enviros®

February 24, 1995

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

RE: Work Plan
Former Shell Service Station
2101 Park Boulevard
Oakland, California
WIC #204-5508-1206

Dear Mr. Walker:

Enviros, Inc. (Enviros) has prepared this work plan for the above referenced location. This work plan presents the technical objectives and approach to perform a site investigation to evaluate the presence of petroleum hydrocarbons in subsurface soils and groundwater beneath the subject property (Plates 1 and 2). The scope of work presented in this work plan will be performed to comply with Regional Water Quality Control Board (RWQCB) and Alameda County Health Care Services Agency (ACHCSA) guidelines.

The objectives described in this work plan are to:

- Evaluate subsurface conditions in former underground storage tank (UST) and dispenser island areas through the collection and analysis of representative soil and groundwater samples,
- Obtain a continuous soil profile through continuous coring of one drilling location,
- Identify existing wells located within a 1/4-mile radius of the subject property, and
- Identify existing property uses within a two block radius of the subject property.

Site History

Existing Property Use

The site is presently occupied by a closed Goodyear Tire and Auto Store. A waste oil tank, apparently used by Goodyear, is located to the southeast of the existing building.

Former Site Layouts

Based on a review of documents provided by Shell, it appears that three previous generations of former gasoline underground storage tanks, two generations of former dispenser islands, and two generations of former waste oil tanks have been located at the site. The locations of these former improvements are shown on Plate 2.

The "Plot Plan - Service Station L-480," obtained from Shell files, shows that underground storage tanks were originally located in the sidewalk along the Park Boulevard frontage (first generation tanks). One island (first generation island) was also present as part of this layout, and was located to the northwest of the first generation tanks. Plot plan notes indicate that the first generation tanks, islands, and buildings were to be

Enviros, Inc 270 Perkins Street P.O. Box 259 Sonoma, California 95476-0259 Tel 707 935-4850 Fax 707 / 935-6649

removed, and that one of the gas tanks was to be relocated and used as the waste oil tank. The presence of a first generation waste oil tank is not noted. A copy of this plot plan is presented in Appendix A.

This Plot Plan also shows the second generation site layout which included two 7500-gallon gasoline tanks (second generation tanks), the relocated gas tank, now used as a waste oil tank (first generation waste oil tank), and two islands (second generation islands). Additionally, a Kaprealian Engineering, Inc. (KEI) *Subsurface Investigation Report* dated January 13, 1987 documents removal of three 10,000-gallon fiberglass gasoline tanks (third generation tanks). This report shows these tanks in a location slightly northwest of the second generation tanks.

A Blaine Tech Services report dated November 21, 1986 documents removal of a waste oil tank, from a location different than the one in which the first generation waste oil tank was shown on the plot plan. It appears that this represents a second generation waste oil tank.

Previous Site Investigations

Removal of Third Generation Tanks

The KEI report documents sampling performed in conjunction with the removal of three 10,000-gallon fiberglass USTs.

Groundwater was present in the excavation at a depth of approximately 9 feet below grade (fbg). One soil sample was collected from the excavation sidewall, and contained 120 parts per million (ppm) Total Petroleum Hydrocarbons calculated as Gasoline (TPH-G) and 1.1 ppm benzene. A water sample collected from the excavations contained 4400 parts per billion (ppb) TPH-G and 7.6 ppb benzene.

The report also notes that subsurface soils exposed during the excavation consisted of clay.

Removal of Second Generation Waste Oil Tank

The Blaine report dated November 21, 1986 documents the removal of one 550-gallon waste oil tank.

One soil sample was collected at a depth of 12.5 fbg. This sample was analyzed for Waste Oil and was reported to contain a concentration of 2464 ppm.

(Is this TOG? We don't have.)

Nearby Investigations

RWQCB files were reviewed for nearby investigations to obtain approximate depth to water and groundwater flow direction information. A file for "Yuen's Garage", located one block to the west, at the northwest corner of the intersection of Park Boulevard and Wayne Street was identified. The most recent data was from 1990, and identified groundwater flow to the west, at a depth of approximately 4 - 5 fbg. This flow direction is consistent with topography and flows toward Lake Merritt.

Technical Rationale for Proposed Scope of Work

Technical rationale for the tasks described in this work plan include the following:

- Exploratory soil borings and the collection of soil samples are proposed to evaluate subsurface conditions in former locations of potential petroleum hydrocarbon sources.

- Nearby investigation data suggest that groundwater is present at depths of less than 10 fbg, and flows to the west.

- First and second generation waste oil tank areas are located beneath the building and are presently inaccessible. However, groundwater samples from a soil boring placed in a downgradient direction from these former tanks will be analyzed for waste oil constituents.

Work Tasks

Task 1 - Permits

Required drilling permits will be obtained from the Alameda County Flood Control District - Zone 7.

Task 2 - Health and Safety Plan

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

Task 3 - Utility Clearance

Proposed drilling locations will be marked and their locations cleared through Underground Services Alert (USA) prior to drilling.

Task 4 - Proposed Soil Borings

Eleven exploratory borings will be drilled in locations shown on Plate 3. Soil samples will be collected at five-foot intervals and at significant lithologic changes for chemical analysis and lithologic description. Boring S-G will be continuously cored.

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 selected 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 the each boring. Head-space vapor measurements will be recorded on the log.

These borings will be terminated when the saturated zone is encountered, which is anticipated to be at depths of 4 to 9 fbg.

The drilling will be performed in two phases. During the first phase, borings S-B, S-C, S-D, S-F, S-G, S-H, S-I, and S-J will be completed using a geoprobe drilling system. Soil

samples from these eight borings will be submitted for chemical analysis as described under "Task 7 - Chemical Analysis." Based on laboratory analytical data from the first phase of drilling, the appropriate drilling method and completion of borings S-A, S-E, and S-K will be selected as the second phase. If data indicate that soil has *not* been impacted, these three borings will be completed using the geoprobe drilling system, and samples collected as described above.

However, if data indicate that soil and/or groundwater have been impacted by petroleum hydrocarbons, these borings will be drilled with a hollow-stem auger rig, and completed as groundwater monitoring wells. Sampling intervals and protocols will be as described above.

Standard field methods and procedures are presented in Appendix B.

Task 5 - Groundwater Monitoring Well Installation (If Required)

If petroleum hydrocarbon contamination is encountered, borings S-A, S-E, and S-K will be completed as groundwater monitoring wells.

Wells will be completed using 2-inch diameter Schedule 40 PVC casing. Well screen interval is proposed to be approximately 5 feet above (if field conditions permit) to 10 feet below first encountered groundwater. The sandpack will be placed 1-foot above the top of the well screen followed by a 1-foot thick bentonite seal. Each well will be secured with a locking cap under a traffic-rated well box. A well completion detail will be prepared for each groundwater monitoring well.

Task 6 - Groundwater Monitoring Well Development and Sampling (If Wells are Installed)

The groundwater monitoring wells will be developed and sampled by a Shell-approved sampling contractor.

Task 7 - Chemical Analysis

Groundwater samples (if wells are installed), and selected soil samples from each boring or well will be analyzed for Total Petroleum Hydrocarbons calculated as Gasoline (TPH-G) according to EPA Method 8015 (Modified) and benzene, toluene, ethylbenzene, and xylenes (BTEX) according to EPA Method 8020. If boring S-K is converted to a well, groundwater samples taken from it will also be analyzed for Oil & Grease according to EPA Method 5520 E&F, Total Petroleum Hydrocarbons calculated as Diesel (TPH-D) according to EPA Method 8015 (Modified), Volatile Organics according to EPA Method 8010 and ICAP metals according to EPA Method 8010.

Task 8 - Groundwater Monitoring Wellhead Survey (If Wells are Installed)

Wellhead elevations will be surveyed relative to Mean Sea Level by a State of California Licensed Surveyor. Measurements will be made to the nearest 0.01 foot.

Task 9 - Well Survey

Existing and abandoned wells within a 1/4-mile survey will be identified. Results of this survey will be contained in the Final Results Report.

Task 10 - Surrounding Property Use Survey

Properties within a two-block radius of the subject property will be surveyed and their current uses identified. This information will be reported on a map of the area contained in the Final Results Report

Task 11 - Existing/Former Site Uses Map

A map will be generated which shows locations of existing site structures, along with former underground tanks and islands. This map will be included in the Final Results Report.

Task 12 - Final Results Report Preparation

Following the receipt of chemical analytical results from the laboratory, Enviros will prepare a written report describing field procedures, laboratory results, boring logs, and will include the additional research information described in Tasks 9 through 11.

Schedule

Enviros is prepared to begin work upon receipt of the following:

- Approval of this work plan by ACHCSA,
- Appropriate permits, and
- Approval of right-of-entry agreements from Goodyear.

Goodyear's agreement for right-of-entry is subject to their approval of this work plan.

If you have any questions regarding the scope of work outlined in this work plan, please call.

Sincerely,

Enviros, Inc.

Jeffrey L. Peterson
Hydrogeologist

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 - Former UST and Island Areas
Plate 3 - Proposed Boring Locations

Appendix A - Plot Plan - Service Station L-480
Appendix B - Field Methods and Procedures

cc: Mr. Barney Chan, Alameda County Health Care Services Agency
Mr. Frank J. Schlessinger
Mr. Steve McCara, Goodyear Tire and Auto

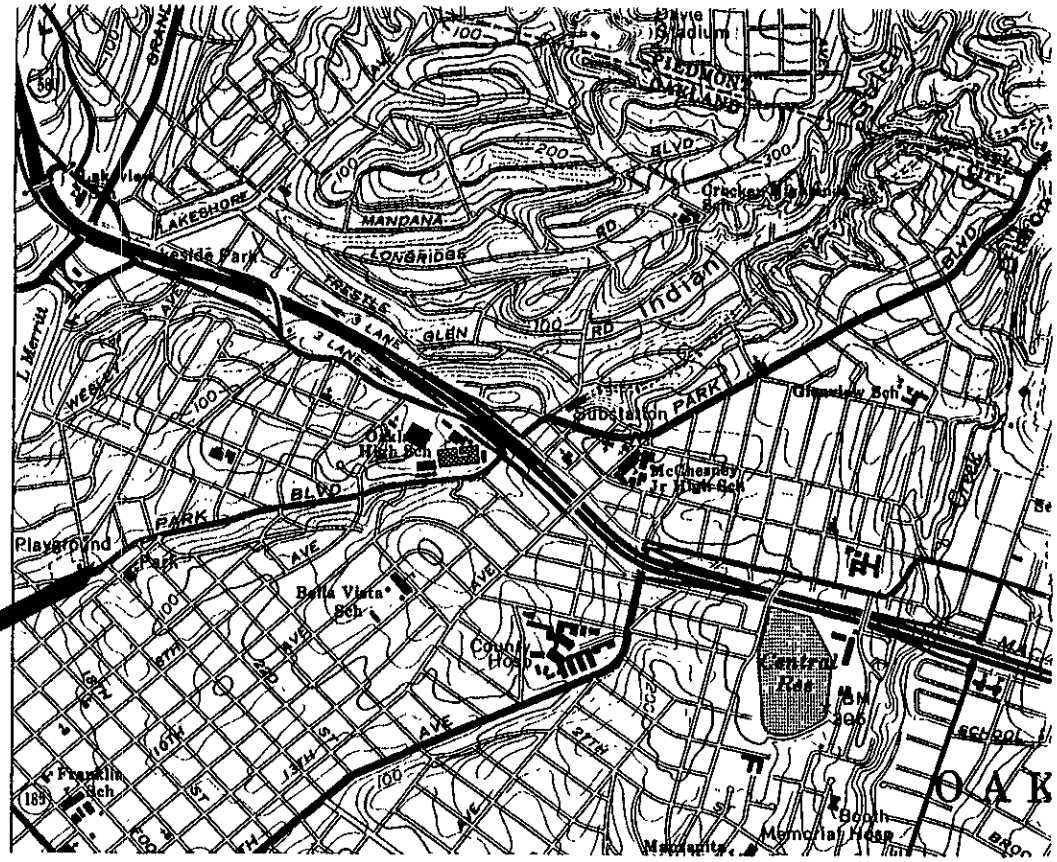


PLATE
1

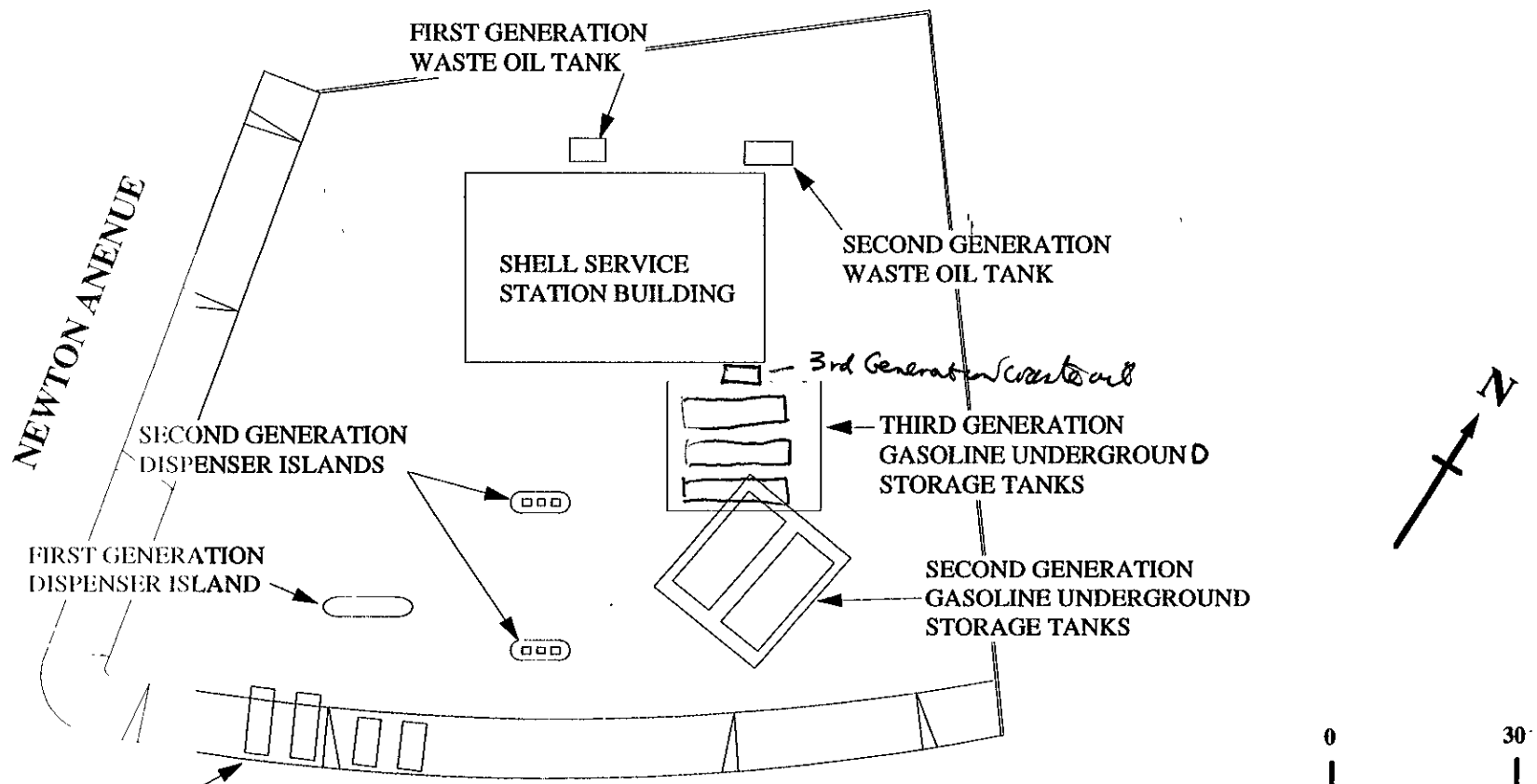
VICINITY MAP
Former Shell Service Station
2101 Park Boulevard
Oakland, California

enviros®
E4/95267.01

Drawn By: GLV

Date: 2-24-95

Approved By: _____ Date: 2-28-95



PLATE

2

SITE PLAN - FORMER UST AND DISPENSER ISLAND AREAS
Former Shell Service Station
2101 Park Boulevard
Oakland, California

enviros®
E4/95267.01

Drawn By: GLV | Date: 2-24-95 | Approved By: [signature] | Date: 2-29-95

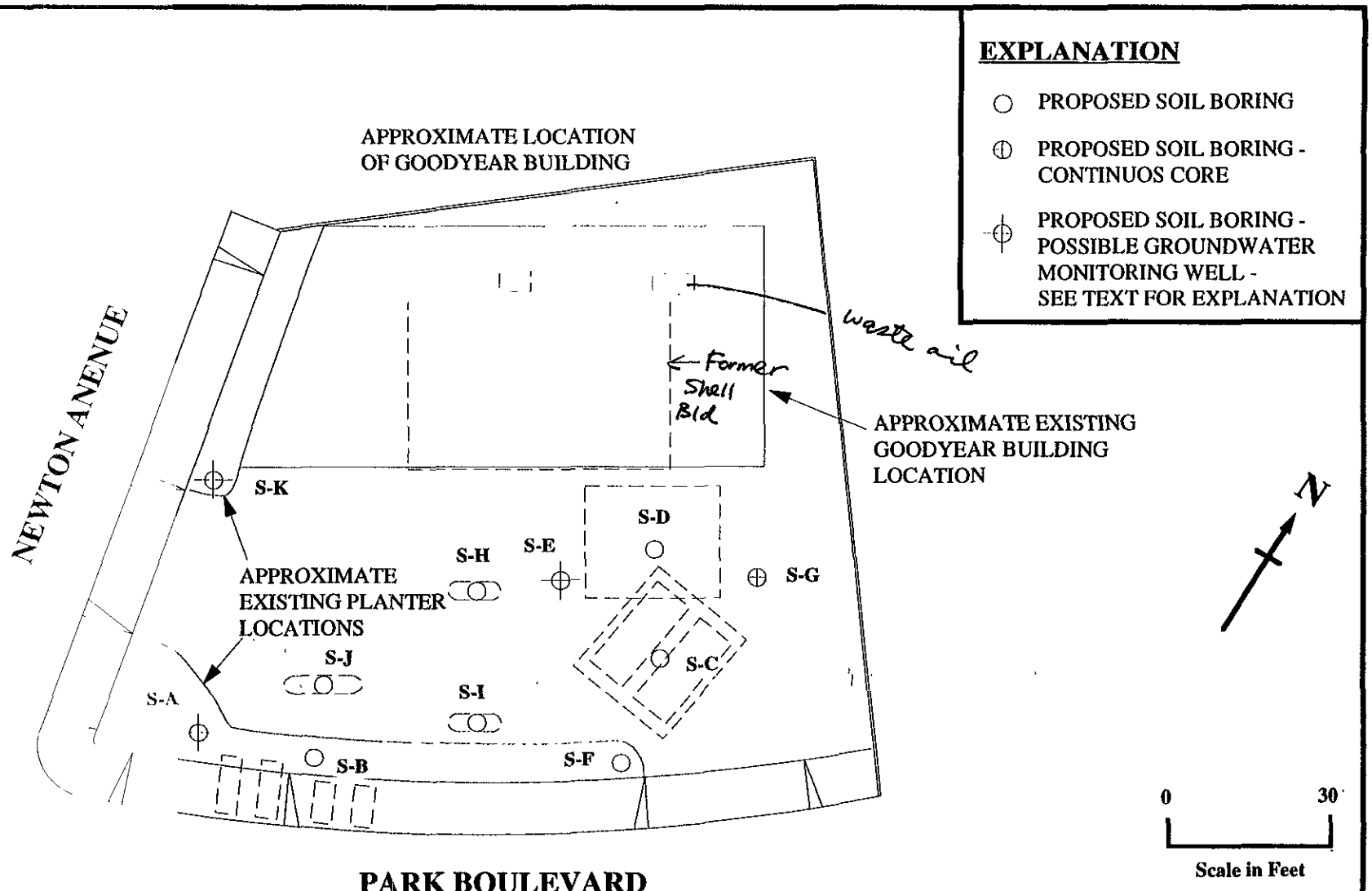


PLATE
3

PROPOSED BORING LOCATIONS
Former Shell Service Station
2101 Park Boulevard
Oakland, California

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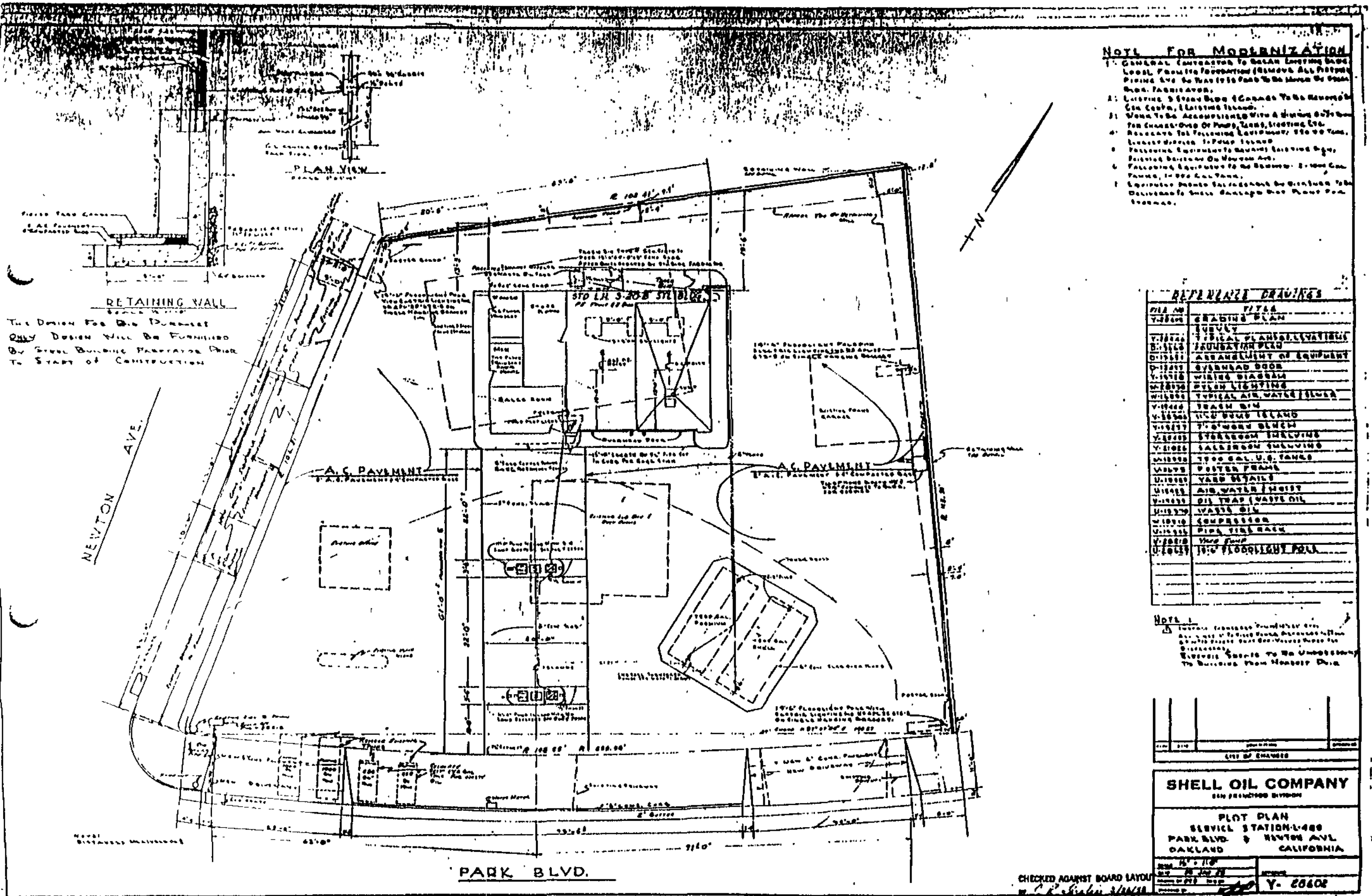
E4/95267.01

Drawn By: GLV | Date: 2-24-95 | Approved By: [signature] | Date: 2-24-95

APPENDIX A

PLOT PLAN - SERVICE STATION L-480



NOTE FOR MODERNIZATION
PLAN VIEW
RETAINING WALL
NEWTON AVE.
STD L.H. 3-20 B STL BLDG.
A.C. PAVEMENT
A.C. PAVEMENT
PARK BLVD.
REFERENCE DRAWINGS
GRADING PLAN
SURVEY
FOUNDATION PLAN
ARRANGEMENT OF EQUIPMENT
OVERHEAD DOOR
WIRING DIAGRAM
PYLON LIGHTING
TRASH BIN
COMPRESSOR
LIST OF CHANGES
SHELL OIL COMPANY
PLOT PLAN
OAKLAND
CALIFORNIA
CHECKED AGAINST BOARD LAYOUT

APPENDIX B

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.

Geoprobe Drilling Methods

The geoprobe system utilizes a percussion hammer and hydraulically-powered system to drive probes which are approximately 1.75-inches in diameter to the desired depth and retrieve soil and groundwater samples.

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.