



BP OIL

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Environmental Resources Management
Building 13, Suite N
295 SW 41st Street
Renton, Washington 98055-4931
(206) 251-0667

July 27, 1994

Mr. Richard Hiett
California Regional Water Quality Control Board
San Francisco Bay Region
2101 Webster Street, Suite 500
Oakland, CA 94612

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ALERT
MAYNAT

RE: BP OIL FACILITY #11133
2220 98th Avenue
Oakland, California

Dear Mr. Hiett:

Attached please find our revised WORK PLAN FOR INSTALLATION OF VAPOR EXTRACTION WELLS DATED JULY 13, 1994 for the above referenced facility. This report includes a Site Safety Plan.

If you have question or comments I may be reached at
(206) 251-0689.

Respectfully,

Scott T. Hooton
Scott T. Hooton
Environmental Resources Management

STH:aa ERM11133WP

cc: Mr. Barney Chan, Alameda County Health Care Service Agency,
80 Swan Way, Room 200, Oakland, CA 94621

Mr. Brady Nagle, Alisto, 1777 Oakland Blvd., Suite 200,
Walnut Creek, CA 94596

Site file

JUL 21 1994
BP OIL CO.
ENVIRONMENTAL DEPT.
WEST COAST REGION OFFICE

**WORK PLAN
FOR
INSTALLATION OF VAPOR EXTRACTION WELLS**

**BP Oil Company Service Station No. 11133
2220 98th Avenue
Oakland, California**

Project No. 10-025-04

Prepared for:

**BP Oil Company
Environmental Resources Management
295 S.W. 41st Street
Building N, Suite 13
Renton, Washington**

Prepared by:

**Alisto Engineering Group
1777 Oakland Boulevard, Suite 200
Walnut Creek, California**

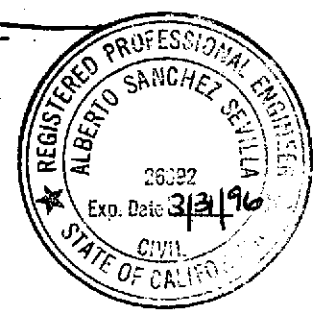
July 13, 1994



**Peter Beaver
Engineering Manager**



**Al Sevilla, P.E.
Principal**



**WORK PLAN
FOR
INSTALLATION OF VAPOR EXTRACTION WELLS**

**BP Oil Company Service Station No. 11133
2220 98th Avenue
Oakland, California**

Project No. 10-025-04

INTRODUCTION

This proposed scope of work is for installation of six vapor extraction wells at BP Oil Company Service Station No. 11133, 2220 98th Avenue, Oakland, California. The vapor extraction wells will be installed as part of the proposed groundwater extraction/vapor recovery treatment system. The work plan is based on available reports and information.

Activities will be performed in accordance with the technical specifications of BP Oil Company and the requirements and guidelines of the Alameda County Health Care Services Agency, Alameda County Flood Control District (Zone 7), and the California Regional Water Quality Control Board, San Francisco Bay Region.

SCOPE OF WORK

Alisto proposes to install six 4-inch-diameter vapor extraction wells in addition to the three vapor extraction wells on the western portion of the property. Three vapor extraction wells will be installed near the eastern property boundary and two near the underground fuel tanks on the western portion of the site. One of the wells will be installed at Springfield Street, near Monitoring Well AW-4, south of the site, and will require an encroachment permit from the City of Oakland.

The vapor extraction wells are intended to recover hydrocarbon vapors in the soil beneath the site. The proposed scope of work includes: obtaining permits; locating underground utilities; drilling, sampling, and installing the wells; and preparing a well installation report presenting the results and findings. The locations of the proposed wells are shown on the attached site plan.

Task 1: Acquire Permits

Before beginning work, Alisto will: (1) procure well installation permits from Zone 7 and ACHCSA, and an encroachment permit from the City of Oakland; (2) locate underground utilities; and (3) schedule field activities.

Task 2: Install Vapor Extraction Wells

Six soil borings will be drilled to approximately 20 feet below grade using a truck-mounted CME 75 drilling rig equipped with 12-inch-diameter hollow-stem augers. Soil samples will be collected at 5-foot intervals and at significant stratigraphic changes beginning at 5 feet below grade and continuing to the total depth of the borings. Samples will be collected from a split-spoon sampler lined with stainless steel tubes and logged in the field by a qualified geologist or engineer using the Unified Soils Classification System. Each sample will also be field screened using a photo-ionization detector or combustible gas indicator. The samples will be sealed airtight with Teflon or aluminum sheeting, plastic caps, and adhesive tape, and placed immediately into a cooler containing blue or dry ice.

The borings will be converted into six 4-inch-diameter vapor extraction wells. The proposed wells will be installed and constructed based on site-specific hydrogeologic conditions. The screened interval of the wells will extend from approximately 5 feet below grade to the bottom of each boring. The wells will be constructed using Schedule 40, PVC casing with 0.010-inch perforations, and the associated filter pack. An approximately 1-foot-thick bentonite spacer will be installed above the sand pack, and the remainder of the annulus will be sealed with Portland Type I/II neat cement. The top of each casing will be secured with a watertight locking cap or utility box finished flush with the ground surface.

Task 3: Prepare Report

A draft report presenting the findings and well construction details will be submitted to BP Oil Company for review. On approval, a final report will be forwarded to BP Oil Company for submittal to the appropriate parties.

SITE SAFETY PLAN

All field procedures and activities will be conducted in accordance with a site-specific safety plan. The site safety plan will be developed in accordance with applicable requirements of the California Environmental Protection Agency and the federal and state Occupational Safety and Health Administration.

IMPLEMENTATION SCHEDULE

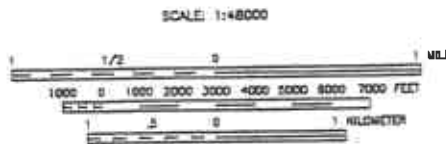
Installation of the vapor extraction wells will be completed and a report submitted within 50 days after receipt of written approval of the proposed work plan from the appropriate regulatory agencies.

The estimated schedule for completion of the tasks is as follows:

<u>Task/Activity</u>	<u>Days After Work Plan Approval</u>
- Acquire Permits	25
- Install Vapor Extraction Wells	35
- Prepare Report	50



VICINITY MAP



QUADRANGLE LOCATION

UTM GRID AND 1980 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

DESCRIPTION OF WORK

SOIL AND GROUNDWATER REMEDIATION SYSTEM
 BP OIL SERVICE STATION NO. 11133
 2220 98TH AVENUE
 OAKLAND, CALIFORNIA

GENERAL NOTES

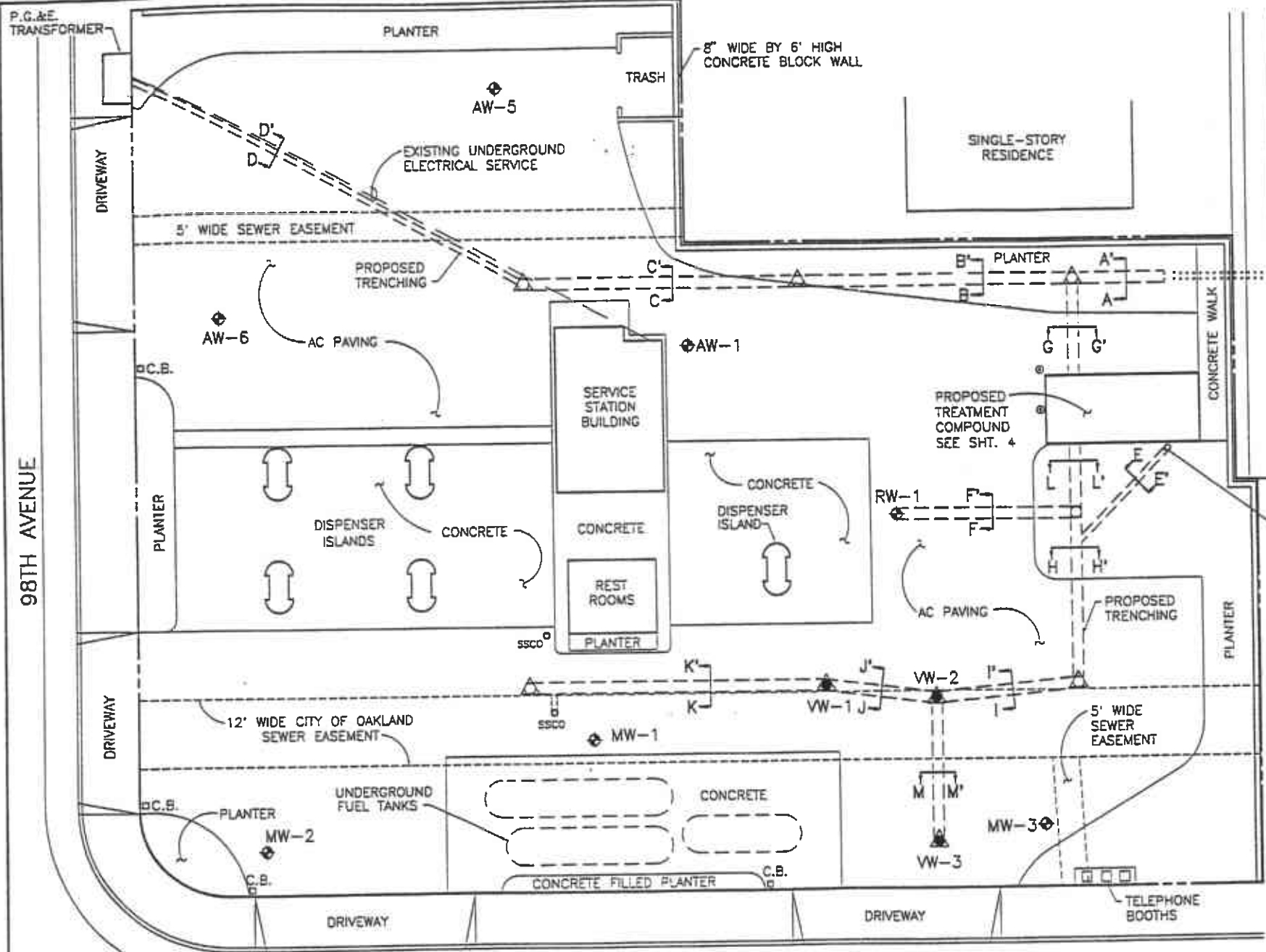
- ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE UNIFORM BUILDING CODE, 1991 EDITION, LOCAL CODES AND APPLICABLE STATE AND FEDERAL REGULATIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL FIELD DIMENSIONS AND IDENTIFYING ALL CONFLICTING UTILITIES PRIOR TO BEGINNING ANY WORK. AS-BUILT DRAWINGS OF EXISTING FACILITIES OR STRUCTURES ARE NOT AVAILABLE. DAMAGE TO EXISTING PIPING, CONDUIT OR OTHER ITEMS SHALL BE REPAIRED OR REPLACED TO ORIGINAL CONDITION BY THE CONTRACTOR.
- ENGINEER SHALL BE RESPONSIBLE FOR BUILDING AND SEWER DISCHARGE PERMITS. CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING OTHER PERMITS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING THE CONSTRUCTION AREA AGAINST ENTRY BY UNAUTHORIZED PERSONNEL FOR THE DURATION OF THE PROJECT.
- ASPHALT AND CONCRETE SURFACES SHALL BE SAWCUT IN A STRAIGHT LINE PRIOR TO REMOVAL FOR TRENCHING OR EXCAVATING.
- UTILITY TRENCHES SHALL BE EXCAVATED A MINIMUM OF THREE INCHES DEEPER THAN THE BOTTOM OF INSTALLED PIPES OR CONDUITS. ALL LINES SHALL HAVE A MINIMUM COVER OF 6 INCHES OF COMPACTED SAND AND A MINIMUM BURIAL DEPTH OF 18 INCHES, UNLESS NOTED OTHERWISE.
- TRENCHES SHALL BE BACKFILLED WITH CLEAN SAND WITH A MAXIMUM LOOSE LIFT OF 8 INCHES BEFORE COMPACTION. COMPACTION SHALL BE TO A DENSITY OF NO LESS THAN 95% OF MAXIMUM.
- FOR ASPHALT PAVING, CONTRACTOR SHALL PLACE A CLASS 2, 3/4 INCH AGGREGATE BASE TO A MINIMUM THICKNESS OF SIX INCHES PRIOR TO RESURFACING. AGGREGATE BASE SHALL HAVE A RELATIVE COMPACTION OF NOT LESS THAN 95%. ASPHALT PAVEMENT TOP COURSE TO BE 3 INCHES IN THICKNESS MINIMUM.
- CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2500 PSI. MINIMUM THICKNESS OF CONCRETE TO BE 6 INCHES. FINISH SHALL BE STEEL TROWEL SMOOTH OR TO MATCH SURROUNDINGS.
- SURFACING MATERIALS SHALL MATCH SURROUNDINGS UNLESS NOTED OTHERWISE. ASPHALT PAVING SHALL BE SLURRY SEALED TO MATCH EXISTING SURFACE, IF APPLICABLE.
- ALL LIQUID CARRYING LINES SHALL BE PRESSURE TESTED TO 75 PSI BEFORE BACKFILL. ALL CONTAINMENT CONDUIT SHALL BE PRESSURE TESTED TO 5 PSI BEFORE BACKFILL. ENGINEER SHALL BE NOTIFIED OF AND WITNESS PRESSURE TESTING. CITY INSPECTOR SHALL ALSO BE NOTIFIED AND WITNESS PRESSURE TESTING.
- TELEPHONE SERVICE SHALL TERMINATE IN A PANEL MOUNTED 28L4 NETWORK INTERFACE DEVICE.
- ELECTRICAL CONDUIT TO TERMINATE WITH AT LEAST 10 FEET OF RIGID METALLIC AT ALL PENETRATIONS, STUB-UPS OR EXPLOSION PROOF SEAL-OFFS.
- ALL CONDUIT, PIPE AND CONTAINMENT STUB-UPS TO BE A MINIMUM OF 18 INCHES ABOVE FINISHED GRADE.

- ALL ELECTRICAL PANELS, METERS, CONDUIT AND PIPING IN TREATMENT AREA NOT PENETRATING THE PAD SHALL BE MOUNTED A MINIMUM OF 36 INCHES ABOVE GRADE. ALL PANELS, METERS, PIPES AND CONDUITS SHALL BE MOUNTED ON A BACKBOARD OF 3/4 INCH EXTERIOR PLYWOOD MOUNTED ON UNISTRUT INSTALLED VERTICALLY 6 FOOT CENTERS OR ON UNISTRUT ALONE INSTALLED VERTICALLY ON 2 FOOT CENTERS.
- ALL WOOD AND BARE STEEL SHALL BE PRIMED WITH A COMPATIBLE PRIMER AND FINISH COATED IN COLORS TO MATCH THE EXISTING STRUCTURES.

CONSTRUCTION NOTES

- ALL UNDERGROUND ELECTRICAL CONDUIT SHALL USE LONG SWEEPS FOR ALL BENDS. VAULTS MAY BE USED FOR PULL BOXES AS REQUIRED BY THE ELECTRICAL CODE.
- ALL UNDERGROUND CONTAINMENT CONDUIT AND ELECTRICAL CONDUIT SHALL USE LONG SWEEPS FOR ALL BENDS. VAULTS MAY BE USED AS JUNCTION BOXES WITH APPROVAL FROM THE ENGINEER.
- PULL ROPES WILL BE INSTALLED IN ALL CONDUIT AND CONTAINMENT CONDUIT.
- AN EXTERNAL 12 GAUGE STRANDED COPPER BOND WIRE WILL BE INSTALLED PARALLEL TO ALL BURIED PVC CONDUIT AND BE MECHANICALLY BONDED TO THE RIGID STEEL CONDUIT WHICH TERMINATES AT EACH END.
- A CAUTION TAPE SHALL BE INSTALLED IN THE TRENCH BACKFILL AT LEAST 6 INCHES ABOVE THE UPPERMOST PIPING.
- ALL VAULTS SHALL BE SET TOTALLY IN CONCRETE. VAULTS WITH A DEPTH GREATER THAN 12 INCHES SHALL BE SET IN TWO OR MORE POURS WITH THE UPPERMOST LIFT A MAXIMUM OF 10 INCHES THICK. TOPS OF VAULTS SHALL BE SET 1/2 INCH ABOVE GRADE IN COLLAR OF CONCRETE WITH A MINIMUM COLLAR WIDTH OF 12 INCHES. CONCRETE SHALL BE SLOPED FROM TOP OF VAULT TO EXISTING GRADE.
- THE POURED CONCRETE TREATMENT AREA SHALL BE INSTALLED ON GRADE WITH 10 GAUGE, 6 INCH BY 6 INCH WELDED WIRE REINFORCEMENT SET ON 2 INCH HIGH SADDLES.
- THE EFFLUENT DISCHARGE LINE TO THE SEWER SHALL HAVE A MINIMUM SLOPE OF 2%.
- A NEW 240 VOLT 200 AMP THREE PHASE UNDERGROUND SERVICE SHALL BE OBTAINED FROM PG&E. THE METER SHALL BE MOUNTED ON THE OUTSIDE OF THE TREATMENT ENCLOSURE.
- APPROPRIATELY COUPLED FLEXIBLE HOSE SHALL BE PROVIDED BY THE OWNER OR ENGINEER, IN LENGTHS SUFFICIENT TO ALLOW EITHER CARBON ABSORBER TO BE USED AS THE PRIMARY VESSEL.
- THE OWNER OR ENGINEER SHALL SUPPLY ELECTRICAL CONTROL PANEL INSTRUMENTATION/CONTROLS, WELL VAULTS, NITRILE HOSE AND FITTINGS, FLOW METERS, GAUGES, SWITCHES, VALVES, CARTRIDGE FILTERS, AIR STRIPPER, CARBON VESSELS AND THERMAL OXIDIZER UNIT. CONTRACTOR SHALL FURNISH ALL OTHER EQUIPMENT AND MATERIALS. A CHAIN LINK FENCE WITH CHAIN LINK COVER, BOTH WITH REDWOOD SLATS, SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.

										VICINITY MAP & NOTES			
										BP OIL COMPANY			
										BP OIL SERVICE STATION NO. 11133 2220 98TH AVENUE OAKLAND, CALIFORNIA			
										ALISTO ENGINEERING GROUP WALNUT CREEK, CALIFORNIA			
										DRAWN BY: RJKW		DATE: 4-11-84	
										DESIGNED BY:		DATE:	
										APPROVED BY:		DATE:	
NO.	DATE	REVISIONS	BY	APP.	APP.	SLIP	APP.	DATE	SCALE	JOB #	SHEET #	REV.	
								4-11-84	AS NOTED	10-025	1		

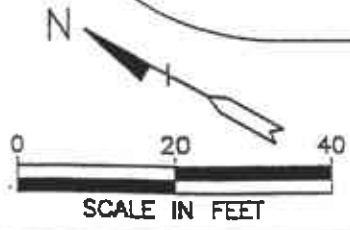


- LEGEND**
- ◆ EXISTING MONITORING WELL
 - ▲ EXISTING VAPOR EXTRACTION WELL
 - △ PROPOSED VAPOR EXTRACTION WELL
 - PROPOSED PIPING VAULT
 - SSCO ○ SEWER SERVICE CLEANOUT
 - BOLLARD
 - PROPERTY LINE
 - +— CENTERLINE OF ROADWAY
 - - - - - PROPOSED TRENCHING
 - ⋯⋯⋯ PROPOSED TUNNELING

- ABBREVIATIONS**
- AC ASPHALT CONCRETE
 - P.G.&E. PACIFIC GAS AND ELECTRIC
 - C.B. CATCH BASIN

SYSTEM SPECIFICATIONS	
THERMAL OXIDIZER	RETOX, 600 CFM @ 50" W.C., 25 HP REGENERATIVE BLOWER, 95% HEAT RECOVERY, 95%+ DESTRUCTION, REGENERATIVE THERMAL OXIDIZER
VAPOR EXTRACTION SYSTEM	
AIR FLOW TOTAL	550 CFM
AIR FLOW STRIPPER	150 CFM
AIR FLOW EXTRACTION WELLS TOTAL (9)	400 CFM
LENGTH OF SCREEN COMBINED	90'
GROUNDWATER EXTRACTION SYSTEM	
EXTRACTION WELL FLOW RATE (1)	1 GPM
SUBMERSIBLE PUMP, 1/2 HP	13 GPM @ 80 PSI

2-STORY APARTMENT BUILDINGS



ALISTO ENGINEERING GROUP WALNUT CREEK, CALIFORNIA	
DESIGN BY: ROW	DATE: 4-7-94
DESIGNED BY:	DATE:
APPROVED BY:	DATE:

SITE PLAN			
BP OIL COMPANY			
BP OIL SERVICE STATION NO. 11133			
2220 98TH AVENUE			
OAKLAND, CALIFORNIA			
DATE: 4-7-94	SCALE: AS NOTED	JOB #: 10-025	SHEET #: 2

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SITE SAFETY PLAN

FOR

**BP Oil Company Service Station No. 11133
2220 98th Avenue
Oakland, California**

Project No. 10-029-04

1.0 INTRODUCTION

This site safety plan (SSP), designed to address safety provisions during site investigation and well closure, provides procedures to protect onsite personnel from physical and chemical hazards resulting from drilling, abandonment, excavation, site restoration, groundwater monitoring and sampling, and system maintenance operations. The SSP establishes personnel responsibilities, general safe work practices and field procedures, personal protective equipment (PPE) standards, decontamination procedures, and emergency action plans.

This SSP conforms with health and safety requirements promulgated by the United States Occupational Safety and Health Administration (OSHA) and California Occupational Safety and Health Administration (Cal-OSHA). Alisto Engineering Group will conduct the proposed scope of work at the above property following the procedures set forth in this SSP.

2.0 RESPONSIBILITIES OF KEY PERSONNEL

Onsite personnel will have assigned responsibilities. The project manager, assigned to supervise field work, will serve as the site safety officer (SSO). The SSO or a designated alternative will ensure that all personnel have received a copy of the SSP. The SSO will be ensure that personnel understand and comply with the SSP. Additionally, the SSO will be responsible for initiating emergency response procedures, if necessary.

Before the work begins, the SSO will conduct a site-specific training session to ensure that personnel are aware of potential physical and chemical hazards and safe work practices.

Personnel must initially complete a 40-hour hazardous materials training course as required by Code of Federal Regulations (CFR) 1910.120. Thereafter, they are required to complete an 8-hour hazardous materials refresher course annually. Additionally, personnel will be required to document their full understanding of this SSP before admission to the site. Compliance with the SSP will be monitored at all times by the SSO. Appropriate PPE, listed in Section 7.0, will be available and used by onsite personnel.

Personnel will take reasonable precautions to avoid unforeseen hazards. They will be held responsible to perform only those tasks for which they are qualified. Each person will be responsible for strict adherence to all procedures described in the SSP. Any deviation will be reported to the SSO and corrected.

3.0 STANDARD OPERATING PROCEDURES

Onsite personnel will be briefed each day in "tail-gate" meetings as to the day's goals and equipment to be used. Anticipated contaminants, physical hazards, and emergency procedures will be reviewed. Appropriate PPE will be worn and verified correct by the SSO, including respirator fit. Health and safety procedures will be discussed.

A qualified drilling contractor will deliver and operate equipment. Only qualified personnel will have contact with this equipment. All personnel, including the drilling contractor and his employees, will be required to wear hard hats and steel-toed boots when close to drilling equipment. Additionally, safety glasses with side shields or goggles and hearing protection may be required. Nitrile or neoprene gloves will be worn by personnel collecting or handling samples, to prevent exposure to contaminants. Gloves will be changed between samples, and used ones discarded, to avoid cross-contamination.

Respiratory equipment will be worn if vapor contamination levels exceed action levels. No onsite smoking, open flame, or sparks will be permitted, to prevent accidental ignition of gasoline. All personnel will adhere to safety procedures and requirements.

4.0 JOB HAZARD ANALYSIS

Physical and chemical hazards which may be encountered onsite include those associated with operating mechanical equipment and dealing with potentially hazardous chemicals.

4.1 Physical Hazard Assessment

Physical hazards which may be encountered during drilling, excavation, site restoration, and system maintenance include the following:

1. Injury or limb amputation from falling objects, moving machinery, or equipment placed in a walk area.
2. Explosion and fires resulting from punctured natural gas pipelines or combustion of flammable/combustible liquids.
3. Electrocutation from buried or overhead power lines.
4. Explosion in trenches or excavations containing flammable/combustible chemicals.
5. Asphyxiation or toxic inhalation resulting from entering confined spaces containing less than 19.5 percent oxygen or more than 25 percent oxygen or containing hazardous chemicals.
6. Hearing loss resulting from noise generated during operation of heavy equipment.
7. Heat stress associated with hot weather and/or use of PPE.

4.2 Chemical Hazard Assessment

Hazardous chemicals which may be encountered onsite include gasoline fuel hydrocarbons; benzene, toluene, ethylbenzene, and total xylenes (BTEX); and tetraethyl lead. These chemicals are volatile, flammable, and moderately to extremely toxic. They present a possible inhalation, absorption, and ingestion hazard. They may damage an unprotected individual's liver, kidneys, central nervous system, and bone marrow. Benzene is a known human carcinogen and ethylbenzene in vapor and liquid form is a skin irritant.

Gasoline vapors in concentrations greater than 300 parts per million (ppm) can cause eye, nose, and throat irritation, headaches, dizziness, and anesthesia. Skin contact with liquid gasoline may result in irritation, dermatitis, and absorption of specific toxic petroleum fractions.

OSHA and the American Conference of Governmental Industrial Hygienists (ACGIH) have established exposure limits for these chemicals. Threshold limit value (TLV) is the exposure limit determined by ACGIH to which a person may be repeatedly exposed without adverse effects. The permissible exposure limit (PEL) is the maximum permitted 8-hour time-weighted average (TWA) of airborne contaminant that a person may be exposed to. The short-term exposure limit (STEL) is a 15-minute TWA exposure which is not to be exceeded at any time during a workday even if the 8-hour TWA is below the PEL. The ceiling limit (CL) is the maximum concentration of an airborne contaminant to which a person may be exposed at any time.

PEL, STEL, and CL are measured in ppm and/or milligrams per meter cubed (mg/m^3). Exposure limits established by OSHA and ACGIH for contaminants which may become airborne at this site are listed in the following table. Values are from OSHA unless otherwise noted. For purposes of health and safety, the strictest established exposure limit will be used.

<u>Compound</u>	<u>TLV</u> <u>(ppm)</u>	<u>PEL</u> <u>(ppm)</u>	<u>STEL</u> <u>(ppm)</u>	<u>CL</u> <u>(ppm)</u>
Gasoline	300	500		
Benzene	1.0	5.0	0.10*	1.0*
Ethylbenzene	100	100	125	
Toluene	100	150	100	500
Total Xylenes	100	150	100	300

*Values specified by ACGIH.

5.0 SITE MONITORING

Physical and chemical hazards must be monitored at the site to ensure that employees are not exposed to hazardous situations. Monitoring will be performed during this project as described below.

5.1 Monitoring of Physical Hazards

Exposure to excessive heat, noise, and hazardous work conditions will be monitored throughout the project. Personnel entering areas where people cannot carry on a normal conversation will be required to wear hearing protection. If heat stress is anticipated due to hot weather or use of PPE, personnel will be monitored by the SSP and provided beverages, shaded rest areas, and breaks.

Work area safety inspections will be conducted by the SSO on a daily basis before start of work and as conditions change. Hazardous conditions reported to or observed by the SSO will be corrected immediately.

5.2 Exposure Monitoring Plan

Fire, explosive, and toxic inhalation hazards will be evaluated throughout the project. A direct-reading combustible gas indicator (CGI) or organic vapor meter (OVM) will be used to evaluate possible formation of flammable atmospheres in the work area. Continuous flammability measurements will be taken at the top of the boring near the work crew throughout well installation. Periodic measurements will be taken from soil piles, excavations, and confined areas where flammable/combustible vapors may accumulate. Work will be suspended if combustible readings exceed 10 percent of the lower explosive limit (LEL).

6.0 SAFETY PRACTICES AND PRECAUTIONS

Simple precautions will reduce or eliminate physical and chemical hazards associated with drilling, excavation, site restoration, and system maintenance. Precautions include using qualified and trained personnel; ensuring compliance with the SSP; ensuring proper engineering controls; good housekeeping procedures; using PPE; and familiarity with emergency response procedures.

To prevent injury from moving machinery, automobiles, fires, or other physical hazards, the following procedures will be implemented:

1. Keep drill rig and mast at least 50 feet away from overhead electrical power lines.
2. Identify underground utilities before work begins. Shut down, lock out, and tag power lines and pipelines as appropriate, particularly power supply and emergency "shutoffs" for dispenser pumps and associated delivery lines.
3. Bond and ground drilling and excavation equipment during all operations. Bond and ground handling and transportation equipment during loading of soils and pumping and transfer of leachate.

4. Maintain equipment in proper working order and inspect before each use.
5. Use spark-resistant tools in areas where an ignition source could start a fire.
6. Clean up spills or deposits of oil or flammable, combustible, or hazardous liquids.
7. Water down, if necessary, working areas, excavated material, and unpaved roadways during excavation, handling, stockpiling, and backfilling, to minimize dust.
8. Remove or properly contain waste materials daily. Store excavated materials in closed-top barrels or roll-off bins located onsite to prevent any volatile organic compounds (VOCs) from escaping into the atmosphere.
9. Remove materials which may fuel a fire or impede regress of a fire from the work area.
10. Keep access to the fire extinguisher clear. Use fire extinguishers on equipment or small fires only.
11. Maintain an adequately-stocked first-aid kit onsite at all times.
12. Keep the work area clean and free of obstacles.
13. Use a "buddy system" in areas of high automobile traffic.
14. Wear ear plugs in areas of high noise (whenever noise makes it difficult for a normal conversation to be carried on).
15. Do not use drugs or alcohol during response operations.

The following procedures must be followed when working with or around hazardous materials or soils which may be contaminated with hazardous chemicals:

1. Do not smoke, eat, drink, or engage in any other activity which would increase hand-to-mouth contact.
2. Wear respiratory protective equipment and clothing as deemed necessary by the SSO. Do not wear a respirator over facial hair as this prevents a proper seal.
3. Do not walk, sit, lean, or kneel in puddles, leachate, or discolored surfaces.
4. Wash hands and face when leaving the work area.
5. Wash the entire body if decontamination procedures are in effect for outer garments.
6. Clean, sanitize, inspect, and maintain respirators after each use.

7. Establish work areas including the hot (contaminated) zone, decontamination zone, and safe zone, as necessary. Minimize personnel and equipment in the hot zone.
8. Establish procedures for exiting the hot zone before beginning onsite activities.

7.0 PPE

PPE may be required to safely perform onsite work. Onsite personnel will have access to respirators with organic vapor cartridges. Replacement cartridges will be available onsite as needed. When handling samples, the geologist will wear nitrile or neoprene gloves. Personnel will wear hard hats and steel-toed boots when in the proximity of drilling equipment.

PPE required for this project includes:

1. Half-face air purifying respirator with organic vapor cartridges and dust/mist filters
2. Hard hat
3. Steel-toed boots or chemically-resistant booties
4. Safety glasses with side-shields or safety goggles
5. Nitrile or Neoprene gloves
6. Ear plugs or muffs
7. Coveralls or other suitable work clothing

8.0 WORK ZONES AND SECURITY MEASURES

Access to the site will be restricted to authorized personnel. Barricades and/or traffic cones will be placed to form a barricade at least 20 feet away from and surrounding the site during drilling operations. The SSO will be responsible for site security.

9.0 DECONTAMINATION MEASURES

The best method for protection is to avoid contamination. To achieve this, comply with the safety precautions discussed in Section 6.0. Drilling and sampling equipment will be decontaminated by steam cleaning before being brought onsite. Sampling equipment will be decontaminated before each sample is collected and drilling equipment will be decontaminated before each boring is drilled.

The project geologist will oversee operations and log borings in consultation with drillers. He or she will also ensure that proper protocol is used when collecting and handling samples.

10.0 TRAINING

The SSO will conduct a pre-job training session to discuss all points of the SSP. The SSO will ensure that everyone fully understands site hazards before work begins. Onsite personnel will be trained in the following:

1. Anticipated hazards
2. Safety practices to be followed
3. PPE
4. Emergency procedures and location of posted phone numbers

Personnel must initially complete a 40-hour hazardous materials training course as required by CFR 1910.120. Thereafter, personnel are required to annually complete an 8-hour hazardous materials refresher course. Use of respirators must be in accordance with the written respiratory protection program. Personnel must be properly trained and fit-tested for the respirator worn.

11.0 MEDICAL SURVEILLANCE

According to CFR 29, 1910.120, paragraph (f), employees who wear respirators 30 days or more during 1 year or who have been exposed to hazardous substances or health hazards above established PELs are required to be medically monitored. Although airborne contamination levels are anticipated below permissible PELs, respirators fitted with organic vapor cartridges should be worn when a gasoline odor is present. Consequently, personnel must participate in a medical surveillance program.

12.0 RECORDKEEPING

Documentation will be kept on all personnel exposed to contaminant hazards on the job site according to OSHA regulations. This will include documentation that employees have received training on the SSP, respiratory protection, MSDS forms, and all emergency procedures. These will be reviewed during the pre-site training meeting.

Exposure records on each job will be kept for 30 years to meet regulatory requirements. Included will be names and social security numbers of employees, medical evaluations, on-the-job logs from entry to exit, first aid administered, visits onsite by non-employees, and personal air monitoring records.

13.0 EMERGENCY RESPONSE AND CONTINGENCY PLAN

In the event of accident, injury, fire, explosion, or other emergency, the project geologist, SSO, or designated representative will be responsible for coordinating emergency response

activities. The responsible person will call: 911; the hospital during a medical emergency; and the appropriate government agencies. During an emergency, the following steps will be implemented:

1. The SSO will verbally notify onsite personnel of the emergency and direct personnel to perform any required duties, including shutdown of site utilities, if necessary.
2. If the emergency cannot be readily contained, extinguished, or controlled by onsite personnel, the SSO will call 911 and inform them of the location and details of the emergency situation.
3. If evacuation is necessary, personnel will meet at the north corner of the intersection of Tara Hills Drive and Appian Way.
4. The SSO will notify the project manager and principal, if necessary.
5. The SSO and the project manager, will decide when to resume operations after an incident has been controlled.

13.1 Flammable Atmosphere

In the event that CGI or OVM readings on site exceed 10 percent LEL, work will be suspended, monitoring will be continued, the area will be isolated, and some or all of the following engineering controls will be implemented:

1. Contaminated soils will be sprayed down, if necessary, with deodorizing chemicals to reduce vaporization of volatile organic compounds or permeation of other gases.
2. Vapors from pooled petroleum product will be suppressed, if necessary, by spraying with foam or an appropriate chemical suppressant.
3. Portions of the stockpiled soil will be covered with plastic sheeting.
4. Air movers will be used to ventilate areas of concentration to below 10 percent LEL.
5. Wells emitting excessive chemical concentrations will be ventilated, capped, or shut in, as necessary.

13.2 Toxic Atmosphere

In the event that airborne concentrations of the chemicals of concern exceed the TLV, the above engineering control measures will be implemented to reduce concentrations to or below the TLVs, if practical. If such reduction is not possible, PPE will be used to limit worker exposure during operations.

In the event that airborne concentrations of the chemicals exceed twice the TLV, work will be suspended and appropriate engineering controls will be implemented to reduce concentrations to or below twice the TLV.

14.0 RESPONSIBLE PARTIES

Responsible parties involved with installation of the groundwater monitoring wells are:

- BP Oil Company
Environmental Resources Management
295 S.W. 41st Street
Building 13, Suite N
Renton, Washington 98055

Contact: Scott Hooton
(206) 251-0689

- Alisto Engineering Group
1777 Oakland Boulevard, Suite 200
Walnut Creek, California 94596

Contact: David Lipnicke
Project Engineer
(510) 295-1650

15.0 SUMMARY OF SITE ORGANIZATION AND COORDINATION

- General:
Site Safety Officer (SSO) - David Lipnicke
Subcontractor - Soils Exploration Service
Driller -
Driller's helper -
- Site Access Control -

Activities will be on- and offsite, outside, and the work area will be well ventilated. The area will be barricaded at least 20 feet in all directions. Standard Caltrans lane or sidewalk closure procedures will be followed for work performed in the public right-of-way.

16.0 EMERGENCY MEDICAL CARE AND PROCEDURES

- Nearest Emergency Medical Facility

Name: Oak Knoll Naval Hospital

Address: 8750 Mountain Street, Oakland, California

Phone Number: (510) 633-5000

Directions: Approximately 1/2 mile north on 98th Ave, Right on Golf Links Road under freeway, left on Mountain Boulevard, Hospital will be on the right.

- Emergency Telephone Numbers

Fire Department: 911

Police Department: 911

Other: _____

I have read and agree to comply with the health and safety plan for the following project:

BP Oil Company Service Station No. 11133
2220 98th Avenue, Oakland, California

Signature: _____ Date: _____
Representing: _____
Title: _____

Signature: _____ Date: _____
Representing: _____
Title: _____

Signature: _____ Date: _____
Representing: _____
Title: _____

Signature: _____ Date: _____
Representing: _____
Title: _____

Signature: _____ Date: _____
Representing: _____
Title: _____