



BP OIL

ENVIRONMENTAL  
PROTECTION

95 MAY 12 PM 12:40

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

May 8, 1995

Alameda County Health Care Services Agency  
Attention Ms. Juliet Shin - Senior Hazardous Materials Specialist  
1131 Harbor Bay Parkway, Ste. 250  
Alameda, CA 94502-6577

RE: BP Oil Site No. 11270  
3255 McCartney Road  
Alameda, CA

Dear Ms. Shin:

Enclosed find a report entitled Subsurface Investigation Report, dated March 22, 1995.

As you will recall, this report documents work performed under at least two separate workplans previously approved by the Alameda County Health Care Services Agency, including: (1) the replacement of four monitoring wells (MW-1, 2, 3, and 4) near the existing tank farm with a single monitoring well (MW-6); (2) the installation of a monitoring well near the western portion of the site (MW-5); and, (3) the installation of well MW-7 immediately west of offsite well XW-3.

Please note that groundwater chemical data and gradient measurements will be addressed in subsequent groundwater monitoring events to be performed by Alisto. This information will assist in addressing the concerns that you have previously raised regarding the use of the X-series monitoring wells for groundwater sampling and water level measurement.

You may also want to note that groundwater electrical conductivity measurements strongly suggest that groundwater in the vicinity of the site is not potable. The electrical conductivity measurements for MW-7 were converted into total dissolved solids (TDS) concentrations with results ranging from 4,500 mg/L to 5000 mg/L. Based on the SFRWQCB Groundwater Basin Plan Amendments, I understand that groundwater with TDS concentrations exceeding 3,000 mg/L is not considered suitable or potentially suitable for a municipal or domestic water supply. Because our electrical conductivity measurements indicate that groundwater beneath this site may not be of current or potential beneficial uses, we will sample all of the wells for TDS during the next sampling event. If the TDS concentrations exceed 3,000 mg/L, I understand that no further corrective action activities would be required. If this is not correct, your efforts to point out my misunderstanding will be most appreciated.

*Incident*

By copy of this letter to Alisto Engineering group, all wells are to be sampled for TDS during the next scheduled sampling event.

If you have additional questions, please contact me at your earliest convenience. I can be reached at (206) 251-0689.

Sincerely,



Scott T. Hooton  
Environmental Resources Management

attachment

cc: site file  
A. Sevilla - Alisto (w/attachment)

ENVIRONMENTAL  
PROTECTION

95 MAY 12 PM 12:40

MAY 5 1995

BP OIL CO.  
ENVIRONMENTAL DEPT.  
WEST COAST REGION OFFICE

## **SUBSURFACE INVESTIGATION REPORT**

**BP Service Station No. 11270  
3255 Mecartney Road  
Alameda, California**

Prepared for:  
**BP OIL COMPANY**  
295 S. W. 41<sup>st</sup> Street  
Building 13, Suite N  
Renton, WA 98055

Prepared by:

**HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.**  
2363 Mariner Square Drive, Suite 243  
Alameda, CA 94501  
HETI Job No. 9-042.2

**March 22, 1995**

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## 1.0 INTRODUCTION

The purpose of this report is to present the results for field activities performed by Hydro-Environmental Technologies, Inc. (HETI) for BP Oil, Company (BP).

The tasks performed during this phase of work included the following:

- Drilled and logged three soil borings.
- Collected soil samples from the borings for laboratory analysis.
- Installed one two-inch diameter and two four-inch diameter monitoring wells.
- Destroyed four four-inch diameter monitoring wells.
- Developed the new monitoring wells.
- Surveyed on- and off-site wells to a temporary on-site benchmark.
- Performed a step-drawdown test on monitoring well MW-5.

### 1.1 SITE LOCATION AND DESCRIPTION

The site is located at 3255 Mecartney Road in the Harbor Bay Landing (HBL) Shopping Mall in Alameda, California (Figure 1). It is presently an operating BP service station with three underground gasoline storage tanks and one used oil tank. Figure 2 shows the layout of the site and the location of existing underground storage tanks and dispenser islands.

Four monitoring wells are present on-site, adjacent to the underground storage tanks. These monitoring wells are designated MW-1, MW-2, MW-3 and MW-4. Three off-site monitoring wells, designated XW-1, XW-2 and XW-3, are located adjacent to the site (Figure 2).

### 1.2 BACKGROUND

In October 1992, HETI conducted a preliminary site assessment. Work performed during the preliminary site assessment included the collection of ground water samples from monitoring wells MW-2 and MW-4. Ground water samples were not collected from monitoring wells MW-1 and MW-3 due to insufficient ground water recharge after well purging. Detectable concentrations of petroleum hydrocarbons were found in ground water samples collected from monitoring wells MW-2 and MW-4. Detailed results were presented in HETI's Preliminary Site Assessment Report dated January 7, 1993.

Historically, the depth to first encountered groundwater in the wells has ranged from approximately 5.0 to 7.0 feet below ground surface (bgs). Refer to the latest Alisto Engineering Group (Alisto) Groundwater Monitoring and Sampling Report for historical wellhead elevation data and current ground water elevation contours. According to Alisto, the ground water flow direction is generally towards the west at an approximate gradient of 2.9%, but varies across the site from northwest to southwest.

During previous monitoring and sampling events, ground water samples collected from all wells have contained dissolved petroleum hydrocarbons. The history of petroleum hydrocarbon concentrations in ground water samples collected from the on-site wells is available in the latest Alisto Groundwater Monitoring and Sampling Report.

## 2.0 FIELD ACTIVITIES

All drilling and soil sampling was performed in accordance with state and local agency guidelines. A copy of HETI's standard field protocols was submitted as an attachment to the Preliminary Site Assessment Report.

### 2.1 Soil Borehole Drilling and Soil Sampling

A safety meeting was conducted with Bayland Drilling personnel prior to the start of drilling on June 17, 1993. A site safety briefing was conducted with PC Exploration, Inc (PCX) personnel prior to the two drilling events on January 18, and 19, 1995. At the end of each briefing, all personnel reviewed and signed the Site Safety Plans prepared by HETI for this site; copies are attached in Appendix A. Prior to drilling and well installation and destruction, permits were obtained from the Zone Seven Water Agency; copies are included in Appendix B.

On June 17, 1993 Bayland Drilling used a CME-75 hollow-stem auger drill rig to drill one ten-inch diameter soil boring designated MW-5 near the western corner of the site. The boring was drilled to a total depth of approximately 15 feet bgs. Ground water was initially encountered at approximately 7.5 feet bgs.

During the two drilling events in January 1995, PCX used a Mobile B-55 hollow-stem auger drill rig to drill two ten-inch diameter soil borings designated MW-6 and MW-7. Boring MW-6 was drilled to a total depth of approximately 15.0 feet bgs. Boring MW-7 was drilled to a total depth of approximately 16.5 feet bgs. Heaving sands were observed in boring MW-7 between approximately 14.0 and 16.5 feet bgs. Ground water was initially encountered during drilling in January 1995 at approximately 5.0 feet bgs.

A 2.0-inch inside diameter split-spoon sampler, lined with brass tubes, was used to collect soil samples from each boring at a depth of five feet bgs. Soil samples collected from above the water table were labeled, documented on a chain-of-custody form, and placed in a cooler on ice for transport to the laboratory. Soil samples collected from boring MW-5 were transported to PACE Inc. (PACE), a state DHS-certified laboratory located in Novato, California. Soil samples collected from borings MW-6 and MW-7 were transported to Analytical Technologies, Inc. (ATI), a state DHS-certified laboratory located in Pensacola, Florida.

Soil samples collected from boring MW-5 were analyzed for TPHd and TPHg using EPA Method 8015 (modified), and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8020 (modified). Soil samples collected from borings MW-6 and MW-7 were analyzed for TPHd and TPHg using EPA Method 8015 and BTEX using EPA Method 8020.

Portions of each split spoon sample were retained for visual lithologic description by a HETI engineer using the Unified Soil Classification System, and for volatile organic headspace analysis using a Thermo-Environmental Model 580B organic vapor meter (OVM). OVM readings are presented on the Soil Boring Log and Well Construction Diagrams in Appendix B. Note that OVM readings do not necessarily correlate to actual soil concentrations, but give a relative indication of hydrocarbon concentrations in the soil.

## **2.2 Well Installation, Development and Surveying**

On June 17, 1993 boring MW-5 and on January 19, 1995 boring MW-6 were converted into four-inch diameter monitoring wells with the same designation. On January 19, 1995 boring MW-7 was converted into a two-inch diameter monitoring well with the same designation. All wells were constructed of Schedule 40 PVC casing. The new well locations are shown on Figure 2, the Site Plan. The well construction details are presented on the Soil Boring Log and Well Construction Diagrams and are included in Appendix B, as are the State of California Well Completion Reports.

On June 21, 1993 well MW-5 and on January 28, January 31, and February 2, 1995 wells MW-6 and MW-7 were all developed by a combination of surging and bailing. The depth to first encountered ground water was measured with an electric water sounder in each of the new wells prior to development. Each well was bailed of at least ten well volumes or until dry while observing the pH, temperature and conductivity for stabilization.

On January 28, 1995 the elevation of the top-of-casing of monitoring wells MW-5, MW-6, MW-7, XW-1, XW-2 and XW-3 were surveyed relative to an on-site benchmark.

### 2.3 Well Destruction

On January 18, 1995 PC used a Mobile B-55 hollow-stem auger drill rig to abandon on-site monitoring wells MW-1 through MW-4. Once the traffic-rated well boxes were removed, each well was overdrilled with twelve-inch diameter augers and the casings were removed intact. Well MW-1 was drilled to a total depth of approximately 15 feet bgs and wells MW-2, MW-3 and MW-4 were drilled to a total depth of 10 feet bgs. Neither well seals nor bottom well plugs were observed in any of the four wells at the time of destruction. Each borehole was grouted to the surface, and finished with black-tinted concrete flush with the surface.

### 2.3 Step-Drawdown Aquifer Test

On June 21, 1993 a step-drawdown aquifer test was attempted on well MW-5 to provide data that will be used to plan a future constant discharge aquifer test. MW-5 was pumped at a flow rate of less than 0.5 gallons per minute (gpm) for ten minutes, when the well went dry.

## 3.0 RESULTS OF INVESTIGATION

### 3.1 Site Stratigraphy

Sediments encountered at the site generally consisted of lean clay, poorly graded gravel, silty sand and poorly graded sand.

### 3.2 Results of Soil Sample Analysis

TPHd was detected in the soil samples collected from borings MW-5, MW-6 and MW-7 at concentrations of 11,000 micrograms per kilogram ( $\mu\text{g}/\text{kg}$ ), 480,000  $\mu\text{g}/\text{kg}$  and 110,000  $\mu\text{g}/\text{kg}$ , respectively. *480ppm*

*110ppm*  
TPHg was not detected in concentrations exceeding the method detection limit in the soil samples collected from borings MW-5 and MW-7 each at a depth of 5 feet below grade. TPHg was detected in a concentration of 89,000  $\mu\text{g}/\text{kg}$  in the soil sample collected from boring MW-6 at a depth of 5 feet bgs.

Benzene was not detected in concentrations exceeding the method detection limit in the soil samples collected from all borings. Analytical soil sample results for the sample collected from soil borings MW-5, MW-6 and MW-7 are presented in Table 1. Copies of the laboratory reports and chain-of-custody are attached in Appendix C.



### 3.3 Results of Step-Drawdown Aquifer Test

No significant results were obtained from the attempted step-draw down test. Monitoring well MW-5 could not maintain a flow rate of less than 0.5 gpm for more than ten minutes.

### 4.0 SUMMARY

The results of the field activities and laboratory analyses of soil samples collected during this investigation are discussed below.

- Ground water monitoring well MW-5 was installed at the site on June 17, 1993.
- Ground water monitoring wells MW-6 and MW-7 were installed at the site on January 19, 1995.
- Soil types encountered at the site generally consisted of lean clay, poorly graded gravel, silty sand and poorly graded sand.
- Neither TPHg nor BTEX were detected in the soil samples collected from borings MW-5 and MW-7 each at a depth of 5 feet bgs. TPHg and BTEX were detected in the soil sample collected from boring MW-6 at a depth of 5 feet bgs. *but TPHg detected at other depths*
- TPHd was detected above the method detection limit in the soil samples collected from borings MW-5, MW-6 and MW-7.
- Monitoring well MW-5 has a yield of less than 0.5 gpm.
- Monitoring wells MW-1 through MW-4 were destroyed on January 18, 1995.

## 5.0 CERTIFICATION

This report was prepared under the supervision of a registered professional geologist. All statements, conclusions and recommendations are based solely upon field observations and analytical analyses performed by a state-certified laboratory related to the work performed by Hydro-Environmental Technologies, Inc.

It is possible that variations in the soil or ground water conditions exist beyond the points explored in this investigation. Also, site conditions are subject to change at some time in the future due to variations in rainfall, temperature, regional water usage, or other factors.

The service performed by Hydro-Environmental Technologies, Inc. has been conducted in a manner consistent with the level of care and skill ordinarily exercised by members of our profession currently practicing under similar conditions in the area of the site. No other warranty, expressed or implied, is made.

Hydro-Environmental Technologies, Inc. includes in this report chemical analytical data from a state-certified laboratory. These analyses are performed according to procedures suggested by the U.S. EPA and the State of California. Hydro-Environmental Technologies, Inc. is not responsible for laboratory errors in procedure or result reporting.

HYDRO-ENVIRONMENTAL TECHNOLOGIES, INC.

Prepared by:

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Frances H. Maroni  
Project Manager

Reviewed by:

---

Gary Pischke, C.E.G.  
Senior Geologist

# FIGURES

**TABLE 1**

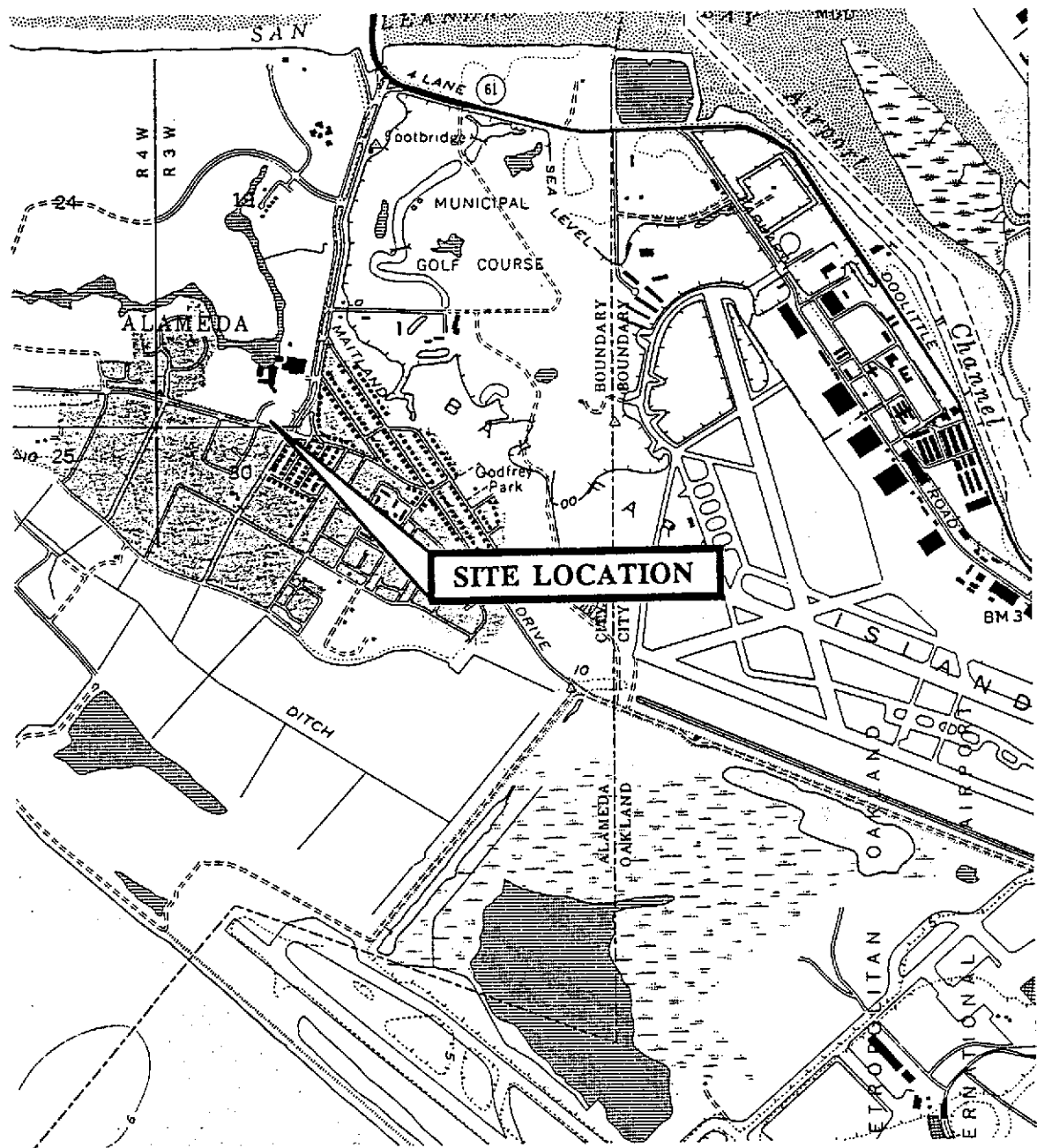
**SOIL SAMPLE ANALYTICAL RESULTS**

BP Service Station No. 11270  
 3255 Mecartney Road  
 Alameda, California

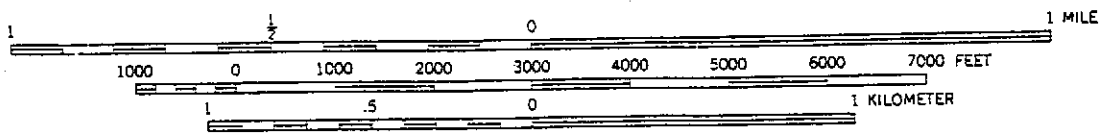
Sample No.	Date	TPHd (µg/kg)	TPHg (µg/kg)	B (µg/kg)	T (µg/kg)	E (µg/kg)	X (µg/kg)
MW-5-5'	6/17/93	11,000 (1)	ND<1000 (2)	ND<5.0 (3)	ND<5.0 (3)	ND<5.0 (3)	ND<5.0 (3)
MW-6-5'	1/19/95	480,000	89,000	ND<50	210	630	4,800
MW-7-5'	1/18/95	110,000	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<1.0

**Notes:**

- Sample No. : Soil boring designation and sample collection depth.
- Date : Sample collection date.
- (1) TPHd : Total petroleum hydrocarbons as diesel by EPA Method 8015 (modified).
- (2) TPHg : Total petroleum hydrocarbons as gasoline by EPA Method 8015 (modified).
- (3) BTEX : Benzene, toluene, ethylbenzene and total xylenes by EPA Method 8020 (modified).
- µg/kg : Micrograms per kilogram.
- TPHd : Total petroleum hydrocarbons as diesel by California Leaking Underground Fuel Tank (CA LUFT) Manual protocols.
- TPHg : Total petroleum hydrocarbons as gasoline by California Leaking Underground Fuel Tank (CA LUFT) Manual protocols.
- BTEX : Benzene, toluene, ethylbenzene and total xylenes by California Leaking Underground Fuel Tank (CA LUFT) Manual protocols
- ND : Not detected in concentrations exceeding the indicated laboratory method detection limit.



SOURCE:  
 USGS QUADRANGLE, 7.5 MINUTE SERIES  
 ENTITLED "SAN LEANDRO, CA"  
 SCALE 1: 24 000



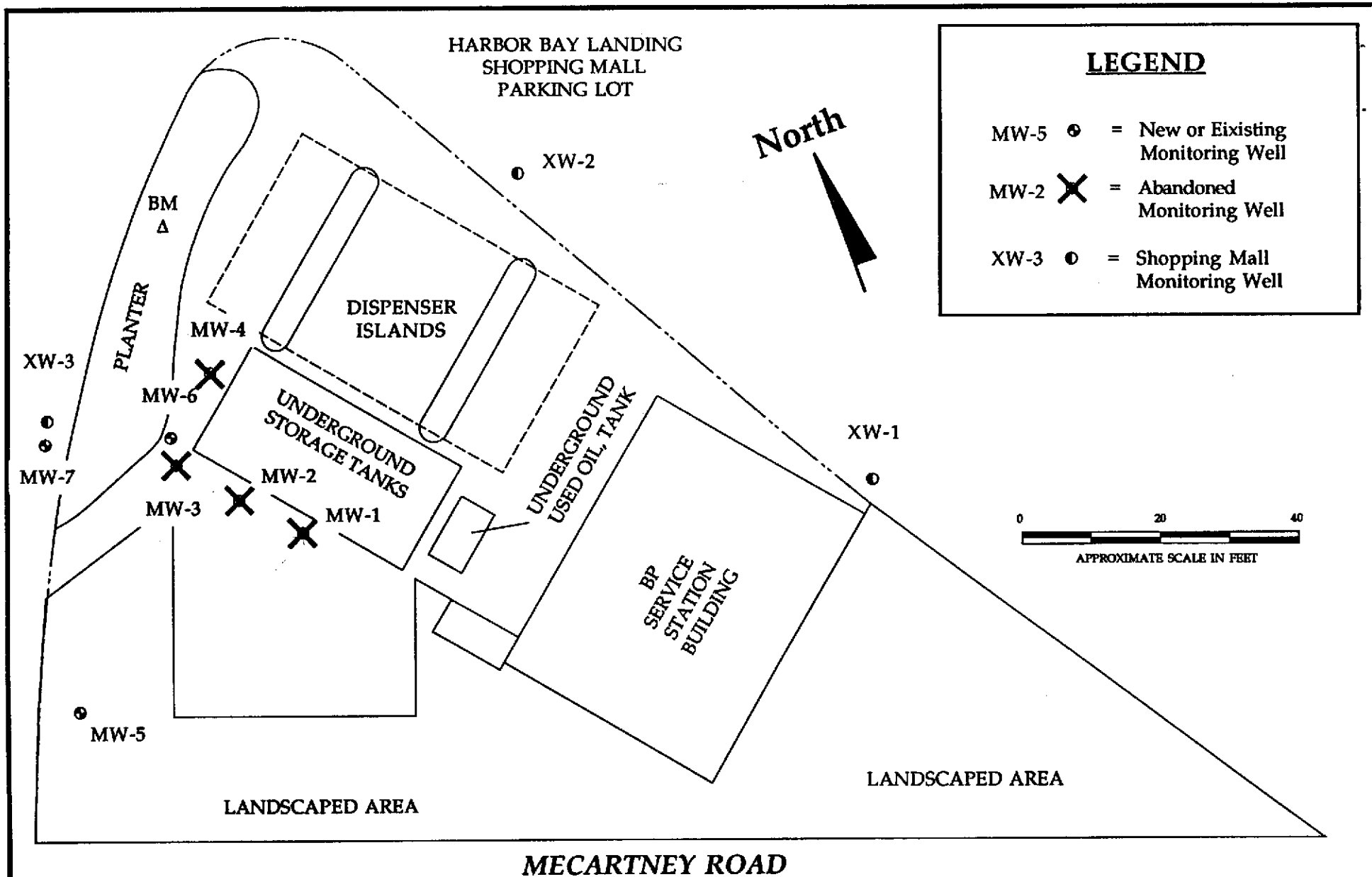
North



**HYDR**  
**ENVIR**  **MENTAL**  
**TECHN**  **OLOGIES, INC.**

**Site Location Map**  
 BP Service Station No. 11270  
 3255 McCartney Road  
 Alameda, California

Job No.  
 9-042  
 Figure  
 1



**LEGEND**

MW-5 ● = New or Existing Monitoring Well

MW-2 ✕ = Abandoned Monitoring Well

XW-3 ● = Shopping Mall Monitoring Well

**HYDR** -  
**ENVIR** -  
**TECHN** -  
**LOGIES, INC.**

**SITE PLAN**

BP Service Station No. 11270  
 3255 Mecartney Road  
 Alameda, California

Figure  
**2**

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9-042.2 2/95

# APPENDIX A

# FIELD CREW HEALTH & SAFETY PLAN

PRE-ACTIVITY BRIEFING

Project Location: BP @ Island Dr + Macartney Rd., Alameda, CA

Client: BP Oil Job No. 9-042.1

**POTENTIAL PHYSICAL HAZARDS AT WORKSITE:** Underground/overhead utility lines; flying/falling objects; pinch points/caught between objects; exertion or strain; lifting, slipping, tripping, falling, moving equipment and vehicle traffic at worksite; noise creating a hazardous situation; burns from steam or engine parts; heat stress or exhaustion. Trash with nails; broken glass, fires, explosion, electrical shock.

**CHEMICAL HAZARDS:** May involve exposure to methane gas at landfills; gasoline vapors, solvents, etc. Chemical hazards may include respiratory and skin contact.

**RESPIRATORY PROTECTIVE EQUIPMENT:** None required unless organic vapor levels in work area exceed current state or federal minimum, then half-face respirator with appropriate vapor filter cartridge as required.

**PROTECTIVE CLOTHING AND EQUIPMENT:** Normal work clothes: No shorts, hardhat mandatory for all personnel working at site; steel-toed boots recommended for geologist, required for driller and helper. Ear and eye protection as needed. Hazardous conditions require nitrile gloves, Tyvek coveralls, and respirators.

**SITE SPECIFIC INSTRUCTIONS:** Driller will examine all wires/cables and ropes daily. Drilling equipment will be maintained in safe operating condition and meet state safety requirements. Know location of first aid kit, fire extinguisher, and telephone. Block/chock rig as required. No drilling or working at site without project geologist being present. Use hand tools safely. Driller and helper will wear hard hat at all times while at job.

Driller's Signature Adam Lujan Date: 6-17-97

Helper Bruce Hill Date: 6-17-93

Project Geologist D. M. Ross Date: 6/17/93

NEAREST HOSPITAL OR CLINIC \_\_\_\_\_

HOSPITAL ADDRESS & DIRECTIONS FROM JOB SITE \_\_\_\_\_

\_\_\_\_\_ call 911 \_\_\_\_\_

**EMERGENCY PROCEDURE:** Begin appropriate first-aid,  
Send person for help. Call 911



**SITE SAFETY PLAN  
FOR**

**CLIENT:** BP OIL CO  
**SITE:** #11270 Job No: 9-042.a  
**ADDRESS:** 3255 MECARTNEY DRIVE  
ALAMEDA, CA

**SCOPE OF WORK (Check all that apply):**

- |                                     |                                     |                               |                                     |
|-------------------------------------|-------------------------------------|-------------------------------|-------------------------------------|
| Soil Excavation.....                | <input type="checkbox"/>            | Soil Stockpile Sampling.....  | <input checked="" type="checkbox"/> |
| Drilling.....                       | <input checked="" type="checkbox"/> | Monitoring Well Sampling..... | <input type="checkbox"/>            |
| Testing                             |                                     | System Installation           |                                     |
| Aquifer.....                        | <input type="checkbox"/>            | Ground Water.....             | <input type="checkbox"/>            |
| Vapor Extraction.....               | <input type="checkbox"/>            | Vapor Extraction.....         | <input type="checkbox"/>            |
| Air Sparging.....                   | <input type="checkbox"/>            | Air Sparging.....             | <input type="checkbox"/>            |
| System Operation and Maintenance... | <input type="checkbox"/>            |                               |                                     |

**PURPOSE AND SCOPE**

This Site Safety Plan (SSP) establishes the basic safety guidelines and requirements for the above scope(s) of work at the above site (see Site Location Map - Figure 1). This SSP addresses the expected potential hazards that may be encountered during this project.

The provisions set-forth in this SSP will apply to Hydro-Environmental Technologies, Inc. (HETI) employees and any subcontractors working for HETI at the job site. All personnel working for HETI, including subcontractors, at the job site must read this SSP, and sign the attached Compliance Agreement (Appendix A) before entering the work area.

**I FACILITY BACKGROUND**

The site is located at 3255 Mecartney Road in the Harbor Bay Landing (HBL) Shopping Mall in Alameda, California (Figure 1). It is presently an operating BP service station with three underground gasoline storage tanks and one used oil tank. Figure 2 shows the layout of the site and the location of existing underground storage tanks and dispenser islands.

Five monitoring wells are present on-site, adjacent to the underground storage tanks. These monitoring wells are designated MW-1, MW-2, MW-3, MW-4 and MW-5. Three off-site monitoring wells installed by HBL, designated XW-1, XW-2 and XW-3, are located adjacent to the site (Figure 2).

In October 1992, HETI conducted a preliminary site assessment. Work performed during the preliminary site assessment included the collection of ground water samples from monitoring wells MW-2 and MW-4. Ground water samples were not collected from monitoring wells MW-1 and MW-3 due to insufficient ground water recharge after well purging. Detectable concentrations of petroleum hydrocarbons were found in ground water samples collected from monitoring wells MW-2 and MW-4. Detailed results were presented in HETI's Preliminary Site Assessment Report dated November 18, 1992.

A Phase I Environmental Investigation was completed in November, 1992. The results of this effort were presented in the Hydro-Environmental Technologies, Inc.'s (HETI's) Preliminary Site Assessment Report dated January 7, 1993. As presented in the report, concentrations of petroleum hydrocarbons were detected in the ground water samples collected from monitoring wells MW-2 and MW-4. These wells, along with MW-1 and MW-3 were present at the site prior to the initiation of this assessment. Monitoring wells MW-1 and MW-3 were not sampled due to inadequate well recharge.

A Phase II Environmental Investigation was completed in June, 1993. The results were presented in HETI's Phase II Subsurface Investigation Report dated September 29, 1993. As presented in the report, monitoring well MW-5 was installed at the site and a step-draw down test was performed. Well MW-5 could not maintain a low flow rate of less than 0.5 gpm for more than ten minutes.

Soil types encountered at the site generally consisted of lean clay, poorly graded gravel, silty sand and poorly graded sand. Neither TPHg nor BTEX were detected in concentrations exceeding the method detection limits in soil sample collected from boring MW-5 at a depth of 5 feet below grade. TPHd was detected at a concentration of 11 ppm in this sample.

Depth to ground water in the wells is approximately 6 feet below grade. Ground water flow is predominantly towards the west at an approximate gradient of 0.029 ft/ft. Separate phase petroleum was not detected in any of the monitoring wells. TPHd was detected in the ground water samples collected from monitoring wells MW-2, MW-4 and MW-5. TPHg and BTEX were detected in the ground water samples collected from monitoring wells MW-2 and MW-4. Neither TPHg nor BTEX were detected in concentrations exceeding the method detection limits in the ground water samples collected from monitoring well MW-5.

#### **WORKPLAN FOR ADDITIONAL ASSESSMENT:**

HETI plans to permit and destroy four existing ground water monitoring wells, designated MW-1 through MW-4, as shown on the attached site plan. The well casings, seals and filter packs will be drilled out and grouted to the surface and cemented. Also, HETI plans to permit and drill one eight-inch diameter soil boring off-site and one ten-inch diameter soil boring on-site. The proposed well locations are shown on the site plan. A Mobile B-55 hollow-stem auger drill rig will be used to drill the soil borings.

The borings will be drilled to a total depth each of approximately 15 feet below grade surface (bgs).

During drilling, ground water is anticipated to be encountered at approximately 6 feet bgs. A 2.0-inch inside diameter split-spoon sampler, lined with brass tubes, will be used to collect soil samples from both boreholes at five feet bgs just above the water table.

The soil samples collected from above the water table will be labeled, documented on a chain-of-custody form, and placed in a cooler for transport to a state DHS-certified laboratory. Soil samples will be analyzed for total petroleum hydrocarbons as diesel (TPHd) and total petroleum hydrocarbons as gasoline (TPHg) using EPA Method 8015 (modified), and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Method 8020 (modified). A composite soil sample will be collected from the drill cuttings for disposal purposes.

The eight-inch diameter soil boring will be converted into a two-inch diameter monitoring well, designated MW-7 and the ten-inch diameter soil boring will be converted into a four-inch diameter monitoring well, designated MW-6. Both wells will be constructed of Schedule 40 PVC casing. The monitoring wells will be screened from 3 to 15 feet below ground surface (bgs).

The new monitoring wells will be developed by a combination of surging and bailing. Each well will be bailed of at least ten well volumes or until dry. The new wells will be surveyed to a common datum to enable comparison of local and regional data. The results of these activities will be presented in a Report. The report will include all pertinent information specified by State and County guidelines.

## II. KEY SAFETY PERSONNEL AND RESPONSIBILITIES

All personnel working for HETI at the job site are responsible for project safety. Specific individual responsibilities are listed below:

Project Manager: FRANCES MAROLI

The Project Manager is responsible for preparation of this SSP. He/she has the authority to provide for the auditing of compliance with the provisions of this SSP, suspend or modify work practices, and to report to the Regional Manager any individuals whose conduct does not meet the provisions presented in this SSP. The Project Manager can be reached at (510) 521-2684.

Site Safety Officer: FRANCES MAROLI

The Site Safety Officer (SSO) is responsible for the dissemination of the information contained in this SSP to all HETI personnel working at the job site, and to the responsible representative(s) of each subcontractor firm working for HETI at the job site.

The SSO is responsible for ensuring the following items are adequately addressed:

- Inspection of tools, drilling equipment and safety equipment
- Safety supplies & equipment inventory
- Site-specific training/hazard communication
- Accident/incident reporting
- Decontamination/contamination reduction procedures

The Site Safety Officer shall be responsible to take necessary steps to ensure that employees are protected from physical hazards, which could include;

- Falling objects such as tools or equipment
- Falls from elevations
- Tripping over hoses, pipes, tools, or equipment
- Slipping on wet or oily surfaces
- Insufficient or faulty protective equipment
- Insufficient or faulty operations, equipment, or tools
- Noise

The SSO has the authority to suspend work anytime he/she determines the safety provisions set-forth in this SSP are inadequate to ensure worker safety. The SSO or Project Manager must be present during all phases of the site work.

SSO Pager Number: (800) 908-3158

### III. JOB HAZARD ANALYSIS / SITE CHARACTERIZATION

#### CHEMICAL HAZARDS:

The hazardous chemicals which may be encountered at the site are petroleum hydrocarbons, including benzene, toluene, ethylbenzene, and xylene. A summary of relevant chemical, physical and toxicological properties for each chemical hazard is discussed below:

**Benzene:** Colorless liquid with an aromatic odor.

Vapor pressure	75 mm Hg @ 68 °F
Flash point	12 °F
Hazard classification	flammable liquid
Permissible exposure limit (PEL)	1.0 ppm

Benzene is recognized by the National Institute of Occupational Safety and Health (NIOSH) as a potential human carcinogen.

Recommended exposure limit (NIOSH)	0.1 ppm
------------------------------------	---------

Benzene can enter the body through all four routes of exposure: (1) inhalation; (2) adsorption; (3) ingestion; and (4) injection. Target organs are the blood, central nervous system, skin, bone marrow, eyes, and respiratory system. Acute exposure effects include irritation of the eyes, nose, and respiratory system as well as headache, nausea, staggered gait, depression, and abdominal pain. The chronic effect of over-exposure is the potential for cancer.

**Toluene:** Colorless liquid with an aromatic odor.

Vapor pressure	22 mm Hg @ 68 °F
Flash point	40 °F
Hazard classification	flammable liquid
Permissible exposure limit (PEL)	100 ppm

Toluene can enter the body through all four routes of exposure: (1) inhalation; (2) adsorption; (3) ingestion; and (4) injection. Target organs are the central nervous system, liver, kidneys, and skin. Acute exposure effects include fatigue, dizziness, headache, euphoria, dilated pupils, paralysis.

**Ethylbenzene:** Colorless liquid with an aromatic odor.

Vapor pressure	7.1 mm Hg @ 68 °F
Flash point	55 °F
Hazard classification	flammable liquid
Permissible exposure limit (PEL)	100 ppm

Ethylbenzene can enter the body through all four routes of exposure: (1) inhalation; (2) adsorption; (3) ingestion; and (4) injection. Target organs are the eyes, upper respiratory system, skin

and central nervous system. Acute exposure effects include irritation of the eyes and mucous membranes, nose, and respiratory system as well as headache, nausea, staggered gait, headache, dermatitis, narcosis and coma.

**Xylenes:**

Colorless liquid with an aromatic odor.

Vapor pressure

8 mm Hg @ 68 °F

Flash point

63° F to 81 °F

Hazard classification

flammable liquid

Permissible exposure limit (PEL)

100 ppm

Xylenes can enter the body through all four routes of exposure: (1) inhalation; (2) adsorption; (3) ingestion; and (4) injection. Target organs are the central nervous system, eyes, gastrointestinal tract, blood, liver, kidneys and skin. Acute exposure effects include dizziness, excitement, drowsiness, incoordination, abdominal pain, vomiting, and irritation of the eyes, nose and throat.

**Other Potentially Hazardous Chemicals:**

\_\_\_\_\_ N/A \_\_\_\_\_

Vapor pressure \_\_\_\_\_ mm Hg @ 68 °F

Flash point \_\_\_\_\_ °F

Hazard classification \_\_\_\_\_

Permissible exposure limit (PEL) \_\_\_\_\_ ppm

Potential carcinogen

Potential exposure routes:

inhalation  adsorption  ingestion  injection

Exposure effects include: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

The controls to limit potential for exposure to the above chemical hazards is addressed below:

- o Inhalation of contaminants will be controlled by SEE SECTION V
- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_

- o Ingestion of contaminants will be controlled by prohibiting eating, drinking, smoking, and chewing in the work area. In addition, workers shall wash their hands and face before engaging in any of the above activities.
- o Absorption of contaminants will be controlled by SEE SECTION VI  


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- o Injection of contaminants will be controlled by wearing work gloves in the work area.

**FIRE HAZARDS:**

The potential for fire or explosion exists whenever flammable liquids or vapors are present above lower explosions limit (LEL) concentrations and sufficient oxygen is present to support combustion. These potential fire hazards are addressed below:

- o The potential exists for petroleum hydrocarbon vapors to exceed LEL concentrations within the wells. However, well-gas generally does not contain sufficient oxygen to support combustion.
- o Other potential fire hazards associated with the scope of work have been mitigated by: N/A  


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- o In addition to the above, the HETI truck shall have an operative fire extinguisher on board. All personnel shall be familiar with its location and use.

**ELECTRICAL HAZARDS:**

The potential electrical hazards expected on the job site are addressed below:

- o Expected voltages: N/A
- o No electrical enclosures will be opened unless power is disconnected. Power will be verified disconnected with a meter prior to working on any circuits.

## PHYSICAL HAZARDS:

The potential physical hazards expected at the job site are addressed below:

- o The potential for physical injury exists from the operation of moving equipment such as drill rigs, forklifts and trucks. Use of steel toe boots, hard hats, and safety glasses will be required when in the work area. Backup alarms are required on all trucks and forklifts.
- o The potential for physical injury exists from public traffic on the site. The site is  is not  open to public vehicles. Work will  will not  be performed in the public right-of-way. If work is performed in the public right-of-way, orange vests shall be worn, a traffic control plan is attached and an encroachment permit from the appropriate government agency shall be obtained.
- o The potential for burns from hot surfaces exist from the operation of an internal combustion engine , an air compressor . Compressed air piping is hot. All hot surfaces shall be allowed to cool and/or be handled with thick cloth work gloves.
- o The potential for noise hazards exist at the site from the operation of \_\_\_\_\_  
DRILL RIG  
It is not expected that noise levels will exceed the acceptable CAL-OSHA permissible exposure level of 90 dB. However, workers should be aware of the presence of these hazards and take steps to avoid them. Ear / noise protection, though not required, shall be available to all personnel within the job site in the event noise levels exceed worker comfort or protection levels.
- o Personnel should be cognizant of the fact that when protective equipment such as respirators, gloves, and/or protective clothing are worn, visibility, hearing, and manual dexterity are impaired.

## HEAT STRESS:

The anticipated weather conditions will be: OVERCAST, SO'S F

The potential for heat stress is present if the temperature exceeds 80°F. Some signs and symptoms of heat stress are presented below:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include: muscle spasms, heavy sweating, dizziness, nausea and fainting.
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include: pale, cool, moist skin; heavy sweating; dizziness; nausea and fainting.



- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occurs. Competent medical help must be obtained. Signs and symptoms are: red, hot, unusually dry skin; lack of or reduced perspiration; nausea; dizziness and confusion; strong, rapid pulse and coma.

Preventing heat stress is particularly important because once someone suffers from heat stroke or heat exhaustion, that person may be predisposed to additional heat injuries. To avoid heat stress the following steps shall be taken whenever the ambient temperature is over 80 °F:

- 1) Field personnel shall have a work/rest cycle of 2 hours work, 15 minutes rest.
- 2) The Site Safety Officer shall mandate work slowdowns as needed.

#### IV. JOB HAZARD SUMMARY

In summary, the expected potential hazards to personnel working in the work area are (Check all that apply):

- |   |                                     |
|---|-------------------------------------|
| (1) Over exposure to chemical contaminants                    | <input type="checkbox"/>            |
| (2) Physical injury from equipment being operated at job site | <input checked="" type="checkbox"/> |
| (3) Public traffic  | <input checked="" type="checkbox"/> |
| (4) Hot surfaces  | <input type="checkbox"/>            |
| (5) Heat stress   | <input type="checkbox"/>            |
| (6) Fire  | <input type="checkbox"/>            |
| (7) Electrical shock  | <input type="checkbox"/>            |
| (8) Other   | <input type="checkbox"/>            |

As described in Section III - Job Hazard Analysis, these potential hazards have been mitigated for the protection of both the worker health and safety. The proposed work does not appear to present any potential health risk to workers, the surrounding community, or the environment.

#### V. EXPOSURE MONITORING PLAN

Periodic monitoring for organic vapors is  is not  required. The Site Safety Officer shall monitor the ambient air in the work area with an organic vapor photoionization meter (Thermo Environmental Model 580B OVM, or equivalent) should their presence be detected by odor. If the meter indicates petroleum

hydrocarbon concentrations in the area exceed 300 ppm, the Site Safety Officer shall require personnel in the work area to wear respirators with organic vapor cartridges (MSA 464046, or equivalent).

The manufacturer's calibration procedures for the Model 580B OVM are located within the instrument case. Field calibration shall be performed daily during use.

All personnel working for HETI at the job site shall be monitored for heat stress. Because workers at the job site are expected to be wearing permeable clothing (e.g. standard cotton or synthetic work clothes), monitoring for heat stress will consist of personnel constantly observing each other for any of the heat stress symptoms discussed in Section III.

Field personnel shall be cautioned to inform each other of non-visual effects of the presence of toxins, such as: headaches, dizziness, nausea, blurred vision, cramps, irritation of eyes, skin, or respiratory tract, changes in complexion or skin discoloration, changes in apparent motor coordination, changes in personality or demeanor, excessive salivation or changes in pupillary response or changes in speech ability or pattern.

## VI. PERSONAL PROTECTIVE EQUIPMENT

Level D personal protection equipment is expected to be the highest protective level required to complete the field activities for this project. Modified Level C protection may also be required at the discretion of the Site Safety Officer. The following lists summarize the personal protective equipment that shall be available to all field personnel working in the work area:

### Level D Protection (shall be worn at all times)

- Boots, steel toe
- Safety glasses, chemical splash goggles, or face shield
- Hard hat
- Work gloves required  optional
- Long leg trousers
- Long sleeves required  optional

### Modified Level C Protection (available at all times.)

- Half-face air purifying respirator with organic vapor cartridges to be used should organic vapor concentrations exceed 300 ppm as discussed in Section V of this SSP.
- Hearing protection

## VII. SITE CONTROL

The exclusion, contamination reduction, and support zones are shown in Figure 2. these zones shall be marked with natural barriers, cones or tape as appropriate. Personnel without the proper training, personal protective equipment or who have not agreed to follow this SSP shall not be allowed into the exclusion or contamination reduction zones.

## VIII. DECONTAMINATION MEASURES

Field personnel shall wash hands and face before entering a clean area. Additional decontamination measures are discussed under General Safe Work Practices (section IX).

## IX. GENERAL SAFE WORK PRACTICES

The project operations shall be conducted with the following minimum safety requirements employed:

- Eating, drinking, and smoking shall be restricted to a designated support zone.
- All personnel shall wash hands and face before eating, drinking, or smoking.

## X. SANITATION

The location of the nearest running water source and toilet is ON-SITE

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A portable potable water cooler or other source of drinking water shall be maintained on site.

## XI. STANDARD OPERATING PROCEDURES

The following HETI protocols apply to this scope of work:

- |  |                                     |
|--|-------------------------------------|
| Drilling, Well Construction and Sampling Protocols | <input checked="" type="checkbox"/> |
| Soil Vapor Extraction Protocol                     | <input type="checkbox"/>            |
| Air sparging Protocol                              | <input type="checkbox"/>            |

## XII EMERGENCY RESPONSE PLAN

In the event of an accident resulting in physical injury, first aid will be administered and the injured worker will be transported to

ALAMEDA HOSPITAL, 2070 CLINTON AVENUE

In the event of a fire or explosion, local fire or response agencies will be called by dialling 9-1-1. The Project Manager shall also be notified.

### Emergency Telephone Numbers:

Fire and Police..... 911  
Hospital ..... EMERGENCY ..... (523) 4357

Directions to Hospital: See Figure 1

PROCEED NORTH ON ISLAND DRIVE TO OTIS DRIVE  
GO EAST (LEFT) ON OTIS DRIVE TO WILLOW AVE  
GO NORTH (RIGHT) ON WILLOW ST TO CLINTON AVE  
ALAMEDA HOSPITAL IS ON THE LEFT HAND SIDE  
OF WILLOW ST ON THE CORNER OF WILLOW ST  
AND CLINTON AVE.

A fire extinguisher, located in the HETI vehicle will be located on-site during all installation, testing and servicing activities.

### Additional Contingency Telephone Numbers:

HETI..... (510) 521-2684

All cases where an accident has occurred will require filling out an incident / accident report and submitting it within 48 hours of the accident.

## XIII TRAINING REQUIREMENTS

All site personnel will be required to have completed the 40 hours of basic OSHA-SARA training for personnel assigned to hazardous waste sites in compliance with OSHA Standard 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response, and all are required to participate in the annual OSHA-SARA 8-hour refresher courses.

#### XIV. MEDICAL SURVEILLANCE PROGRAM

HETI personnel and subcontractors engaged in field operations shall be participants in their company Medical Surveillance program, and must be cleared by the examining physician(s) to wear respiratory protection devices and protective clothing for working with hazardous materials. The applicable requirements under California Administrative Code (CAC) Title 8, Section 5216, which is available at the HETI office for review, shall be observed. Project-specific medical surveillance is  is not  required.

#### XV. DOCUMENTATION

All personnel shall sign the compliance agreement (Appendix A).

Daily documentation shall be provided by a daily log, completed by the Site Safety Officer in his/her field notebook. The Site Safety Officer shall record the names of all personnel working for HETI and any site visitor(s). (S)he shall also record accidents, illness and other safety related matters. In the case of an accident, or injury, during field operations, (s)he will prepare and submit an Incident/Accident Report.

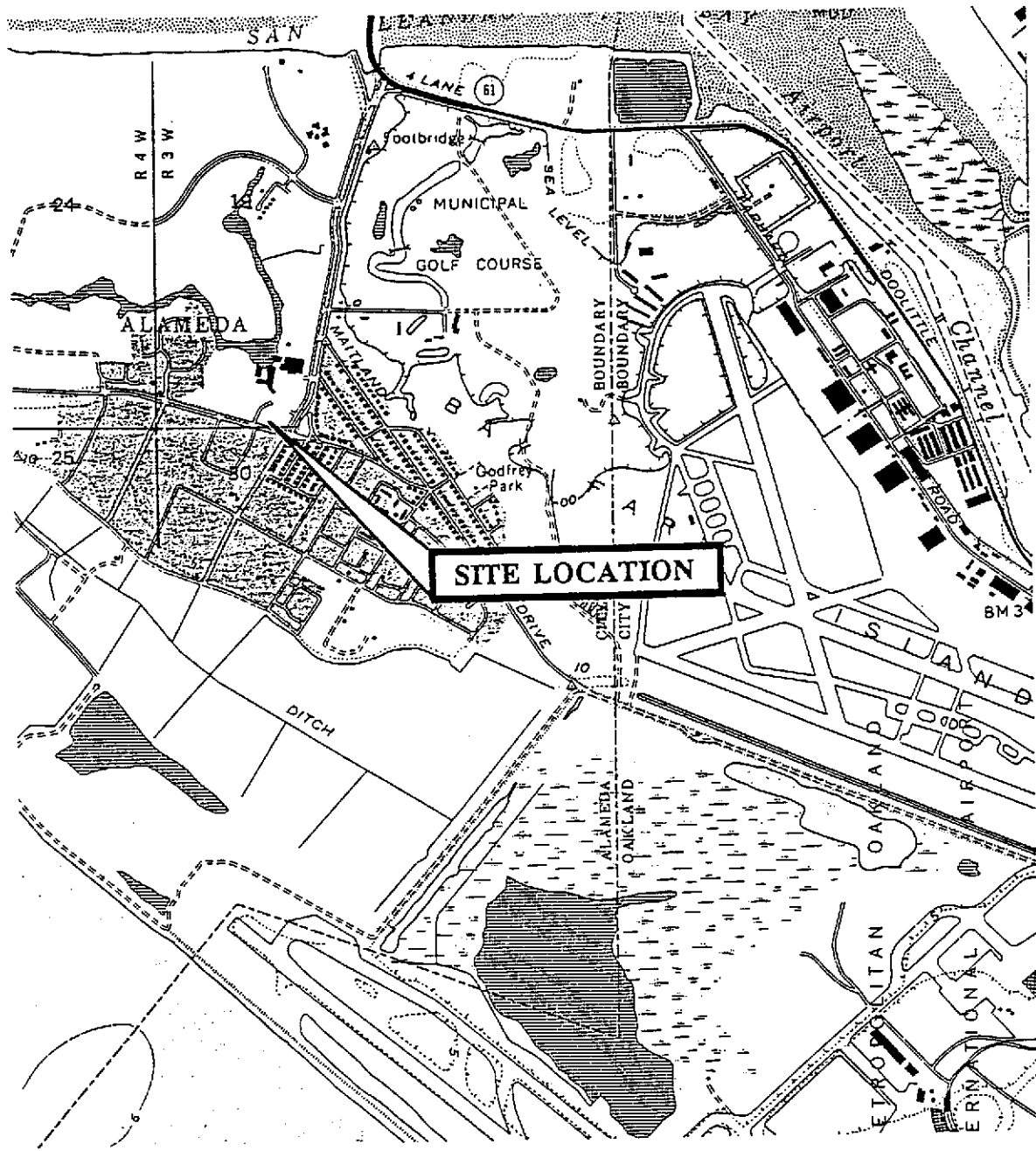
In case air monitoring is implemented, OVM readings (including times) shall be recorded in the daily log.

SSP prepared by: FRANCIS MATRODI Date: 1.11.95

SSP Approved by: FRANCIS MATRODI Date: 1.14.95

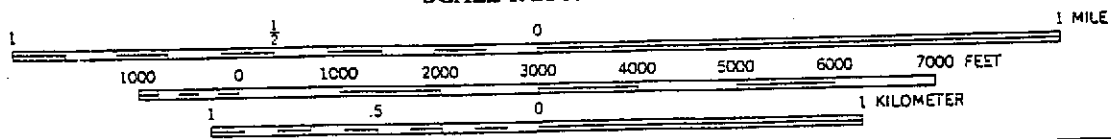
Project Manager





**SITE LOCATION**

SOURCE:  
 USGS QUADRANGLE, 75 MINUTE SERIES  
 ENTITLED "SAN LEANDRO, CA"  
 SCALE 1: 24 000

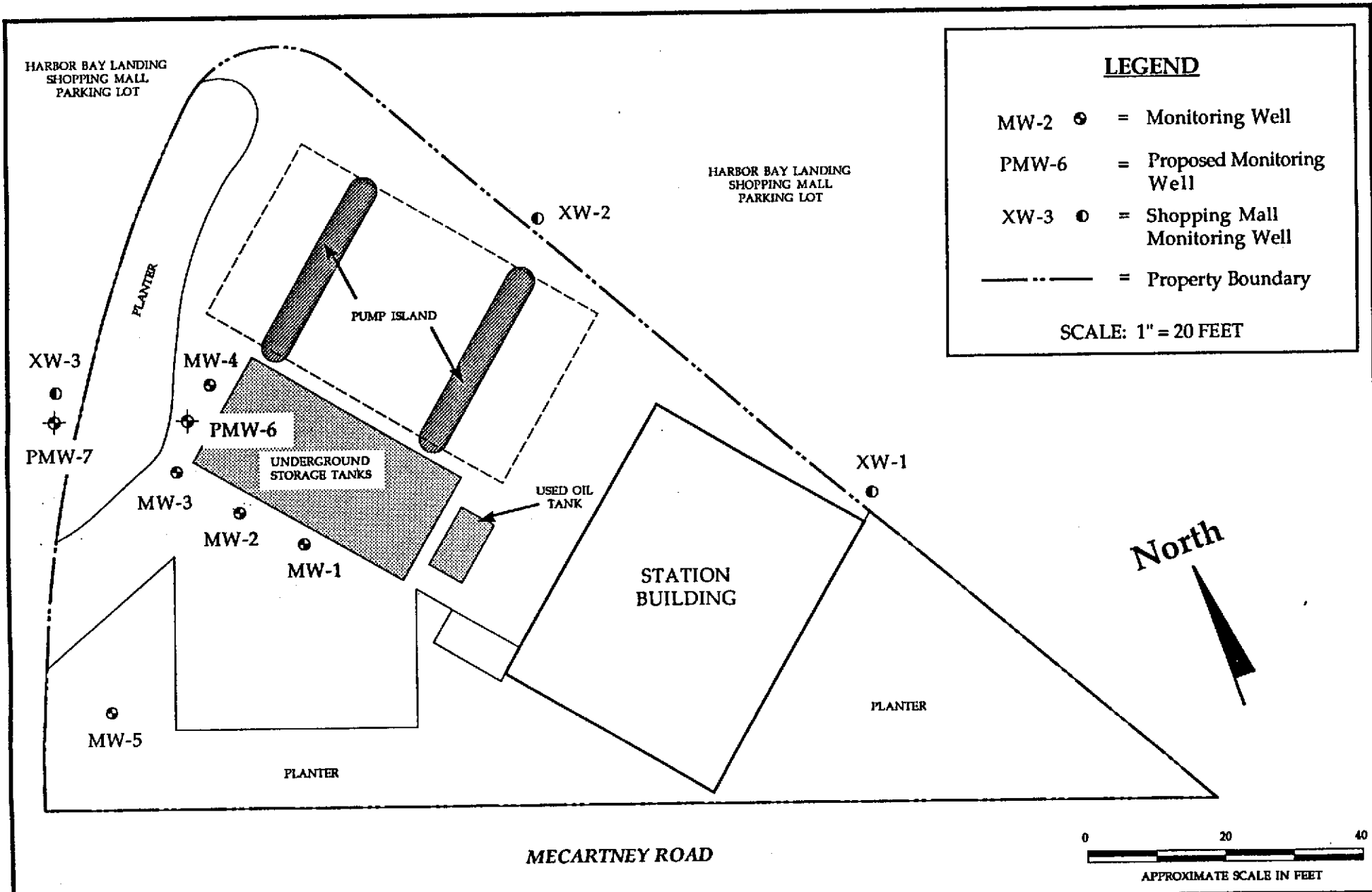


North

**HYDR**  
**ENVIR**  **MENTAL**  
**TECHN**  **LOGIES, INC.**

**Site Location Map**  
 BP Service Station No. 11270  
 3255 McCartney Road  
 Alameda, California

Job No.  
 9-042  
 Figure  
**1**

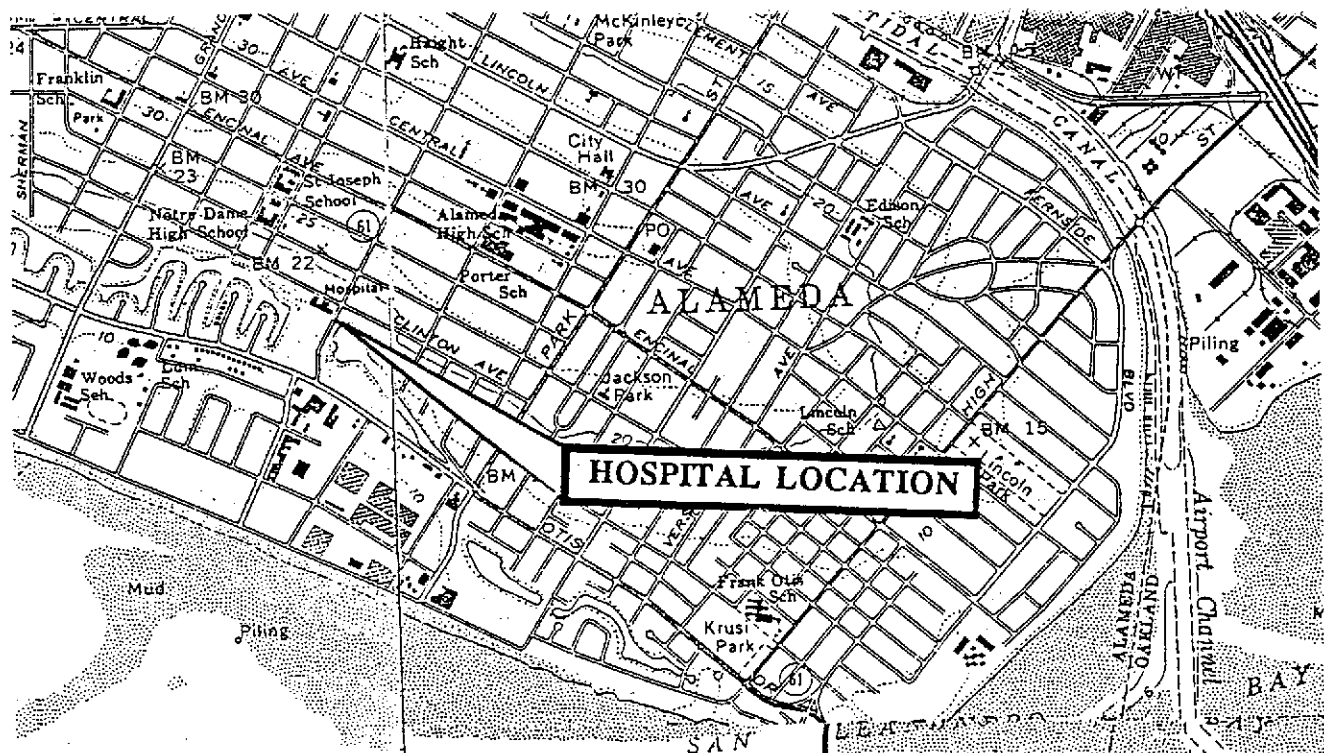


**HYDR** **-**  
**ENVIR** **NMENTAL**  
**TECHN** **LOGIES, INC.**

**SITE PLAN**  
 BP Service Station No. 11270  
 3255 Mecartney Road  
 Alameda, California

**Figure**  
**2**  
 9-042.2 1/95

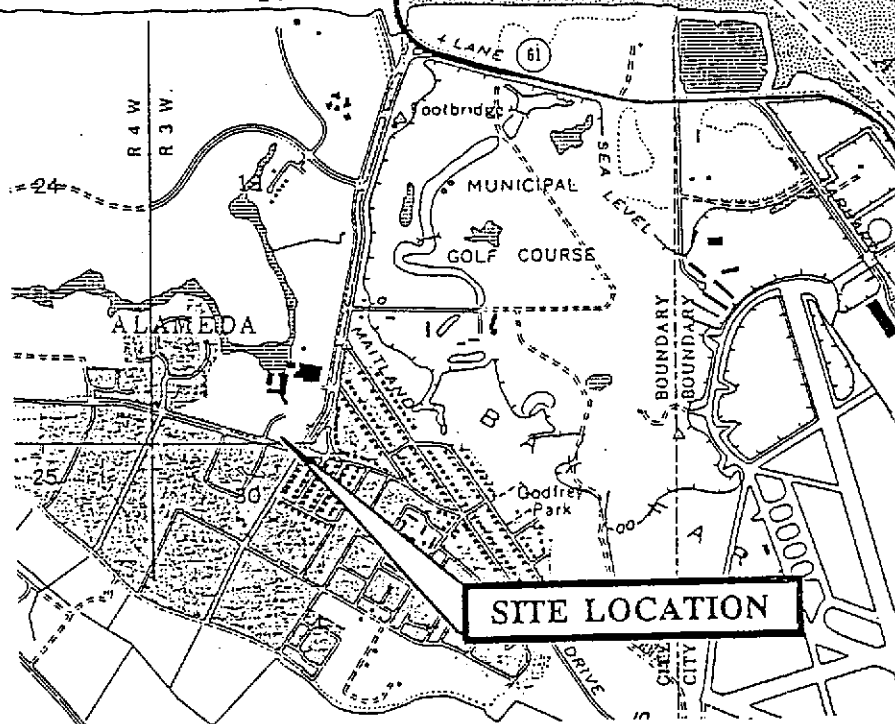




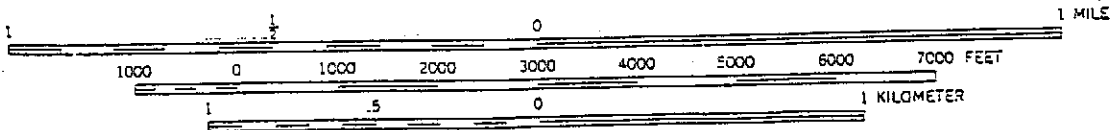
North



QUADRANGLE LOCATION



SCALE 1: 24 000



**HYDR** -  
**ENVIR** -  
**TECHN** -  
**LOGIES, INC.**

**HOSPITAL LOCATION MAP**

BP Service Station No. 11270  
 3255 Mecartney Road  
 Alameda, California

Figure

3

9-042.2 1/95

## APPENDIX B



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE • PLEASANTON, CALIFORNIA 94566 • (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT BP 55 #11270  
2555 McCartney Road  
Alameda, California

PERMIT NUMBER 93308  
LOCATION NUMBER \_\_\_\_\_

CLIENT  
name BP Oil Suite 301  
address 1400 Southcenter Pkwy. Phone (206) 394-5234  
city Tukwila Zip 98148

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT  
name Hydro-Environmental  
Technologies Inc. Suite 243  
address 2363 Mariner Sq. Dr. Phone (510) 521-2684  
city Alameda Zip 94501

TYPE OF PROJECT  
All Construction \_\_\_\_\_ Geotechnical Investigation \_\_\_\_\_  
Cathodic Protection \_\_\_\_\_ General \_\_\_\_\_  
Water Supply \_\_\_\_\_ Contamination \_\_\_\_\_  
Monitoring  Well Destruction \_\_\_\_\_

PROPOSED WATER SUPPLY WELL USE  
Domestic \_\_\_\_\_ Industrial \_\_\_\_\_ Other \_\_\_\_\_  
Municipal \_\_\_\_\_ Irrigation \_\_\_\_\_

DRILLING METHOD:  
Rod Rotary \_\_\_\_\_ Air Rotary \_\_\_\_\_ Auger   
Cable \_\_\_\_\_ Other \_\_\_\_\_

DRILLER'S LICENSE NO. C-57374152

WELL PROJECTS  
Drill Hole Diameter 10 In. Maximum \_\_\_\_\_  
Casing Diameter 4 In. Depth 25 ft.  
Surface Seal Depth 4 ft. Number 3

GEOTECHNICAL PROJECTS  
Number of Borings \_\_\_\_\_ Maximum \_\_\_\_\_  
Hole Diameter \_\_\_\_\_ In. Depth \_\_\_\_\_ ft.

ESTIMATED STARTING DATE 6-9-93  
ESTIMATED COMPLETION DATE 7-9-93

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Henry Hursh Date 6-4-93

- (A.) GENERAL
  1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
  2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling log and location sketch for geotechnical projects.
  3. Permit is void if project not begun within 90 days of approval date.
- (B.) WATER WELLS, INCLUDING PIEZOMETERS
  1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
  2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
- C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.
- D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.
- E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 7 Jun 93  
Wyman Hong

FILE 9-047,2  
PERMITS



# ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588

VOICE (510) 484-2600  
FAX (510) 462-3914

## DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT BP STATION 11270  
3255 MCGARTNEY RD.  
ALAMEDA, CA

PERMIT NUMBER 94819  
LOCATION NUMBER \_\_\_\_\_

APPLICANT  
NAME BP OIL COMPANY  
ADDRESS 295 S.W. 41ST ST. Voice (206) 251-0629  
RENTON, WA Zip 98055

### PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT  
NAME SCOTT KELLSTEDT  
WELL Fax (510) 521-5018  
ADDRESS 2363 MARINER SQ. DR. Voice (510) 521-2624  
ALAMEDA, CA Zip 94501

### A. GENERAL

1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

### B. WATER WELLS, INCLUDING PIEZOMETERS

1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

TYPE OF PROJECT

Construction	Geotechnical Investigation
Cathodic Protection	General
Water Supply	Contamination
Monitoring	Well Destruction

PROPOSED WATER SUPPLY WELL USE

Domestic	Industrial	Other
Municipal	Irrigation	

DRILLING METHOD:

Fluid Rotary	Air Rotary	Auger
Table	Other	

DRILLER'S LICENSE NO. 057-482390

WELL PROJECTS

Drill Hole Diameter	<u>8</u> in.	Maximum
Casing Diameter	<u>4 1/2</u> in.	Depth
Surface Seal Depth	<u>3</u> ft.	Number

GEOTECHNICAL PROJECTS

Number of Borings	Maximum
Hole Diameter	Depth

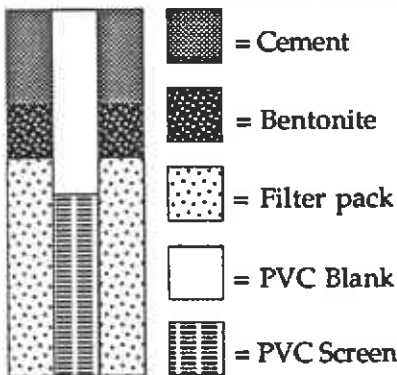
ESTIMATED STARTING DATE 1/1/95  
ESTIMATED COMPLETION DATE 1/15/95

Approved Wyman Hong Date 23 Dec 94  
Wyman Hong

# UNIFIED SOIL CLASSIFICATION SYSTEM - VISUAL CLASSIFICATION OF SOILS (ASTM D-2488)

MAJOR DIVISIONS	GROUP SYMBOL	GROUP NAME	DESCRIPTION	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	GW	Well-graded gravel Well-graded gravel with sand	Well-graded gravels or gravel-sand mixtures, little or no fines.
		GP	Poorly-graded gravel Poorly-graded gravel with sand	Poorly-graded gravels or gravel sand mixture, little or no fines.
		GM	Silty gravel Silty gravel with sand	Silty gravels, gravel-sand-silt mixtures.
		GC	Clayey gravel Clayey gravel with sand	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS	SW	Well-graded sand Well-graded sand with gravel	Well-graded sands or gravelly sands, little or no fines.
		SP	Poorly-graded sand Poorly-graded sand with gravel	Poorly-graded sands or gravelly sands, little or no fines.
		SM	Silty sand Silty sand with gravel	Silty sands, sand-silt mixtures.
		SC	Clayey sand Clayey sand with gravel	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS	SILTS AND CLAYS	ML	Silt; Silt with sand; Silt with gravel; Sandy silt; Sandy silt with gravel; Gravelly silt; Gravelly silt with sand	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
		CL	Lean clay; Lean clay with sand; Lean clay with gravel Sandy lean clay; Sandy lean clay with gravel Gravelly lean clay; Gravelly lean clay with sand	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
	ELASTIC SILTS AND CLAYS	MH	Elastic silt; Elastic silt with sand; Elastic silt with gravel Sandy elastic silt; Sandy elastic silt with gravel Gravelly elastic silt; Gravelly elastic silt with sand	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.
		CH	Fat clay; Fat clay with sand; Fat clay with gravel Sandy fat clay; Sandy fat clay with gravel Gravelly fat clay; Gravelly fat clay with sand	Inorganic clays of high plasticity, fat clays.
HIGHLY ORGANIC SOILS	OL/OH	Organic soil; Organic soil with sand; Organic soil with gravel Sandy organic soil; Sandy organic soil with gravel Gravelly organic soil; Gravelly organic soil with sand	Organic silts and organic silt-clays of low plasticity Organic clays of medium to high plasticity.	
	Pt	Peat	Peat and other highly organic soils.	
BEDROCK	Br	Bedrock	Igneous, metamorphic and sedimentary rocks	

### WELL CONSTRUCTION DETAILS



- = Cement
- = Bentonite
- = Filter pack
- = PVC Blank
- = PVC Screen



Approximate first encountered water level



Approximate stabilized water level

Retained for (MW-1-7.5) Analysis



Sample Interval

**NOTE:** Blow count represents the number of blows of a 140-lb hammer falling 30 inches per blow required to drive a sampler through the last 12 inches of an 18-inch penetration.

No warranty is provided as to the continuity of soil strata between borings. Logs represent the soil section observed at the boring location on the date of drilling only.

S = Sampler sank into medium under the weight of the hammer (no blow count)

P = Sampler was pushed into medium by drilling rig (no blow count)

NR = No Recovery

S-3 = Denotes that sample was sent for laboratory analysis.

SANDS & GRAVELS	BLOWS/FT
VERY LOOSE	0 - 5
LOOSE	5 - 12
MED. DENSE	12 - 37
DENSE	37 - 62
VERY DENSE	OVER 62

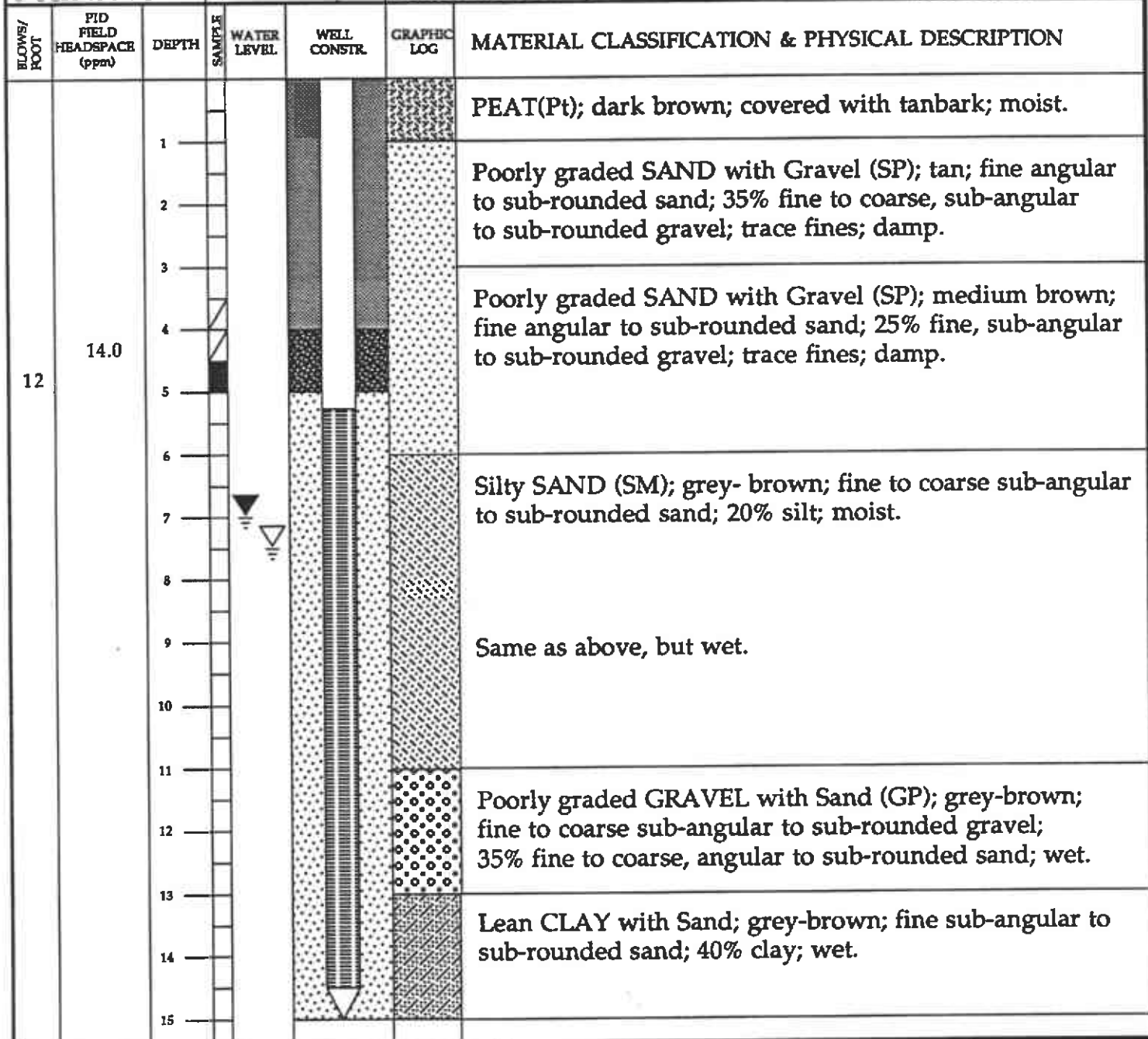
SILTS & CLAYS	BLOWS/FT
SOFT	0 - 5
FIRM	5 - 10
STIFF	10 - 20
VERY STIFF	20 - 40
HARD	OVER 40

**HYDR-  
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**SOIL BORING AND  
WELL CONSTRUCTION LOG  
LEGEND**

**APPENDIX C  
PLATE  
C-1**

SITE/LOCATION 3255 Mecartney Road, Alameda, CA		BEGUN 6/17/93	BORING DIAMETER 10 Inches	ANGLE/BEARING 90 Degrees	BORING NO MW-5
DRILLING CONTRACTOR Bayland Drilling		COMPLETED 6/17/93	FIRST ENCOUNTERED WATER DEPTH 7.5 Feet		BOTTOM OF BORING 15 Feet
OPERATOR Adam Higuaro		LOGGED BY Tony Ramirez	STATIC WATER DEPTH/DATE 7.0 Feet		WELL NO. MW-5
DRILL MAKE & MODEL CME 75		SAMPLING METHOD California modified split spoon			BOTTOM OF WELL 15 Feet
WELL MATERIAL 4" SCH 40 PVC	SLOT SIZE 0.010"	FILTER PACK #2/16	WELL SEAL Neat cement over hydrated bentonite pellets		PLANNED USE Monitoring



**HYDR-  
ENVIRONMENTAL  
TECHNOLOGIES, INC.**

DATE: June 18, 1993

APPROVED BY: Owen C. Ratchye, P.E.

**SOIL BORING LOG AND  
WELL CONSTRUCTION DIAGRAM  
MW-5**

BP Service Station No. 11270  
3255 Mecartney Road  
Alameda, CA

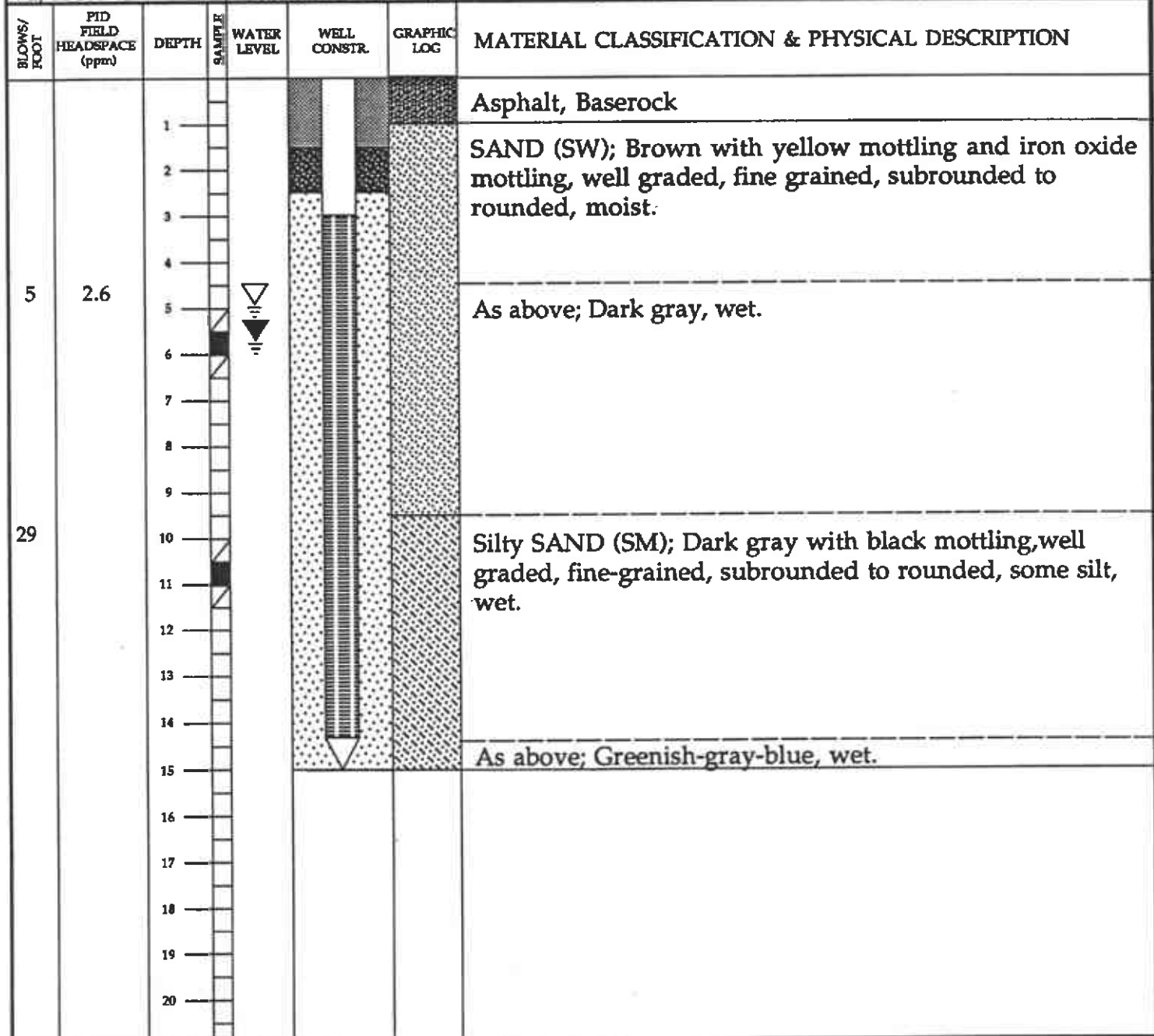
PLATE  
B-2

SHEET 1 OF 1

JOB NO.

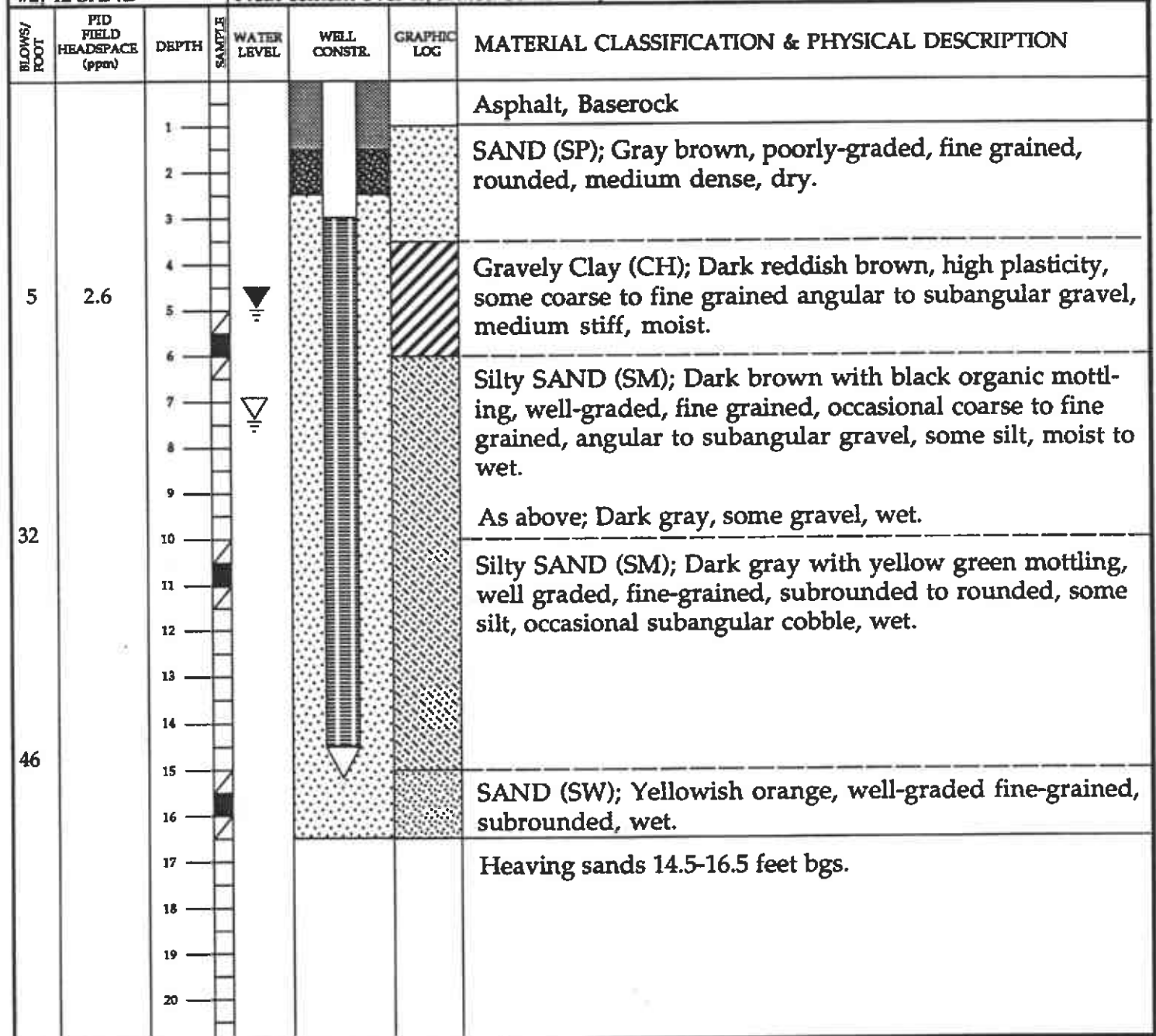
9-042.1

SITE/LOCATION 3255 Mecartney Road, Alameda, CA		BEGUN 1/19/95	BORING DIAMETER 10 Inches	ANGLE/BEARING 90 Degrees	BORING NO MW-6
DRILLING CONTRACTOR PC Exploration, Inc.		COMPLETED 1/19/95	FIRST ENCOUNTERED WATER DEPTH 5.0 Feet		BOTTOM OF BORING 15.0 Feet
DRILL MAKE & MODEL CME 75	OPERATOR Frank Bartolovi	LOGGED BY Frances Maroni	STATIC WATER DEPTH/DATE 5.76 Feet (1/28/95)		WELL NO. MW-6
WELL MATERIAL PVC SCH 40	SLOT SIZE 0.010"	SAMPLING METHOD California modified split spoon			BOTTOM OF WELL 15.0 Feet
FILTER PACK #2/12 SAND	WELL SEAL Neat cement over hydrated bentonite pellets			PLANNED USE Monitoring	



<b>HYDR- ENVIRONMENTAL TECHNOLOGIES, INC.</b>	<b>SOIL BORING LOG AND WELL CONSTRUCTION DIAGRAM MW-6</b>	PLATE B-3
		SHEET 1 OF 1
DATE: February 10, 1995	BP Service Station No. 11270 3255 Mecartney Road Alameda, CA	JOB NO. 9-042.2
APPROVED BY: Gary Pischke C.E.G.		

SITE/LOCATION 3255 Mecartney Road, Alameda, CA		BEGUN 1/18/95	BORING DIAMETER 10 Inches	ANGLE/BEARING 90 Degrees	BORING NO MW-7
DRILLING CONTRACTOR PC Exploration, Inc.		COMPLETED 1/19/95	FIRST ENCOUNTERED WATER DEPTH 5.0 Feet		BOTTOM OF BORING 16.5 Feet
DRILL MAKE & MODEL CME 75	OPERATOR Frank Bartolovi	LOGGED BY Frances Maroni	STATIC WATER DEPTH/DATE 7.54 Feet		WELL NO. MW-7
WELL MATERIAL PVC SCH 40	SLOT SIZE 0.010"	SAMPLING METHOD California modified split spoon			BOTTOM OF WELL 15.0 Feet
FILTER PACK #2/12 SAND		WELL SEAL Neat cement over hydrated bentonite pellets			PLANNED USE Monitoring



**HYDR-  
ENVIRONMENTAL  
TECHNOLOGIES, INC.**

**SOIL BORING LOG AND  
WELL CONSTRUCTION DIAGRAM  
MW-7**

PLATE  
B-4

SHEET 1 OF 1

BP Service Station No. 11270  
3255 Mecartney Road  
Alameda, CA

JOB NO.  
9-042.2

DATE: February 10, 1995

APPROVED BY: Gary Pischke C.E.G.



**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

**CONFIDENTIAL**

STATE OF CALIFORNIA DWR  
WELL COMPLETION REPORT  
(WELL LOGS)

**REMOVED**

# APPENDIX C



PURGED/SAMPLED BY: TR DATE: 6/21/93

**GAUGING DATA:**

Depth to bottom: 14.78 ft.  
 Depth to water: 7.44 ft.  
 Saturated Thickness: 7.34 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
<u>4 in.</u>	<u>x 0.65</u>
6 in.	x 1.44

Well casing volume 4.77 gallons  
 # volumes to purge x 10 vols.  
 \*Total volume to purge = 47.7 gallons  
 \* unless chemical parameters stabilize earlier

**PURGING DATA:**

Purge method: PVC bailer Submersible pump/ Suction lift pump/ \_\_\_\_\_  
 (circle one)

DRY ⇒  
 DRY ⇒

Time	Volume (gallons)	Temp. (°C) ←	Conductivity (mS/cm)	pH
2:15	0	—	—	—
2:17	5	23.1	7.79	7.75
2:49	7	22.0	7.89	7.55

Color: olive Turbidity: heavy  
 Recharge: very poor SPP ∅ ft.

**SAMPLING DATA:**

Sampling method: Dedicated bailer

Sample for: (circle)

- TPH<sub>g</sub>/BTEX METALS TOC 8010
- TPH<sub>d</sub> O-Pb TEL 8020
- TPH<sub>no</sub> Total Pb EDS 8240
- 601 602 Nitrate 8250 8270
- Other: \_\_\_\_\_

**HYDRO-  
 ENVIRONMENTAL  
 TECHNOLOGIES, INC.**

MONITORING WELL PURGE/SAMPLE SHEET  
 WELL # MW-5  
 LOCATION: BP/ALAMEDA-MECARTNEY

Job No.  
 9-042.1  
 SHEET  
 1 of 1

DEVELOPED BY: EM

DATE: 1-28-95

**INITIAL DEVELOPING DATA:**

Depth to bottom: 14.5 ft.

Depth to water: 5.76 ft.

Saturated Thickness: 8.88 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 5.8 gallons

# volumes to purge x 10 vols.

\*Total volume to purge = 58 gallons

\* unless chemical parameters do not stabilize

**PURGING DATA:**

Purge method: Stainless Steel Bailer/PVC bailer/ Submersible pump/ Suction lift pump/ \_\_\_\_\_ (circle one)

Temp/Conductivity/pH Instrument: \_\_\_\_\_

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH	Turbidity
9:20	0	—	—	—	—
	5	60.9	2.11	8.71	high
	10	61.2	1.52	8.20	↓
9:30	15	61.6	1.48	8.18	↓
	<del>20</del>	<del>61.8</del>	<del>1.45</del>	<del>8.15</del>	<del>↓</del>
	15 gallon on 1/28/95				
9:30 1-31-95 10m	25:20	61.5	1.55	8.76	400
	30:25	61.5	1.38	8.51	↓
	30	60.5	1.40	8.45	↓
	35	60.6	1.45	8.10	↓
10am	40	60.5	1.52	8.71	↓
9:45 2-2-95 12m	45	61.8	1.70	7.81	MOD
	50	62.4	1.89	7.85	MOD

5.4  
58.9  
.65  
445  
53+0  
5785

DTW  
6.10

**FINAL DEVELOPING DATA:**

Depth to bottom: \_\_\_\_\_ ft.

Depth to water: \_\_\_\_\_ ft.

Saturated Thickness: \_\_\_\_\_ ft.

Color: \_\_\_\_\_

Recharge: \_\_\_\_\_

SPP \_\_\_\_\_ ft. Sheen

**HYDR-  
ENVIRONMENTAL  
TECHNOLOGIES, INC.**

DEVELOPMENT DATA SHEET

WELL # MW-6

LOCATION: 3255 MCCAUSTON

Job No.

9-0422

SHEET

1 of

DEVELOPED BY: CM

DATE: 2/2/95

**INITIAL DEVELOPING DATA:**

Depth to bottom: 14.63 ft.

Depth to water: 5.76 ft.

Saturated Thickness: 8.88 ft.

Conversion	
diam.	gals/ft.
2 in.	x 0.16
<u>4 in.</u>	<u>x 0.65</u>
6 in.	x 1.44

Well casing volume 5.8 gallons

# volumes to purge x 10 vols.

Total volume to purge = 60 gallons

\* unless chemical parameters do not stabilize

**PURGING DATA:**

Purge method: Stainless Steel Bailer / PVC bailer / Submersible pump / Suction lift pump / \_\_\_\_\_ (circle one)

Temp/Conductivity/pH Instrument: \_\_\_\_\_

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH
	0	—	—	—
	55	61.1	1.91	7.89
10 <sup>15</sup> min	60	60.1	1.83	7.80

SLIGHT-MOD  
SLIGHT-MOD

**FINAL DEVELOPING DATA:**

Depth to bottom: 14.70 ft.

Depth to water: 13.10 ft.

Saturated Thickness: 1.60 ft.

Color: GRty

Recharge: POOR

Initial Turbidity: HIGH

Final Turbidity: SLIGHT-MOD.

SPP \_\_\_\_\_ ft. Sheen \_\_\_\_\_

**HYDR - ENVIRONMENTAL TECHNOLOGIES, INC.**

DEVELOPMENT DATA SHEET  
WELL # MW-6  
LOCATION: BP NEGATIVELY

Job No. 9-042  
SHEET 2 of 2

DEVELOPED BY: EM

DATE: 1.28.95

**INITIAL DEVELOPING DATA:**

Depth to bottom: 14.61 ft.

Depth to water: 7.54 ft.

Saturated Thickness: 7.07 ft.

Conversion	
diam.	gals/ft.
<u>2 in.</u>	<u>x 0.16</u>
4 in.	x 0.65
6 in.	x 1.44

Well casing volume 1.13 gallons

# volumes to purge x 10 vols.

\*Total volume to purge = 11.3 gallons

\* unless chemical parameters do not stabilize

**PURGING DATA:**

Purge method: Stainless Steel Bailor/PVC bailor/Submersible pump/ Suction lift pump/ \_\_\_\_\_ (circle one)

Temp/Conductivity/pH Instrument: \_\_\_\_\_

Time	Volume (gallons)	Temp. (°F)	Conductivity (mS/cm)	pH	Turbidity
8:20	0	—	—	—	—
8:30	35	62.4	11.60	6.89	High
8:40	610	63.4	10.70	6.97	High
8:50	915	63.5	10.30	7.00	MOD
9:00	1220	62.6	11.90	7.50	MOD

**FINAL DEVELOPING DATA:**

Depth to bottom: 14.61 ft.

Depth to water: 7.63 ft.

Saturated Thickness: \_\_\_\_\_ ft.

XW-3 DTB: 13.56  
7.22

Color: BROWN

Recharge: GOOD

SPP \_\_\_\_\_ ft. Sheen \_\_\_\_\_

$$\begin{array}{r}
 7.07 \\
 \times 1.6 \\
 \hline
 4242 \\
 7070 \\
 \hline
 11312
 \end{array}$$


DEVELOPMENT DATA SHEET

WELL # MW-7

LOCATION: 3255 McCARTNEY

Job No. 9-0422

SHEET 1 of 1

## APPENDIX D



# REPORT OF LABORATORY ANALYSIS

Hydro-Environmental Technologies, Inc.  
2363 Mariner Square Drive, Suite 243  
Alameda, CA 94501

July 01, 1993  
PACE Project Number: 430621502

Attn: Mr. Tony Ramirez

Client Reference: BP Station # 11270

PACE Sample Number: 70 0073243  
Date Collected: 06/17/93  
Date Received: 06/21/93  
Client Sample ID: MW-5-5'

<u>Parameter</u>	<u>Units</u>	<u>MDL</u>	<u>DATE ANALYZED</u>
------------------	--------------	------------	----------------------

### ORGANIC ANALYSIS

#### PURGEABLE FUELS AND AROMATICS

TOTAL FUEL HYDROCARBONS, (LIGHT):			-	06/28/93
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	1000	ND	06/28/93
PURGEABLE AROMATICS (BTXE BY EPA 8020M):			-	06/28/93
Benzene	ug/kg wet	5.0	ND	06/28/93
Toluene	ug/kg wet	5.0	ND	06/28/93
Ethylbenzene	ug/kg wet	5.0	ND	06/28/93
Xylenes, Total	ug/kg wet	5.0	ND	06/28/93

#### EXTRACTABLE FUELS EPA 3550/8015

Extractable Fuels, as Diesel	mg/kg	5.0	11	06/29/93
Date Extracted			06/23/93	

These data have been reviewed and are approved for release.

Darrell C. Cain  
Regional Director



# REPORT OF LABORATORY ANALYSIS

Mr. Tony Ramirez  
Page 2

FOOTNOTES  
for page 1

July 01, 1993  
PACE Project Number: 430621502

Client Reference: BP Station # 11270

MDL Method Detection Limit  
ND Not detected at or above the MDL.



# REPORT OF LABORATORY ANALYSIS

Mr. Tony Ramirez  
Page 3

QUALITY CONTROL DATA

July 01, 1993  
PACE Project Number: 430621502

Client Reference: BP Station # 11270

EXTRACTABLE FUELS EPA 3550/8015  
Batch: 70 22320  
Samples: 70 0073243

METHOD BLANK:

Parameter	Units	MDL	Method Blank
Extractable Fuels, as Diesel	mg/kg	5.0	ND

LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:

Parameter	Units	MDL	Reference Value	Recv	Dupl Recv	RPD
Extractable Fuels, as Diesel	mg/kg	5.0	33.3	85%	79%	7%



**REPORT OF LABORATORY ANALYSIS**

Mr. Tony Ramirez  
Page 4

QUALITY CONTROL DATA

July 01, 1993  
PACE Project Number: 430621502

Client Reference: BP Station # 11270

**PURGEABLE FUELS AND AROMATICS**

Batch: 70 22224  
Samples: 70 0073243

**METHOD BLANK:**

Parameter	Units	MDL	Method Blank
TOTAL FUEL HYDROCARBONS, (LIGHT):			-
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	ND
PURGEABLE AROMATICS (BTXE BY EPA 8020M)			-
Benzene	ug/kg wet	1.0	ND
Toluene	ug/kg wet	1.0	ND
Ethylbenzene	ug/kg wet	1.0	ND
Xylenes, Total	ug/kg wet	1.0	NO

**LABORATORY CONTROL SAMPLE AND CONTROL SAMPLE DUPLICATE:**

Parameter	Units	MDL	Reference Value	Recv	Dup1 Recv	RPD
Purgeable Fuels, as Gasoline (EPA 8015M)	ug/kg wet	200	1000	82%	83%	1%
Benzene	ug/kg wet	1.0	40.0	105%	98%	6%
Toluene	ug/kg wet	1.0	40.0	96%	88%	8%
Ethylbenzene	ug/kg wet	1.0	40.0	96%	89%	7%
Xylenes, Total	ug/kg wet	1.0	120	99%	88%	11%

Mr. Tony Ramirez  
Page 5

FOOTNOTES  
for pages 3 through 4

July 01, 1993  
PACE Project Number: 430621502

Client Reference: BP Station # 11270

MDL Method Detection Limit  
ND Not detected at or above the MDL.  
RPD Relative Percent Difference



BP= 11270

CHAIN-OF-CUSTODY RECORD Analytical Request

Client: INV. ROFTAN KONMEUMZ ZCH  
Address: ...  
Phone: ...

Report To: TCM / RMH  
Bill To: BP  
P.O. # / Billing Reference: 1998937  
Project Name / No. ...

Pace Client No.  
Pace Project Manager  
Pace Project No. 430621-502  
\*Requested Due Date:

Sampled By (PRINT): FREDERICKS MARONI  
Date Sampled: 6/17/93  
Sampler Signature: FREDERICKS MARONI

NO. OF CONTAINERS	PRESERVATIVES				ANALYSES REQUEST	REMARKS
	UNPRESERVED	H <sub>2</sub> SO <sub>4</sub>	HNO <sub>3</sub>	VOA		
					TRIP BTEX DIESEL	

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PAGE NO.	NO. OF CONTAINERS	PRESERVATIVES	ANALYSES REQUEST	REMARKS
1	M11-S-51	4:1p	soil	7324.3	1	X	X X X	
2								
3								
4								
5								
6								
7								
8								

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT / DATE	RETURNED / DATE	ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME

Additional Comments: BP ANALYSIS DIESEL ANALYSIS VIA HYDRO/AME - CC CHE

Handwritten signature and notes: ...  
DATE: 6/21/93  
Pace