enviros®

Transmittal

Date: October 3, 1994

To: Mr. Lynn Walker
Shell Oil Company
P.O. Box 4023
Concord, California 94524

From: Diane Lundquist

RE: **Work Plan**
Former Shell Service Station
461 Eighth Street
Oakland, California
WIC #204-5508-6205

Comments:

Transmitted herewith is the subject work plan.

If you have any questions, please call (707) 935-4850.

cc: Ms. Jennifer Eberlee, Alameda County Health Care Services Agency
Mr. Richard Hiett, Regional Water Quality Control Board
Mr. Jim Matthews, Shell Oil Company
Mr. Steven Schulman, Wells Fargo Bank

Enviros, Inc. 19411 Riverside Drive Post Office Box 259 Sonoma California 95476 Tel 707 / 935-4850 Fax 707 / 935-4855

enviros®

October 3, 1994

Mr. Lynn Walker
Shell Oil Company
P.O. Box 4023
Concord, California 94524

RE: **Work Plan**
Former Shell Service Station
461 Eighth Street
Oakland, California
WIC #204-5508-6205

Dear Mr. Walker:

Enviros, Inc. (Enviros) has prepared this work plan for the above referenced site (Plate 1). The objective of this work plan is to install onsite monitoring wells to assess the extent of petroleum hydrocarbons, if any, in groundwater at the site and to aid in determining the source of hydrocarbons found offsite to the south.

Previous Work

Emcon Associates Investigation

According to data provided by the previous site consultant, a service station was constructed on the subject property in 1965 and was initially operated by American Oil Company. Shell Oil Company began operation of the site around 1974 and continued until May 1980. The service station was demolished and the underground storage tanks were removed in 1985. Currently, the subject property is operated by City Services Parking and is used as a parking lot. The existing monitoring wells and the previous site layout are shown on Plates 2 and 3, respectively.

The following summary was provided by the previous site consultant:

- In January 1979, the Bay Area Rapid Transit District (BART) noticed a gasoline odor in the water leaking into a nearby BART tunnel under the intersection of 7th Street and Broadway, approximately 20 feet southwest of the subject property.

- During 1981, Monitoring Wells S-1, S-2 and S-3 were installed on the Shell site. Well S-4 was installed adjacent to the BART Tunnel. Wells S-5 and S-6 were installed near the reported leak in the tunnel. Well S-7 was installed at

Enviros, Inc. 19411 Riverside Drive P.O. Box 259 Sonoma, California 95476-0259 Tel 707 / 935-4850 Fax 707 / 935-4855

Washington and 5th Street on the southwest side of Highway 880. A recovery well was also installed adjacent to Well S-6. BART sealed the groundwater leak in approximately 1981.

- Recovery of contaminated groundwater continued from February 1982 to August 1982, when the system was shut down because the effluent discharge exceeded permitted discharge levels. Well S-7 and the recovery well were destroyed in 1985. Wells S-1, S-2 and S-3 were destroyed in 1987.

- A Preliminary Site Assessment (PSA) was prepared by GeoStrategies in June 1993. The PSA included seven sites with known leaking USTs within one-quarter mile of the subject site. Based on proximity to the subject property, groundwater flow direction and the nature of leakage, the PSA concluded that four of the seven sites with leaking USTs may have had an impact on soil or groundwater conditions at the former Shell site. Additionally, a reference provided by Shell Oil Company indicates that in approximately 1980, the Oakland Police Department replaced leaking USTs located at the southwest corner of 6th and Washington Streets. No regulatory files concerning the Police Department site activities were uncovered during the preparation of the GeoStrategies PSA.

- Quarterly monitoring has been conducted in offsite wells S-4, S-5, and S-6 since October 1988. Separate phase hydrocarbons have been periodically been observed in Wells S-5 and S-6 and have been removed by bailing the wells or by a vacuum truck.

- An onsite subsurface soil investigation was conducted by Enviros using the Geoprobe on July 7, 1994. Three areas of the site were investigated: the former UST area, the former dispenser isalnd area, and the former waste oil tank area. In the former UST area TPH-G and Benzene was not detected, and the highest TPH-D concentration was 50 ppm. In the former dispenser island area the highest found concentrations were as follows: TPH-G - 15 ppm, TPH-D - 410 ppm, and Benzene - 0.24 ppm. In the former waste oil tank area TPH-G, TPH-D, and BTEX compounds were all ND. Oil and Grease were detected at a maximum of 54 ppm. Additionally, 980 ppm of zinc was detected in soils from the former waste oil tank area.

Geology and Hydrogeology

The geology of the subject property has described by Radbruch (1967). According to Radbruch, the site is underlain by the Merritt Sand; a fine-grain, silty to clayey sand deposit that contains lenses of sandy clay and clay. Local subsurface conditions have been described on exploratory boring logs for wells installed at the site. The boring logs indicate that encountered sand deposits are intercalated with finer grained material such as silts and clays.

Groundwater has been encountered in Wells S-4, S-5 and S-6 at approximately 15 to 20 feet below grade. Groundwater flow directions have historically ranged from [redacted] northeast.

away from bay?

Work Tasks

Task 1 - Permits

Obtain required drilling permits from local agencies.

Task 2 - Preparation of a Health and Safety Plan

A site-specific Health & Safety Plan will be prepared for field work.

Task 3 - Site Investigation

A total of [redacted] be drilled in the approximate locations shown on Plates 2 & 3. Soil samples will be collected from each boring at five foot intervals and at significant lithologic changes for chemical analysis and lithologic description.

An Enviros geologist will supervise the drilling and describe encountered soils using the Unified Soil Classification System (USCS). Soil sample intervals will be screened in the field for organic vapor by measuring head-space vapors using an organic vapor meter (OVM). Soil samples for chemical analysis will be properly sealed, labeled, and entered onto a chain-of-custody record. Soil samples will be preserved in a cooler with ice for transport to a State of California certified laboratory.

An exploratory boring log will be prepared for each well boring. Head-space vapor measurements will be recorded on the log.

All three of the exploratory borings will be converted to groundwater monitoring wells. Groundwater is expected to be encountered at a depth of 19-21 feet below grade. Wells will be screened from an interval approximately 5 feet above and 10 feet below first encountered groundwater. A well completion detail will be prepared for each groundwater monitoring well.

Standard drilling procedures for soil borings and groundwater monitoring wells are presented in Appendix A

Task 4 - Well Development

Prior to groundwater sampling, newly installed groundwater monitoring wells will be developed according to standard procedures contained in Appendix A.

Task 5 - Groundwater Sampling

Groundwater samples will be collected from groundwater monitoring wells by an approved Shell sampling contractor.

Water samples will be labeled, entered onto a chain-of-custody record, and preserved in a cooler with ice for transport to a State of California certified laboratory.

Task 6 - Chemical Analyses

Soil and groundwater samples collected from the site will be analyzed for Total Petroleum Hydrocarbons calculated as gasoline according to EPA Method 8015 (Modified) and Benzene, Toluene, Ethylbenzene and Xylenes (BTEX) according to EPA Method 8020.

Task 7 - Wellhead Survey

The elevations of the top of casing and the top of vault box of the newly installed wells will be measured by a licensed surveyor and referenced to Mean Sea Level. Additonally, the elevation of the three existing offsite wells will be resurveyed.

Task 8 - Report Preparation

Following the receipt of chemical analytical results from the laboratory, Enviros will prepare a written report describing field procedures and laboratory results, and present conclusions and recommendations.

The scope of work described in this work plan will be performed under the supervision of a registered professional engineer.

Schedule

Enviros recommends that the tasks proposed in this work plan commence following the receipt of appropriate well permits and site access agreement.

Enviros appreciates the opportunity to present this work plan to Shell. If you have any questions, please call at (707) 935-4850.

Sincerely,

Enviros, Inc.

Joe W. Neely
Project Geologist

Diane M. Lundquist, P.E.
Senior Engineer
C46725

REGISTERED PROFESSIONAL ENGINEER
DIANE M. LUNDQUIST
NO. C46725
CIVIL
STATE OF CALIFORNIA

Attachments: Plate 1 - Vicinity Map
Plate 2 - Site Plan
Plate 3 - Proposed Groundwater Monitoring Well Locations

Appendix A - Field Methods and Procedures

cc: Ms. Jennifer Eberlee, Alameda County Health Care Services Agency
Richard Hiett, Regional Water Quality Control Board, San Francisco Region
Mr. Jim Matthews, Shell Oil Company
Mr. Steven Schulman, Wells Fargo Bank

Base Map: 1993 Thomas Guide

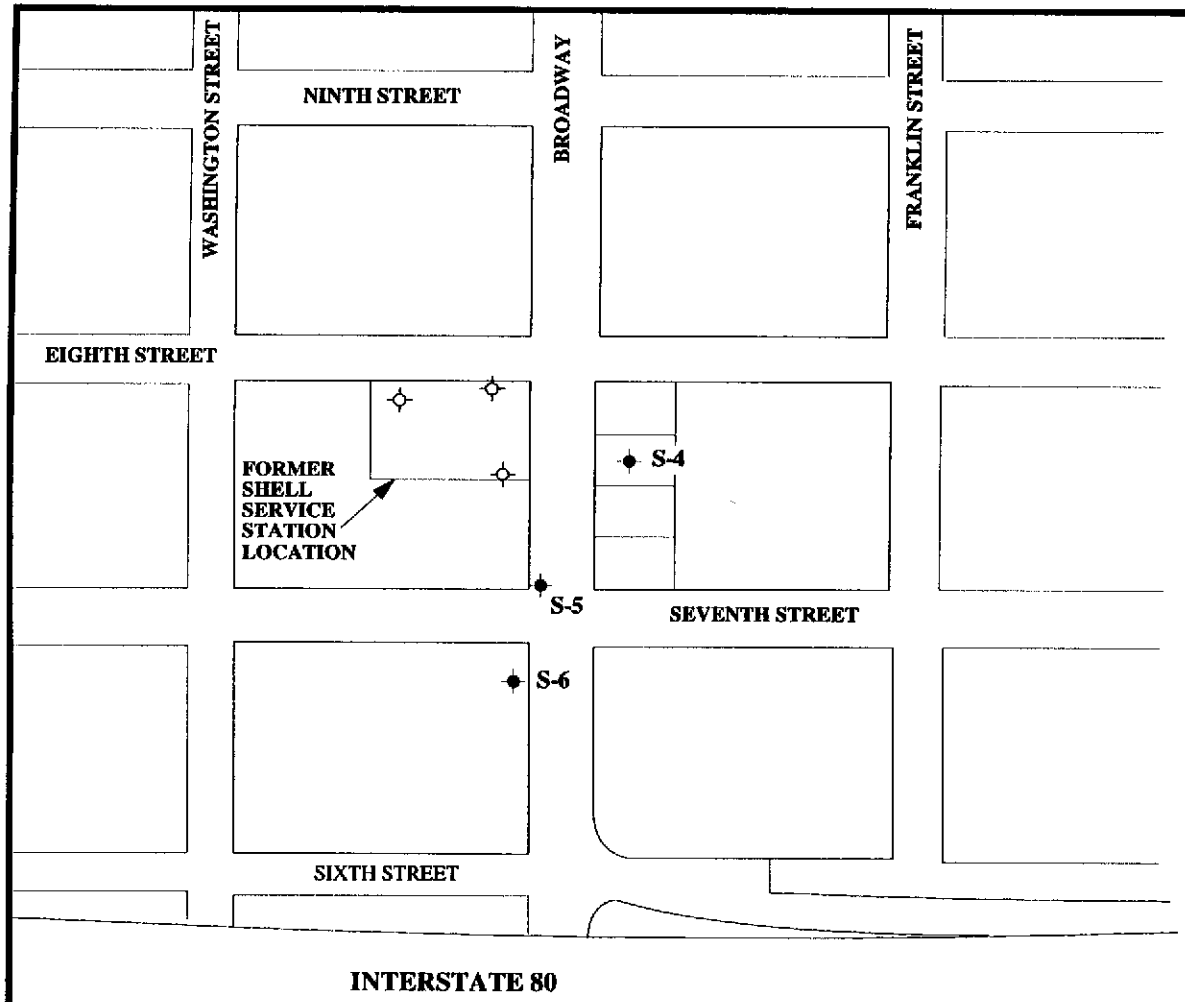
Plate 1

VICINITY MAP
Former Shell Service Station
461 Eighth Street
Oakland, California

enviros®
E494216.03

Drawn By: JWN Date: 10/3/94

Approved By: JM Date: 3-OCT-94



EXPLANATION

- Groundwater Monitoring Well
- Proposed Monitoring Well

N

0 200

Scale in Feet

Note: Base Map taken from GeoStrategies Inc. Report dated 10-4-93.

PLATE **2**

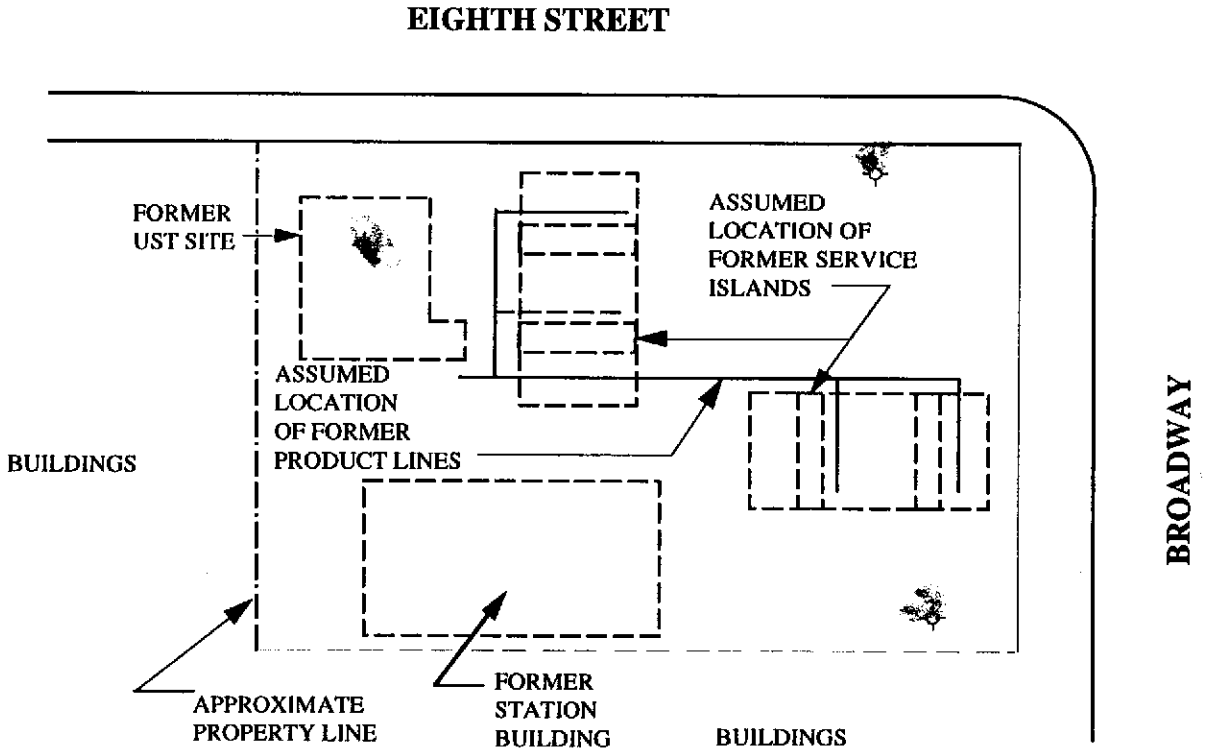
EXTENDED SITE PLAN
Former Shell Service Station
461 Eighth Street
Oakland, California

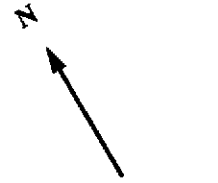
enviros®
E494216.03

Drawn By: JWN | Date: 10/3/94 | Approved By: JR | Date: 3-OCT-94

EXPLANATION

Proposed Monitoring Well Location





Base Map: GeoStrategies, Inc. Site Plan 9/93

PLATE		
3	**SITE PLAN** Former Shell Service Station 461 Eighth Street Oakland, California	*enviros*® E494216.03
Drawn By: JWN Date: 9/21/94		Approved By: JM Date: 3-OCT-94

Appendix A

Field Methods and Procedures

Field Methods and Procedures

EXPLORATION DRILLING

Mobilization

Prior to any drilling activities, Enviros, Inc. (Enviros) 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. Enviros 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 groundwater. 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 possibility 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 soils 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 an Enviros geologist. 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 Enviros field log of boring. 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) OVM reading

Soil samples selected for chemical analysis are covered with teflon tape and the ends are capped to prevent volatilization. The samples are labeled and entered on a chain-of-custody form, and placed in a cooler on 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 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 professional engineer.

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 (e.g. 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 created 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 tremie 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 Enviros for each well installed.

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

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 well are required, existing and newly installed wells are surveyed relative to MSL.