Shell Oil Company

**EAST BAY
MARKETING DISTRICT**

P.O. Box 4023
Concord, CA 94524
(415) 676-1414

October 16, 1989

Mr. Rick Mueller
City of Pleasanton
Pleasanton Fire Department
Post Office Box 520
Pleasanton, California 94566-0802

SUBJECT: SHELL SERVICE STATION
5251 HOPYARD ROAD
PLEASANTON, CALIFORNIA

Dear Mr. Mueller:

Enclosed is a copy of the Quarterly Report and Work Plan issued by GeoStrategies Inc., dated October 12, 1989, for the subject location. The Work Plan proposes the performance of the following tasks.

- Install three groundwater monitoring wells to further assess the extent of the dissolved hydrocarbon plume.
- Conduct a half-mile radius well survey and assess beneficial water uses which may be impacted in the area.

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. Tom Callaghan, Regional Water Quality Control Board
Mr. John Werfal, Gettler-Ryan Inc.

GeoStrategies Inc.

QUARTERLY REPORT AND WORK PLAN

JULY - SEPTEMBER 1989

Shell Service Station
5251 Hopyard Road
Pleasanton, California

Report No. 7633-3

October 12, 1989

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

October 12, 1989

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

Attn: Mr. John Werfal

Re: QUARTERLY REPORT AND WORK PLAN
Shell Service Station
5251 Hopyard Road
Pleasanton, California

Gentlemen:

This quarterly report and work plan has been prepared for the above referenced site, for the July through September, 1989 quarter. A Work Plan has been included with the quarterly report, proposing additional work at the site.

INTRODUCTION

This report describes the results of the third quarterly ground-water sampling for 1989 performed by Gettler-Ryan Inc. (G-R), in accordance with the current quarterly monitoring plan for the site. The field and chemical analytical data discussed in this report were collected between July 1, and September 30, 1989. The Work Plan addresses the need to perform additional field activities to further evaluate the extent of hydrocarbons in the soil and groundwater.

SITE HISTORY

In January 1988, one ground-water monitoring well (S-1) and three vadose wells (V-1 through V-3) were installed to assess soil and ground-water conditions beneath the site. Soil samples from S-1 were ND for TPH-Gasoline, TPH-Diesel, and TPH-Oil. Benzene was detected in the soil sample taken from 14 to 15.5 feet (0.19 ppm). Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) and benzene were detected in groundwater from S-1 at 0.6 parts per million (ppm) and 0.22 ppm, respectively. Groundwater was not detected (ND) for Total Petroleum Hydrocarbons calculated as Diesel (TPH-Diesel) and as Oil (TPH-Oil). A report was prepared by Pacific Environmental Group (PACIFIC) dated March 9, 1988.

In December 1988, quarterly sampling of the wells was initiated and performed by G-R. Ground-water samples were obtained from the ground-water monitoring well (S-1) and the vapor monitoring wells (V-1 through V-3) as the ground-water level had risen. TPH-Gasoline was detected in each of the wells with concentrations ranging from 0.14 to 17 ppm. Benzene concentrations in these wells ranged from 0.0038 to 5.1 ppm. TPH-Diesel concentrations ranged from 0.1 to 1 ppm. A report was prepared by G-R dated January 10, 1989.

In March 1989, TPH-Gasoline (8.2 ppm), benzene (2.9 ppm), and TPH-Diesel (3.6 ppm) were detected in Well S-1, the only well sampled that quarter. The results are included in the G-R report dated May 1, 1989.

On April 7, 1989, Woodward-Clyde Consultants (WCC) issued a work plan for additional site investigation.

Four ground-water monitoring wells (S-2 through S-5) were installed by GSI on May 4, 1989. TPH-Gasoline was detected in soil samples collected from S-3 at five feet (5. ppm) and 10 feet (1,100. ppm) and benzene was detected in the 10 foot sample (8. ppm). Diesel was detected in the five foot samples from S-2 (10. ppm), S-3 (10. ppm), and S-5 (19. ppm) and in the 10 foot sample from S-3 (2,300. ppm). TPH-Gasoline was detected in monitoring wells S-1, S-3, and S-5. Concentrations ranged from 0.05 ppm (S-5) to 8.2 ppm (S-1). Benzene was detected in Wells S-1 (2.9 ppm) and S-3 (0.33). TPH-Diesel was detected in Wells S-1 (3.6 ppm) and S-3 (1.4 ppm). A report was prepared by GSI dated July 13, 1989.

GROUND-WATER LEVEL MONITORING

Potentiometric Data

Prior to ground-water sampling, static water-levels were measured in each well using an electric well sounder (Table 1). Static water-levels were measured from the surveyed top of the 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 collected on July 20, 1989.

Separate-Phase Hydrocarbon Measurements

Each well was monitored for separate-phase petroleum hydrocarbons, if present, using a calibrated portable oil-water interface probe to measure the thickness to the nearest ± *0.01 foot.* Separate-phase product was not observed in any wells during this quarters ground-water sampling.

Historical chemical analytical and ground-water monitoring data were tabulated and included in the January - March, 1989 Ground-water Sampling Report. This data will be retabulated and included in the January - March 1990 Ground-water Sampling Report.

CHEMICAL ANALYTICAL DATA

Ground-water samples were collected from site monitoring wells on July 20, 1989. The ground-water samples were analyzed for TPH-Gasoline and TPH-Diesel according to EPA Method 8015 (Modified); and BTEX according to EPA Method 8020. All samples were analyzed by International Technology Analytical Services (IT), a State-certified laboratory in San Jose, California.

Two monitoring wells were found to contain detectable concentrations of TPH-Gasoline and TPH-Diesel. As shown on Table 1, Benzene concentrations above California Department of Health Services (DHS) action levels were identified in monitoring wells S-1 (6.2 ppm), S-3 (2.3 ppm), and S-5 (0.01 ppm). TPH-Gasoline/Benzene and TPH-Diesel concentration maps for this quarter are presented on Plates 3 and 4, respectively.

Quality Control

Quality Control (QC) samples for this quarter's ground-water sampling included a trip blank, a field blank, and a duplicate sample. 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. The duplicate sample was collected in the field and submitted without well designation to assess laboratory performance. G-R Sampling Methods and Procedures are presented in Appendix A. The IT chemical analytical report, the G-R Ground-Water Sampling Forms, and the Chain-of-Custody Forms are included in the Ground-Water Sampling Report presented in Appendix B.

WORK PLAN

GSI has reviewed available field and chemical data for this site. Based on our review, we recommend that three additional monitoring wells be installed to further assess the lateral and vertical extent of the hydrocarbon plume. Two off-site wells will be installed downgradient along Hopyard Road and one well along Owens Drive. Soil and ground-water samples from the proposed wells will be analyzed for TPH-Gasoline, TPH-Diesel, and BTEX. The location of the three proposed wells is shown on Plate 1. Exploratory borings will be drilled to an anticipated depth of 25 feet or the base of the first encountered water bearing zone. Soil samples will be collected for lithologic description and field head-space analysis using an organic vapor monitor (OVM), and chemical analysis on selected samples. As a minimum, soil samples will be collected at five-foot intervals and at significant lithologic changes. In addition, we recommend that a survey of wells within a half-mile radius of the site be performed to assess the proximity of potential usable water supplies deemed suitable or potentially suitable for municipal or domestic water supply (State Water Resources Control Board Resolution No. 88-63).

The rationale for the above proposed scope of work is based on the following criteria:

- As shown on Plate 3, TPH-Gasoline has been detected in Wells S-1 (21. ppm) and S-3 (9.7 ppm).

- Benzene concentrations have been detected above current State of California Department of Health Services (DHS) action levels in existing monitoring wells S-1 (6.2 ppm), S-3 (2.3 ppm), and S-5 (0.010 ppm). Additional investigations are necessary to assess whether or not dissolved hydrocarbons have migrated off-site.

- A ND boundary needs to be established so the hydrocarbon plume configuration can be evaluated for development and implementation of the appropriate remedial action.

GSI recommends that the proposed monitoring wells screened intervals be installed a minimum of three-feet above the equilibrated water level to accommodate for separate-phase product (if present), and potential diurnal and seasonal ground-water fluctuations. Notwithstanding, the well screens will be emplaced so that well designs are compatible with subsurface geologic conditions. No well screens will be installed that potentially could permit cross-contamination of adjacent aquifers.

Upon completion of field work and review of field and chemical data, GSI will prepare a report describing field procedures, hydrogeologic conditions, and chemical analytical results.

Methods and Procedures that will be used to investigate this site are presented in Appendix A.

SUMMARY

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

- o Water levels were measured in selected monitoring wells (Table 1). A potentiometric map was constructed from static water-level data (Plate 2). The approximate ground-water gradient was calculated to be 0.016.
- o TPH-Gasoline concentrations in ground-water ranged from ND to 21. ppm.
- o Wells S-1, S-3, and S-5 contain concentrations of benzene above current DHS action levels, ranging from 0.010 to 6.2 ppm.
- o TPH-Diesel concentrations ranged from ND to 8.5 ppm in the groundwater.

PLANNED SITE ACTIVITIES

The following activities are planned for the fourth quarter, October through December 1989, at the site:

- o All scheduled wells will be sampled and analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-Gasoline) and as Diesel (TPH-Diesel) according to EPA Method 8015 (Modified); and Benzene, Toluene, Ethylbenzene, and Xylene (BTEX) according to EPA Method 8020.
- o Water levels will be measured bimonthly 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-Gasoline, TPH-Diesel, and benzene.
- Install off-site wells to further delineate the hydrocarbon plume.

If you have any questions, please call.

GeoStrategies Inc. by,

David A. Ferreira
Geologist

Jeffrey L. Peterson

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

CHRISTOPHER M. PALMER
№ 1262

Christopher M. Palmer

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

DAF/JLP/kjj

Plate 1. Site Plan
Plate 2. Potentiometric Map
Plate 3. TPH/Benzene Concentration Map
Plate 4. TPH (Diesel) Concentration Map
Appendix A - Field Methods and Procedures
Appendix B - Chemical Analytical Reports

TABLE 1

GROUND-WATER ANALYSIS DATA

WELL NO	SAMPLE DATE	ANALYSIS DATE	TPH-G (PPM)	BENZENE (PPM)	TOLUENE (PPM)	ETHYLBENZENE (PPM)	XYLENES (PPM)	TPH-D (PPM)	WELL ELEV (FT)	STATIC WATER ELEV (FT)	PRODUCT THICKNESS (FT)	DEPTH TO WATER (FT)
S-1	20-Jul-89	27-Jul-89	21.	6.2	1.5	1.1	0.7	8.5 *	326.73	318.02	----	8.71
S-2	20-Jul-89	27-Jul-89	ND	ND	ND	ND	ND	ND	326.59	317.76	----	8.83
S-3	20-Jul-89	28-Jul-89	9.7	2.3	0.03	0.88	0.16	2.2 **	327.38	317.83	----	9.55
S-4	20-Jul-89	02-Aug-89	ND	ND	ND	ND	ND	ND **	327.38	319.35	----	8.03
S-5	20-Jul-89	28-Jul-89	ND	0.01	ND	ND	ND	ND **	327.76	318.50	----	9.62
SD-1	20-Jul-89	28-Jul-89	24.	6.5	1.7	1.2	1.	9.4 *	----	----	----	----
SF-3	20-Jul-89	27-Jul-89	ND	ND	ND	ND	ND	----	----	----	----	----
TB	20-Jul-89	27-Jul-89	ND	ND	ND	ND	ND	----	----	----	----	----

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

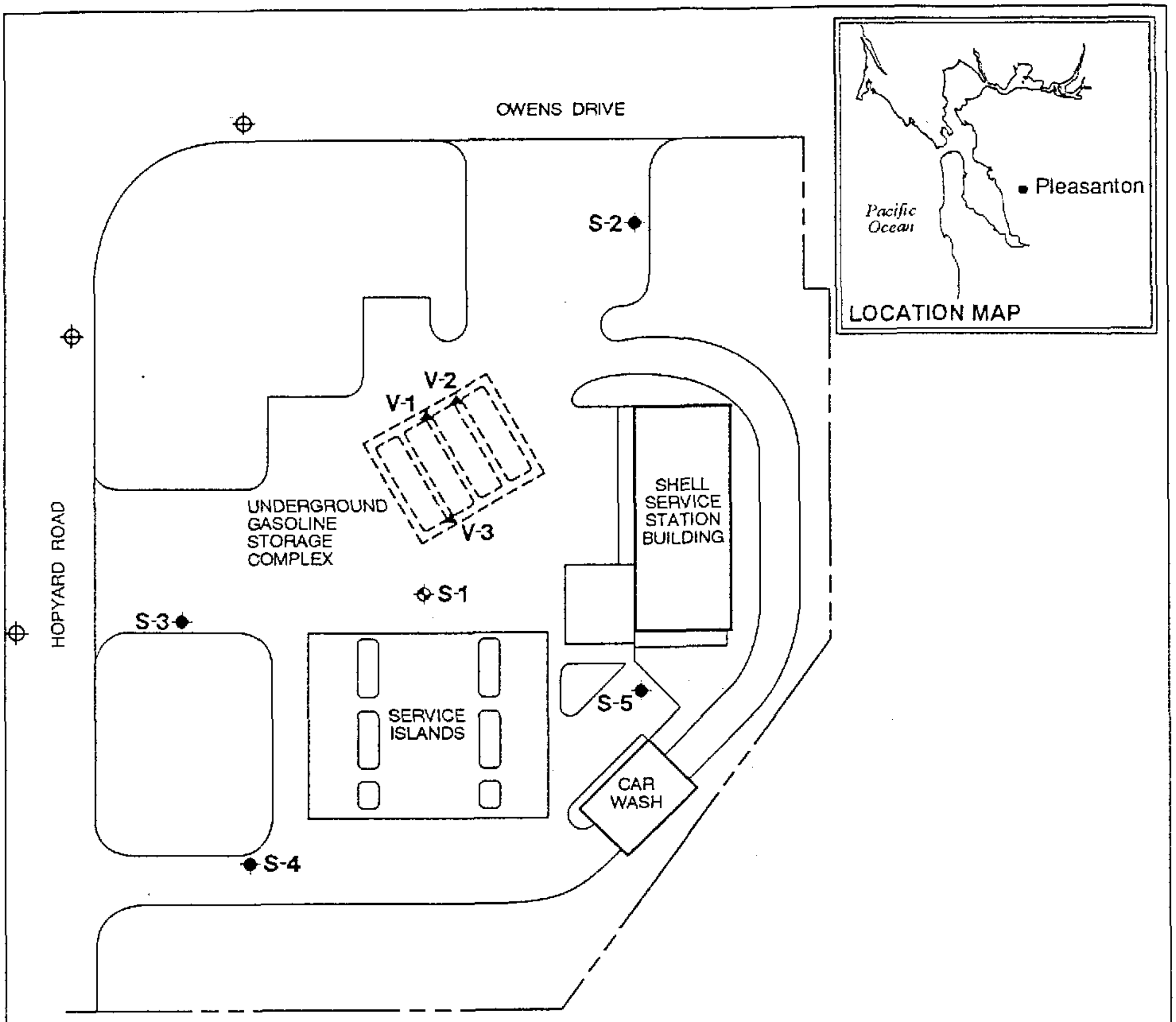
CURRENT DEPARTMENT OF HEALTH SERVICES ACTION LEVELS

Benzene 0.0007 ppm   Xylenes 0.620 ppm
Toluene 0.100 ppm   Ethylbenzene 0.680 ppm

* Analysis Date = 30-Jul-89   ** Analysis Date = 27-Jul-89

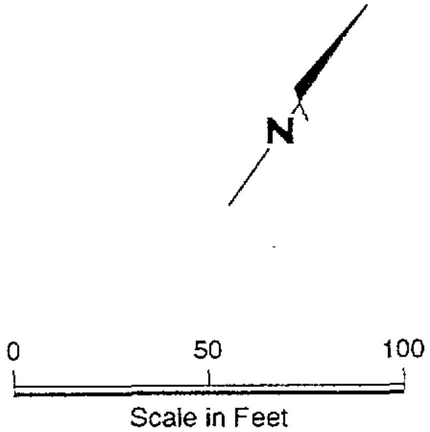
Note: 1. For chemical parameter detection limits, refer to I.T. laboratory reports in Appendix B
2. Water level elevations referenced to MSL
3. See laboratory reports for compounds detected under diesel analysis (Appendix B)

Project No. 7633-3



EXPLANATION

◆ S-2	Groundwater monitoring well location
◇ S-1	Groundwater monitoring well location by Pacific Environmental Group, Inc.
▲ V-1	Vapor monitoring well location
⊕	Proposed groundwater monitoring well location



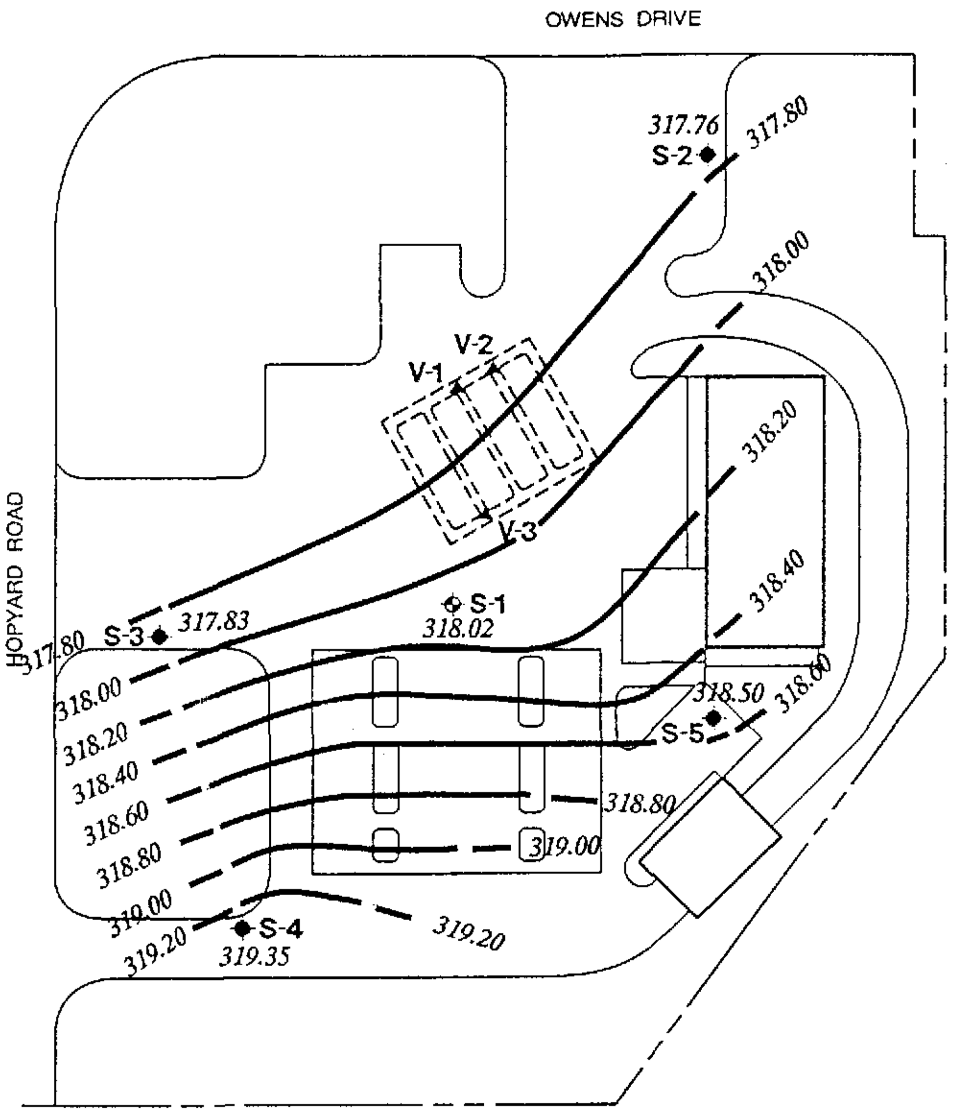
Base Map: Woodward-Clyde Consultants

GSI GeoStrategies Inc.

Site Plan
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7633	Clup CEG 1262	8/89		



EXPLANATION

◆ S-2	Groundwater monitoring well location
◇ S-1	Groundwater monitoring well location by Pacific Environmental Group, Inc.
▲ V-1	Vapor monitoring well location
318.40	Groundwater elevation contour Approx. Gradient = 0.016
318.02	Groundwater elevation measured on July 20, 1989 in feet referenced to mean sea level (MSL)

N

0 50 100

Scale in Feet

Base Map: Woodward-Clyde Consultants

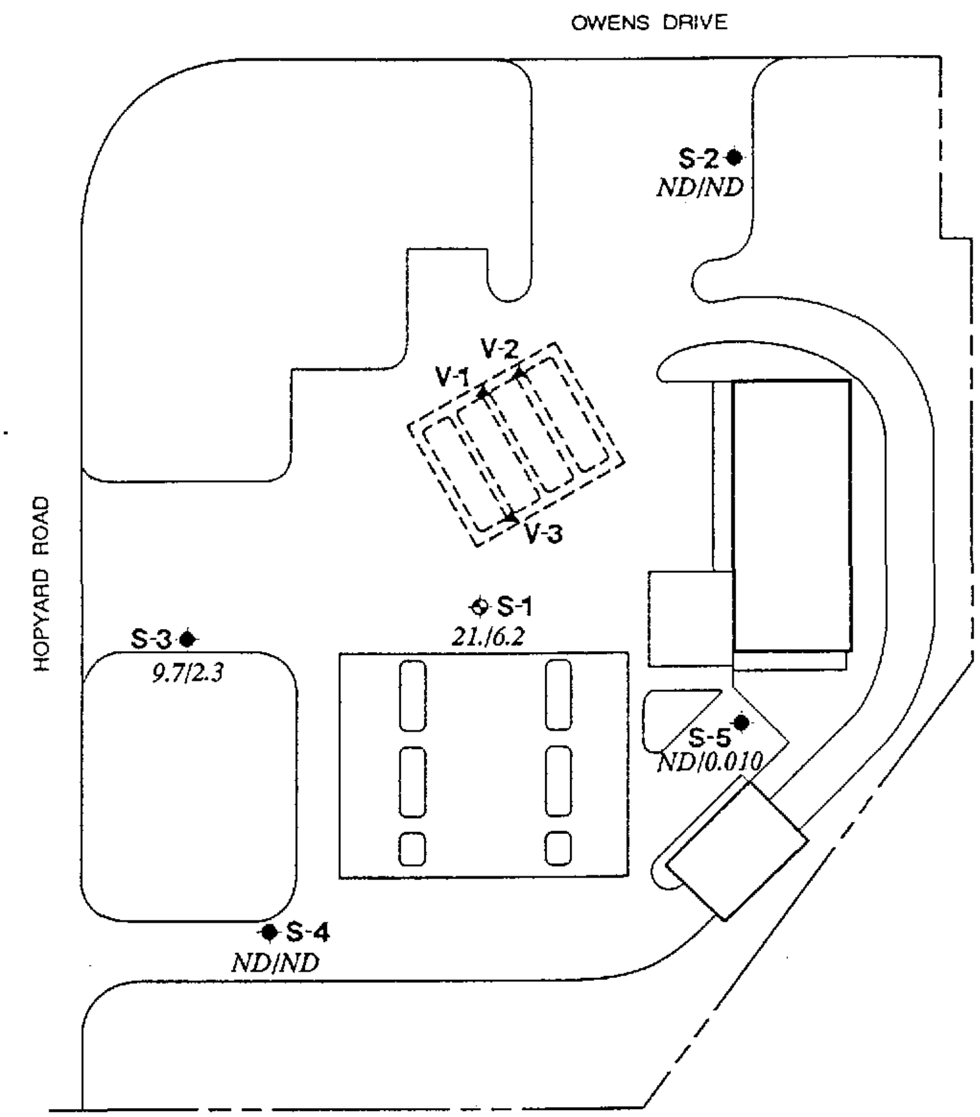
GSI GeoStrategies Inc.

Potentiometric Map
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE

2

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7633	CEG 1262	8/89		



EXPLANATION

◆ S-2	Groundwater monitoring well location
◇ S-1	Groundwater monitoring well location by Pacific Environmental Group, Inc.
▲ V-1	Vapor monitoring well location
21./6.2	TPH (Total Petroleum Hydrocarbon as Gasoline)/Benzene concentrations sampled on July 20, 1989 in ppm (parts per million)
ND	Not Detected (see laboratory reports for detection limits)

N

0 50 100

Scale in Feet

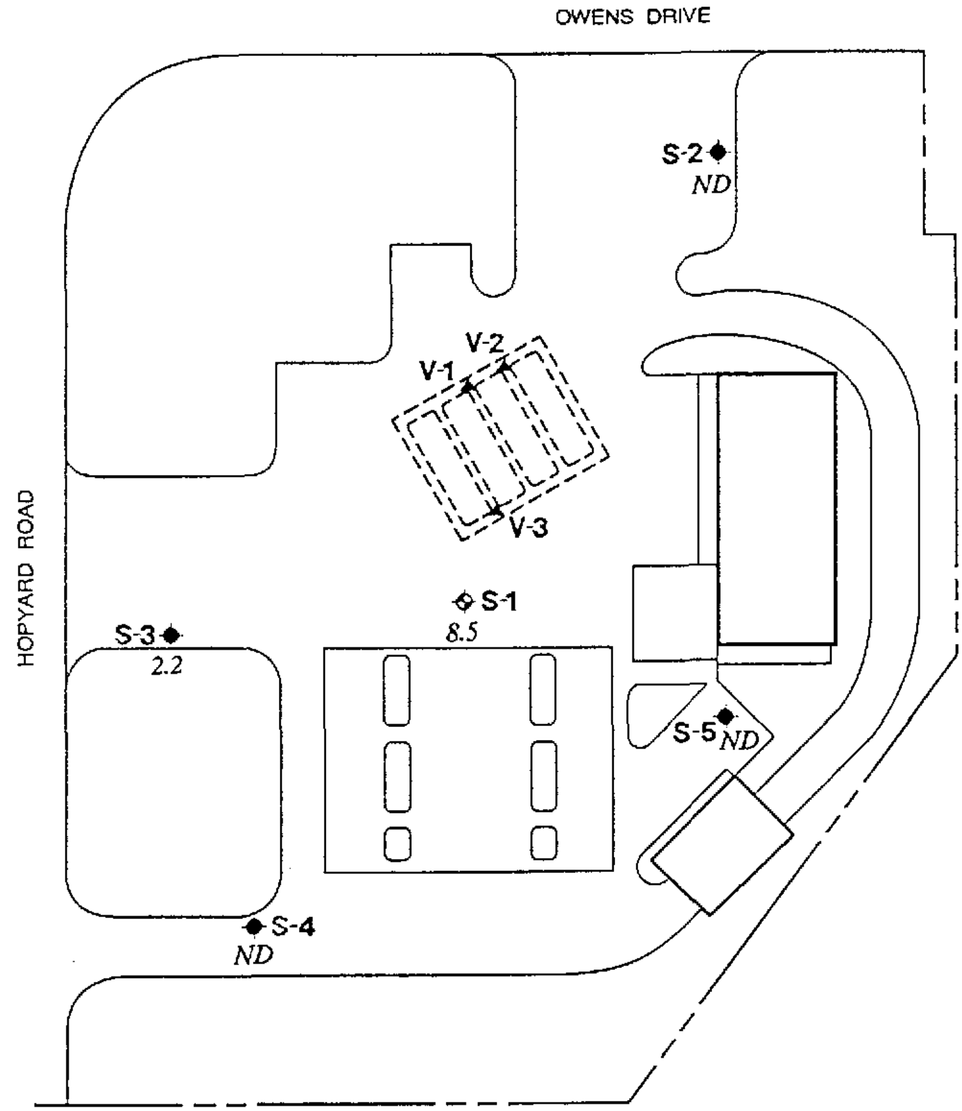
Base Map: Woodward-Clyde Consultants

GeoStrategies Inc.

TPH/Benzene Concentration Map
Shell Service Station
5251 Hopyard Road
Pleasanton, California

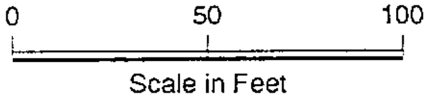
PLATE
3

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7633	CEG1262	8/89		



EXPLANATION

◆ S-2	Groundwater monitoring well location
◇ S-1	Groundwater monitoring well location by Pacific Environmental Group, Inc.
▲ V-1	Vapor monitoring well location
2.2	TPH (Total Petroleum Hydrocarbon as Diesel) concentration sampled on July 20, 1989 in ppm (parts per million)
ND	Not Detected (see laboratory reports for detection limits)



Base Map: Woodward-Clyde Consultants

GSI GeoStrategies Inc.

TPH (Diesel) Concentration Map
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE
4

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
7633	Cmp CEG 1262	8/89		

FIELD METHODS AND PROCEDURES

EXPLORATION DRILLING

Mobilization

Prior to any drilling activities, GSI will verify that 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 half-mile of the project site will be identified. Drillers will be notified in advance so that drilling equipment can be 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.

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. When mud rotary drilling is used, an electric log will be performed for additional lithological information. Also during mud rotary drilling, precautions will be taken to prevent mud from circulating contaminants by using a conductor casing to seal off contaminated zones. Samples will be collected for lithologic logging by continuous chip, and where needed by drive sample or core as specified by the supervising geologist.

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 samples are typically collected at 5-foot intervals as a minimum from ground surface to total depth of boring. Additional soil samples will 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 (Figure 1). Soil colors will be described using the Munsell Color Chart. Rock units will be logged using appropriate lithologic terms, and colors described by the G.S.A. Rock Color Chart.

Head-space analyses will be performed to check for the evidence 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 (or existing grade)
5) Depth with respect to ground water
6) OVA reading

Soil samples (full brass liners) selected for chemical analysis are immediately covered with aluminum foil and the liner 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 stockpiled on-site. Soils are sampled and analyzed for site-specific chemical parameters. Disposition of soils is dependent of chemical analytical results of the samples.

Soil Sampling - cont.

Soil borings not converted to monitoring wells will be backfilled (sealed) to ground surface using either a neat cement or cement-bentonite grout mixture. Backfilling will be tremied by continuously pumping grout from the bottom to the top of the boring where depth exceeds 20' or as required by local permit requirements.

All field and office work, including exploratory boring logs, are prepared under the direction of a registered geologist.

Monitoring Well Installation

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 potentially creates hydraulic interconnection of two or more aquifer units. Screen slot size and well sand pack will be compatible with encountered aquifer materials, as confirmed by sieve analysis.

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 continuously 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 tremie-pumped 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 before drilling and between wells 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 mean sea level (MSL). If additional wells are required, then 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

These documents are used to verify Gettler-Ryan Inc. sampling procedures and consistent with current regulatory guidance. If site specific work and sampling plans are required, those plans will be developed from these documents.

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

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

Regional Water Quality Control Board (Central Valley Region)	Memorandum: Disposal, Treatment, and Refuse of Soils Contaminated with Petroleum Fractions (August, 1986)
State of California Department of Health Services	Hazardous Waste Testing Laboratory Certification List (March, 1987)
State of California Water Resources Control Board	Leaking Underground Fuel Tank (LUFT) Field Manual (May, 1988), and LUFT Field Manual Revision (April, 1989)
State of California Water Resources Control Board	Title 23, (Register #85.#33-8-17-85), Subchapter 16: Underground Tank Regulations; Article 3, Sections 2632 and 2634; Article 4, 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)
Santa Clara Valley Water District	Investigation and Remediation at Fuel Leak sites: Guidelines for Investigation and Technical Report Preparation (March 1989)
American Petroleum Institute	Groundwater Monitoring & Sample Bias; API Publication 4367, Environmental Affairs Department, June 1983
Site Specific (as needed)	General and specific regulatory documents as required.

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

1. A clean pair of new, disposable gloves are worn for each well being sampled.
2. When possible, samples are collected from known or suspected wells that are least contaminated (i.e. background) followed by wells in increasing order of contamination.

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

1. All sample bottles and equipment are kept away from fuels and solvents. When possible, gasoline (used in generators) is stored away from bailers, sample bottles, purging pumps, etc.
2. Bailers are made of Teflon or Stainless Steel. Other materials such as plastic may contaminate samples with phthalate esters which interfere with many Gas Chromatography (GC) analyses.
3. Volatile organic ground-water samples are collected so that air passage through the sample does not occur or is minimal (to prevent volatiles from being stripped from the samples): sample bottles are filled by slowly running the sample down the side of the bottle until there is a positive convex meniscus over the neck of the bottle; the Teflon side of the septum (in cap) is positioned against the meniscus, and the cap screwed on tightly; the sample is inverted and the bottle lightly tapped. The absence of an air bubble indicates a successful seal; if a bubble is evident, the cap is removed, more sample is added, and the bottle is resealed.
4. Extra Teflon seals are brought into the field in case seals are difficult to handle and/or are dropped. Dropped seals are considered contaminated and are not used. When replacing seals or if seals become flipped, care is taken to assure that the Teflon seal faces down.

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

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

A. Trip Blank: Used for purgeable organic compounds only; QC samples are collected in 40 milliliter (ml) 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 as follows:

A. Up to 2 wells - Trip Blank Only

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

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

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

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

SAMPLE COLLECTION

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

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

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

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

Decontamination Procedures

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

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

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

Water-Level Measurements

Prior to purging and sampling a well, the static-water levels are measured in all wells at a project site using an electric sounder and/or calibrated portable oil-water interface probe (Figure 3). Both static water-level and separate-phase product thickness are measured to the nearest ±0.01 foot. The presence of separate-phase product is confirmed using a clean, acrylic or polyvinylchloride (PVC) bailer, measured to the nearest ±0.01 foot with a decimal scale tape.

Water-Level Measurements (continued)

The monofilament line used to lower the bailer is replaced between wells with new line to preclude the possibility of cross-contamination. Field observations (e.g. well integrity, product color, turbidity, water color, odors, etc.) are noted on the G-R Well Sampling Field Data Sheet shown in Figure 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 (Figure 4). Methods of purging will be assessed based on well size, location, accessibility, and known chemical conditions. Individual well purge volumes are calculated from borehole volumes which take into account the sand packed interval in the well annular space. As a general rule, a minimum of 3 and a maximum of 10 borehole volumes will be purged. Wells which dewater or demonstrate slow recharge periods (i.e. low-yield wells) during purging activities may be sampled after fewer purging cycles. If a low-yield (low recovery) well is to be sampled, sampling will not take place until at least 80 percent of the previously measured water column has been replaced by recharge, or as per local requirements. Physical parameter measurements (temperature, pH, and specific conductance) are closely monitored throughout the well purging process and are used by the G-R sampling crew as indicators for assessing sufficient purging. Purging is continued until all three physical parameters have stabilized. Specific conductance (conductivity) meters are read to the nearest ±10 umhos/cm, and are calibrated daily. pH meters are read to the nearest ±0.1 pH units and are calibrated daily. Temperature is read to the nearest 0.1 degree F. Calibration of physical parameter meters will follow manufacturers specifications. Monitoring wells will be purged according to the protocol presented in Figure 4. Collected field data during purging activities will be entered on the G-R Well Sampling Field Data Sheet shown in Figure 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 by an adhesive label, noted in permanent ink immediately after the sample is collected. Label information will include:

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

Sampler's identification

Project number

Date and time of collection

Type of preservation used

Well Sampling Data Forms

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

Project number

Client

Location

Source (i.e. well number)

Time and date

Well accessibility and integrity

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

Calculated and actual purge volumes

Chain-of-Custody

A Chain-of-Custody record (Figure 5) 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 <u>always</u> be accompanied by a Chain-of-Custody record. When transferring the samples, the individual relinquishing and receiving the samples will sign, date, and note the time on the Chain-of-Custody record. G-R will be responsible for notifying the laboratory coordinator when and how many samples will be sent to the laboratory for analysis, and what types of analyses shall be performed.

TABLE 1

SAMPLE ANALYSIS METHODS, CONTAINERS, PRESERVATIONS, AND HOLDING TIMES

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

GSI GeoStrategies Inc.

FIELD EXPLORATORY BORING LOG

Field location of boring:

Project No.:
Date:
Boring No:

Client:

Location:

City:

Sheet
of

Logged by:
Driller:

Casing installation data:

Drilling method:

Hole diameter:

Top of Box Elevation:
Datum:

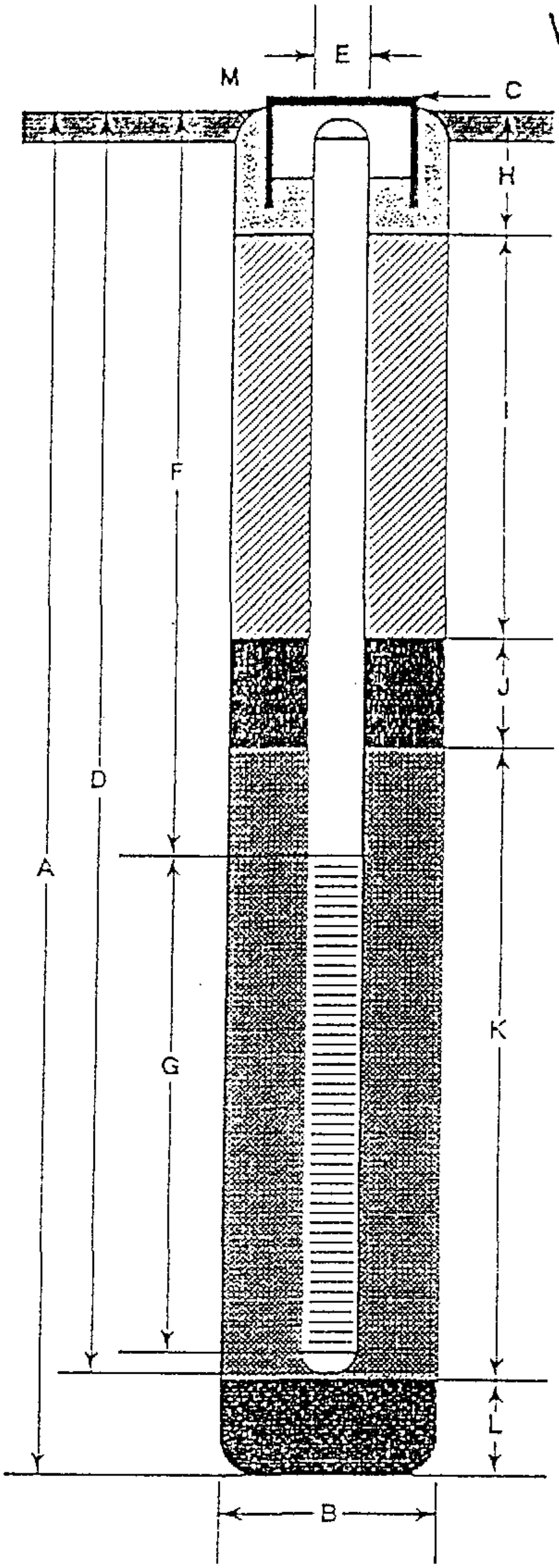
Water Level				
Time				
Date				

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

Remarks:

FIGURE 1

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 ______________ in.

H Surface Seal from ______ to ______ ft.
Seal Material ______________

I Backfill from ______ to ______ ft.
Backfill Material ______________

J Seal from ______ to ______ ft.
Seal Material ______________

K Gravel Pack from ______ to ______ ft.
Pack Material ______________

L Bottom Seal ______________ ft.
Seal Material ______________

M ______________
____

GSI GeoStrategies Inc.

Well Construction Detail

WELL NO.

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

FIGURE 2

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 3

Monitoring Well Sampling Protocol Schematic

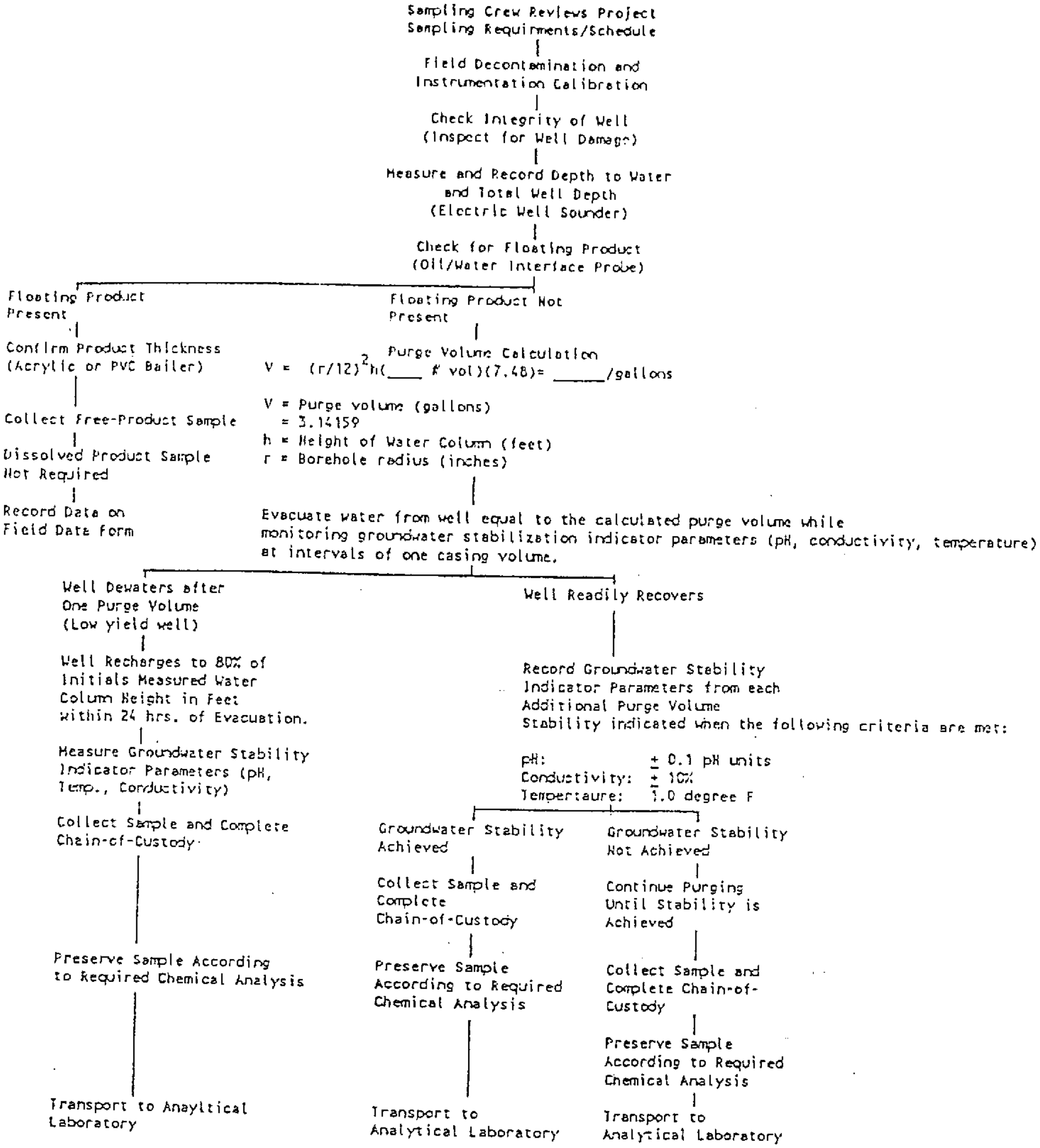


FIGURE 4

Gettler - Ryan Inc.
ENVIRONMENTAL DIVISION

Chain of Custody

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 ______________________

FIGURE 5

gettler — ryan inc.

August 11, 1989

GROUNDWATER SAMPLING REPORT

Referenced Site: Shell Service Station
5251 Hopyard Road
Pleasanton, California

Sampling Date: July 20, 1989

This report presents the results of the quarterly groundwater sampling and analytical program conducted by Gettler-Ryan Inc. on July 20, 1989 at the referenced location. The site is occupied by an operating service station located on the southeast corner of Hopyard Road and Owens Drive. The service station has underground storage tanks containing regular leaded, unleaded and super unleaded gasoline products and diesel.

There are currently three vadose zone monitoring wells and five groundwater monitoring wells on site at the locations shown on the attached site map. Prior to sampling, all wells were inspected for total well depth, water level, 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 8.03 to 9.62 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-3) and a trip blank, supplied by the laboratory, were included and analyzed to assess quality control. A duplicate sample (SD-1) 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.

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.

Paulson

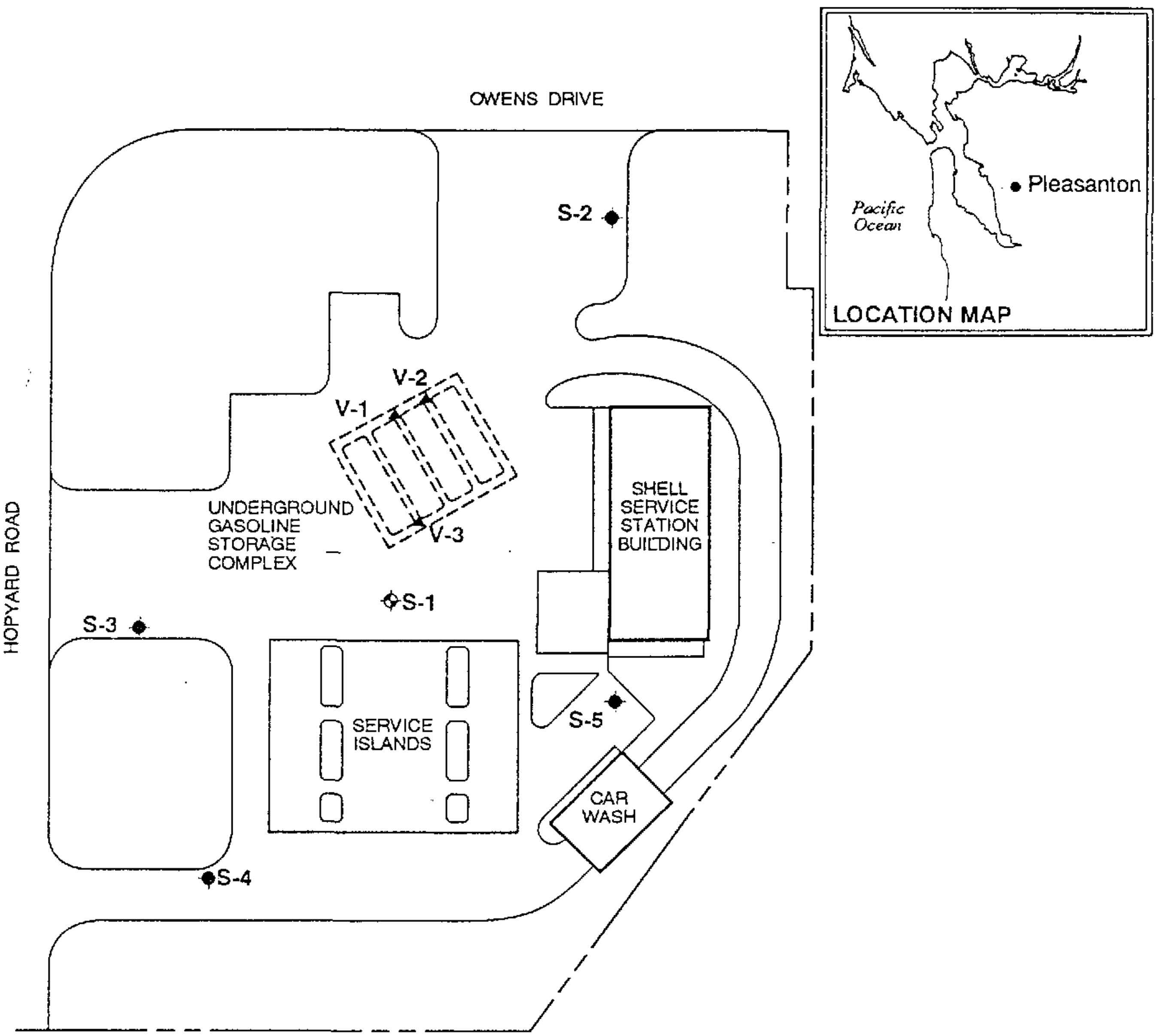
Tom Paulson
Sampling Manager

attachments

TABLE OF MONITORING DATA
GROUNDWATER WELL SAMPLING REPORT

WELL I.D.	S-1	S-2	S-3	S-4	S-5
Casing Diameter (inches)	3	3	3	3	3
Total Well Depth (feet)	28.8	24.6	24.9	24.5	24.8
Depth to Water (feet)	8.71	8.83	9.55	8.03	9.62
Free Product (feet)	none	none	none	none	none
Reason Not Sampled	----	----	----	----	----
Calculated 4 Case Vol.(gal.)	30.4	24.0	23.2	25.2	23.2
Did Well Dewater?	yes	no	yes	yes	no
Volume Evacuated (gal.)	22	30	21	21	29
Purging Device	Suction	Suction	Suction	Suction	Suction
Sampling Device	Bailer	Bailer	Bailer	Bailer	Bailer
Time	11:70	08:36	10:36	09:55	09:16
Temperature (F)*	66.5	65.6	67.2	68.7	64.5
pH*	7.12	7.16	6.91	7.96	7.17
Conductivity (umhos/cm)*	2490	5310	4510	1355	1484

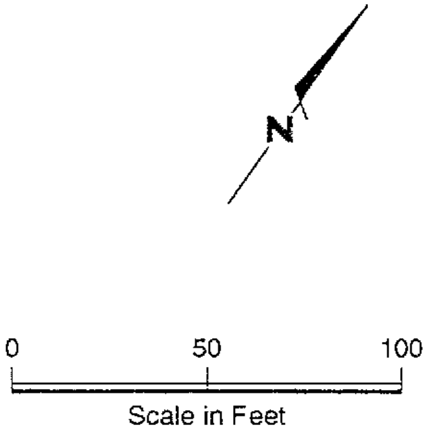
* Indicates Stabilized Value



EXPLANATION

◆ S-2	Groundwater monitoring well location
◇ S-1	Groundwater monitoring well location by Woodward-Clyde Consultants
▲ V-1	Vapor monitoring well location

Base Map: Woodward-Clyde Consultants



GSI GeoStrategies Inc.

Site Plan
Shell Service Station
5251 Hopyard Road
Pleasanton, California

PLATE
1

JOB NUMBER	REVIEWED BY RG/CEG	DATE	REVISED DATE	REVISED DATE
633		5/89		

INTERNATIONAL TECHNOLOGY CORPORATION

ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

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

Date: August 8, 1989

Work Order Number: S9-07-179

P.O. Number: 3633

This is the Certificate of Analysis for the following samples:

Client Project ID:	GR #3633, 5251 Hopyard Road/ Owens, Pleasanton, CA
Date Received by Lab:	7/20/89
Number of Samples:	8
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.

The method of analysis for high boiling hydrocarbons involves extracting the samples with solvent and examining the extracts by gas chromatography using a flame ionization detector.

Reviewed and Approved

Michael E. Dean
Project Manager

MED/an
7 Pages Following - Tables of Results

Page: 1 of 7
Date: August 8, 1989
Client Project ID: GR #3633, Shell,
5251 Hopyard Road/Owens, Pleasanton, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-07-179

Client Sample ID:	S-1
Sample Date:	7/20/89
Lab Sample ID:	S9-07-179-01
Receipt Condition:	Cool, pH <2

Low Boiling Hydrocarbons Analysis Date: 7/27/89

High Boiling Hydrocarbons Extraction Date: 7/26/89
High Boiling Hydrocarbons Analysis Date: 7/30/89

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

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	2.5	21.
Benzene	0.02	6.2
Toluene	0.05	1.5
Ethyl Benzene	0.05	1.1
Xylenes (total)	0.2	0.7
High Boiling Hydrocarbons, calculated as Diesel	0.3	8.5

Client Sample ID: S-2
Sample Date: 7/20/89
Lab Sample ID: S9-07-179-02
Receipt Condition: Cool, pH <2

Low Boiling Hydrocarbons Analysis Date: 7/27/89

High Boiling Hydrocarbons Extraction Date: 7/26/89
High Boiling Hydrocarbons Analysis Date: 7/27/89

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

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	0.05	None
Benzene	0.0005	None
Toluene	0.001	None
Ethyl Benzene	0.001	None
Xylenes (total)	0.003	None
High Boiling Hydrocarbons, calculated as Diesel	0.1	None

Client Sample ID:	S-3
Sample Date:	7/20/89
Lab Sample ID:	S9-07-179-03
Receipt Condition:	Cool, pH <2

Low Boiling Hydrocarbons Analysis Date: 7/28/89

High Boiling Hydrocarbons Extraction Date: 7/26/89
High Boiling Hydrocarbons Analysis Date: 7/27/89

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

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	1.0	9.7
Benzene	0.01	2.3
Toluene	0.02	0.03
Ethyl Benzene	0.02	0.88
Xylenes (total)	0.06	0.16
High Boiling Hydrocarbons, calculated as Diesel	0.1	2.2

Date: August 8, 1989
Client Project ID: GR #3633, Shell,
5251 Hopyard Road/Owens, Pleasanton, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-07-179

Client Sample ID: S-4
Sample Date: 7/20/89
Lab Sample ID: S9-07-179-04
Receipt Condition: Cool, pH <2

Low Boiling Hydrocarbons Analysis Date: 8/2/89

High Boiling Hydrocarbons Extraction Date: 7/26/89
High Boiling Hydrocarbons Analysis Date: 7/27/89

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

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	0.05	None
Benzene	0.0005	None
Toluene	0.001	None
Ethyl Benzene	0.001	None
Xylenes (total)	0.003	None
High Boiling Hydrocarbons, calculated as Diesel	0.1	None

Client Sample ID: S-5
Sample Date: 7/20/89
Lab Sample ID: S9-07-179-05
Receipt Condition: Cool, pH <2

Low Boiling Hydrocarbons Analysis Date: 7/28/89

High Boiling Hydrocarbons Extraction Date: 7/26/89
High Boiling Hydrocarbons Analysis Date: 7/27/89

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

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	0.05	None
Benzene	0.0005	0.010
Toluene	0.001	None
Ethyl Benzene	0.001	None
Xylenes (total)	0.003	None
High Boiling Hydrocarbons, calculated as Diesel	0.1	None

Page: 6 of 7
Date: August 8, 1989
Client Project ID: GR #3633, Shell,
5251 Hopyard Road/Owens, Pleasanton, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-07-179

Client Sample ID: SD-1
Sample Date: 7/20/89
Lab Sample ID: S9-07-179-06
Receipt Condition: Cool, pH <2

Low Boiling Hydrocarbons Analysis Date: 7/28/89

High Boiling Hydrocarbons Extraction Date: 7/26/89
High Boiling Hydrocarbons Analysis Date: 7/30/89

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

Results - Milligrams per Liter

Parameter	Detection Limit	Detected
Low Boiling Hydrocarbons, calculated as Gasoline	2.5	24.
Benzene	0.02	6.5
Toluene	0.05	1.7
Ethyl Benzene	0.05	1.2
Xylenes (total)	0.2	1.0
High Boiling Hydrocarbons, calculated as Diesel	0.3	9.4

A

Page: 7 of 7
Date: August 8, 1989
Client Project ID: GR #3633, Shell,
5251 Hopyard Road/Owens, Pleasanton, CA

IT ANALYTICAL SERVICES
SAN JOSE, CA

Work Order Number: S9-07-179

Lab Sample ID	Client Sample ID	Sample Date	Date Analysis Completed	Sample Condition on Receipt
S9-07-179-07	SF-3	7/20/89	7/27/89	cool pH ≤2
S9-07-179-08	Trip Blank	7/19/89	7/27/89	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)
S9-07-179-07	SF-3	ND	ND	ND	ND	ND
S9-07-179-08	Trip Blank	ND	ND	ND	ND	ND
Detection Limit		0.05	0.0005	0.001	0.001	0.003

51-01-111

Gettler - Ryan Inc. ENVIRONMENTAL DIVISION

Chain of Custody

COMPANY Shell Oil Company JOB NO. 00378
JOB LOCATION 5251 Hopyard Rd / Owens
CITY Pleasanton PHONE NO. (415) 783-7500
AUTHORIZED John Werfal DATE 7/20/89 P.O. NO. 3633

SAMPLE ID	NO. OF CONTAINERS	SAMPLE MATRIX	DATE/TIME SAMPLED	ANALYSIS REQUIRED	SAMPLE CONDITION LAB ID
S-1	5	Liquid	7/20/89 / 11:20	TPH HBF a Diesel THC (Gas) BTXE	OK / Cool
S-2			/ 8:36		
S-3			/ 10:36		
S-4			/ 9:55		
S-5			/ 9:16		
SD-1			/ 11:20		
SF-3	3		/ 10:36		
Trip blank	2		7/19/89 / —	THC (Gas) BTXE	

RELINQUISHED BY: Guadalupe Sanchez 7/20/89 16:52
RECEIVED BY:

RELINQUISHED BY:
RECEIVED BY:

RELINQUISHED BY:
RECEIVED BY LAB: Josephine DeCarli 7/20/89 16:52

DESIGNATED LABORATORY: IT SCV DHS #: 137

REMARKS: Normal TAT Results due

DATE COMPLETED 7/20/89 ~~FOREMAN~~ Sampler Guadalupe Sanchez

ORIGINAL