundwater monitoring wells. Tentative locations are shown on Figures 1 and 2. All procedures for drilling, well construction, soil and groundwater sampling, and chemical analyses will follow the general guidelines described in the WCC report of investigations at the site dated June 17, 1988.

The static water table has been measured at depths of 11 to 14 feet below grade in most existing wells at the site. Based on these depths, the proposed borings should be drilled to approximately 20 to 30 feet below grade. The exact boring depths will be determined in the field based on the depth to the top of the saturated zone. The new wells should be screened from a depth of not higher than 5 feet below grade down to at least 10 feet, and not greater than 15 feet, below the top of the saturated zone. Blank casing will be installed from the top of the screen to approximately 0.5 feet below grade. If a clay layer is encountered below the saturated zone which is at least 5 feet thick, the boring will be filled with bentonite pellets to the top of the clay layer, and the well will be constructed.

If contamination is found in either the soils or groundwater in this investigation, additional drilling will be required. A final report will be issued upon completion of all drilling and sampling.

Sincerely,

WOODWARD-CLYDE CONSULTANTS

REGISTERED GEOLOGIST
RICHARD W. ELY
No. 4137
Exp. 6/30/90
STATE OF CALIFORNIA

Richard W. Ely, R.G. No. 4137
Project Geologist

Ronald C. Petersen
Project Scientist

RCP/sst
COT/8820011L24

Enclosures

REFERENCES

Pacific Environmental Group, Inc., January 15, 1988, Letter Report to Gettler-Ryan on the Investigation at the Shell Service Station, Telegraph Avenue and 28th Street.

Woodward-Clyde Consultants, June 17, 1988, Letter Report to Gettler-Ryan on the Environmental Assessment, Former Shell Service Station, 2800 Telegraph Avenue, Oakland, California

Table 1. SUMMARY OF SOIL SAMPLE ANALYTICAL RESULTS, FORMER SHELL SERVICE STATION, 2800 TELEGRAPH AVENUE, OAKLAND, CALIFORNIA

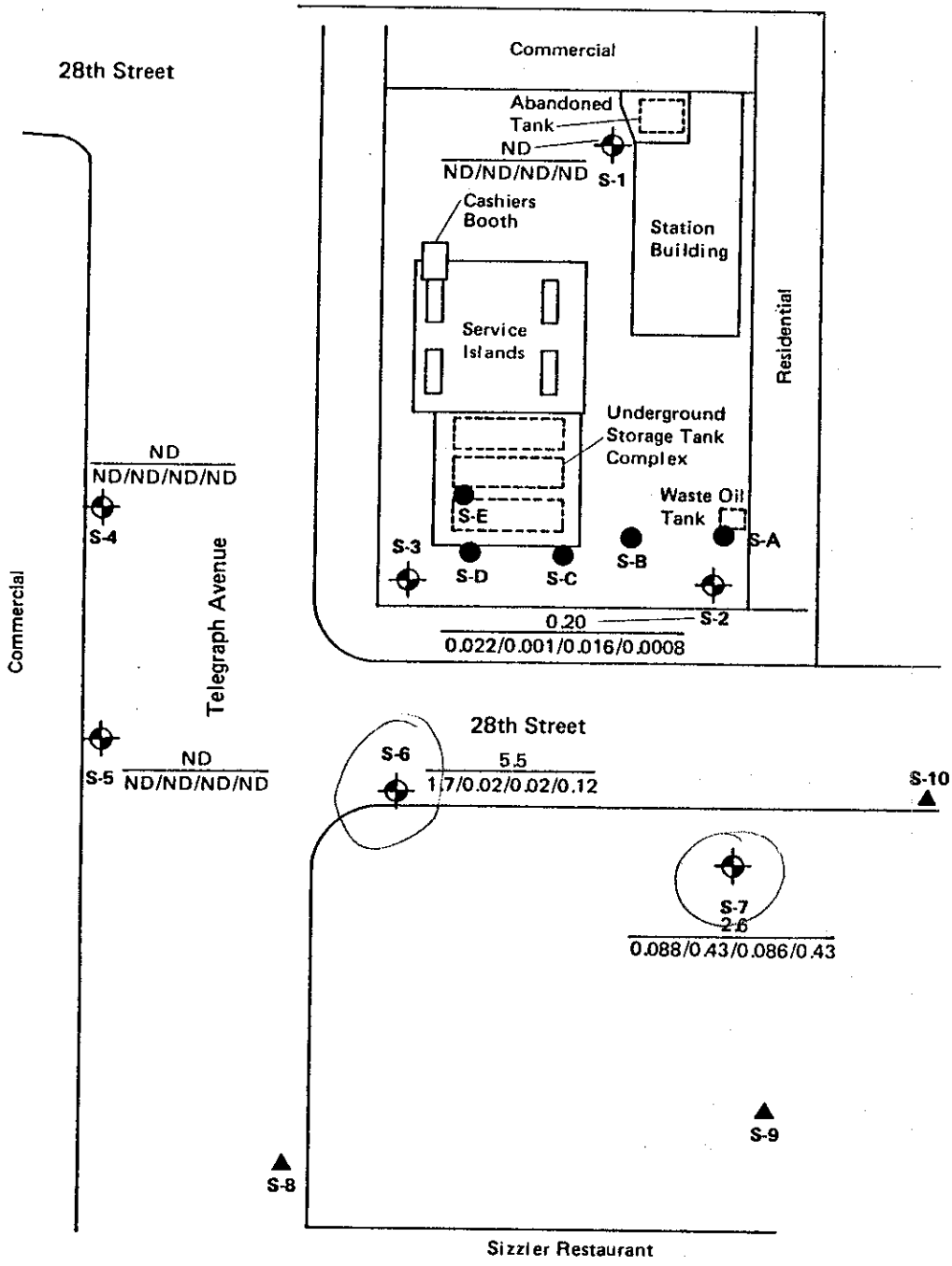
| Sample Identification | Sample Number and Depth (feet) | Parts per Million - Dry Soil Basis: Low Boiling Hydrocarbons (calculated as gasoline) | Benzene | Toluene | Ethyl Benzene | Xylenes |
|---|---|---|---|---|---|---|
| S-4 | 2A, 9-10.5 | ND | ND | ND | ND | ND |
| S-5 | 3A, 9-10.5 | ND | ND | ND | ND | ND |
| S-6 | 2A, 9-10.5 | 4800.* | 24.* | 20.* | 150.* | 790.* |
| S-6 | 3A, 14-15.5 | ND | 0.5 | ND | ND | ND |
| S-6 | 4A, 19-20.5 | ND | ND | ND | ND | ND |
| S-7 | 3A, 9-10.5 | 250.** | 0.8** | ND** | 4.** | 19.** |
| S-7 | 4A, 14-15.5 | ND | ND | ND | ND | ND |
| S-7 | 5A, 19-20.5 | ND | ND | ND | ND | ND |
| Detection Limit | | 5. | 0.05 | 0.1 | 0.1 | 0.3 |
| | | 500.* | 5.* | 10.* | 10.* | 30.* |
| | | 80.** | 0.8** | 2.** | 2.** | 5.** |

ND = None Detected

Table 2. SUMMARY OF GROUNDWATER ANALYTICAL RESULTS, FORMER SHELL SERVICE STATION, 2800 TELEGRAPH AVENUE, OAKLAND, CALIFORNIA

| Lab Number | Sample Identification | Milligrams per Liter: Low Boiling Hydrocarbons (calculated as gasoline) | Benzene | Toluene | Ethyl Benzene | Xylenes |
|---|---|---|---|---|---|---|
| S8-11-105-01 | S-1 | ND | ND | ND | ND | ND |
| S8-11-105-02 | S-2 | 0.20 | 0.022 | 0.001 | 0.016 | 0.008 |
| S8-11-105-03 | S-4 | ND | ND | ND | ND | ND |
| S8-11-105-04 | S-5 | ND | ND | ND | ND | ND |
| S8-11-105-05 | S-6 | 5.5* | 1.7* | 0.02* | 0.02* | 0.12* |
| S8-11-105-06 | S-7 | 2.6** | 0.088** | 0.43** | 0.086** | 0.43** |
| Detection Limit | | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |
| Detection Limit | | 1.* | 0.02* | 0.02* | 0.02* | 0.06* |
| Detection Limit | | 0.2** | 0.002** | 0.02** | 0.005** | 0.02** |

ND = None Detected




LEGEND

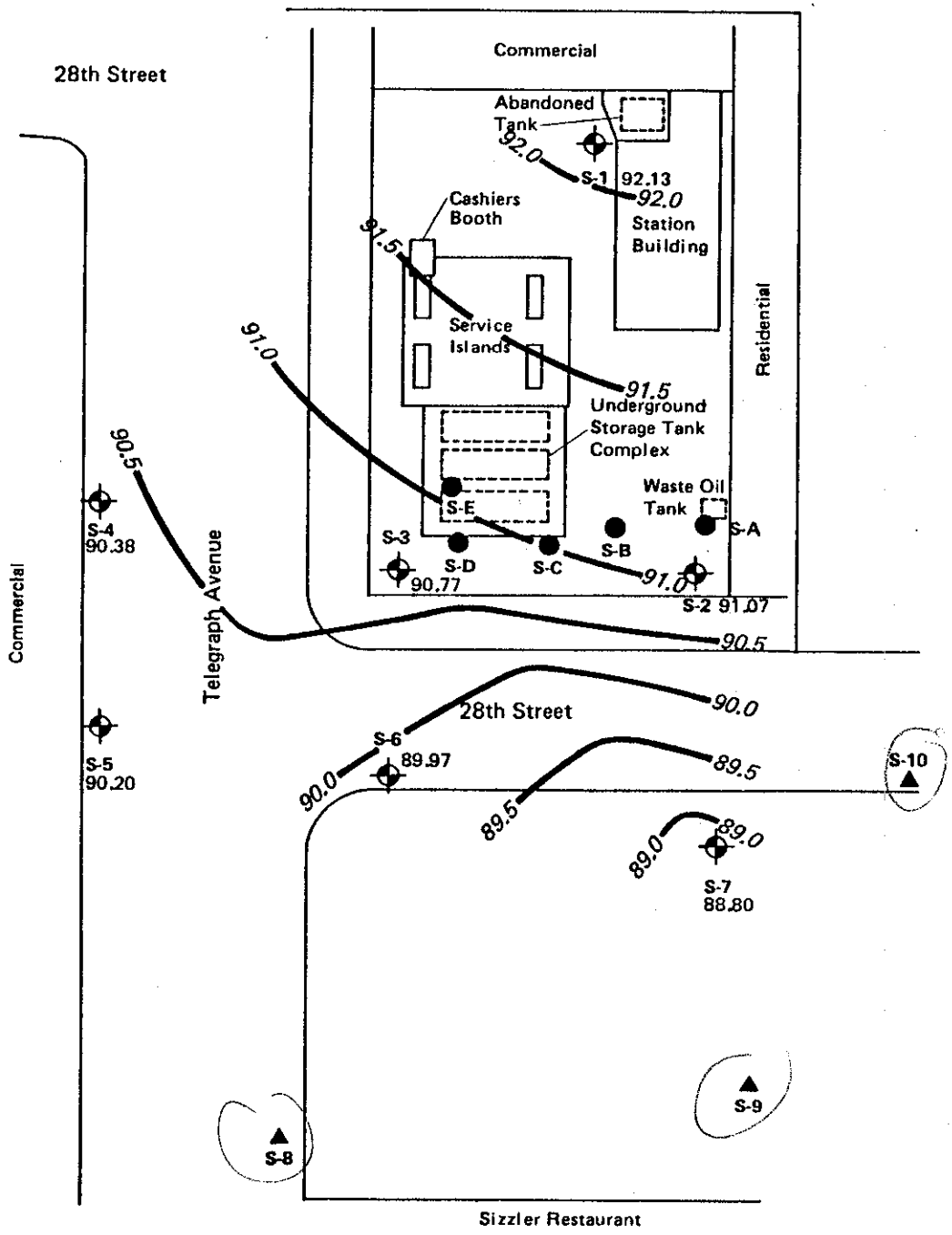
- S-B — Approximate Soil Boring Location
- S-3 — Approximate Goundwater Monitoring Well Location
- S-8 — Proposed Goundwater Monitoring Well Location (approximate)

5.5 / 1.7/0.02/0.02/0.12 — Gasoline / Benzene/Toluene/Ethyl Benzene/Xylenes Concentration in mg/ℓ in Groundwater Samples Collected November 8, 1988 by Gettler-Ryan Inc.

N

0 30 feet

| Project No. 8820011A | Gettler-Ryan | GROUNDWATER CONTAMINATION MAP FORMER SHELL SERVICE STATION 2800 TELEGRAPH AVE., OAKLAND, CA | Figure 1 |
|---|---|---|---|
| **Woodward-Clyde Consultants** | | | |




LEGEND

- S-B — Approximate Soil Boring Location
- S-3 / 90.77 — Approximate Groundwater Monitoring Well Location. Groundwater elevation, in feet, surveyed to project datum November 8, 1988 by Gettler-Ryan Inc.
- S-8 — Proposed Goundwater Monitoring Well Location (approximate)
- 91.0 — Contour Interval = 0.5 feet

N

0 30
feet

| Project No. 8820011A | Gettler-Ryan | GROUNDWATER ELEVATION CONTOURS FORMER SHELL SERVICE STATION 2800 TELEGRAPH AVE., OAKLAND, CA | Figure 2 |
|---|---|---|---|
| **Woodward-Clyde Consultants** | | | |

GeoStrategies Inc.

# QUARTERLY GROUND-WATER SAMPLING REPORT

APRIL - JUNE 1989

Shell Service Station
2800 Telegraph Avenue
Oakland, California

Report No. 7610-2

June 26, 1989

gettler — ryan inc.
general contractors

June 29, 1989

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

Reference: Shell Service Station
2800 Telegraph Avenue
Oakland, California

Gentlemen:

As authorized by Ms. Diane Lundquist of Shell Oil Company, Gettler-Ryan Inc. is forwarding a copy of the Quarterly Ground-Water Sampling Report prepared by GeoStrategies Inc. for the above referenced location.

The installation of additional groundwater monitoring wells to further evaluate the extent of contamination is pending receipt of an encroachment permit from the City of Oakland. Based upon recent conversations with the City of Oakland, we anticipate that the encroachment permit for this site should be issued by July 7, 1989.

Please do not hesitate to call should you have any questions or comments regarding this project.

Sincerely,

John P. Werfal
Project Manager

enclosure

cc: Ms. Diane Lundquist, Shell Oil Company
Mr. Tom Callaghan, Regional Water Quality Control Board



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

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

June 26, 1989

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

Attn: Mr. John Werfal

Re: QUARTERLY MONITORING REPORT
Shell Service Station
2800 Telegraph Avenue
Oakland, California

Gentlemen:

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

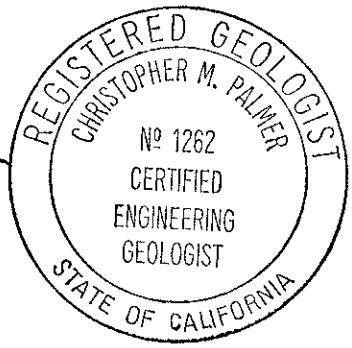
If you have any questions, please call.

GeoStrategies Inc. by,

Jeffrey L. Peterson/cmp

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

Christopher M. Palmer




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

JLP/CMP/kj

Report No. 7610-2

## 1.0 INTRODUCTION

This Quarterly Ground-Water Sampling Report has been prepared for the former Shell Service Station located at 2800 Telegraph Avenue 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 December 1987, one exploratory soil boring (S-A) was drilled adjacent to the waste oil tank, and four exploratory soil borings (S-B through S-E) were drilled adjacent to the gasoline tanks in order to document soil conditions prior to relinquishment of the property. Gasoline concentrations as high as 4,400 ppm and Benzene concentrations ranging from 0.05 ppm to 26 ppm were encountered. This work was performed by Pacific Environmental Group (PEG), and is discussed in a report dated January 15, 1988.

The underground storage tanks were removed in December 1988. During the tank removal, soil samples were collected by Kapreallian Engineering Inc. (KEI). Total petroleum hydrocarbons calculated as gasoline was noted in all the soil samples taken by KEI, and levels ranged from 2,700 ppm to 71 ppm. Benzene was detected in four of the samples, and ranged from 0.85 ppm to 0.098 ppm. This is discussed in a KEI report dated December 16, 1989.

In April 1988, three ground-water monitoring wells (S-1, S-2, and S-3) were installed. Laboratory analysis of soil from Wells S-2 and S-3 detected gasoline concentrations ranging from 4.800 ppm to 5 ppm. Groundwater concentrations ranged from 46 ppm in Well S-3 to none detected in Well S-1 for total hydrocarbons calculated as gasoline. No high boiling hydrocarbons were detected in Well S-1 as discussed in Woodward-Clyde Consultants report dated July 17, 1988.

## 2.0 SITE HISTORY (continued)

Four additional groundwater monitoring wells (S-4 through S-7) were installed in October 1988 around the periphery of the subject site. These wells were to help assess the lateral and downgradient limits of the petroleum contamination. Laboratory analysis of the groundwater taken from all the wells at the time of installation revealed groundwater concentrations of Total Petroleum Hydrocarbons calculated as Gasoline in Wells S-2, S-6, and S-7 ranging from 5.5 ppm to 0.20 ppm. Benzene levels in these wells ranged from 1.7 ppm to 0.022 ppm. This is discussed in a Woodward-Clyde Consultants report dated March 20, 1989

Quarterly groundwater monitoring was begun in May 1988, by Blaine Technical Services, Inc. Quarterly monitoring of this site was taken over by Gettler-Ryan Inc. in November 1988. Groundwater sampling for the first quarter of 1989 was completed by Gettler-Ryan Inc. on February 22, 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 contoured and are presented on Plate 2. Water-level data used to prepare the quarterly potentiometric map were taken from data collected on the same day that ground-water sampling occurred. Water-level measurements for this quarter have been compiled with databased historical water-level data presented in Appendix C of this report.

### 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. Floating product was observed in Well S-3 at a maximum thickness of 0.01 feet this quarter. Floating-product measurements for the quarter are presented in the appended Groundwater Sampling Report (See Appendix C). These data have been compiled in Table 1 and have been added to the historical database presented in Appendix C.

## 4.0 CHEMICAL ANALYTICAL DATA

Ground-water samples were collected from site monitoring wells on May 2, 1989. All 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 this analytical work was International Technology Corporation (IT), of Santa Clara, California. The G-R Groundwater Sampling Report for the second quarter sampling round performed in 1989 is presented in Appendix B.

Four wells (Well S-2, S-3, S-6, and S-7) were found to contain aromatic fractions of petroleum hydrocarbon products above the established action levels set by the State of California Department of Health Services (DHS). As shown on Table 1, benzene concentrations in these wells exceeded DHS action levels. The toluene concentrations in Wells S-3, and S-6 exceeded DHS action limits. The ethylbenzene and xylene concentrations exceeded DHS action limits in Well S-3.

### 4.1 Quality Control

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

Water-quality data for this quarterly report are summarized in Table 1. TPH and benzene chemical analytical data were used to prepare Isoconcentration maps for this quarter (Refer to Plates 3 and 4).

## 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). A potentiometric map was constructed from static water-level data.
- Floating product was found in Well S-3.
- TPH was detected in Wells S-2, S-3, S-6, and S-7 (Table 1). TPH concentrations ranged from 0.8 to 47 ppm.
- Benzene concentrations exceeded DHS action levels in Wells S-2, S-3, S-6, and S-7. Toluene concentrations exceeded DHS action levels in Wells S-3 and S-6. Ethylbenzene and Xylene concentrations exceeded DHS action levels in Well S-3.

## 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 levels will be measured monthly and selected data will be used to prepare a potentiometric map across the site. The local ground-water gradient will be calculated.
- Chemical data will be used to construct Isoconcentration maps for TPH and Benzene.
- Install three additional monitoring wells as proposed by Woodward-Clyde Consultants in their report dated March 20, 1989. This work is pending receipt of an encroachment permit from the City of Oakland.

TABLE 1

GROUND-WATER ANALYSIS 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 | 02-May-89 | 10-May-89 | ND | ND | ND | ND | ND | 102.81 | 93.42 | ---- | 9.39 |
| S-2 | 02-May-89 | 10-May-89 | 2.2 | 0.5 | 0.12 | 0.052 | 0.18 | 101.11 | 92.05 | ---- | 9.06 |
| S-3 | 02-May-89 | 10-May-89 | 47. | 2. | 1.7 | 6. | 7.2 | 101.39 | 92.36 | ---- | 9.03 |
| S-4 | 02-May-89 | 10-May-89 | ND | ND | ND | ND | ND | 101.55 | 91.17 | ---- | 10.38 |
| S-5 | 02-May-89 | 10-May-89 | ND | ND | ND | ND | ND | 100.91 | 90.74 | ---- | 10.17 |
| S-6 | 02-May-89 | 10-May-89 | 9.1. | 3.7 | 0.28 | 0.12 | 0.3 | 100.00 | 90.88 | ---- | 9.12 |
| S-7 | 02-May-89 | 10-May-89 | 0.8 | 0.032 | 0.021 | 0.014 | 0.11 | 100.82 | 90.02 | ---- | 10.80 |
| SD-2 | 02-May-89 | 10-May-89 | 2.1 | 0.46 | 0.11 | 0.05 | 0.16 | ---- | ---- | ---- | ---- |
| SF-1 | 02-May-89 | 10-May-89 | ND | ND | ND | ND | ND | ---- | ---- | ---- | ---- |
| TB | 02-May-89 | 10-May-89 | ND | ND | ND | ND | ND | ---- | ---- | ---- | ---- |

TPH = Total Petroleum Hydrocarbons as Gasoline
PPM = parts per million
SD = Duplicate Sample
SF = Field Blank
TB = Trip Blank
ND = None Detected

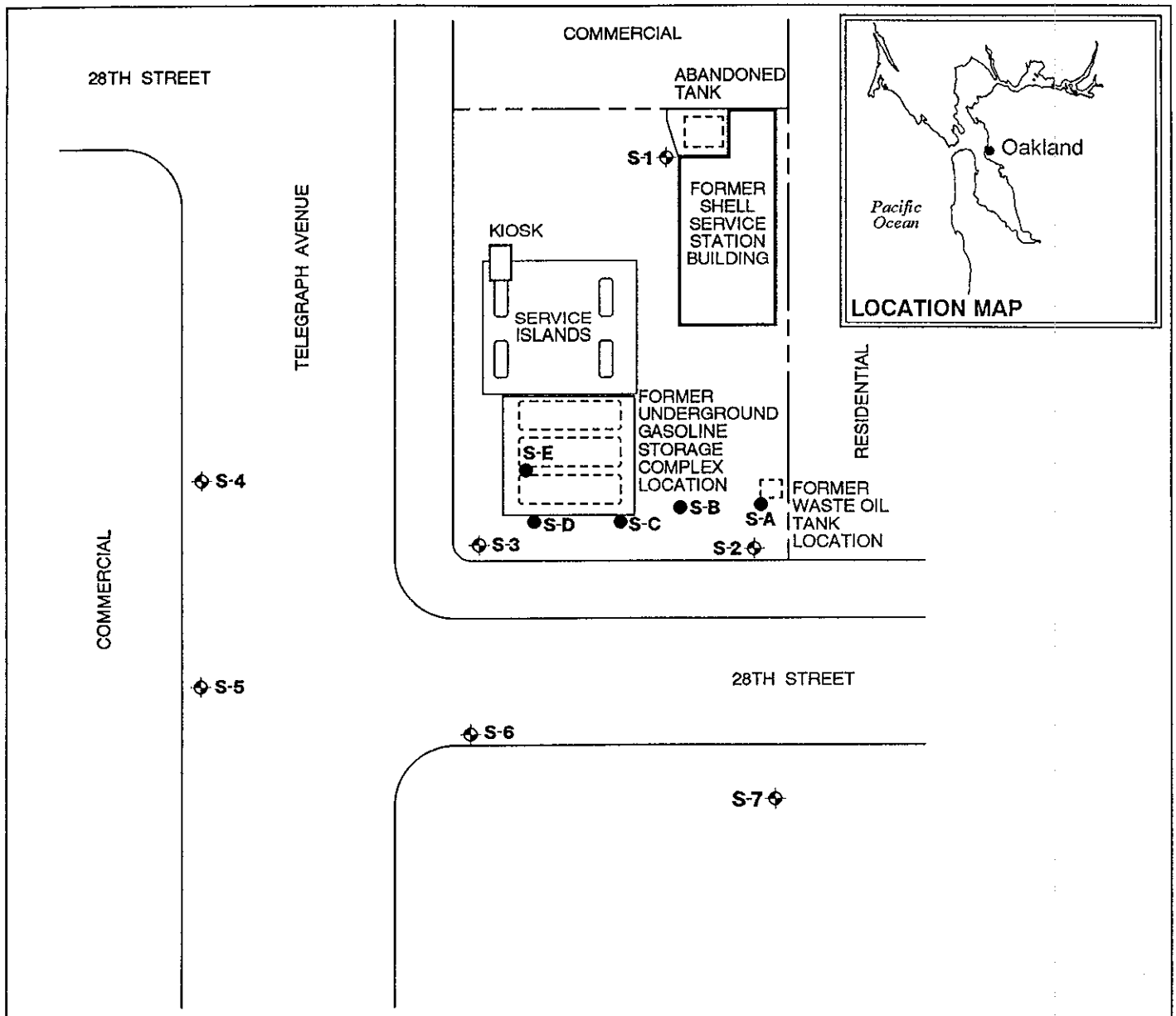
CURRENT DEPARTMENT OF HEALTH SERVICES ACTION LEVELS

Benzene 0.0007 ppm
Toluene 0.100 ppm
Xylenes 0.620 ppm
Ethylbenzene 0.680 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

Project No. 7610-1

# ILLUSTRATIONS




## EXPLANATION

| | |
|---|---|
| ⊕ S-1 | Approximate groundwater monitoring well location by Woodward-Clyde Consultants |
| ● S-A | Approximate soil boring location |
| ⊕ | Proposed groundwater monitoring well location |

N

Base Map: Woodward-Clyde consultants

0 50 100

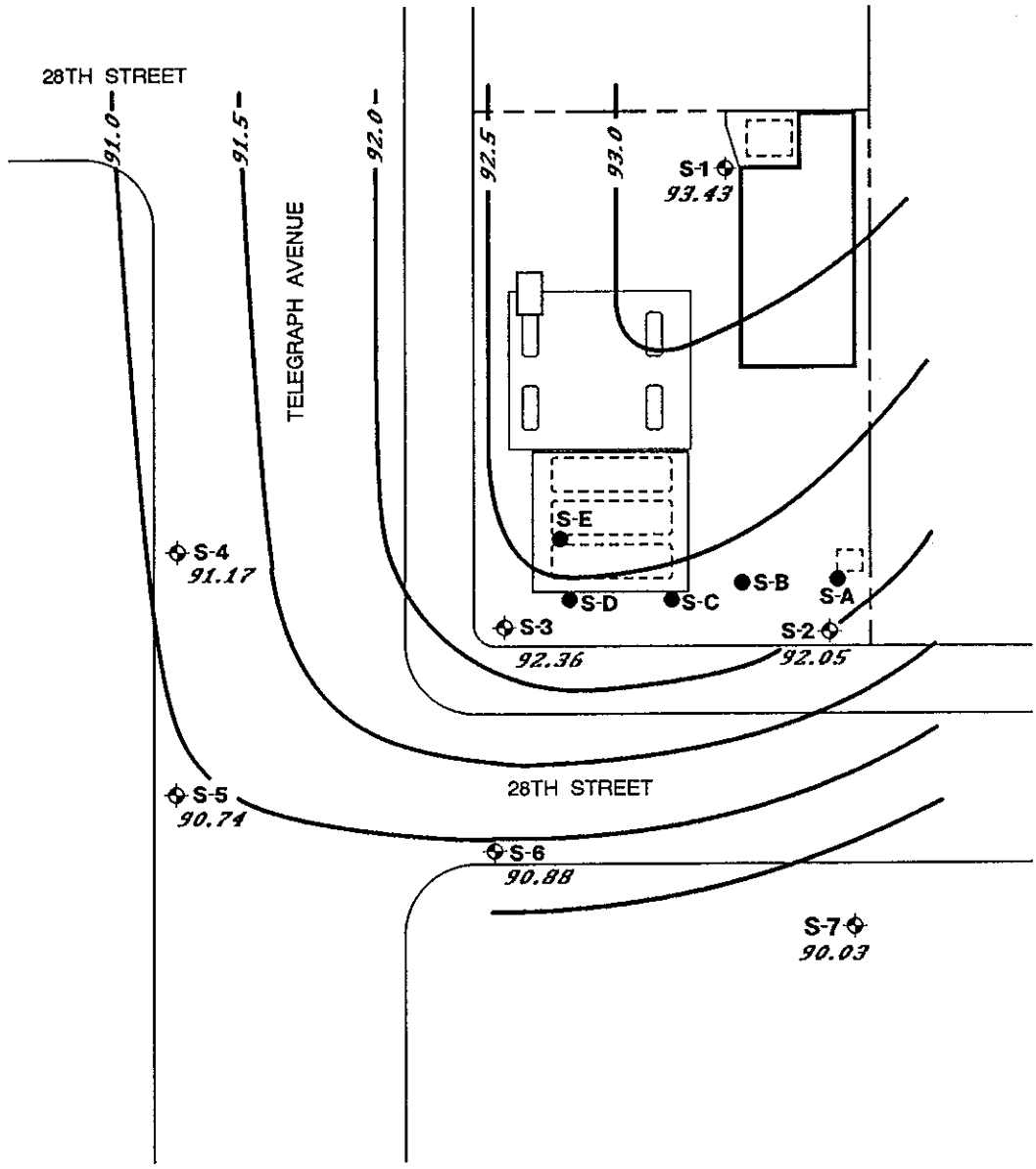
Scale in Feet

GeoStrategies Inc.

**Site Plan**
Former Shell Service Station
2800 Telegraph Avenue
Oakland, California

PLATE **1**

| JOB NUMBER | REVIEWED BY RG/CEG | DATE | REVISED DATE | REVISED DATE |
|---|---|---|---|---|
| 7610 | CMP CEG 1262 | 6/89 | | |




**EXPLANATION**

| | |
|---|---|
| ⊕ S-1 | Approximate groundwater monitoring well location by Woodward-Clyde Consultants |
| ● S-A | Approximate soil boring location |
| —— 91.0 | Groundwater elevation contour (dashed where approximate) Interval = 0.5 feet; Approximate Gradient = 0.014 |
| 90.88 | Groundwater elevation measured on 5/2/89 in feet referenced to project datum |

N

0 50 100

Scale in Feet

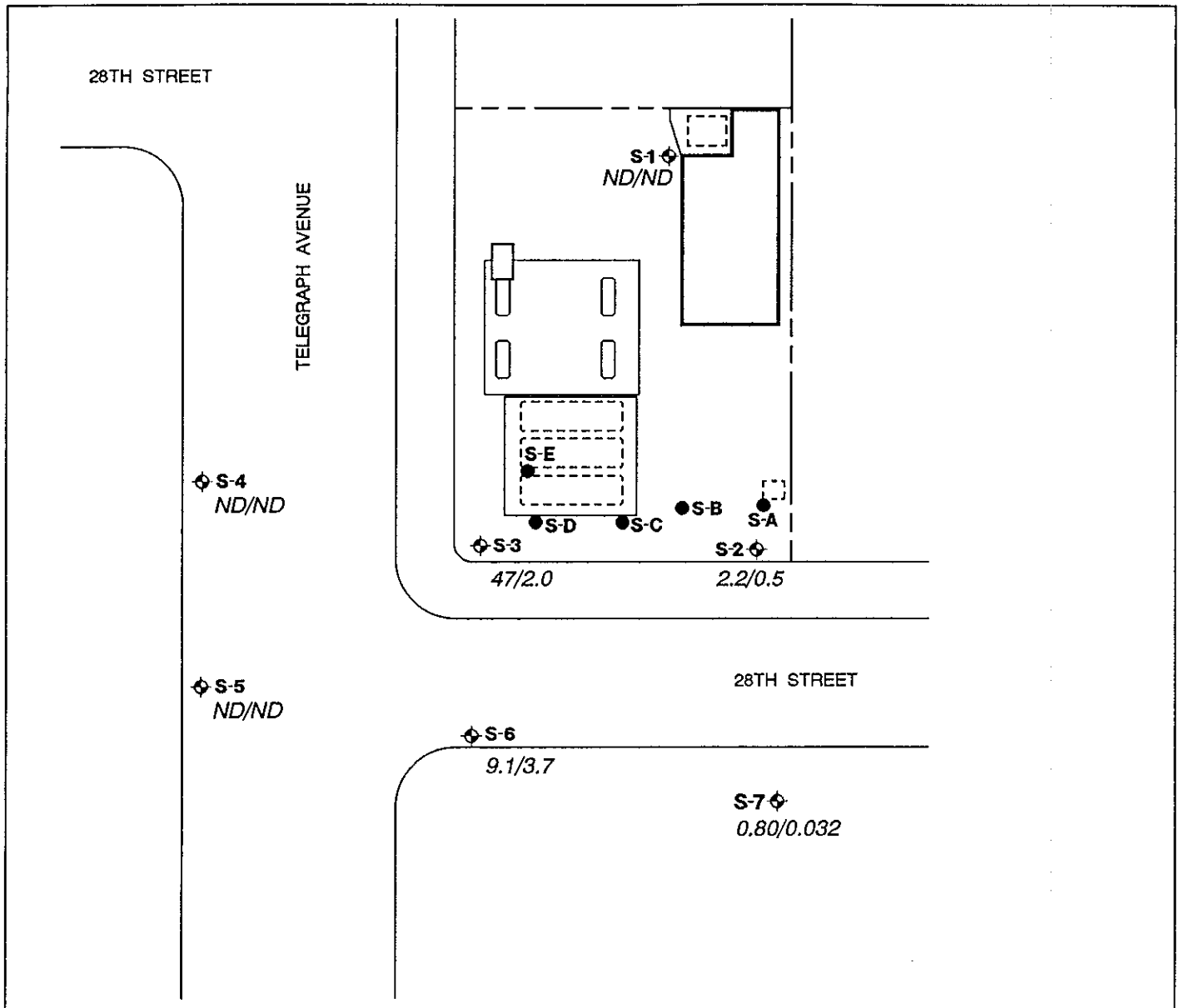
Base Map: Woodward-Clyde consultants

GeoStrategies Inc.

**Potentiometric Map**
Former Shell Service Station
2800 Telegraph Avenue
Oakland, California

PLATE **2**

| JOB NUMBER | REVIEWED BY RG/CEG | DATE | REVISED DATE | REVISED DATE |
|---|---|---|---|---|
| 7610 | CWP CEG 1262 | 6/89 | | |




**EXPLANATION**

| | |
|---|---|
| S-1 | Approximate groundwater monitoring well location by Woodward-Clyde Consultants |
| S-A | Approximate soil boring location |
| *9.1/3.7* | TPH(Total Petroleum Hydrocarbon)/Benzene concentrations measured on 5/2/89 in ppm (parts per million) |
| *ND* | Not Detected (see laboratory reports for detection limits) |

N

0 50 100

Scale in Feet

Base Map: Woodward-Clyde consultants

GeoStrategies Inc.

**TPH/Benzene Concentration Map**
Former Shell Service Station
2800 Telegraph Avenue
Oakland, California

PLATE **3**

| JOB NUMBER | REVIEWED BY RG/CEG | DATE | REVISED DATE | REVISED DATE |
|---|---|---|---|---|
| 7610 | CMP CEG 1262 | 6/89 | | |

# APPENDIX A

# METHODS AND PROCEDURES

# FIELD METHODS AND PROCEDURES

## EXPLORATION DRILLING

### Mobilization

Prior to any drilling activities, GSI will verify necessary drilling permits have been secured.

Utility locations will be located and drilling will be conducted so as not to disrupt activities at a project site. GSI will obtain and review available public data on subsurface geology and if warranted, the location of wells within a quarter-mile of the project site will be identified. Drillers will be notified in advance so that drilling equipment can be properly inspected prior to performing work.

### Drilling

The subsurface investigations are typically performed to assess the lateral and vertical extent of petroleum hydrocarbons present in soils and ground water. Drilling methods will be selected to optimize field data requirements as well as be compatible with known or suspected subsurface geologic conditions.

### Soil Sampling

Shallow soil borings will be drilled using a truck-mounted hollow-stem auger drilling rig, unless site conditions favor a different drilling method. Drilling and sampling methods will be consistent with ASTM Method D-1452-80. The auger size will be a minimum 6-inch nominal outside-diameter O.D. No drilling fluids will be used during this drilling method. The augers and other tools used in the bore hole will be steam cleaned before use and between borings to minimize the possibilities of cross-contamination between borings.

Soil Sampling (continued)

Soil samples are typically collected at 5-foot intervals as a minimum from ground surface to total depth of boring. Additional soil samples may be collected based on significant lithologic changes and/or potential chemical content. Soil samples from each sampling interval will be lithologically described by a GSI geologist.

Head-space analyses will be performed to check for the presence of volatile organic compounds. Head-space analyses will be performed using an organic vapor analyzer; either an OVA, HNu, or OVM. Organic vapor concentrations will be recorded on the GSI field log of boring (Figure 1). The selection of soil samples for chemical analysis are typically based on the following criteria:

1) Soil discoloration
2) Soil odors
3) Visual confirmation of chemical in soil
4) Depth with respect to underground tanks
5) Depth with respect to ground water
6) OVA reading

Soil samples (full brass liners) selected for chemical analysis are covered with aluminum foil and the ends are capped to prevent volatilization. The samples are labeled and entered onto a Chain-of-Custody form, and placed in a cooler on blue ice for transport to a State-certified analytical laboratory.

Soil cuttings are stock-piled on-site. A composite sample is collected and analyzed for site-specific chemical parameters. Disposition of soils is dependent of chemical analytical results of the composite sample.

Soil borings are backfilled (sealed) to ground surface using either a neat cement or cement-bentonite grout mixture.

Exploratory boring logs are prepared under the direction of registered geologist.

Monitor Well Installation

Monitoring wells are installed using a truck-mounted hollow-stem auger drill rig or mud-rotary drill rig. Typically, the hollow-stem rig is used for wells up to 100 feet, if subsurface conditions are favorable. Wells greater than 100-feet deep are typically drilled using mud-rotary techniques.

Monitoring well casing and screen will be constructed of Schedule 40, flush-joint threaded polyvinylchloride (PVC). The well screen will be factory mill-slotted unless additional open area is required (eg. conversion to an extraction well in a low-yield aquifer). The screen length will be placed adjacent to the aquifer material to a minimum of 2-feet above encountered water. No screen shall be placed in a borehole that creates hydraulic interconnection of two or more aquifer units. Screen slot size will be compatible with encountered aquifer materials.

Monitoring wells will be completed below grade (Figure 2) unless special conditions exist that require above-grade completion design. In the event a monitoring well is required in an aquifer unit beneath an existing aquifer, the upper aquifer will be sealed off by installing a steel conductor casing with an annular neat cement or cement-bentonite grout seal. This seal will be tremied pumped from the bottom of the annulus to ground surface.

The monitoring well sand pack will be placed adjacent to the entire screened interval and will extend a recommended minimum distance of 2-feet above the top of the screen. No sand pack will be placed that interconnects two or more aquifer units. A minimum 2-foot bentonite pellet or bentonite slurry seal will be placed above the sand pack. Sand pack, bentonite, and cement seal levels will be confirmed by sounding the annulus with a calibrated weighted tape. The remaining annular space above the bentonite seal will be grouted with a bentonite-cement mixture and will be placed from the bottom of the annular space to the ground surface. The bentonite content of the grout will not exceed 5 percent by weight. A field log of boring and a field well completion form will be prepared by GSI for each well installed.

Decontamination of drilling equipment will consist of steam cleaning, and/or Alconox wash.

Well Development

Monitoring wells will be developed using a submersible pump, bladder pump or bailer. All well developing equipment will be decontaminated prior to development using a steam cleaner and/or Alconox detergent wash. Wells will be developed until discharge water is visibly clear and free of sediment. The adequacy of well development will be assessed by the GSI geologist. Indicator parameters (pH, specific conductance, and temperature) will be monitored and recorded during well development. Field instrument calibrations will be performed according to manufacturer's specifications.

Well Surveying

Monitoring wells will be surveyed to obtain top of box elevations to the nearest ±0.01 foot. Water level measurements will be recorded to the nearest ±0.01 foot and referenced to either a project site datum or mean sea level (MSL). A project site datum is typically used for the initial three wells installed at a site to obtain ground-water flow direction and gradient. If additional wells are required, existing and newly installed wells are surveyed relative to MSL.

## 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 $\pm 10$ umhos/cm, and are calibrated daily. pH meters are read to the nearest $\pm 0.1$ 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 1

GeoStrategies Inc.

# FIELD EXPLORATORY BORING LOG

| | | |
|---|---|---|
| Field location of boring: | Project No.: | Date: |
| | Client: | |
| | Location: | |
| | City: | |
| | Logged by: | Driller: |
| Drilling method: | Casing installation data: | |
| Hole diameter: | Top of Box Elevation: | Datum: |

Boring No:

Sheet of

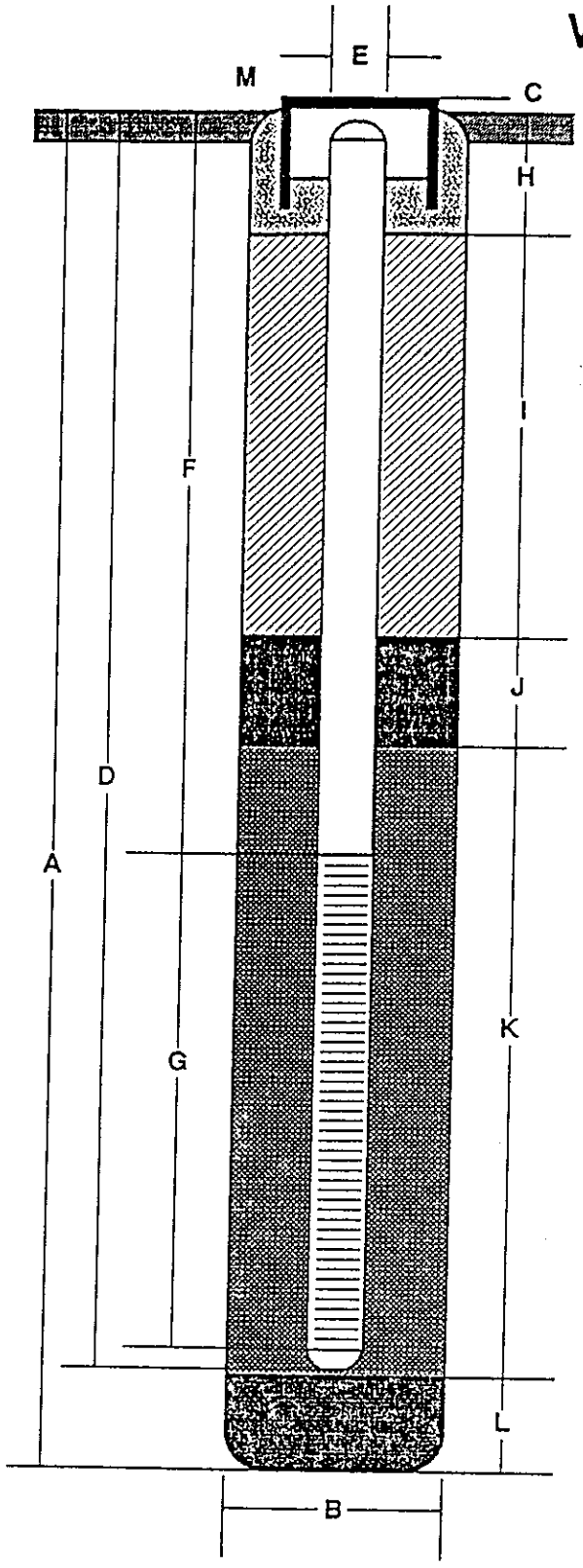
| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Water Level | | | | | | | | |
| Time | | | | | | | | |
| Date | | | | | | | | |

| PID (ppm) | Blows/ft. or Pressure (psi) | Type of Sample | Sample Number | Depth (ft.) | Sample | Well Detail | Soil Group Symbol (USCS) | Description |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |

Remarks:

FIGURE 2

# WELL CONSTRUCTION DETAIL




A Total Depth of Boring _____ ft.

B Diameter of Boring _____ in.
Drilling Method _____

C Top of Box Elevation _____ ft.
☐ Referenced to Mean Sea Level
☐ Referenced to Project Datum

D Casing Length _____ ft.
Material _____

E Casing Diameter _____ in.

F Depth to Top Perforations _____ ft.

G Perforated Length _____ ft.
Perforated Interval from _____ to _____ ft.
Perforation Type _____
Perforation Size _____

H Surface Seal _____ ft.
Seal Material _____

I Backfill _____ ft.
Backfill Material _____

J Seal _____ ft.
Seal Material _____

K Gravel Pack _____ ft.
Pack Material _____

L Bottom Seal _____ ft.
Seal Material _____

M _____
_____

GeoStrategies Inc.

Well Construction Detail

WELL NO.

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

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

Sampling Crew Reviews Project Sampling Requirments/Schedule

↓

Field Decontamination and Instrumentation Calibration

↓

Check Integrity of Well (Inspect for Well Damage)

↓

Measure and Record Depth to Water and Total Well Depth (Electric Well Sounder)

↓

Check for Floating Product (Oil/Water Interface Probe)

**Floating Product Present**

↓

Confirm Product Thickness (Acrylic or PVC Bailer)

↓

Collect Free-Product Sample

↓

Dissolved Product Sample Not Required

↓

Record Data on Field Data Form

**Floating Product Not Present**

↓

Purge Volume Calculation

$V = (r/12)^2 h(\_\_\_ \text{ \# vol})(7.48) = \_\_\_\_\_ \text{/gallons}$

V = Purge volume (gallons)
= 3.14159
h = Height of Water Column (feet)
r = Borehole radius (inches)

↓

Evacuate water from well equal to the calculated purge volume while monitoring groundwater stabilization indicator parameters (pH, conductivity, temperature) at intervals of one casing volume.

**Well Dewaters after One Purge Volume (Low yield well)**

↓

Well Recharges to 80% of Initials Measured Water Column Height in Feet within 24 hrs. of Evacuation.

↓

Measure Groundwater Stability Indicator Parameters (pH, Temp., Conductivity)

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Anayltical Laboratory

**Well Readily Recovers**

↓

Record Groundwater Stability Indicator Parameters from each Additional Purge Volume

Stability indicated when the following criteria are met:

| | |
|---|---|
| pH: | ± 0.1 pH units |
| Conductivity: | ± 10% |
| Tempertaure: | 1.0 degree F |

**Groundwater Stability Achieved**

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

**Groundwater Stability Not Achieved**

↓

Continue Purging Until Stability is Achieved

↓

Collect Sample and Complete Chain-of-Custody

↓

Preserve Sample According to Required Chemical Analysis

↓

Transport to Analytical Laboratory

**Geffler - Ryan Inc.** FIGURE 5

ENVIRONMENTAL DIVISION

**Chain of Custod**

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 30, 1989

GROUNDWATER SAMPLING REPORT

Shell Oil Company
Post Office Box 4023
Concord, California 94520

Referenced Site: Former Shell Service Station
2800 Telegraph Avenue
Oakland, California

Sampling Date: May 2, 1989

This report presents the results of the quarterly groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on May 2, 1989 at the referenced location. The site, located on the northeast corner of Telegraph and 28th Avenue, 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 four off site at the locations shown on the attached site map. Prior to sampling, the 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 9.03 to 10.80 feet below grade. Separate phase product was not observed in any monitoring wells.

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. In cases where a well dewatered or less than four case volumes were purged, groundwater samples were obtained after the physical parameters had stabilized. 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 field blank (SF-1), and trip blank, supplied by the laboratory, were included and analyzed to assess quality control. A duplicate sample (SD-2), was submitted without well designations, to assess laboratory performance. Analytical results for the blanks are included in the Certified Analytical Report (CAR's). 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

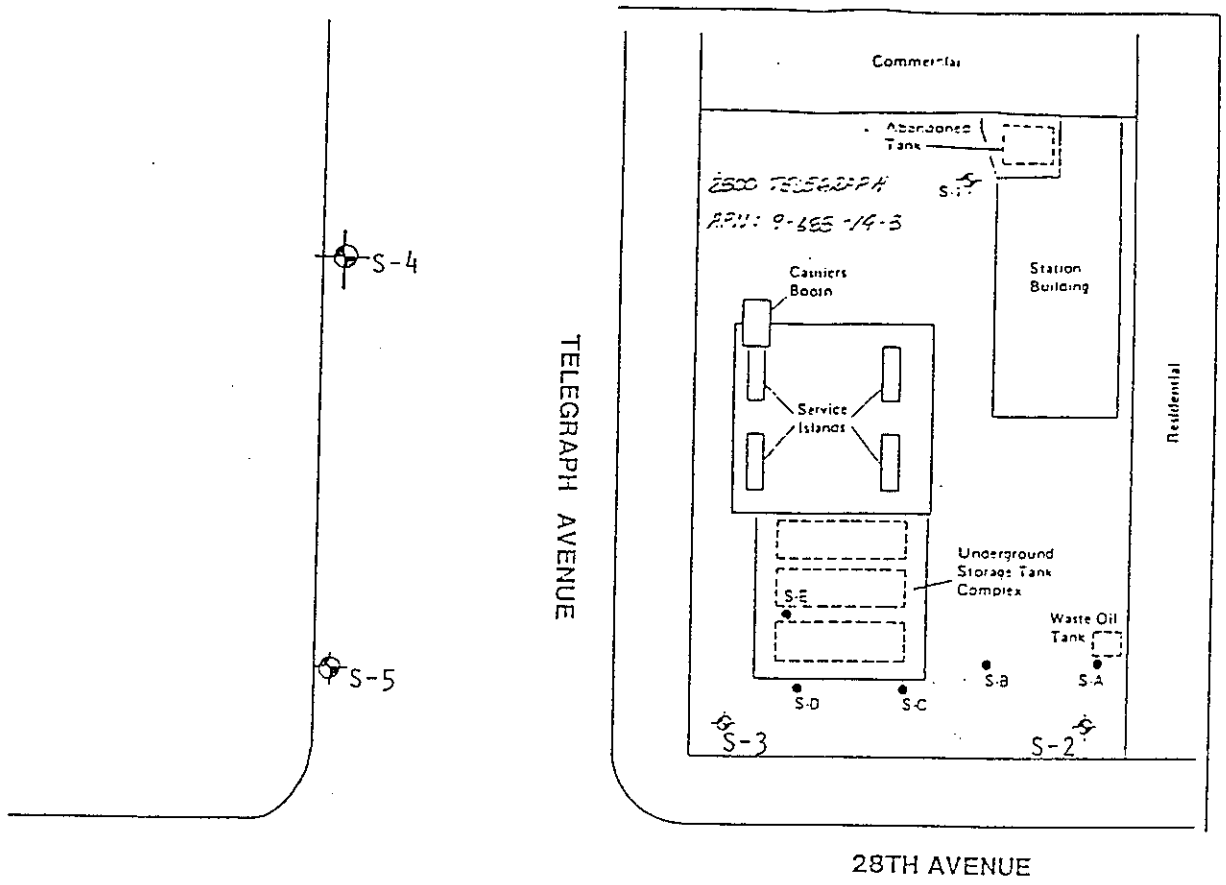
| WELL I.D. | S-1 | S-2<br>SD-2 | S-3 | S-4 | S-5 | S-6 |
|---|---|---|---|---|---|---|
| Casing Diameter (inches) | 3 | 3 | 3 | 3 | 3 | 3 |
| Total Well Depth (feet) | 28.00 | 24.80 | 25.50 | 29.50 | 30.60 | 22.20 |
| Depth to Water (feet) | 9.39 | 9.06 | 9.03 | 10.38 | 10.17 | 9.12 |
| Free Product (feet) | none | none | none | none | none | none |
| Reason Not Sampled | ---- | ---- | ---- | ---- | ---- | ---- |
| Calculated 4 Case Vol.(gal.) | 28.3 | 24.0 | 25.0 | 29.2 | 31.2 | 19.9 |
| Did Well Dewater? | no | yes | no | yes | no | yes |
| Volume Evacuated (gal.) | 36 | 18 | 31 | 26 | 39 | 21 |
| Purging Device | Suction | Suction | Suction | Suction | Suction | Suction |
| Sampling Device | Bailer | Bailer | Bailer | Bailer | Bailer | Bailer |
| Time | 13:42 | 14:14 | 14:52 | 14:00 | 14:31 | 12:39 |
| Temperature (F)* | 64.4 | 65.9 | 65.5 | 70.8 | 67.4 | 67.7 |
| pH* | 6.36 | 6.60 | 6.63 | 6.54 | 6.60 | 6.88 |
| Conductivity (umhos/cm)* | 340 | 529 | 375 | 365 | 190 | 571 |

* Indicates Stabilized Value

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

| WELL I.D. | S-7 |
|---|---|
| Casing Diameter (inches) | 3 |
| Total Well Depth (feet) | 30.90 |
| Depth to Water (feet) | 10.80 |
| Free Product (feet) | none |
| Reason Not Sampled | ---- |
| Calculated 4 Case Vol.(gal.) | 30.6 |
| Did Well Dewater? | no |
| Volume Evacuated (gal.) | 39 |
| Purging Device | Suction |
| Sampling Device | Bailer |
| Time | 11:58 |
| Temperature (F)* | 66.8 |
| pH* | 7.29 |
| Conductivity (umhos/cm)* | 772 |

* Indicates Stabilized Value




MONITORING WELL LOCATION

0 30
feet

SHELL SERVICE STATION
2800 TELEGRAPH AVENUE
OAKLAND, CALIFORNIA

INTERNATIONAL TECHNOLOGY CORPORATION

# ANALYTICAL SERVICES

## CERTIFICATE OF ANALYSIS

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

Date: June 5, 1989

Work Order Number: S9-Ø5-Ø31

P.O. Number: 361Ø

This is the Certificate of Analysis for the following samples:

| | |
|---|---|
| Client Project ID: | GR #361Ø, Shell, 28ØØ Telegraph & 28th Ave., Oakland, CORRECTED REPORT |
| Date Received by Lab: | 5/3/89 |
| Number of Samples: | 1Ø |
| Sample Type: | Water |

The method of analysis for low boiling hydrocarbons is taken from EPA Methods 8Ø15, 8Ø2Ø and 5Ø3Ø. 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: June 5, 1989
Client Project ID: GR #3610, Shell, 2800 Telegraph & 28th Ave., Oakland, CORRECTED REPORT

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-05-031

| Lab Sample ID | Client Sample ID | Sample Date | Date Analysis Completed | Sample Condition on Receipt |
|---|---|---|---|---|
| S9-05-031-01 | S-1 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-02 | S-2 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-03 | S-3 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-04 | S-4 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-05 | S-5 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-06 | S-6 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-07 | S-7 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-08 | SD-2 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-09 | SF-1 | 5/2/89 | 5/10/89 | cool pH <2 |
| S9-05-031-10 | Trip Blank | 5/2/89 | 5/10/89 | 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) |
|---|---|---|---|---|---|---|
| S9-05-031-01 | S-1 | ND | ND | ND | ND | ND |
| Detection Limit | | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |
| S9-05-031-02 | S-2 | 2.2 | 0.50 | 0.052 | 0.12 | 0.18 |
| Detection Limit | | 0.5 | 0.005 | 0.001 | 0.001 | 0.003 |
| S9-05-031-03 | S-3 | 47. | 2.0 | 6.0 | 1.7 | 7.2 |
| Detection Limit | | 5. | 0.05 | 0.1 | 0.1 | 0.3 |
| S9-05-031-04 | S-4 | ND | ND | ND | ND | ND |
| Detection Limit | | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |
| S9-05-031-05 | S-5 | ND | ND | ND | ND | ND |
| Detection Limit | | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |
| S9-05-031-06 | S-6 | 9.1 | 3.7 | 0.12 | 0.28 | 0.3 |
| Detection Limit | | 2.0 | 0.02 | 0.05 | 0.05 | 0.2 |
| S9-05-031-07 | S-7 | 0.80 | 0.032 | 0.014 | 0.021 | 0.11 |
| Detection Limit | | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |
| S9-05-031-08 | SD-2 | 2.1 | 0.46 | 0.05 | 0.11 | 0.16 |
| Detection Limit | | 0.5 | 0.005 | 0.01 | 0.01 | 0.03 |
| S9-05-031-09 | SF-1 | ND | ND | ND | ND | ND |
| Detection Limit | | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |
| S9-05-031-10 | Trip Blank | ND | ND | ND | ND | ND |
| Detection Limit | | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |

682-1-89

Gettler - Ryan Inc. — ENVIRONMENTAL DIVISION — 59-05-031 — **Chain of Custody**

COMPANY Shell Oil Company — JOB NO. 076

JOB LOCATION 2800 Telegraph / 28th Aves.

CITY Oakland, CA — PHONE NO. (415) 483-7500

AUTHORIZED John Werfal — DATE 5/2/89 — P.O. NO. 3610

| | SAMPLE ID | NO. OF CONTAINERS | SAMPLE MATRIX | DATE/TIME SAMPLED | ANALYSIS REQUIRED | SAMPLE CONDITION LAB ID |
|---|---|---|---|---|---|---|
| 01 | S-1 | 3 | Liquid | 5-2/1342 | TPH (Gas) BTXE | Cool/Ok |
| 02 | S-2 | | | /1414 | | |
| 03 | S-3 | | | /1452 | | |
| 04 | S-4 | | | /1400 | | |
| 05 | S-5 | | | /1431 | | |
| 06 | S-6 | | | /1239 | | |
| 07 | S-7 | | | /1156 | | |
| 08 | SD-2 | | | /— | | |
| 09 | SF-1 | | | /— | | |
| 10 | Trip Blank | 2 | (No date) | /— | | |
| | | | | 5-1-89 | | |

RELINQUISHED BY: Guadalupe Ryan 5-3-89 08:30 — RECEIVED BY: [signature] 5-3-89 08:30

RELINQUISHED BY: [signature] 5-3-89 16:10 — RECEIVED BY:

RELINQUISHED BY: — RECEIVED BY LAB: [signature] 5/3/89 16:10

DESIGNATED LABORATORY: FT SCV — DHS #: 137

REMARKS: Normal TAT Results due 5/10/89

DATE COMPLETED May 2, 1989 — FOREMAN Samplers: [signature] Guadalupe Ryan

ORIGINAL

# APPENDIX C

# HISTORICAL DATABASE

## CHEMICAL DATA

## MONITORING DATA

# CHEMICAL ANALYTICAL DATA

SHELL OIL COMPANY OAKLAND - 2800 TELEGRAPH AVENUE & 28TH

ANALYTICAL LOG

| DATE | SAMPLE POINT | TVHC (PPM) | BENZENE (PPM) | TOLUENE (PPM) | XYLENES (PPM) |
|---|---|---|---|---|---|
| DETECTION LIMITS | -------- | 0.05 | 0.0005 | 0.001 | 0.004 |
| 02-May-88 | S-1 | ND | 0.5 | ND | ND |
| 02-May-88 | S-2 | 1.6 | 0.079 | 0.089 | 0.048 |
| 02-May-88 | S-3 | 46 | 2.7 | 10 | 10 |

| DATE | SAMPLE POINT | TVHC (PPM) | BENZENE (PPM) | TOLUENE (PPM) | E.B. (PPM) | XYLENES (PPM) |
|---|---|---|---|---|---|---|
| DETECTION LIMITS | -------- | 0.05 | 0.0005 | 0.001 | 0.001 | 0.003 |
| 08-Nov-88 | S-1 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 03-May-89 | S-1 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 08-Nov-88 | S-2 | 0.20 | 0.0220 | 0.001 | 0.016 | 0.008 |
| 03-May-89 | S-2 | 2.20 | 0.5000 | 0.052 | 0.120 | 0.180 |
| 03-May-89 | S-3 | 47.00 | 2.0000 | 6.000 | 1.700 | 7.200 |
| 08-Nov-88 | S-4 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 22-Feb-89 | S-4 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 03-May-89 | S-4 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 08-Nov-88 | S-5 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 22-Feb-89 | S-5 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 03-May-89 | S-5 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 08-Nov-88 | S-6 | 5.50 | 1.7000 | 0.020 | 0.020 | 0.120 |
| 22-Feb-89 | S-6 | 6.00 | 2.4000 | 0.050 | 0.110 | 0.300 |
| 03-May-89 | S-6 | 9.10 | 3.7000 | 0.120 | 0.280 | 0.300 |
| 08-Nov-88 | S-7 | 2.60 | 0.0880 | 0.430 | 0.086 | 0.430 |
| 22-Feb-89 | S-7 | 0.80 | 0.0250 | 0.027 | 0.029 | 0.170 |
| 03-May-89 | S-7 | 0.80 | 0.0320 | 0.014 | 0.021 | 0.110 |
| 03-May-89 | TB | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 03-May-89 | SD-2 | 2.10 | 0.4600 | 0.050 | 0.110 | 0.160 |
| 22-Feb-89 | SD-5 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 03-May-89 | SF-1 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |
| 22-Feb-89 | SF-6 | <0.05 | <0.0005 | <0.001 | <0.001 | <0.003 |

# WELL MONITORING DATA

| DATE | WELL | DTH | DTW | HT | BAILED | FLOWMETER | PT-LIQ. | PT-H20 | EMP | C.ELEV |
|---|---|---|---|---|---|---|---|---|---|---|
| 27-Sep-88 | A | 10.37 | (1.00) | .00 | | | | | | |
| 11-Oct-88 | A | | N/A | | | | | | | |
| 25-Oct-88 | A | 10.30 | (1.00) | .00 | | | | | | |
| 08-Nov-88 | A | | N/A | | | | | | | |
| 22-Nov-88 | A | 9.16 | (1.00) | .00 | | | | | | |
| 06-Dec-88 | A | | N/A | | | | | | | |
| 20-Dec-88 | A | | N/A | | | | | | | |
| 03-Jan-89 | A | | N/A TANKS REMOVED | | | | | | | |
| 27-Sep-88 | B | 10.22 | (1.00) | .00 | | | | | | |
| 11-Oct-88 | B | | N/A | | | | | | | |
| 25-Oct-88 | B | 10.16 | (1.00) | .00 | | | | | | |
| 08-Nov-88 | B | | N/A | | | | | | | |
| 22-Nov-88 | B | | 8.92 | 0.00 | | | | | | |
| 06-Dec-88 | B | | N/A | | | | | | | |
| 20-Dec-88 | B | | N/A | | | | | | | |
| 03-Jan-89 | B | | N/A TANKS REMOVED | | | | | | | |
| 22-Nov-88 | C | 9.00 | (1.00) | .00 | | | | | | |
| 06-Dec-88 | C | | N/A | | | | | | | |
| 20-Dec-88 | C | | N/A | | | | | | | |
| 03-Jan-89 | C | | N/A TANKS REMOVED | | | | | | | |
| 22-Nov-88 | D | | 9.05 | 0.00 | | | | | | |
| 06-Dec-88 | D | | N/A | | | | | | | |
| 20-Dec-88 | D | | N/A | | | | | | | |
| 03-Jan-89 | D | | N/A TANKS REMOVED | | | | | | | |
| 16-Aug-88 | 1 | | 14.33 | 0.00 | | | | | DF | |
| 30-Aug-88 | 1 | | 10.48 | 0.00 | | | | | DF | |
| 13-Sep-88 | 1 | | 10.66 | 0.00 | | | | | DF | |
| 27-Sep-88 | 1 | | 10.86 | 0.00 | | | | | GS | |
| 11-Oct-88 | 1 | | 10.82 | 0.00 | | | | | DF | |
| 25-Oct-88 | 1 | | 10.85 | 0.00 | | | | | GS | |
| 08-Nov-88 | 1 | | 10.69 | 0.00 | | | | | DF | |
| 22-Nov-88 | 1 | | 9.65 | 0.00 | | | | | GS | |
| 06-Dec-88 | 1 | | N/A | | | | | | DF | |
| 20-Dec-88 | 1 | | N/A | | | | | | GS | |
| 03-Jan-89 | 1 | | N/A COVERED | | | | | | DF | |
| 17-Jan-89 | 1 | | 9.10 | 0.00 | | | | | CA | |
| 31-Jan-89 | 1 | | N/A | | | | | | DF | |
| 14-Feb-89 | 1 | | N/A | | | | | | CA | |
| 28-Feb-89 | 1 | | 9.56 | 0.00 | | | | | DF | |
| 16-Mar-89 | 1 | | 8.49 | 0.00 | | | | | BH | |
| 30-Mar-89 | 1 | | 9.30 | 0.00 | | | | | SM | |
| 16-Aug-88 | 2 | | 14.18 | 0.00 | | | | | | |
| 30-Aug-88 | 2 | | 10.27 | 0.00 | | | | | | |
| 13-Sep-88 | 2 | | 10.29 | 0.00 | | | | | | |
| 27-Sep-88 | 2 | | 10.50 | 0.00 | | | | | | |

| DATE | WELL | DTH | DTW | HT | BAILED | FLOWMETER | PT-LIQ. | PT-H2O | EMP | C.ELEV |
|---|---|---|---|---|---|---|---|---|---|---|
| 11-Oct-88 | 2 | | 10.52 | 0.00 | | | | | | |
| 25-Oct-88 | 2 | | 10.48 | 0.00 | | | | | | |
| 08-Nov-88 | 2 | | 10.39 | 0.00 | | | | | | |
| 22-Nov-88 | 2 | | 9.43 | 0.00 | | | | | | |
| 06-Dec-88 | 2 | | N/A | | | | | | | |
| 20-Dec-88 | 2 | | N/A | | | | | | | |
| 03-Jan-89 | 2 | | N/A | COVERED | | | | | | |
| 17-Jan-89 | 2 | 8.65 | (1.00) | 0.02 | | | | | | |
| 31-Jan-89 | 2 | | N/A | | | | | | | |
| 14-Feb-89 | 2 | | N/A | | | | | | | |
| 28-Feb-89 | 2 | | 9.10 | 0.00 | | | | | | |
| 16-Mar-89 | 2 | | 7.74 | 0.00 | | | | | | |
| 30-Mar-89 | 2 | | 7.49 | 0.00 | | | | | | |
| 16-Aug-88 | 3 | | 14.04 | 0.00 | | | | | | |
| 30-Aug-88 | 3 | | 10.19 | 0.00 | | | | | | |
| 13-Sep-88 | 3 | 10.28 | (1.00) | 0.04 | | | | | | |
| 27-Sep-88 | 3 | 10.35 | (1.00) | 0.08 | | | | | | |
| 11-Oct-88 | 3 | 10.39 | (1.00) | 0.10 | | | | | | |
| 25-Oct-88 | 3 | 10.32 | (1.00) | 0.12 | | | | | | |
| 08-Nov-88 | 3 | 10.33 | (1.00) | .00 | | | | | | |
| 22-Nov-88 | 3 | 9.50 | (1.00) | 0.03 | | | | | | |
| 06-Dec-88 | 3 | 8.79 | (1.00) | .00 | | | | | | |
| 20-Dec-88 | 3 | 9.65 | (1.00) | 0.03 | | | | | | |
| 03-Jan-89 | 3 | 8.27 | (1.00) | 0.01 | | | | | | |
| 17-Jan-89 | 3 | | N/A | | | | | | | |
| 31-Jan-89 | 3 | | N/A | | | | | | | |
| 14-Feb-89 | 3 | | N/A | | | | | | | |
| 28-Feb-89 | 3 | 9.17 | (1.00) | .00 | | | | | | |
| 16-Mar-89 | 3 | 8.18 | (1.00) | .00 | | | | | | |
| 30-Mar-89 | 3 | | 7.62 | 0.00 | | | | | | |
| 22-Nov-88 | 4 | | 10.80 | 0.00 | | | | | | |
| 06-Dec-88 | 4 | | 10.63 | 0.00 | | | | | | |
| 20-Dec-88 | 4 | | 10.76 | 0.00 | | | | | | |
| 03-Jan-89 | 4 | | 10.18 | 0.00 | | | | | | |
| 17-Jan-89 | 4 | | 10.31 | 0.00 | | | | | | |
| 31-Jan-89 | 4 | | 10.49 | 0.00 | | | | | | |
| 14-Feb-89 | 4 | | 10.35 | 0.00 | | | | | | |
| 28-Feb-89 | 4 | | 10.42 | 0.00 | | | | | | |
| 16-Mar-89 | 4 | | 10.25 | 0.00 | | | | | | |
| 30-Mar-89 | 4 | | 9.60 | 0.00 | | | | | | |
| 22-Nov-88 | 5 | | 10.30 | 0.00 | | | | | | |
| 06-Dec-88 | 5 | | 10.23 | 0.00 | | | | | | |
| 20-Dec-88 | 5 | | 10.10 | 0.00 | | | | | | |
| 03-Jan-89 | 5 | | 9.97 | 0.00 | | | | | | |
| 17-Jan-89 | 5 | | 10.10 | 0.00 | | | | | | |
| 31-Jan-89 | 5 | | 10.18 | 0.00 | | | | | | |



gettler — ryan inc. (415) 783-7500
general and environmental contractors

| DATE | WELL | DTH | DTW | HT | BAILED | FLOWMETER | PT-LIQ. | PT-H2O | EMP | C.ELEV |
|---|---|---|---|---|---|---|---|---|---|---|
| 14-Feb-89 | 5 | | 10.00 | 0.00 | | | | | | |
| 28-Feb-89 | 5 | | 10.16 | 0.00 | | | | | | |
| 16-Mar-89 | 5 | | 9.81 | 0.00 | | | | | | |
| 30-Mar-89 | 5 | | 9.71 | 0.00 | | | | | | |
| 22-Nov-88 | 6 | | 9.51 | 0.00 | | | | | | |
| 06-Dec-88 | 6 | | 8.71 | 0.00 | | | | | | |
| 20-Dec-88 | 6 | | 9.45 | 0.00 | | | | | | |
| 03-Jan-89 | 6 | | 8.37 | 0.00 | | | | | | |
| 17-Jan-89 | 6 | | 8.70 | 0.00 | | | | | | |
| 31-Jan-89 | 6 | | 9.34 | 0.00 | | | | | | |
| 14-Feb-89 | 6 | | 8.70 | 0.00 | | | | | | |
| 28-Feb-89 | 6 | | 9.12 | 0.00 | | | | | | |
| 16-Mar-89 | 6 | | 8.16 | 0.00 | | | | | | |
| 30-Mar-89 | 6 | | 7.84 | 0.00 | | | | | | |
| 22-Nov-88 | 7 | | 11.20 | 0.00 | | | | | | |
| 06-Dec-88 | 7 | | 10.56 | 0.00 | | | | | | |
| 20-Dec-88 | 7 | | 11.00 | 0.00 | | | | | | |
| 03-Jan-89 | 7 | | 9.90 | 0.00 | | | | | | |
| 17-Jan-89 | 7 | | 10.40 | 0.00 | | | | | | |
| 31-Jan-89 | 7 | | 10.84 | 0.00 | | | | | | |
| 14-Feb-89 | 7 | | 10.21 | 0.00 | | | | | | |
| 28-Feb-89 | 7 | | 10.83 | 0.00 | | | | | | |
| 16-Mar-89 | 7 | | 9.64 | 0.00 | | | | | | |
| 30-Mar-89 | 7 | | 9.07 | 0.00 | | | | | | |



gettler — ryan inc. (415) 783-7500
general and environmental contractors

SHELL OIL COMPANY OAKLAND - 2800 TELEGRAPH/28TH

| DATE | WELL | DTH | DTW | HT | BAILED | FLOWMETER | PT-LIQ. | PT-H20 | EMP | C.ELEV |
|---|---|---|---|---|---|---|---|---|---|---|
| 13-Apr-89 | 1 | | 9.07 | 0.00 | | | | | BH | |
| 27-Apr-89 | 1 | | 9.30 | 0.00 | | | | | CA | |
| 11-May-89 | 1 | | 9.53 | 0.00 | | | | | SM | |
| 25-May-89 | 1 | | 9.69 | 0.00 | | | | | BH | |
| 08-Jun-89 | 1 | | 9.79 | 0.00 | | | | | SM | |
| 22-Jun-89 | 1 | | 9.91 | 0.00 | | | | | BH | |
| 13-Apr-89 | 2 | | 8.54 | 0.00 | | | | | | |
| 27-Apr-89 | 2 | | 8.99 | 0.00 | | | | | | |
| 11-May-89 | 2 | | 9.35 | 0.00 | | | | | | |
| 25-May-89 | 2 | | 9.63 | 0.00 | | | | | | |
| 08-Jun-89 | 2 | | 9.73 | 0.00 | | | | | | |
| 22-Jun-89 | 2 | | 9.74 | 0.00 | | | | | | |
| 13-Apr-89 | 3 | 8.47 | (1.00) | .00 | | | | | | |
| 27-Apr-89 | 3 | 8.92 | (1.00) | .00 | | | | | | |
| 11-May-89 | 3 | 9.22 | (1.00) | 0.01 | | | | | | |
| 25-May-89 | 3 | 9.48 | (1.00) | .00 | | | | | | |
| 08-Jun-89 | 3 | 9.60 | (1.00) | 0.01 | | | | | | |
| 22-Jun-89 | 3 | 9.61 | (1.00) | 0.01 | | | | | | |
| 13-Apr-89 | 4 | | 10.25 | 0.00 | | | | | | |
| 27-Apr-89 | 4 | | 10.23 | 0.00 | | | | | | |
| 11-May-89 | 4 | | 10.50 | 0.00 | | | | | | |
| 25-May-89 | 4 | | 10.59 | 0.00 | | | | | | |
| 08-Jun-89 | 4 | | 10.68 | 0.00 | | | | | | |
| 22-Jun-89 | 4 | | 10.76 | 0.00 | | | | | | |
| 13-Apr-89 | 5 | | 10.00 | 0.00 | | | | | | |
| 27-Apr-89 | 5 | | 10.13 | 0.00 | | | | | | |
| 11-May-89 | 5 | | 10.20 | 0.00 | | | | | | |
| 25-May-89 | 5 | | 10.25 | 0.00 | | | | | | |
| 08-Jun-89 | 5 | | 10.33 | 0.00 | | | | | | |
| 22-Jun-89 | 5 | | 10.35 | 0.00 | | | | | | |
| 13-Apr-89 | 6 | | 9.64 | 0.00 | | | | | | |
| 27-Apr-89 | 6 | | 8.97 | 0.00 | | | | | | |
| 11-May-89 | 6 | | 9.21 | 0.00 | | | | | | |
| 25-May-89 | 6 | | 9.39 | 0.00 | | | | | | |
| 08-Jun-89 | 6 | | 9.54 | 0.00 | | | | | | |
| 22-Jun-89 | 6 | | 9.47 | 0.00 | | | | | | |
| 13-Apr-89 | 7 | | 10.24 | 0.00 | | | | | | |
| 27-Apr-89 | 7 | | 10.68 | 0.00 | | | | | | |
| 11-May-89 | 7 | | 10.97 | 0.00 | | | | | | |
| 25-May-89 | 7 | | 11.19 | 0.00 | | | | | | |
| 08-Jun-89 | 7 | | 11.29 | 0.00 | | | | | | |
| 22-Jun-89 | 7 | | 11.15 | 0.00 | | | | | | |