# WORK PLAN FOR SITE CHARACTERIZATION STUDY

**PROJECT SITE:**

**ALLIANCE GAS STATION**
**20450 HESPERIAN BLVD.**
**HAYWARD, CALIFORNIA**

**PREPARED FOR:**

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**SUBMITTED TO:**

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**HEALTH AGENCY**
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**OAKLAND, CA. 94621**
**(510) 271-4530**

**PREPARED BY:**

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**CEC PROJECT NO. 94-510-1440-2**
**May 6, 1994**

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# WORK PLAN SUMMARY

## INTRODUCTION

**Purpose of work.** The purpose of this work is to fully define the lateral and vertical extent of the existing soil and groundwater plume underlying the site.

**Statement of work.** This project includes the drilling of 6 borings to an approximate depth of 20 feet and 1 boring to a depth of approximately 35 feet. The 35 foot boring will be converted to a groundwater monitoring well. Soil samples will be collected at 5 foot intervals along with one water sample per boring. The water samples will be obtained at first contact with the watertable. The samples will be delivered to a certified laboratory for analysis for TPH-D, TPH-G, and BTEX.

**Site Location and Description.** The project site is the Alliance Gas Station, located at 20450 Hesperian Blvd, Hayward, California (Figure 1). The site layout and previously installed monitoring well and boring locations are shown in Figure 2.

**Background.** On January 26, 1993, Alameda County submitted a letter to Mr. Chauhan requesting him to submit a work plan to investigate the vertical and lateral extent of the potential contamination at his site.

On August 9, 1993, Mr. Zane Miller, a consultant representing Mr. Chauhan, submitted a drilling permit application to Zone 7 Water Agency, for placement of monitoring wells on site.

On August 24, 1993 Viking Drillers, Inc. drilled and placed 3 groundwater monitoring wells at the site. The wells were drilled to a depth of 25 feet. Groundwater was encountered at a depth of 18 feet. Nine soil samples were obtained and delivered on September 9, 1993, to Sequoia Analytical in Sacramento, for analysis of TPH-G and BTEX.

On September 28, 1993, Alameda County submitted a letter to Mr. Danny Chauhan requesting information on the site investigation work performed by Mr. Zane Miller. The data submitted to the county was not acceptable.

On December 2, 1993, Alameda County submitted a letter to Mr. Danny Chauhan stating that they believed the assessment site was contributing to a regional groundwater contaminant plume consisting of separate and dissolved-phase hydrocarbons.

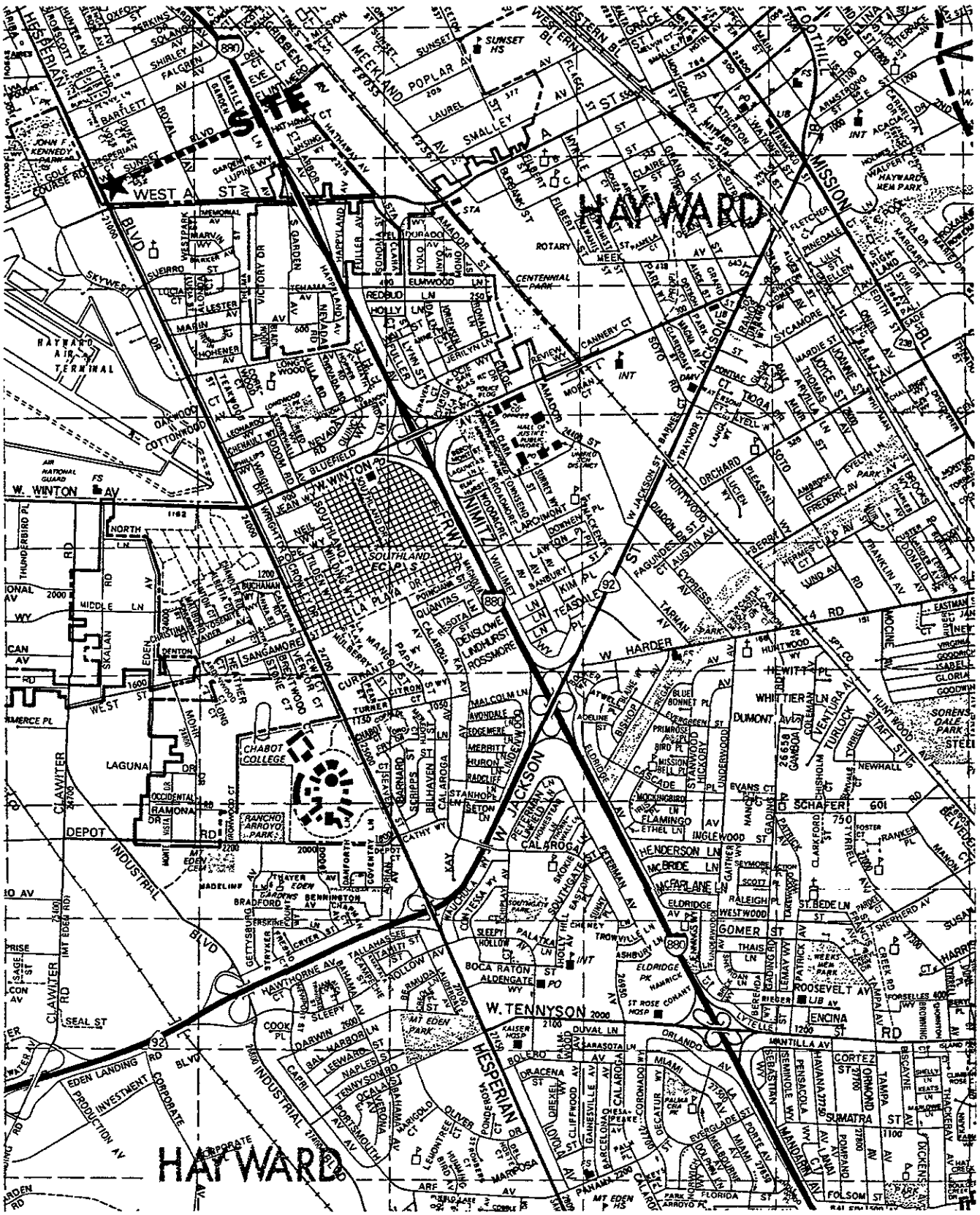


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Figure 1
Site Location Map
20450 Hesperian Blvd
Hayward, CA
Project No. 94-510-1440

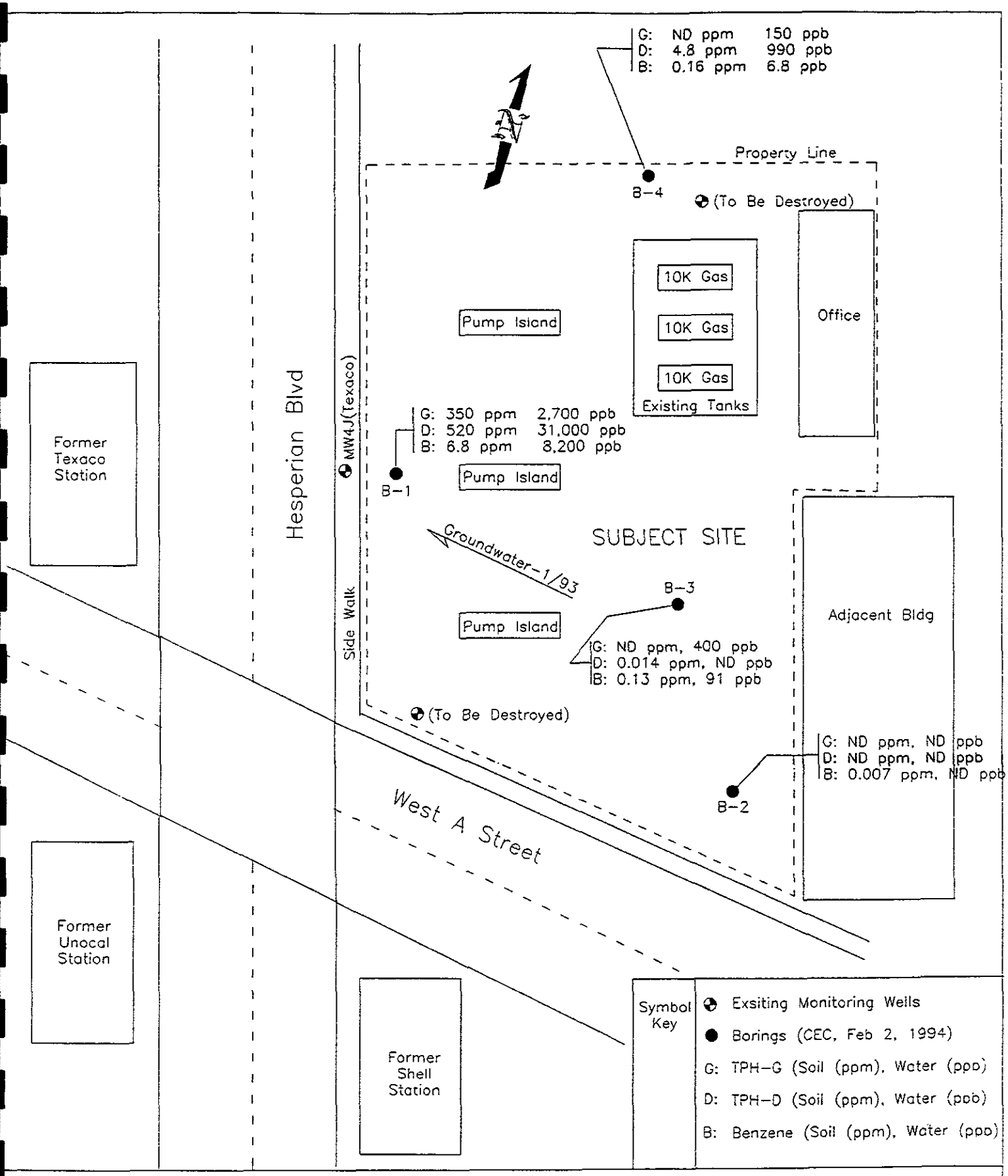


Figure 2
Site Map & Boring Locations
20450 Hesperian Blvd
Hayward, CA
Project No. 94-510-1440

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## PREVIOUS CEC INVESTIGATIONS

On January 7, 1994, The Alliance Gas Station retained the services of Certified Environmental Consulting, Inc. (CEC), to perform a Preliminary Site Assessment (Phase One) and a site investigation (Phase Two) on the subject site.

On January 20, 1994, CEC submitted a Phase 1 Environmental Site Assessment Report to Mr. Chauhan. The report recommended a Phase 2 site investigation.

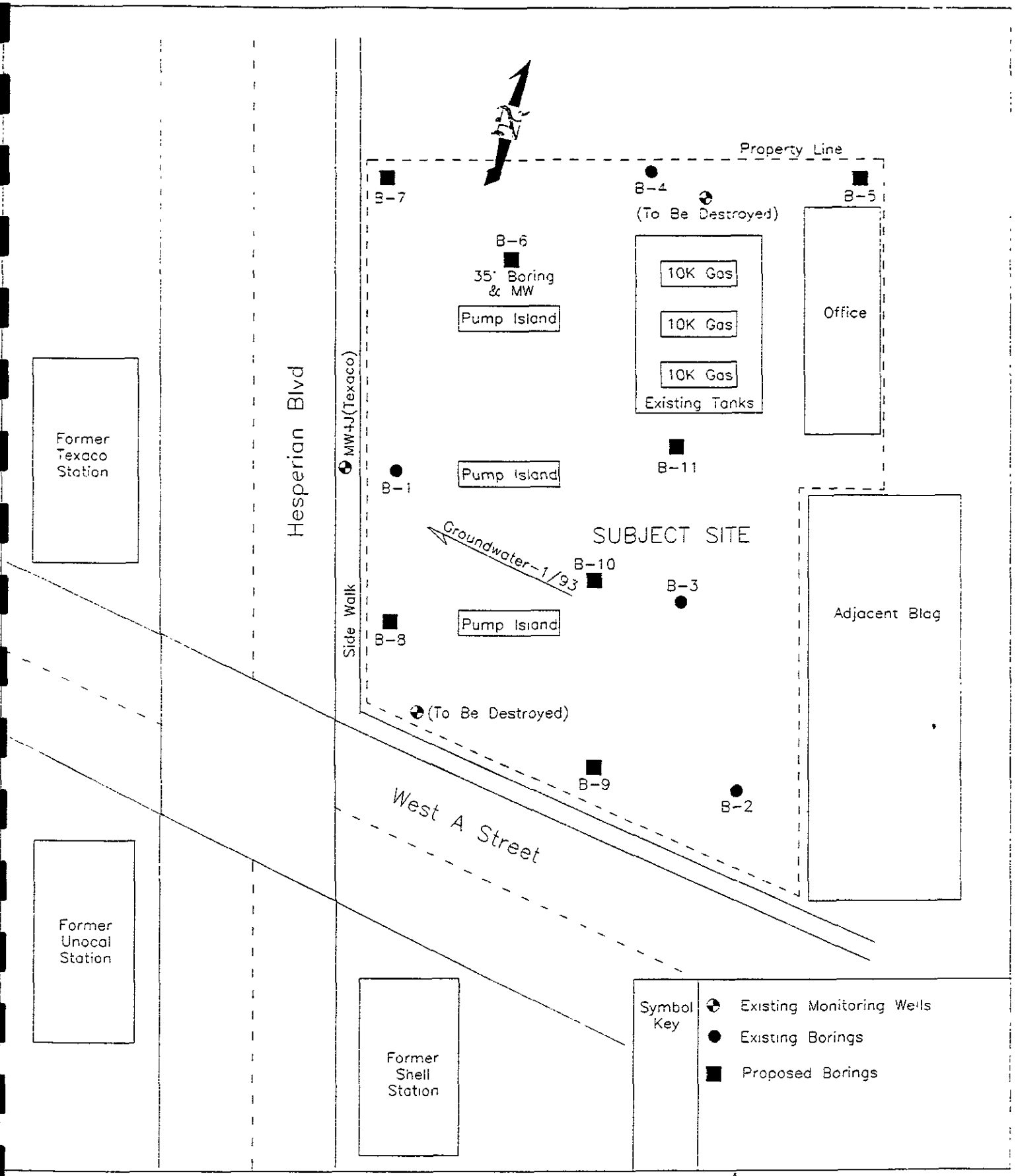
On February 2, 1994, CEC submitted a site investigation report. The results of the report indicated the presence of elevated levels of TPH-D, TPH-G, and BTEX in both the groundwater and soil beneath the site.

On January 24, 1994, four borings were drilled at the assessment site. Soil and groundwater samples were obtained for laboratory analysis. The results of the analysis showed elevated levels of TPH-D, TPH-G, and BTEX in the soil samples in borings 1 and 4. Boring 4 registered non-detect for TPH-D. Elevated levels of TPH-D, TPH-G, and BTEX were present in the groundwater samples in borings 1, 3, and 4 (see Figure 2). In the February 2, 1994 report, CEC recommended a full site characterization study to define the existing soil and groundwater plume.

## PROPOSED SCOPE OF WORK

CEC proposes to drill 6 borings to an approximate depth of 20 feet. Boring B-6 (35' deep) will be converted into a 35 foot deep 7" monitoring well for a possible groundwater extraction permit See Figure 3 for proposed boring locations).

Borings B-5, B-6 and B-11 will not be drilled initially.? When these are drilled, B-59 and B-11 may be converted to monitoring wells. Final location of B-10 will be determined after the evaluation of boring data for B-1 through B-8.




1" = 20'
per Raphael Gallardo
6/7/94

Figure 3
Proposed Boring Locations
20450 Hesperian Blvd
Hayward, CA
Project No. 94-510-1440

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## GEOLOGY AND HYDROGEOLOGY

The site rests on undifferentiated deposits consisting of marine clay, and sand with minor lenses of gravel underlying a thin cover of alluvium and slope wash. The deposits are of Quaternary age upper pleistocene to recent (QU). These are thick unconsolidated deposits with an average thickness exceeding 600 feet. Bedrock occurs at depths of between 468 and 732 feet.

The closest faults in the Quadrangle are the Hayward fault located approximately 1 3/4 miles to Northeast, the West Chabot fault located approximately 2 1/4 miles to the Northeast, and the East Chabot fault located approximately 2 3/4 miles to the Northeast. The Hayward fault is considered to be the most threatening to the area. It is an active fault having displayed movement within the last 11,000 years. The East and West Chabot faults are considered to be inactive.

## HYDROGEOLOGY

The site rests within the East Bay Plain. The plain covers an area of approximately 114 square miles. Most of the groundwater is used for irrigation and industrial use, with very little of it pumped for domestic consumption. The groundwater reservoir is comprised of 3 main unconsolidated water bearing units: The Older Alluvium, the Younger Alluvium, and the Merritt Sand. The reservoir is greater than 1100 feet thick and occurs in unconfined and confined conditions.

The groundwater beneath the East Bay Plain has been seriously threatened by hundreds of documented toxic spills and leaks since 1984. The most serious threat to the groundwater reservoir occurs where the Younger Alluvium, and Merritt Sand outcrop and also along the recharge area of the Older Alluvium. Groundwater in the Older Alluvium has not yet been degraded by toxins.

Groundwater flow direction within the plain in general, is from the Eastern part of the reservoir to the West, towards San Francisco Bay.

Sources:

Geohydrology and Groundwater-Quality Overview East Bay Plain Area, Alameda County, Ca.
June 1988. 205(J) Report.

Geology of the Hayward Quadrangle.
By G.D. Robinson, 1956.

## WORK TO BE COMPLETED

Site work will be conducted in a step-wise manner to allow for changes in the scope of work as additional information is gathered. The overall project is outlined below.

1. Submit Work Plan to the County of Alameda, Department of Environmental Health at (510) 271-4530. If needed, CEC will obtain any necessary encroachment permits for the work performed on City of Hayward property.

2. Submit map showing boring locations.

3. Locate and mark drilling areas with white paint.

4. Notify Underground Service Alert (USA), (800) 227-2600, 48 hours prior to commencement of work.

5. Notify Ms. Juliet Shin, of Alameda County, Department of Environmental Health at (510) 271-4530, 72 hours prior to commencement of site work.

6. Collect soil and groundwater samples from each boring. The samples will be stored in an ice cooler for transportation to a certified laboratory for analysis.

7. Analyze samples collected from the 7 borings for Total Petroleum Hydrocarbons as Diesel (TPH-D), Total Petroleum Hydrocarbons as Gasoline (TPH-G), and Benzene, Ethylbenzene, Toluene, and Xylene (BTEX).

8. Fill boreholes with neat cement to surface to eliminate any migratory pathways for contamination.

9. Submit a final report to the county of Alameda. The report will include site history, summary of all findings, laboratory results and recommendations.

## REPORTS

Technical reports will be prepared and submitted to meet the County's requirements. Reports will include site history, figures identifying sampling locations, drilling logs, summary of all findings, analytical results and recommendations, if any, for further action.

Stanley L. Klemetson Ph.D., P.E.
Executive Vice President

# SOIL SAMPLING IN BOREHOLES

## SOIL SAMPLE COLLECTION

Samples will be collected at 5- foot intervals using a 2.5 inch I.D. modified California split spoon sampler containing three, six-inch-long brass tubes. The sampler and augers will be decontaminated before and after each use by steam cleaning, or an Alconox solution wash, and tap or deionized water rinses. The sampler will be driven ahead of the augers using a 140 pound drop hammer. The average blow counts required to the drive the sampler 18 inches will be recorded on the boring logs.

## HANDLING

Sample tubes will be sealed at each end with Teflon sheeting and PVC end caps, placed in ziplock bags, and stored in an ice chest with ice. Samples will be labeled with sample number, location, and sample depth. Samples will be transported under chain-of-custody procedures to a State-Certified laboratory.

## DOCUMENTATION AND SOIL CLASSIFICATION

Sample locations will be recorded in the geologist's field notebook. Collection methods, signs of contamination, soil type, and any other appropriate information will also be recorded. Soils exposed at the ends of each brass tube will be examined by a geologist for obvious signs of contamination and classified according to the Unified Soil Classification System. These observations will be recorded in the boring logs.

## CHAIN OF CUSTODY

Samples selected for analysis will be labeled indicating project name (or number), sample number, boring number, sample depth, date and collection time. The same information will be recorded on the chain of custody.

## FIELD EQUIPMENT DECONTAMINATION PROCEDURES

The sampler will be decontaminated before and after each use by washing in an Alconox solution, followed by tap water, or deionized water rinses.

All rinseate used in the decontamination process will be stored on site if necessary, in steel DOT approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact and phone number, sealed and left on-site for subsequent disposal pending analytical results.

## SOIL CUTTINGS

Soil cuttings generated during drilling will be placed in steel DOT approved drums, or placed on and covered with plastic sheets. Soils will remain on-site for subsequent disposal pending analytical results. Soil cuttings will be the responsibility of the owner/generator, although CEC may arrange for disposal.

## WATER SAMPLE COLLECTION

Groundwater will be sampled once it is penetrated. A disposable bailer will be used for each sample. The bailer will be dropped down the center of the in-place hollow stem augers to allow for an in-situ water sample collection. The water samples are considered grab samples and are meant for investigatory purposes.

Sample vials and bottles will be filled to overflowing and sealed so that no air is trapped in the vial or bottle. Once filled, samples shall be inverted and tapped to test for air bubbles. Samples will be contained in vials and bottles approved by the US EPA and the RWQCB, San Francisco Bay Region.

## STORAGE AND TRANSPORTATION

Samples exposed to dust, direct sunlight, high temperature, and adverse weather conditions will be avoided whenever possible. Samples shall be transported to the laboratory as soon as possible and on no more than 48 hours from the time they were collected. All samples will be stored in and kept in plastic "ziplock" bags, and kept in a closed ice chest until delivery to the laboratory.

## GENERAL PRACTICES

CEC's standard procedures for soil/water sampling meet or exceed guidelines set by California EPA, California State Regional Water Quality Control Board, San Francisco Bay Region, and the County of San Mateo Department of Health. Drilling, construction, and completion of all exploratory borings will be in conformance with procedures in this manual.

## WELL CONSTRUCTION

CEC's standard procedures for well installation and soil/water sampling meet or exceed guidelines set forth by the EPA and the California State Regional Water Quality Control Board.

Monitoring wells are drilled with a hollow-stem, continuous-flight auger. All borings and logging will be overseen by a registered engineer or geologist with special attention given to the avoidance of cross contaminating underlying aquifers. Although each boring presents unique conditions, several methods used by CEC geologists and engineers prevent pollution of clean aquifer zones underlying contaminated zones. These methods include: (1) when boring in a zone of saturated permeable materials, drilling will cease if 5 feet of impermeable material (usually clays) are reached. The clay layer is most likely an aquiclude separating the shallow and deep aquifers and should not be penetrated. (2) In areas where the depth to the water table is not known, the hole will be bored down to groundwater or to a maximum depth of 45 feet if groundwater is not encountered unless local guidelines specify greater depths. This is above nearly all deep aquifers currently supplying groundwater in the Bay Area counties. If a saturated shallow aquifer is found which is greater than 20 feet thick, drilling will be terminated 20 feet below the top of the aquifer.

The drill rig operator and the CEC geologist will discuss significant changes in material penetrated by the drill, changes in drilling conditions, hydraulic pressure and drilling action. The CEC geologist will be present during the drilling of exploratory borings and will observe and record changes by time and depth and evaluate the relative moisture and content of the samples and note water produce zones. This record will be used later to prepare a detailed lithologic log. The lithologic description of the log will include soil or rock type, color, grain, size, texture, hardness, degree of induration, calcarious content, presence of fossils and other materials (gypsum, hydrocarbons) and other pertinent information. A copy of the logs will be retained in the field file at the proper site.

Monitoring wells will be constructed using a 4" flush schedule PVC well casing from the bottom of the boring to the ground surface. From approximately 5 feet above the ground water surface to the base of the well, the casing will consist of machine slotted well screen. The remainder of the well will be solid PVC casing. The filler pack will be placed in the annular space between the 4-inch well casing and borehole and will extend from the bottom of the well to approximately 2 feet above the top of the screened casing. A layer of bentonite approximately 1 foot thick will be placed above the filled packs and charged with water; The remaining space will be backfilled using a cement bentonite grout mixture. A locking aluminum well cap will be connected to the top of the well to protect it from ground surface traffic. The well will be completed at the ground surface and will be developed until the groundwater is visually clear and free of sediment.

Screen and Riser Pipe

The monitoring well assembly will consist of two or four-inch diameter polyvinyl chloride (PVC) schedule 40 (minimum) casing. The perforated casing (well screen) shall be factory slotted. The perforations will be 0.020 inches in size. These perforated casing sections are not intended to provide optimum flow but will provide hydraulic connection between the previous material in the water-bearing zone and the monitoring well.

Setting Screens and Riser Casings

Upon completion of drilling, the monitoring well will be assembled and lowered to the bottom of the boring. The monitoring well will be designed so that the well screen is approximately opposite the water-bearing zone that will be monitored. The bottom of the screen shall be approximately flush with the bottom of the well and shall be capped with a threaded PVC cap or plug. The PVC joints will be flush coupled and threaded. No PVC cement or other solvents are permitted to be used to fasten the joints of casing or screen.

After the monitoring well assembly has been lowered to the specified depth, filter sand or gravel will be placed in the annular space to a level of about 1 foot above the top of the perforated casing. The depth to the top of the filter pack will be verified using the tremie pipe or a weighted steel tape.

Once the depth to the top of the filter pack has been verified, a layer of bentonite pellets will be placed with space to fill the annular space to a level of about 1 foot above the top of the filter pack. The depth to the top of the bentonite pellets layer must be verified using the tremie pipe or a weighted steel tape.

A bentonite/cement grout seal will be placed above the bentonite pellets layer by pumping through a 1-inch diameter PVC pipe lowered to the bottom of the grouted zone. The bentonite/cement grout will be a mixture of Portland cement, approximately 5 percent by weight (of cement) powdered bentonite and approximately 9 gallons of water. Only clean water from a municipal supply shall be used to prepare the grout. The grout seal will extend from the top of the bentonite pellets layer to the ground surface. After grouting, no work will be done on the monitoring well until the grout has set a minimum of 48 hours.

Development of Monitoring Wells

When the monitoring well installation is complete, the well will be developed by surging, and bailing and/or pumping. Well development generally suppresses damage to the formation by drilling operations, restores natural hydraulic properties to the adjacent soils and improves hydraulic properties near the borehole so the water flows more freely in the wells.

During development, pH, specific conductance, and temperature of the return water will be measured. Well development will proceed until these field water quality parameters have stabilized and the water is, in the judgment of the geologist, at its maximum possible clarity. Wells will be developed by removing the finer material from the formation and filter pack surrounding the wells. The procedure consists of two steps, bailing the well, followed by pumping it until it produces clean water.

The wells will be developed and sampled using a teflon bailer, washed with TSP, rinsed with tap water and then distilled water. A minimum of four well volumes will be removed from the well prior to sampling. To insure that water in the well was exchanged: (1) bailing will commence at the top and work downward; (2) bailing will be done briskly to draw the well down, thereby reducing the percentage of recharge water in relation to possible stagnant water within the well. The well will be allowed to return to 80 percent of the original water level before sampling. The sample vials and bottles will be filled to overflowing; (1) this precludes air bubbles passing through the sample during filling, and (2) sealed so that no air is trapped in the vial. Once filled, samples will be inverted and tapped to test for air bubbles. Samples will be placed on ice and delivered to the lab as soon as possible.

Capping Monitoring Well

Upon completion of the work, a suitable vented screw cap will be fitted on the end of the riser casing to prevent the entry of surface runoff of foreign matter. A steel well cover with a locking top will be set in mortar around the riser casing for protection. The steel protective well cover will be completed below the ground surface in a pre-cast concrete valve box with a traffic-rates cover.

Documentation

A well construction diagram for each monitoring well will be completed by the geologist and submitted to the Project Manager when the work has been completed. In addition, the details of well installation, construction, development and field measurements of water quality parameters will be summarized as daily entries in a field notebook or data sheets which will be submitted to the Project Manager when the work has been completed.

Cleaning of Drilling Equipment

All drilling equipment will be steam cleaned after drilling using clear water from a municipal service.

Well casing, whether constructed of PVC or steel, will be cleaned thoroughly before installation to prevent cross contamination.

## WATER SAMPLE COLLECTION

Groundwater will be sampled using a hydro Punch sample probe system. The Hydro Punch water sample system is advanced through the center of the hollow stem augers to allow for an in-situ water sample collection. Drilling continues to approximately 10 feet below the water table. Once the desired depth is reached, the augers are retracted approximately 5 feet. This allows the Hydro Punch system to come in contact with the water bearing formation. Water flows freely into a disposable bailer contained within a stainless steel sample screen. The bailer is then removed and the captured water placed in the appropriate sample media. The water samples are considered grab samples and are meant for investigatory purposes.

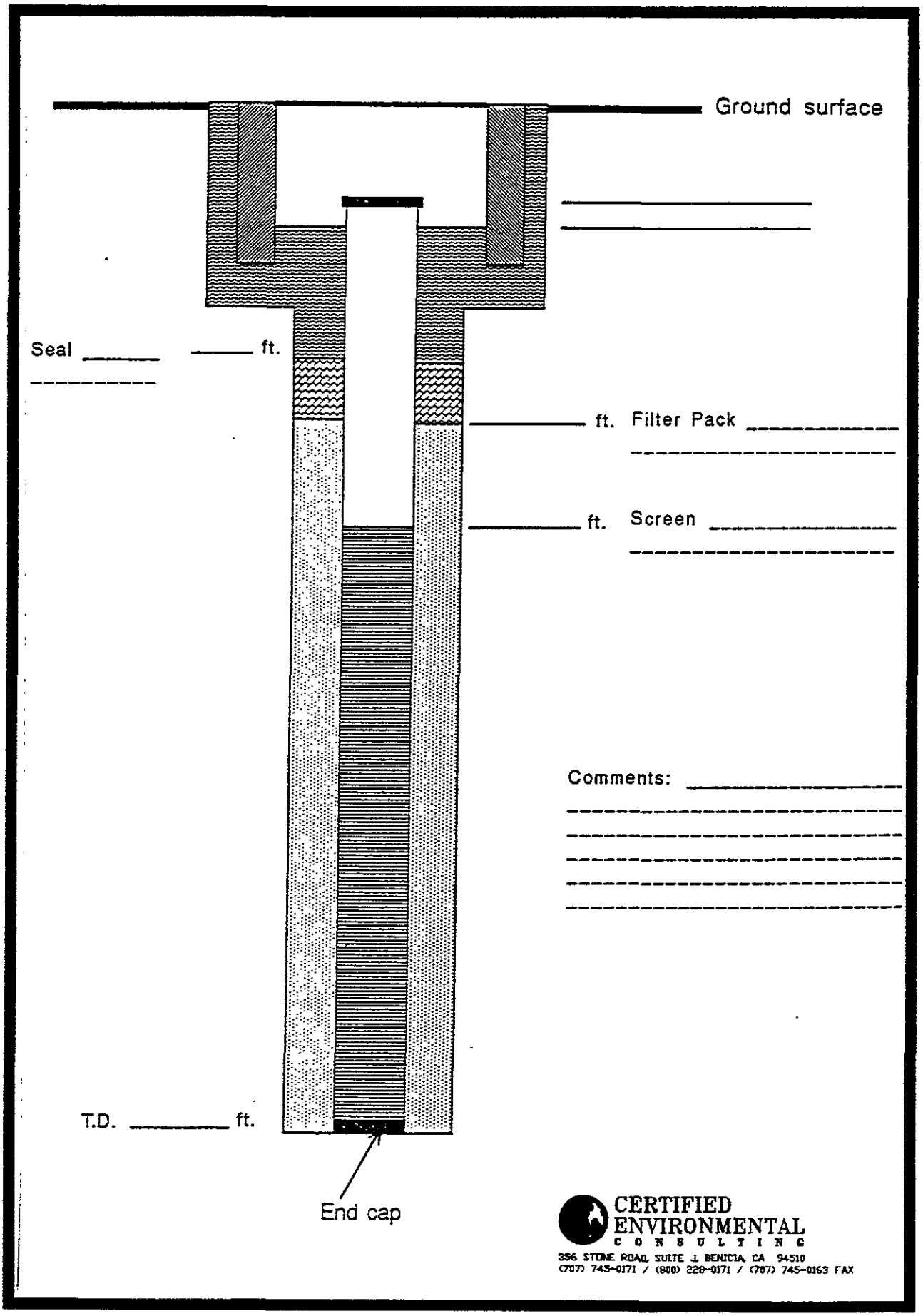
Sample vials and bottles will be filled to overflowing and sealed so that no air is trapped in the vial or bottle. Once filled, samples shall be inverted and tapped to test for air bubbles. Samples will be contained in vial and bottles approved by the US EPA and the RWQCB, San Francisco Bay Region. Some analyses may require separate sample containers in accordance with EPA methods described in 40 CFR Part 136 and SW-846.

Water samples intended for volatile hydrocarbon analysis will be contained in 40 ml VOA vials prepared according to EPA SW 849 and capped with Teflon-lined septa caps. Samples intended for EPA 692 analysis will contain a small amount of preservative (Hcl). Samples intended for EPA 601 and EPA 624 GCMS procedures will not be preserved. Water samples intended for low level diesel analysis will be stored in dark glass 1-liter bottles to reduce degradation by sunlight. Antimicrobial preservative (Hcl) may be added to the sample if a prolonged holding time is expected prior to analysis.

Sample containers will be labelled with self-adhesive, pre-printed tags. labels will contain the following information in waterproof ink:

1. Project number (or name)
2. Sample number (or name)
3. Sample location (well number, etc)
4. Date and time samples were obtained
5. Treatment (preservative added, filtered, etc.
6. Name of sample collector

All purged water will be stored on site in steel DOT approved drums. Drums will be labeled as to contents, suspected contaminants, date container filled, expected removal date, company name, contact and phone number, sealed and left on-site for subsequent disposal pending analytical results.

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## EMERGENCY PROCEDURES

The following emergency response plan will be implemented to handle unanticipated on-site emergencies prior to start up of hazardous waste operations. All emergency incidents will be dealt with in a manner that minimizes adverse health risks to workers.

A. Emergency first aid procedures:

Employee injury: When possible, remove the employee from the contaminated zone and conduct decontamination procedures, first aid, and preparation for transport at a safe distance from the work site.

Eye exposure: Wash eyes with large amounts of potable water. lift the upper and lower lids occasionally. Obtain medical attention.

Skin Exposure: Flush the contaminated skin with water. Remove contaminated clothing. Obtain medical attention immediately when exposed to concentrated solids or liquids.

If paramedic/rescue services are required, they will provide transportation to the hospital. For less serious circumstances, the CEC representative will provide transportation.

B. Emergency telephone numbers are given in the Site Specific Health and Safety Plan.

C. CEC will document the emergency situation. It will include:

- A description of the incident (including the date and time) that necessitated emergency response procedures, and complete an accident/incident investigation or critique of the incident.
- The date, time, and names of all persons/agencies that were notified and their responses.
- The resolution of the incident (including its duration) and the method/corrective action involved.

## ON-SITE FIRST AID

All CERTIFIED personnel engaged in field activities will have available at the job site the necessary health and safety items. Depending upon the job requirements, these may include the following:.

- o First aid Kit
- o Half Mask respirator
- o Organic vapor or other appropriate cartridges
- o Hard Hat
- o Safety Glasses
- o Hearing protection devices
- o Protective gloves
- o Chemical resistant coveralls (coated Tyvek)

**SITE SPECIFIC**
**HEALTH AND SAFETY PLAN**
**FOR**
**20450 HESPERIAN BLVD.**

I. **SITE:** 20450 HESPERIAN BLVD., HAYWARD, CALIFORNIA.

II. **KEY PERSONNEL AND PROJECT ASSIGNMENTS**

| PROJECT ASSIGNMENT | NAME/AGENCY | PHONE |
|---|---|---|
| **Principal Investigator** | Stanley L. Klemetson, P.E. | (707) 745-0171 |
| **Geologist and Assistant Site Safety Officer** | Rafael Gallardo | (707) 745-0171 |
| **Project Manager** | Rafael Gallardo | (707) 745-0171 |
| **Site Safety Officer** | Michael T. Noble, C.I.H. | (510) 867-0322 |
| **Owner:** | Airport Alliance<br>Mr. Danny Chauhan | (510) 887-7715 |

III. **SCOPE OF WORK**

The project includes the drilling of 6 borings to a depth of approximately 20 feet and 1 boring to a depth of approximately 35 feet below surface grade (BSG). The 35 foot boring will be converted to a groundwater monitoring well. One boring will be continuously cored and three will be sampled at 5 foot intervals, or contact change. Soil and water samples will be obtained and delivered to a certified laboratory for analysis. The samples will be analyzed for **TPH-G**, **BTEX**, and **TPH-D**. A final report will be submitted to the Alameda County Health Agency.

IV. **LEVEL OF PROTECTION**

Level D - Level D is the basic work uniform.

V. **SITE SECURITY**

Only authorized personnel will be permitted within 20 feet of equipment.

## VI. EMERGENCY RESPONSE

A. Decontamination procedures for personnel injured or exposed in the work zone Assist the injured or exposed worker out of the sampling area when possible. If possible, carefully remove his PPE, and remove your own, according to standard decontamination procedures administer CPR/first aid as needed. Call for medical help immediately.

B. Emergency response plan

Personnel roles, lines of authority, communications The on-site CEC representative will have final authority on site health and safety methods concerning sampling.

C. Telephone numbers of emergency agencies, key contractor and responsible party.

| | NAME/AGENCY | TELEPHONE |
|---|---|---|
| Ambulance | Hayward | 911 |
| Hospital | Kaiser Permanente<br>Medical Center<br>27400 Hesperian Blvd.<br>Hayward, California | (510) 784-4251 |
| Police Department | Hayward | 911 |
| Fire Department | Hayward | 911 |
| Project Manager | Rafael Gallardo | (707) 745-0171 Office |
| Health/Safety Coordinator | Michael T. Noble | (510) 867-0322 |
| Alameda County<br>Department of Environmental<br>Health Division | Ms. Juliet Shin | (510) 271-4530 |
| CA Dept. Health Services | DHS | (415) 540-2122 |
| US EPA | Emergency Spills in<br>California | (415) 974-8131 |
| Federal OSHA | OSHA | (800) 648-1003 |
| CHEMTREC | CHEMTREC | (800) 424-9300 |
| Underground Service Alert | CEC | (800) 227-2600 |

Directions to hospital (See Figure 4) for route to Kaiser Permanente Medical Center).

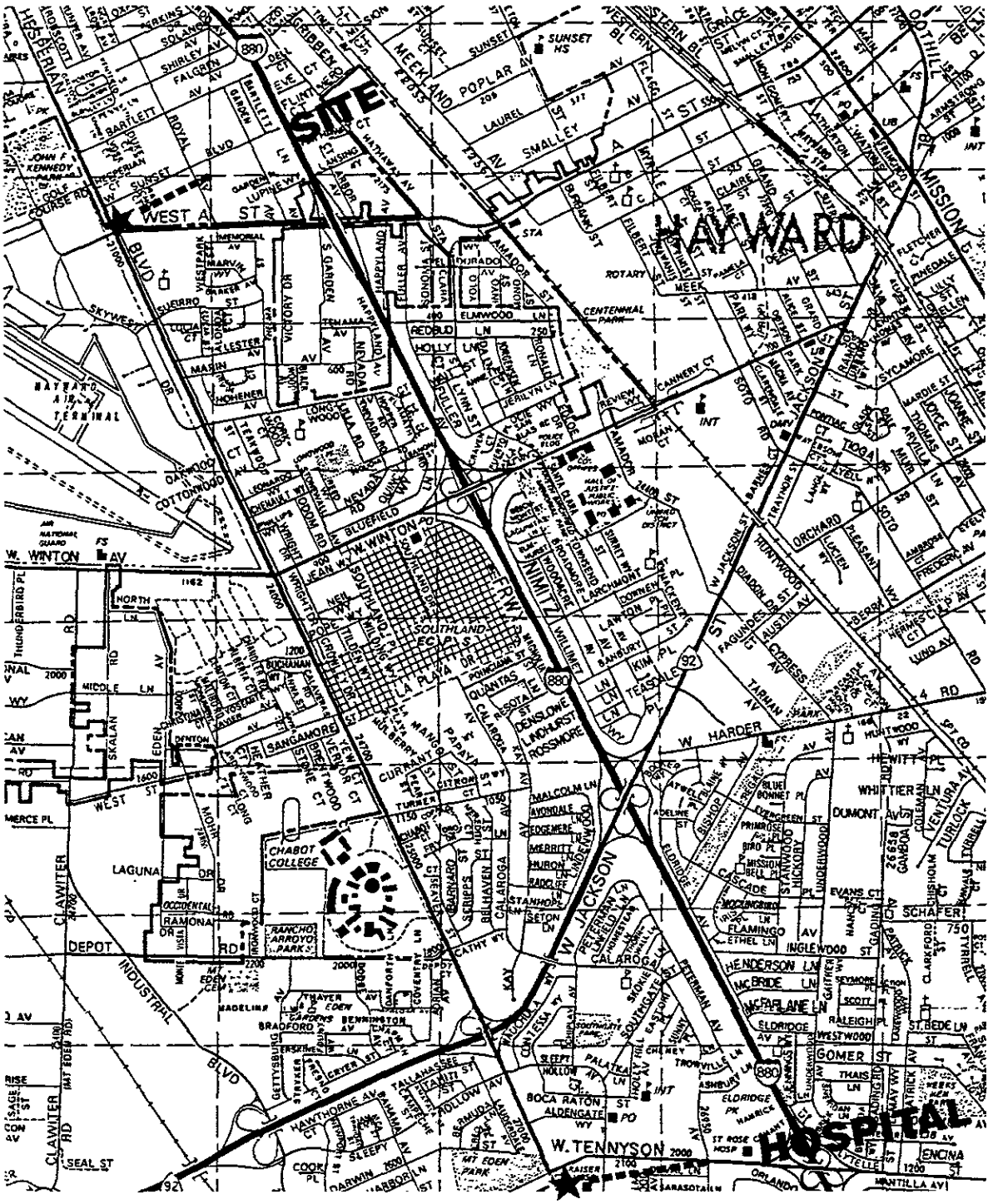


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Figure 4
Route to Hospital
20450 Hesperian Blvd
Hayward, CA
Project No. 94-510-1440