aqua science engineers inc.

ALCO
HAZMAT
93 DEC 17 PM 1:18

December 13, 1993

Alameda County Health Care Services Agency
80 Swan Way, Room 200
Oakland, CA 94621

ATTENTION: Ms. Susan Hugo

SUBJECT: PEA REPORT
Thomas A. Short Company (TASCO)
3430 Wood Street
Oakland, CA 94662

Dear Ms. Hugo:

Please find attached a copy of the PEA Report for the subject site, as prepared by Aqua Science Engineers, Inc. (ASE).

Should any further information become necessary, please feel free to give us a call at (510) 820-9391. It has been our pleasure working with you on this project.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

David Allen
Project Manager

cc: Mr. Thomas D. LaFlamme, TASCO
Ms. Lynn Nakashima, CAL-EPA, DTSC
Mr. Rich Hiett, RWQCB - San Francisco Bay Region
Mr. Allan Chow, CALTRANS

SCALE 1: 24,000 (1Inch = 2000 Feet)

0 1000 2000 3000 4000 5000 6000 FEET

Ref: Oakland, West Quadrangle, Alameda County
USGS 7.5 Minute Series (Topographic)
1959, Photorevised 1980

FIGURE 1

USGS Topographic Site Location Map
Site: Thomas Short Company
3430 Wood Street
Oakland, California

Drawn by: M.M.	Date: 3/93	Scale 1:24,000

Aqua Science Engineers, Inc.

aqua science engineers inc.

ALCO
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93 DEC 17 PM 1:18

December 8, 1993

12/8/93

PRELIMINARY ENDANGERMENT ASSESSMENT REPORT (PEA)

For:

THOMAS A. SHORT COMPANY (TASCO)
3430 WOOD STREET
OAKLAND, CALIFORNIA 94608

Prepared by:

Aqua Science Engineers, Inc.
2411 Old Crow Canyon Road, #4
San Ramon, CA 94583
(510) 820-9391

REGISTERED GEOLOGIST
MICHAEL MARELLO
No. 5339
Exp. 6/30/94
STATE OF CALIFORNIA

David G. Allen
Project Manager

Michael Marello, R.G., #5339
Vice President
Principal Geologist

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1.0 INTRODUCTION

The California Department of Transportation (Caltrans) is proposing some changes in the section of Highway 880 that passes through West Oakland, California. The four lane, double deck section of Highway 880 known as the "Cypress Structure" was destroyed during the October 1989 Loma Prieta earthquake event. Caltrans is planning to initiate reconstruction of this particular section beginning in 1994. Reconstruction will require relocation of some sections of the freeway and acquisition of some properties that are located within the planned right-of-way. The acquisition phase of the freeway relocation project included appraisal and environmental due diligence on the part of Caltrans for those properties which may be acquired.

The Thomas A. Short Company (TASCO) is located at 3430 Wood Street in the City of Oakland, California (**Figure 1**). Caltrans notified TASCO in March of 1991 that this particular property will be required for the Cypress Freeway reconstruction project. During June and July of 1992, a preliminary environmental assessment was conducted at the TASCO site as part of an area-wide baseline assessment under the direction of Caltrans. The findings of the preliminary assessment indicated that releases of hazardous materials including gasoline and diesel fuel had occurred at the site and had impacted soil and groundwater beneath the site.

Caltrans required additional characterization at those sites which were found to contain contamination by the preliminary assessment prior to final appraisal and acquisition. The property owners were provided the option by Caltrans to perform necessary assessment and remediation under private direction according to appropriate local and state regulatory agency guidelines and laws. Additional assessment and remediation was performed at the TASCO site during January, February and October of 1993 by Aqua Science Engineers, Inc (ASE). Caltrans and Cal-EPA DTSC has required documentation of the assessment and remediation to be presented in the Preliminary Endangerment Assessment Report (PEA) format which was made part of the Cal-EPA site mitigation process on July 1, 1989.

Based on the site-specific activities performed, samples collected, and analytical testing, it is the opinion of ASE that the data collected has provided the specific information required as per the State of California, Department of Health Services, DTSC "Interim Guidelines for Preparation of a PEA Report", dated June 1990. The quality of data supplied, as reported by the laboratories contracted for this assessment, falls within the range as prescribed by the California EPA.

2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Identification

- *Site Name*: Thomas A. Short Company (TASCO).
- *Site Address*: 3430 Wood Street, Oakland, California.
- *Mailing Address:* Same as above.
- *Telephone Number*: (510) 655-9375.
- *Other Names:* TASCO.
- *EPA Identification Number:* CAC 00086008.
- *ASPIS (Calsites) Database Number:* Not listed as of March 8, 1993.
- *Assessor's Parcel Number*: Assessor's Map 7, Book 605, Lot 1-10 (Figure 2).
- *Township, Range, Section, and Meridian:* T1S, R4W, Section: 22, Meridian: M.
- *Map of Site Location:* A site location map is provided as **Figure 1**.

Based on a discussion with Mr. Thomas D. LaFlamme, President of TASCO, the site was a vacant lot prior to TASCO's arrival. A review of available aerial photographs of the area did not reveal any previous structures or suspect activities.

2.2 Past and Current Site Activities

- *Business Type:* Manufacturing, repair and distribution of industrial/commercial marine valves and associated parts and accessories.

- *Years of Operation:* 36 years at subject site.

- *Facility Ownership/Operators:* 50% Mrs. Geraldine Short
  50% The Trust of Thomas A. Short

- *Property Owners:* Same as above.

- *Site Business Activities or Manufacturing Processes:*

  On an annual basis, approximately 1,200 valves and associated valve parts and accessories are repaired on site. Repairs include cleaning, welding, lubrication, sealing and painting. On an annual basis, approximately 2,000 new valves and associated parts and accessories are manufactured and distributed as per client drawings and specification. A summary of the primary materials and chemicals used in these processes is provided below:

Materials	Chemicals
Steel	Water based paint
Aluminum bronze	Rust inhibitors
	Lubricating grease
	Cutting lubricants
	Cleaning Solvents (small quantities)

Description of Manufacturing Processes

A map of the process centers is provided as **Figure 3**. The physical processes used during manufacturing at the subject site are:

- Milling Steel
- Drilling Steel
- Cutting Steel
- Welding
- Tap/Dye
- Steam Cleaning
- Sandblasting
- Painting

2.3 HAZARDOUS SUBSTANCE/WASTE MANAGEMENT

2.3.1 Hazardous Substances/Wastes Identification and Quantities

Aqua Science Engineers identified six (6) processes or activities currently and historically performed on the site which utilized or generated hazardous substances or wastes. The processes or activities are or were:

1) Motor vehicle fuel storage and use (underground fuel storage tanks)
2) Storage of chemicals, lubricants and paint
3) Maintenance of tools, machinery and motor vehicles
4) Machining of metal and composite parts
5) Sand blasting, painting and corrosion protection
6) Steam cleaning

The amount and type of hazardous substance utilized or hazardous substances/wastes generated per year from these processes or activities, and the final disposition of the substances/wastes are as follows:

Motor Vehicle Fuel Storage and Use:

TASCO formerly operated two underground motor vehicle fuel storage tanks (USTs) and two associated above ground suction-type product dispensers (**Figure 3**). The USTs consisted of one 1,000 gallon diesel tank, and one 4,000 gallon gasoline tank. The USTs and associated product piping/dispensers were removed during January, 1993. The system was formerly used to fuel company vehicles. Before removal of the system, the average volume of diesel and gasoline purchased by TASCO per year was 1,700 gallons, and 2,000 gallons, respectively.

Storage of Chemicals, Lubricants , Cleaners and Paint:

Aqua Science Engineers identified seven (7) different types of virgin chemicals, lubricants, cleaners and paint stored and used by TASCO. **The locations of the hazardous substance/material storage areas are indicated on Figure 3.** The type and volume of hazardous material/substance identified at the site, and the yearly quantity purchased are as follows:

Hazardous Material/Substance	Volume Identified	Yearly Purchase
Toluene	55 Gallons	385 Gallons
Methyl Ethyl Ketone (MEK)	55 Gallons	165 Gallons
Chevron 360 Cleaner (Stoddard)	55 Gallons	55 Gallons
30W Oil	2 Gallons	9 Gallons
Cutting Oil	5 Gallons	25 Gallons
Water-Based Paint	3 Gallons	3 Gallons
Gear Oil	25 Gallons	25 Gallons

Per conversations with TASCO manufacturing personnel, the toluene, stoddard-type solvent and MEK are used only as cleaning solutions for small parts during the different phases of manufacturing and prior to painting. Typically the solvents will be used on an absorbent rag to wipe down the parts. Typically less than a gallon at a time is handled by the personnel. These small quantity, above-ground, secondary-contained solvents are the only ones used during manufacturing activities at the site. Equally, these cleaning solvents are not used in conjunction with the steam-cleaning unit, and are not disposed of as hazardous waste; they are used until spent.

Maintenance of Machinery, Tools and Motor Vehicles:

As depicted on **Figure 3**, there are many manufacturing/production machines used on site; i.e: drill presses, lathes, milling machines, etc. Each of these machines is maintained on a daily basis by carefully inspecting prior to use. Daily maintenance of the machines includes lubricating the appropriate moving parts, making certain the machines' motors are properly lubricated with oil, and general housekeeping of the production machines. Virgin chemicals/materials (oil, lubricants, etc.) are used during these procedures. Based on a site visit and brief conversations with site personnel, hazardous wastes are not generated as a part of these procedures.

Machining of Metals and Composite Parts:

During the machining of the metal valves and associated parts, metal fragments and chips are generated as part of the process. The metal chips and fragments are collected and stored in an on-site, appropriately labeled, holding bin prior to salvaging/recycling at a local metals recycler.

Sand Blasting, Painting and Corrosion Protection:

Metal valves and associated parts are sand blasted in the sand blasting unit (see **Figure 3** for location of the sand blasting unit). The sand used is "Green-Diamond 20 x 50 Fine", from Clementina, Inc. The make-up of the sand does not include an MSDS from Clementina. It is used/recycled on site until it turns into dust (no longer effective). The residual/reused sand and sand-dust is contained in the baghouse; from there the material is collected and disposed of off-site by an authorized waste management company. On an annual basis, 15 tons of sand are used at the site. The entire sand blasting unit is enclosed in a metal building with a sliding door.

Painting of the metal valves and associated parts is performed in the paint booth (see **Figure 3** for location of paint booth). The paint products are water-based and at no time does the storage of paint include more than 3 gallons (conversations with TASCO personnel verified the use of only water-based paint). Corrosion protection is basically the use of the water-based paint to reduce the affects of the atmosphere on bare metal. Each of these processes are permitted for use through the Bay Area Air Quality Management District. **Copies of the associated permit can be found in Appendix I.**

Steam Cleaning:

Prior to repair of many valves and associated parts, a steam cleaner unit has been used to remove built-up layers of oil and grease. (see **Figure 3** for location of steam cleaning unit). This below-ground steam cleaning unit's dimensions are: 9' x 7' x 4' deep. Also in the area near the steam cleaning unit is an oil-water separator/clarifier with the capacity of approximately 250 gallons (5' x 2' x 3' deep) that sits just west of the steam cleaning unit. The two are piped together. The clarifier is connected to the local sanitary sewer. In a conversation with TASCO personnel, it was indicated that periodically the steam-cleaning and clarifier sludge had been removed and disposed of off-site; however, during the relocating process and downsizing of the company, manifests regarding such removal were unable to be located.

2.3.2 *On-Site Storage, Treatment and Disposal*

The sources of information for on-site hazardous materials storage, treatment and disposal which Aqua Science Engineers utilized for TASCO included visual inspections by ASE of the site, interviews with the TASCO personnel, reviews of TASCO files, and inquiries with the following agencies:

- DTSC Regional Office (Berkeley)
- Regional Water Quality Control Board (San Francisco Bay Region)
- Alameda County Water District
- Alameda County Health Care Services Agency (ACHCSA)
- City of Oakland Fire Department
- Federal EPA

On-Site Hazardous Substances/Wastes Storage Units:

The locations of current and former hazardous substances/wastes storage units at the TASCO site are provided on **Figure 3**. A total of four locations were identified by ASE. The locations numbered on **Figure 3** correspond with the following description:

Number	Type	Capacity	Contents
1	Steel underground fuel tank	4,000 Gallons	gasoline
	Steel underground fuel tank	1,000 Gallons	#2 diesel
2	Concrete sump/clarifier	250 Gallons	waste water
3	Chemical storage area	250 Gallons	cutting oil, gear oil machine oil (30W)
4	Flammable liquid storage area	200 Gallons	Toluene, MEK, Chevron 360 paint (water-based)

On-Site Hazardous Waste Treatment Facilities:

Aqua Science Engineers discovered no evidence of on-site hazardous waste treatment facilities except for a sump/clarifier which is connected to a municipal sewer line located west of the site. The clarifier is associated with the concrete sump/steam-cleaner unit described above (location #2).

On-Site Hazardous Waste Disposal Practices:

Aqua Science Engineers discovered no visual evidence or record of the practice of on-site disposal of hazardous wastes at TASCO.

Containment of Hazardous Substances/Wastes:

All of the on-site chemicals that are used on a daily basis are stored within secondary containment units. An oversized pan is used to catch any leaks or drips that may occur when dispensing the chemicals for use. Drips and leaks, as they occur, are remediated immediately, and the wastes, if any are handled and disposed of appropriately.

Concrete flooring, ranging from 6-12 inches thick, covers the entire site where operations, manufacturing, and assembly occur; the floor was inspected and found to be sealed and free of significant cracks. Equally, these same areas are covered by buildings. The concrete floors have several floor drains dispersed throughout. Manufacturing operations are typically dry operations, and do not include the use of the floor drains as a means of spill diversion. The floor drains are piped to the local sanitary sewer system.

The steam cleaning area is surrounded by a concrete berm.

As depicted on **Figure 3**, the site has storage capabilities for their flammable chemicals in the breezeway. The chemicals stored in this flame resistant building include the Toluene, MEK, Chevron 360 solvent, and the paint.

At this time, the site has no capabilities to process its storm water prior to discharge to the storm sewer located one block south on Wood Street. The areas used to conduct the processes at the TASCO Facility are all covered by buildings.

Hazardous Waste Recovery and Recycling:

Based on conversations with TASCO personnel, chemicals and lubricants are used until they are spent through use. Metal shavings and cuttings are recovered and stored on-site in an appropriately-labeled storage bin for future salvaging/recycling by a local metals recycler (Radomsky Salvage). Approximately 6,000 pounds of scrap metal is removed from the site and recycled annually. The sand is re-used over and over until it becomes too fine (dust) to be effective. At that time, the material is removed from the site by an authorized waste management company.

2.3.3 Regulatory Status

TASCO maintains the following federal, state and local hazardous substance/waste permits for site operations:

Permit:

Bay Area Air Quality Management District

S1: CHEM/MISC> Abrasives blasting, Gravel/Sandblasting room
S2: Spray booth, Air atomized, 10.54 gal/yr solvent, Spray Paint Booth
S4: Solvent cleaning, 25 gal/yr net solvent, wipe cleaning

Effective Dates:

Expires August 1, 1993.

Conditions:

Source 1: 1) S-1 shall be abated by the A-1 baghouse at all times.

2) The A-1 baghouse shall be maintained in good operating condition.

Source 4: 1) Net solvent usage for wipe cleaning shall not exceed 56 gallons during any consecutive 12 month period

2) Only Shell Solvent 360 shall be used as a wipe cleaning solvent and only used in the quantity indicated in condition #1 unless the District provides written authority to use other solvents.

3) An accurate District approved logbook shall be maintained on a monthly basis for the type and quantity of wipe cleaning solvent used in this operation. These records shall be retained for a period of at least two years from the date the first entry. The log shall be kept on site.

2.3.4 Inspection Results

The following is listing of inspections conducted at TASCO by federal, state and local agencies for which records are maintained at the respective agencies. Included in the listing are the inspection dates and significant findings.

Inspection Date:

12/18/92

Inspecting Party:

National Board of Boiler and Pressure Vessels Inspectors

Findings:

Inspected and tested all air, gas and steam lines. No citations issued. Inspection valid through 12/6/95. Inspection #VR-31.

2.4 APPARENT PROBLEM

There are three primary potential sources of contamination at TASCO which have been identified during records research and sampling by Aqua Science Engineers and others. These sources are: 1) the two underground fuel storage tanks, 2) the concrete sump/clarifier and steam cleaning area; 3) the top five feet of fill material which was imported to the site prior to construction of the TASCO facility.

2.4.1 Underground Fuel Storage Tanks

The initial sampling which identified the two USTs and related plumbing as sources of contamination at TASCO was conducted by Geo/Resource Consultants, Inc., during June, 1992. This investigation was directed by Caltrans as part of an area-wide baseline assessment project for property acquisition. Location of soil borings and groundwater monitoring wells installed for this investigation are provided on **Figure 4.**

Chemical analysis of soil samples collected during the initial subsurface investigation indicated gasoline and diesel fuel was present in soil in the immediate area of the underground storage tanks **(Table 1).** Chemical analysis of groundwater samples collected during this investigation indicated the gasoline and diesel fuel detected in soil had impacted shallow groundwater which is located approximately 10-12 feet beneath the site **(Table 3).** The primary environmental resources which were impacted by the gasoline and diesel fuel are soil and shallow groundwater. The primary pathways of human, wildlife and plant exposure is expected to be: 1) direct physical contact with contaminated soil, 2) breathing of volatile vapors emitted from exposed soil or groundwater, and 3) direct physical contact of contaminated groundwater (accumulation in open excavation).

2.4.2 Concrete Sump and Steam Cleaning Area

The initial sampling which identified the concrete sump and steam cleaning area as potential sources of contamination was also conducted by Geo/Resource Consultants as part of the Caltrans base line assessment **(Tables 1 & 2).** The locations of the soil borings installed for this investigation are provided on **Figure 4.**

Chemical analysis of soil samples collected from the soil borings indicated elevated concentrations of total recoverable petroleum hydrocarbons, halogenated and non-halogented volatile organics, and some CCR Title 22 priority pollutant metals were present in soil around and beneath the sump. The primary environmental resource which had been impacted by the contamination was soil. Groundwater sampling was not conducted in this area during that time. The primary pathways of human, wildlife and plant exposure are expected to be the same as described in section 2.4.1.

2.4.3 Imported Fill Material

Imported fill material was encountered during drilling of the above mentioned borings from the ground surface to approximately five feet beneath the ground surface (bgs). Native soil is present beneath the fill material. **The fill material contains soil, household items (bottles), construction scrap (concrete, asphalt, wood, wire, nails), and possibly manufacturing waste (metal filings, waste solids and liquids). The fill material was imported to the site prior to construction of the TASCO facility. The source of the fill is unknown. However, the contents of the fill suggests that the site sits on an area of construction debris.**

Chemical analysis of soil samples collected from the fill material indicated elevated concentrations of total recoverable petroleum hydrocarbons, halogenated and non-halogented volatile organics, and some CCR Title 22 priority pollutant metals were present **(Tables 1 & 2, and Figure 4)**. At the time of the Geo/Resource investigation, it was not clear if the fill material was the source of the detected contamination. The primary environmental resource which was impacted by the contamination was soil. The primary pathways of human, wildlife and plant exposure are expected to be the same as described in section 2.4.1.

2.5 ENVIRONMENTAL SETTING

2.5.1 Factors Related to Soil Pathways

Chemical analysis of soil samples collected during previous subsurface investigations indicate releases of hazardous materials have occurred at the TASCO site and have impacted soil beneath the site. Chemical analyses conducted on soil samples collected from borings drilled around the USTs indicated gasoline and diesel fuel was present in soil. The only source of motor fuels in the immediate area are the USTs and related plumbing. Chemical analysis of soil samples collected from soil borings drilled adjacent to the concrete sump/clarifier and steam cleaning area indicated total recoverable petroleum hydrocarbons, CAM 17 metals and volatile organics are present in soil. Hazardous substances which enter the sump/clarifier may include steam-cleaning condensate which is suspected to contain machining and lubricating oil, grease, and possibly solvents.

Remedial activities which have taken place at TASCO include the removal of the two USTs and related plumbing, and excavation of gasoline and diesel impacted soil beneath and adjacent to the USTs during January, 1993. The tank closure and soil excavation was conducted by Aqua Science Engineers under the direction of the ACHCSA. Chemical analysis of post excavation soil samples indicate gasoline and diesel impacted soil has been adequately removed (soil samples from the overexcavation limits had highs of 19 ppm TPH as gasoline, 0.031 ppm benzene, and 15 ppm lead) **(Table 4)**. ASE received verbal approval for no further overexcavation per a telephone conversation with Ms. Jennifer Eberle, the LOP representative of the ACHCSA. The excavation was backfilled, upon verbal approval, with clean, imported fill and compacted. Therefore, the path of contaminant flow is now incomplete **(see Appendix X for the UST closure report)**.

Topography and Surface Slope of the Site and Surrounding Areas:

Based on a review the USGS Oakland West 7.5 minute quadrangle, the site rests on a primarily flat surface with a ground surface elevation of approximately 15-feet above mean sea level (AMSL). The surface of the area east of the site slopes gently west-southwest at an average gradient of approximately 0.010 ft/ft. The immediate surrounding area is similar in elevation and topography.

Site Land Use and Zoning:

Based on a conversation with Ms. Marina Carlson of the City of Oakland Zoning Department, the site is zoned for "general industrial" usage.

Evidence of Environmental Impacts:

Evidence of environmental impact of contamination at the site are stained and odorous soil which was present in soil borings drilled around the USTs and sump. Stained and odorous soil was also noted on the bottom and walls of the UST excavation pit after removal of the USTs (which was subsequently removed from the excavation and stockpiled on site).

Predominant Hydrologic Soil Group:

Based on a meeting with Mr. Richard Hiett of the RWQCB, San Francisco Bay Region, and review of a USGS Dept. of the Interior Map of the Oakland West area, it was determined that the predominant soil groups are the Bay Mud Formation, consisting of esturaine clay, marine and non-marine deposits (silty sandy clays and silty clays), and several undefined gravel and sand layers which are not totally characterized as far as thickness, depth, and location at this time.

Soil Permeability in the Unsaturated (Vadose) Zone

The unsaturated (vadose) soil zone at the site exists from the surface, to approximately 10 feet bgs. The static depth of the groundwater surface is currently 10-12 feet bgs. **Logs of soil borings drilled at the TASCO site by Geo/Resource and Aqua Science Engineers are provided in Appendices II and III, respectively.** The soil types, encountered depths, and estimated permeability range for the unsaturated zone are as follows:

Soil Type (USCS)	Depth	Permeability (k)
Fill containing silt, clay sand, asphalt, concrete, and household refuse	0 ft. to 5 ft.	Unknown
Very fine sand (SP) with some silt	5 ft. to 6 ft.	10^{-9} to 10^{-7} cm^2
Highly organic clay (OH) containing abundant humus	6 ft. to 8 ft.	10^{-12} to 10^{-9} cm^2
Clay (Bay Mud) (CL) containing some humus	8 ft. to >10 ft.	10^{-15} to 10^{-12} cm^2

The least permeable layer of soil within the vadose zone appears to be the clay (CL) first encountered at approximately eight feet bgs. The estimated high value permeability for this type of soil is 10^{-12} cm^2.

This soil type extends below the current static groundwater elevation. The 1-foot thick sand zone that was found during the UST removal operations was not equally identified in the on-site borings and well drilled by ASE. The only logical reasoning behind this is that during sampling, the intervals of sample collection may not have included this 1-foot thick zone. Data in this section was referenced from: Cherry, John and R. Allen, Freeze, 1979, Groundwater, p. 29.

Seismic Stability of Soils Beneath the Site

Based on the "Flatland Deposits - Their Geology and Engineering Properties and Their Importance to Comprehensive Planning" report, which details the S.F. Bay Region, California, dated 1979, the site rests within Zone C (Very Strong Earthquake Potential) as classified by the 1906 S.F. Earthquake Scale of Wood (1908).

Site Accessibility

Based on a site visit by Aqua Science Engineers personnel, the site is completely surrounded by a cyclone-type fence and gate system. The site is also secured by a laser-type security system which patrols the facility during non-production periods.

Measures Taken to Prevent Direct Contact with Contaminated Soil

The site is completely covered by a combination of asphalt, concrete, or buildings and associated foundation pads. Areas that were previously exposed to contaminated soil (i.e. open tank excavation, boreholes, trenches, etc.) have now been appropriately and completely backfilled.

Locations and Distances of Nearest Residential Area, School, Hospital, etc., to the Site

UNIT	DISTANCE
Business Area	Abutting site in all directions
Residential Area	400 feet southeast of site
McClymonds High School	3/4 mile southeast of site
Unknown Intermediate School	1 1/8 miles east of site
Day-care	None known within 1-mile of site
Hospital	None known within 1-mile of site
Nursing Home	None known within 1-mile of site
Day-care	None known within 1-mile of site
Senior Citizen Community	None known within 1-mile of site

The above-referenced information is based on Thomas Bros. Maps for the Oakland, West area, and current City of Oakland Planning/Zoning Department Maps. **Copies of these maps are provided in Appendix IV.**

Location and Distance of Nearest Critical Wildlife Habitat

Based on the State of California Department of Fish and Game "Natural Diversity Data Base (NDDB) for the Oakland West 7.5 minute quadrangle" the following sites are within a 1-mile radius of the TASCO Facility. **For further detailed information regarding the following sites, please see Appendix V.**

1) NORTHERN CALIFORNIA SALT MARSH. A Natural Community as described by the NDDB. This natural community is 2/10 of 1-mile from the TASCO facility.

2) REITHRODONTOMYS RAVINENTRIS - SALT MARSH HARVEST MOUSE. This federal and state endangered species is approximately 3/10 of 1-mile from the TASCO facility.

3) LATERALLUS JAMAICENSIS COTURNICULUS - CALIFORNIA BLACK RAIL. This state threatened bird is within 3/10 of 1-mile from the TASCO facility.

4) HOLOCARPHA MACRADENIA - SANTA CRUZ TARPLANT. This state endangered plant is approximately 5/10 of 1-mile from the TASCO facility.

Aqua Science Engineers is not aware of any on-site contamination in the soil or groundwater that can presently or potentially affect any flora, fauna, or sensitive ecosystem as identified by the NDDB.

2.5.2 *Factors Related to Water Pathways*

Chemical analysis of groundwater samples collected during previous investigations indicate releases of hazardous materials have occurred at the TASCO site and have impacted groundwater beneath the site **(Table 3)**. Chemical analyses conducted on groundwater samples collected from a groundwater monitoring well and from "Hydropunch" method at the UST location indicated gasoline and volatile aromatic hydrocarbons (BTEX) were present in groundwater. The only source of motor fuels in the immediate area are the USTs and related plumbing. Furthermore, soil contamination in this area is known to extend to the groundwater surface. It is highly probable that the 1-foot thick layer of very fine sand found during the tank removal operations is acting as the conduit for contamination transfer from soil to the groundwater.

Net Seasonal Precipitation Levels

Based on communications during an interview with the Alameda County Zone 7 Flood Control and Water Conservation District representative, Mr. Andreas Godfrey, it was determined that the site rests within the zone of 22-inches of annual rainfall. This value was retrieved from the "Hydrology and Hydraulics Criteria Summary", Western Alameda County. Alameda County Flood Control District, 1989. From the US Department of Interior Geologic Survey.

Local Hydrology

The site is located in the East Bay Plain groundwater basin. The main regional water-bearing unit is a 200-foot thick Pleistocene alluvial deposit, beginning at about the 10-12 foot depth in the site vicinity, that extends beneath West Oakland and most of the East Bay Plain area. Most groundwater in the East Bay Plain is used for irrigation or industrial purposes. Most domestic water is supplied by the East Bay Municipal Utility District and the City of Hayward from surface water sources that have been developed outside of the Plain area. Little groundwater is pumped for domestic consumption (Alameda County Flood Control and Water Conservation District - Zone 7, 1988).

Based on data derived from Aqua Science Engineers and previous consultants, site-specific groundwater sampling has determined a shallow water-bearing zone approximately 10-12 feet below ground surface has been contaminated from an on-site release. This shallow water-bearing zone has a groundwater flow direction toward the west at a gradient of 0.010 ft./ft.

Aquifers Impacted by Releases at the Site and Water Use Data

Based on the sampling events performed by ASE on February 12, 1993 and October 12 & 14, 1993, the shallow water-bearing zone beneath the site has been impacted by a release due to activities at the site. Further regional data regarding this subject and this water-bearing zone was not available at the Department of Health Services Public Water Supply Branch in Berkeley, CA. ASE spoke with Mr. Cliff Bowen, District Engineer, regarding the subject data. His response was that DHS records did not include this subject's data. As discussed previously, most groundwater in the East Bay Plain is used for irrigation or industrial purposes. Most domestic water is supplied by the East Bay Municipal Utility District and the City of Hayward from surface water sources that have been developed outside of the Plain area. Little groundwater is pumped for domestic consumption.

In conversations with the Zone 7, Alameda County, Flood Control and Water Conservation District ASE was informed that data regarding known aquifers and their significant features (conductivity, temp., etc.) in the Alameda County (Oakland area) is not presently available. A report compiling data regarding aquifers in the immediate area of the site is being produced at this time by the afore-mentioned agency.

Here is what the available data shows. As for groundwater uses in the area, based on the Alameda County - Bay Plain Groundwater Study - Well Inventory Report (prepared by the Z7ACFCWCD) there are no identified groundwater wells in a 1/2 mile radius from the site that use groundwater for drinking, industrial processes or irrigation. **A copy of the Z7ACFCWCD report is provided in Appendix VI.**

Possible Contamination Migration Routes Via Surface Water Runoff or Flooding

As detailed on the map provided by the City of Oakland Public Works Department (**Appendix VII**), there is a storm drain located approximately 500 feet south of the subject site on Wood Street at the corner of 34th Street. Surface runoff is directed to this storm drain inlet.

Locations and Uses of Surface Waters which may be Effected by Contamination Migration

The nearest surface water, the San Francisco Bay Salt Marsh and Tidelands, marsh, wetland, and critical habitat, are located approximately 1/4 to 1/2 mile to the west of the site. As detailed in a previous section, approximately 2/10 of 1 mile west of the site is a natural habitat; the home to multiple plant and wildlife species. This natural habitat, The Northern Coastal Salt Marsh, however is not among those on the state or federal endangered list. Based on the findings of chemical analysis of soil and groundwater samples collected from various points at the subject site, it is highly unlikely that a significant risk of surface water contamination is possible. Surface waters of the San Francisco Bay Salt Marsh and Tidelands are not used for human consumption.

Locations and Runoff Flow Distances to Nearest Downhill Surface Water

Data regarding this subject was not available at the Department of Health Services Public Water Supply Branch in Berkeley, CA. ASE spoke with Mr. Cliff Bowen, District Engineer, regarding the subject data; his response was that DHS records did not include this subject's data.

Measures for Preventing or Mitigating Surface Water Runoff from the Site

The areas in which production, manufacturing, assembly, storage and or use of chemicals or wastes at the site are covered by buildings which prevents surface water runoff to come in contact with potentially hazardous materials. In areas where buildings do not cover potentially hazardous surfaces (the sump/steam cleaning area) the surface water runoff is directed toward the sump/clarifier which separates the oil and water prior to discharge.

Flood Plain Identification

In conversations and a meeting with the Zone 7, Alameda County, Flood Control and Water Conservation District (Z7ACFCWCD) representative, Mr. Andreas Godfrey, ASE was informed that the site lies within a Zone 'C' Flood Plain based on the "National Flood Insurance Firm" map entitled Flood Insurance, City of Oakland, Community Panel #0690480015B, effective 9-30-82. Areas within a Zone 'C' Flood Plain have a flood recurrence interval of once in 500 years. Presently, the site has no flood control measures such as a full site dike/berm system.

Identification of Population, Industry and Agriculture Served by Surface Water Intakes

In conversations and a meeting with the Zone 7, Alameda County, Flood Control and Water Conservation District (Z7ACFCWCD) representative, Mr. Andreas Godfrey, and Mr. Cliff Bowen, District Engineer at the Department of Health Services Public Water Supply Branch in Berkeley, ASE was informed that there are no downstream surface water intakes that serve as a drinking water source for human, agricultural, or industry consumption.

2.6 SAMPLING ACTIVITIES AND REQUIREMENTS

2.6.1 Past Sampling Activities

A preliminary subsurface soil and groundwater assessment project was conducted at the TASCO site by Geo/Resource Consultants, Inc. during June, 1992. The preliminary assessment project was directed by Caltans as part of an area-wide environmental baseline assessment for possible property acquisition. The assessment project consisted of drilling three soil borings and one Hydropunch boring around the underground fuel storage tanks (**Figure 4**). The soil borings were drilled using a truck-mounted drill rig equipped with hollow stem auger. Two of the soil borings were drilled to 14 feet (borings B-1 and B-2) and one was drilled two 20 feet (boring W-1).

Boring W-1 was converted to a 20 foot depth, two-inch diameter PVC groundwater monitoring well. The Hydropunch boring (H-1) was advanced to 18 feet bgs. Additionally, one 1.8 foot depth and one 3.5 foot depth soil boring were drilled adjacent to the concrete sump and steam cleaning area (borings A-1 and A-2, **Figure 4**). These boring were drilled using a hand-driven auger. **Soil boring and well construction logs are provided in Appendix II.**

Driven soil samples were collected in soil borings B-1, B-2, H-1, and W-1 at 2.0 ft., 5.0 ft., 8.0 ft., and 14 ft. bgs. Soil samples were collected in boring A-1 at 1.0 ft. bgs, and at 1.0 ft. and 3.0 ft. bgs in boring A-2. Groundwater samples were collected by Hydropunch method in boring H-1 and from groundwater monitoring well W-1. The static depth to groundwater in W-1 was measured at 12.7 feet below the top of casing on July 1, 1992.

Information regarding which laboratory performed the chemical analysis of soil and groundwater has not been made available. According to the sections of the Geo/Resource report which have been made available by Caltrans, the soil samples collected from borings B-1, B-2, H-1 and W-1 were chemically analyzed for total petroleum hydrocarbons, gasoline and diesel fraction (TPH-G, D; EPA Method 8015 modified), Title 22 metals (EPA Method 6010), and benzene, toluene, ethyl benzene, and xylenes (BTEX; EPA Method 8020). The soil samples from borings A-1 and A-2 were chemically analyzed for total recoverable petroleum hydrocarbons (EPA Method 418.1), Title 22 metals (EPA Method 6010), and volatile organic compounds (EPA method 8240). The 1.0 ft. soil sample from boring A-1 exceeded the TTLC for lead. Several samples exceeded 10X the STLC for copper and lead based on TTLC analysis. According to the Geo/Resource report, these samples were re-submitted for STLC analysis. The groundwater samples from well W-1 and Hydropunch point H-1 were analyzed for TPH-gasoline, TPH-diesel, and BTEX.

The results of the chemical analyses are summarized in Tables 1, 2 and 3. The actual laboratory reports and QA/QC analysis performed by previous consultants and their laboratories were not available. **The sections of the project report prepared by Geo/Resource Consultants which were made available to Aqua Science Engineers are provided in Appendix VIII.**

2.6.2 *PEA Sampling Activities*

The sampling activities performed for this PEA have been divided into three phases based on the *Guidance For Preparation of a Preliminary Endangerment Assessment Report* prepared by the Cal-EPA, Toxic Substances Control Division. The three phases are as follows: 1) sample plan preparation; 2) sample collection and analysis; 3) evaluation of sampling results. **Since sampling was conducted as part of this PEA, the sample plan has been submitted with this report (Appendix IX).**

Sample Plan Preparation

The objectives of sampling at the TASCO site were to determine the following:

1) Confirm adequate removal of gasoline and diesel impacted soil from the UST locations.

2) Further investigate the extent of soil contamination adjacent to the concrete sump for total recoverable petroleum hydrocarbons (TRPH), halogenated and non-halogenated volatile organics, and CAM 17 metals.

3) Investigate the possibility of groundwater contamination beneath the concrete sump for TRPH, volatile halogenated and non-halogenated volatile organics, and CAM 17 metals.

4) Further investigate the presence of groundwater contamination beneath the UST locations for gasoline, diesel and BTEX.

5) Investigate the vertical extent of surface fill material and investigate contamination in the fill for TRPH, CAM 17 metals, and halogenated and non-halogenated volatile organics.

6) STLC and TTLC analyses will be conducted for comparison purposes only.

7) The sand blast unit area is not an area of investigation because it is a fully enclosed, dry operation and is housed on a concrete surface. The chemicals MEK, toluene and stoddard-type solvents which are stored above-ground, in small quantities and within secondary contained, bermed areas will also not be investigated for unless otherwise specified.

The rationale of each of the objectives were as follows:

1) Subsequent to removal of USTs in Alameda County, the ACHCSA requires that fuel-impacted soil be removed to minimize possible future health hazards and environmental impact. Approximately 175 cubic yards of gasoline and diesel impacted soil was removed from the excavation and is currently stockpiled/covered on site. Collection and chemical analysis of post excavation soil samples were required to confirm the adequate removal of soil (**see Appendix X for details**).

2) Elevated concentrations of CAM 17 metals, TRPH and volatile organics were detected in soil adjacent to the concrete sump by the previous investigation. Samples were not collected deeper that 3.0 feet for the previous investigation. Additional sampling was required to further define the vertical and lateral extent of contamination in soil at this elevated risk area.

3) The depth to groundwater beneath the site is approximately 10-12 feet bgs. The shallow occurrence of groundwater required that sampling be conducted at the steam cleaning/concrete sump area to determine if groundwater had been significantly impacted by the contamination discovered in soil.

4) Groundwater samples collected from well W-1, located adjacent to the USTs, indicated elevated concentrations of gasoline and BTEX were present. Chemical analysis of additional samples were required to confirm the presence of contamination, provide current chemical analysis data, and to confirm that the removal of impacted soil would be adequate for remediation in this area according to ACHCSA requirements.

5) Approximately five feet of surface fill material was identified in all of the borings drilled for the previous investigation. The fill material was noted to contain glass, concrete, asphalt and other refuse. The origin of the fill is unknown. The fill material was imported to the site prior to construction of the TASCO facility. Investigation and sampling was required to further characterize the extent for the fill and possible contaminant content.

6) ASE assumed that if contaminated material would be required to be overexcavated and disposed of off-site, TTLC and STLC analyses would assist in determining the appropriate handling and disposal options.

The following standards and guidelines were used in preparation of the sample plan:

1) ACHCSA requirements for assessment and remediation.
2) EPA SW 846 *Test Methods for Evaluating Solid Wastes*
3) EPA 500 *Methods for Determination of Organic Compounds in Drinking Water*
4) EPA 600 *Methods for Chemical Analysis of Water and Wastes*
5) RWQCB LUFT Manual
6) CCR Title 22, Chapter 30, Article 11
7) CCR Title 23, Chapter 16, Article 1
8) Federal Register

Sample Collection and Analysis

1) UST Post Excavation Soil Sample Collection and Chemical Analysis:

The two USTs and related plumbing at the TASCO site were excavated and removed on January 28, 1993. The USTs were removed under permit and supervision of the Alameda County Health Care Services Agency (ACHCSA) and the City of Oakland Fire Prevention Bureau. The tanks were last used to contain unleaded gasoline and diesel fuel (per TASCO purchase order files). The former UST locations are provided on **Figure 3.** Soil sample were collected as a formality from beneath the USTs after removal. **The UST closure report prepared for ACHCSA is included as Appendix X.**

In accordance with ACHCSA requirements for remediation of fuel impacted soil, Aqua Science Engineers excavated approximately 175 cubic yards of gasoline and diesel impacted soil from the former UST area on January 29, 1993. The chemical analysis results and boring locations conducted by Geo/Resource during the previous investigation were used as a guide for initial excavation. During excavation, groundwater was encountered at approximately ten feet bgs. Excavation was continued vertically to approximately one foot below first encountered groundwater. Excavation below this depth was not required by the County of Alameda. Soil samples were collected from the bottom and walls of the pit during excavation by backhoe and screened for volatile organic carbon using a Photovac™ portable photoionization detector. The soil screening activities were used as a guide for continued lateral excavation.

Soil excavation continued laterally until the sample screening indicated low levels of residual volatile organic carbon. At that time, confirmation soil samples were collected from the excavation under the supervision of Ms. Jennifer Eberle of the ACHCSA, and Mr. Michael Marello, R.G. #5339 of Aqua Science Engineers. The samples were collected from backhoe scoops of soil taken from the side-walls of the excavation approximately six to ten inches above groundwater level. Precleaned stainless steel tubes were driven into the scoops of soil until completely full. A total of six confirmation soil samples were collected. These samples were designated E-1, E-2, N, S-1, S-2 and W. Grab soil samples were also collected from the excavated soil stockpile. These samples were designated STKP-E and STKP-W. The ends of the tubes were secured with double-thickness aluminum foil, plastic end-caps and tape. The sample tubes were subsequently numbered and placed in an ice chest for temporary cold storage. A diagram showing the dimensions of the excavation and soil sample collection locations is provided as **Figure 5.**

The soil samples were submitted to Priority Environmental Labs (PEL) located in Milpitas California for chemical analysis. PEL is Cal-EPA certified for the chemical analyses performed for this phase of the investigation (DHS No. 1708). The soil samples were analyzed for total volatile petroleum hydrocarbons as gasoline by EPA method 5030/8015M, for total extractable petroleum hydrocarbons as diesel fuel by EPA method 3550/8015M, for volatile aromatic hydrocarbons (BTEX) by EPA method 8020, and for total lead by EPA method 7420. The complete UST removal report along with the certified laboratory report provided by PEL and the sample Chain-of-Custody document is provided in Appendix X. A summary of the chemical analysis data is provided in **Table 4.**

2) Concrete Sump, Surface Fill and Downgradient Location Soil Sample Collection and Chemical Analysis:

A total of three soil borings were drilled in the concrete sump/clarifier by Aqua Science Engineers on February 3, 1993. These soil borings were designated TSB-1, TSB-2 and W-2; boring W-2 was subsequently completed and a groundwater monitoring well as described in the next section. A total of four additional borings were drilled at locations on the northern half of the site to further investigate shallow surface fill material. These borings were designated TSB-3, TSB-4, TSB-5 and TSB-6. The soil borings were drilled using a confined space Simco 2400 drill rig equipped with 8.25-inch O.D. continuous flight hollow stem auger.

On October 8, 1993, soil boring W-3 was drilled west of the site on the opposite side of Wood Street; boring W-3 was subsequently completed and a groundwater monitoring well as described in the next section. W-3 was strategically located downgradient from the site for the purpose of investigating if the transfer of on-site contaminants was occurring in the groundwater **(Figure 4).** This third well point (W-3) would be used to identify the groundwater gradient and direction. A current gradient map is included as **Figure 6.** Drill cuttings were placed in 55 gallon steel 17H drums. The drums were labeled and left on-site. The locations of the soil borings are provided on **Figure 4. Logs of the soil borings are provided in Appendix III.**

For soil borings TSB-1, 2, 3 and W-2, soil samples were collected at 2.5 ft., 5 ft., 7.5 ft., 10 ft., and 13 ft., bgs in each of these borings. For soil boring W-3, soil samples were collected at 6 ft. and 11 ft. For soil borings TSB-4 and TSB-5, soil samples were at 2.5 ft., and 5 ft. bgs. For boring TSB-6 a soil sample was only collected at 2.5 feet. Drill refusal encountered at three feet on four attempts at drilling this boring. Not collecting a sample at five feet was a deviation from the Sample Plan. The soil borings were backfilled with Portland cement after sample collection.

The soil samples were collected ahead of the hollow stem auger using a 1.5 inch I.D. California split spoon sampler holding three six inch length precleaned brass sample tubes. A hydraulic compression hammer was used to drive the sampler into undisturbed soil. The sampler was washed with an Alconox™ and water solution and double rinsed with tap water between sample collection intervals. The ends of the tubes were secured with double-thickness aluminum foil, plastic end-caps and tape. The sample tubes were subsequently numbered and placed in an ice chest for temporary cold storage.

The soil samples from these borings were submitted to Priority Environmental Labs (PEL) for chemical analysis. The organic chemical analyses, and some of the inorganic analyses were performed by PEL. Some of the inorganic analyses were performed by Superior Precision Analytical, Inc., located in Martinez, California. **The certified laboratory reports provided by PEL and Superior Precision Analytical, and the sample Chain-of-Custody document are provided in Appendix XII.** A summary of the chemical analysis data for soil is provided below and in **Tables 5, 6, 7 and 8.**

SAMPLE IDENTIFICATION & DEPTH(S)	CHEMICAL ANALYSES (ALL OR COMBINATION)
TSB-1...2.5', 5', 7.5', 10', 13'	8015M, 418.1, 8020, 8010, CAM 17
TSB-2...2.5', 5', 7.5', 10', 13'	8015M, 418.1, 8020, 8010, CAM 17
TSB-3...2.5', 5'	8015M, 418.1, 8020, 8010, CAM 17
TSB-4...2.5', 5'	8015M, 418.1, 8020, 8010, CAM 17
TSB-5...2.5', 5'	8015M, 418.1, 8020, 8010, CAM 17
TSB-6...2.5'	8015M, 418.1, 8020, 8010, CAM 17
W-2...2.5', 5', 7.5', 10', 13'	8015M, 418.1, 8020, 8010, CAM 17
W-3...6', 11'	8015M, 418.1, 8020, 8010, CAM 17
TSB-1...2.5'	STLC Lead
TSB-5...2.5'	STLC Lead
TSB-6...2.5'	STLC Copper, STLC Lead, STLC Zinc

3) Groundwater Sample Collection and Chemical Analysis:

Groundwater samples were collected from W-1 and W-2 by ASE on February 12, 1993. **Data regarding those analytical results is included in Appendix XIV.** A second sampling event was conducted on October 12 & 14, 1993 subsequent to the installation and development of W-3 (downgradient from the site). The following sections only discuss the latter sampling event.

Soil boring W-2 was completed as a 20 foot total depth, two inch diameter schedule, 40 PVC groundwater monitoring well. Soil boring W-3 was completed as a 15.5 foot total depth, two inch diameter, schedule 40 PVC groundwater monitoring well. **Well construction details are provided on the log of borings W-2 and W-3 (Appendix III).** Pre-existing groundwater monitoring well W-1, installed by Geo/Resource, and wells W-2 and W-3 were purged on October 12 & 14, 1993 by using a precleaned, electric, down-hole, PVC pump. From each well, 5 well volumes of water were purged and placed in 55 gallon steel 17H drums. The drums were labeled and stored on-site. Groundwater samples were collected from each of these wells using new, disposable bottom-draining plastic bailers. Groundwater samples collected from the wells were placed in factory cleaned, sterile 40 ml glass VOA vials and one liter amber glass jars. **Well sampling field logs are provided as Appendix XIII.**

The groundwater samples were submitted to PEL for chemical analysis. The samples collected from W-1, W-2 and W-3 were analyzed for all or a combination of the following analyses: TPH as gasoline using EPA method 5030/8015, TPH as diesel using EPA method 3510/8015, for BTEX by EPA method 8020, for TRPH by EPA method 418.1, for halogenated and non-halogenated volatile organics by EPA methods 601/602, for CAM 17 metals, for pH by EPA method 9040, and for conductivity by EPA method 120.1.

The certified laboratory reports provided by PEL and the sample Chain-of-Custody document are provided in Appendix XIV. A summary of the chemical analysis data for groundwater is provided in Tables 9, 10 and 11.

2.6.3 Evaluation of Sample Results

UST Soil Sample Results

The chemical analyses conducted on soil samples collected during the previous subsurface investigation indicated gasoline and diesel fuel was present in soil in the immediate area of the underground storage tanks. The gasoline and diesel impacted soil was determined to extend vertically to groundwater located at approximately 10-12 feet bgs. Concentrations of gasoline in soil ranged to 14,000 ppm. Concentrations of diesel fuel ranged to 700 ppm. Volatile aromatic hydrocarbon concentrations ranged to 1,400 ppb benzene, 10,000 ppb toluene, 8,300 ppb ethyl benzene, and 60,000 ppb total xylenes (**Table 1**). The total estimated volume of soil impacted by gasoline and diesel fuel was estimated to be 175 cubic yards based on this investigation.

The chemical analyses conducted on post excavation soil samples indicated that soil containing significant concentrations of gasoline and diesel fuel had been effectively removed. Gasoline concentration in the post excavation soil samples ranged from 1.8 ppm (sample E-1) to 19 ppm (sample W). Diesel was not detected in these samples. BTEX concentrations ranged to 31 ppb benzene, 88 ppb toluene, 160 ppb ethyl benzene and 280 ppb total xylenes (sample E-1). These residual concentrations of gasoline and BTEX are not considered significant and will not require further soil excavation according to the ACHCSA. **See Table 4 and the tank removal/closure report in Appendix X.**

Concrete Sump Sample Results

The chemical analysis of soil samples collected from the soil borings conducted during the previous subsurface investigation indicated elevated concentrations of total recoverable petroleum hydrocarbons (TRPH), halogenated and non-halogented volatile organics, and some CCR Title 22 metals were present in soil around and beneath the sump/clarifier area. However, the two soil borings drilled for the previous investigation only penetrated to approximately 3.8 feet below the ground surface and did not provide sampling of chemical analysis data for soil beneath the artificial fill material, or directly above the groundwater surface **(Tables 1 & 2).**

The results of the chemical analyses conducted on the soil samples collected by Aqua Science Engineers indicate that elevated concentrations of TRPH exist in soil from the surface to approximately between 7.5 feet and 10 foot bgs directly adjacent to the concrete sump and steam cleaning area. Low concentrations of some halogenated and non-halogenated volatile organics were also detected in the soil samples collected between 2.5 feet and 13 feet bgs. Elevated concentrations of total lead were also detected in the 2.5 foot depth samples from borings W-2 and TSB-1.

The highest concentrations of TRPH, volatile organics and TTLC metals were detected in the 2.5 foot depth soil samples from the borings drilled in this area (boring W-2, TSB-1 and TSB-2). Soil between the surface and approximately five feet bgs in this area is composed of artificial fill containing asphalt, glass, construction scrap and general household refuse. The concentrations of TRPH at this depth ranged from 230 ppm (boring TSB-2) to 2,400 ppm (TSB-1). Boring TSB-1 contained the highest TRPH concentrations at depth. The 5 ft., and 7.5 foot depth samples from this boring contained 680 ppm and 280 ppm TRPH, respectively. This boring was located nearest to the steam cleaning area.

The highest concentrations of volatile organics and widest variety of detected compounds identified were also detected in TSB-1. With the exception of 1,1 Dichloroethene, halogenated volatile organics were not detected in soil samples collected beneath 2.5 feet. 1,1 Dichloroethene was detected in soil sample collected at 2.5 ft., 7.5 ft., and 13 ft. bgs in boring TSB-1 and TSB-2 ranging from 83 ppb to 23 ppb.

Total lead concentrations in the 2.5 ft. samples from borings TSB-1 and TSB-2 were detected at 420 ppm and 220 ppm, respectively. These concentrations are below the Title 22 TTLC maximum concentration of 1,000 ppm for classification as hazardous waste. However, these concentrations exceed 10X the Title 22 STLC maximum concentration of 5.0 ppm by TTLC analysis. A concentration of a Title 22 metal which exceeds 10X the STLC maximum by TTLC analysis should be considered for STLC analysis. The 2.5 ft. sample from boring TSB-1 was also analyzed for STLC lead to determine if the leachable concentrations of lead in this sample would exceed Title 22 hazardous waste criteria. STLC lead in this sample was detected at 2.5 ppm which is below the Title 22 STLC maximum concentration of 5.0 ppm. **See Tables 5, 6, 7 and 8 for analytical results regarding the above-referenced samples.**

Shallow Fill Material Sample Results

Imported fill material was encountered during drilling of the borings from the previous investigation from ground surface to approximately five feet bgs. The fill material was noted to contain asphalt and concrete scrap. Chemical analysis of soil samples collected from the fill material in the steam cleaning/concrete sump area indicated elevated concentrations of total recoverable petroleum hydrocarbons, volatile organics, and some CCR Title 22 metals were present. Soil contamination in this area was attributed to the presence of the steam cleaning area and concrete sump. The previous investigation did not evaluate the possibility that the fill material may also be a source of contamination detected in this area, and other areas of the site.

The seven on-site soil borings drilled by Aqua Science Engineers at the TASCO site encountered artificial fill material between the surface and at least five feet bgs. Native soil was encountered at 7.5 feet in borings W-2, TSB-1 and TSB-2. Fill material was encountered to total depth of borings TSB-3, 4, 5, and 6 (five feet). The fill material contained soil, abundant construction scrap (concrete, asphalt, wood, wire, nails), household refuse (glass), and possibly manufacturing waste (metal filings, waste solids and liquids). The fill material appears to have been present prior to construction of the TASCO facility.

Chemical analyses conducted on soil samples collected from borings TSB-3, 4, 5 and 6 indicate similar concentrations of TRPH and volatile organics at borings W-1, TSB-1 and TSB-2. The highest concentrations of TRPH in borings TSB-3 thorough TSB-6 were detected in the five foot depth samples (TSB-4 and TSB-5 at 3,200 ppm and 1,400 ppm respectively). The 2.5 foot depth samples from borings TSB-5 and TSB-6 contained elevated concentrations to total lead at 220 ppm and 250 ppm, respectively.

The 2.5 foot sample from boring TSB-6 also contained elevated concentrations of total barium (1,600 ppm), copper (320 ppm), and zinc (4,800 ppm). These concentrations are below the Title 22 TTLC maximum for classification as hazardous waste, but exceeded 10X the Title 22 STLC maximum concentrations by TTLC analysis. The 2.5 ft. depth samples from TSB-5 and TSB-6 were analyzed for STLC lead. The 2.5 ft. sample from boring TSB-6 was also analyzed for STLC copper and zinc. The STLC concentrations for lead, copper and zinc in these samples were below the Title 22 STLC maximum for classification as hazardous waste.

Downgradient Boring Location

Chemical analyses conducted on soil samples collected from boring W-3 indicate only minor, insignificant levels of the contaminants that were found upgradient, on-site. There were no detectable levels of TPH as gasoline or TPH as diesel. Equally, there were no detectable levels of the BTEX constituents. Insignificant levels of TRPH were detected in the 6' and 11' samples (22 ppm and 16 ppm respectively); the levels were far less than samples collected at similar depths on site. No detectable levels of VOCs were detected in either of the two soil samples. As for the CAM 17 metals, both the 6' and 11' sample resulted in detectable levels of some of the metals. However, none exceeded action levels **(Tables 5, 6 and 7)**.

Groundwater Sample Results

The chemical analysis conducted on soil and groundwater samples collected during the previous investigations indicate releases of gasoline have occurred at the TASCO site and have impacted groundwater beneath the site. Groundwater samples collected from well W-1 and from Hydropunch data point H-1 contained TVPH as gasoline concentrations of 1.3 and 16.0 mg/l (ppm), respectively. BTEX concentrations in W-1 were detected at 80 µg/l (ppb) benzene, 6 ppb toluene, non-detect ethyl benzene and 15 ppb xylenes.

Although the previous investigation determined groundwater contamination was present beneath the USTs, it did not provide sampling and chemical analysis data for groundwater beneath the steam cleaning/concrete sump area nor downgradient and across Wood Street from the subject site. Sampling was required in this area to determine if groundwater had been significantly impacted by the contamination discovered in soil, and at what gradient and direction was it flowing.

Furthermore, chemical analysis of additional samples from well W-1 were required to confirm the presence of gasoline contamination detected in the previous investigation, to provide current chemical analysis data, and to confirm that the removal of impacted soil at the former UST locations would be adequate for remediation in this area according to ACHCSA requirements.

Prior to ASE sample collection activities, the three monitoring wells were surveyed to a project datum on October 12, 1993.

Subsequent chemical analyses conducted on groundwater samples collected by Aqua Science Engineers from well W-1 on 2/12/93 confirm the presence of gasoline contamination in groundwater beneath the former locations of the USTs **(see Appendix XIV for analytical report for sampling conducted on 2/12/93).** ASE returned to the site for further groundwater sampling activities on October 12 & 14, 1993 directly after the installation and development of W-3. Analytical results for samples collected from W-1 on October 12 & 14, 1993 are as follows: TVPH as gasoline was detected in the groundwater sample at a concentration of 3,700 ppb (3.7 ppm). TEPH as diesel was not detected. BTEX concentrations in this sample were detected at 4.2 ppb benzene, 6.8 ppb toluene, 7.2 ppb ethyl benzene, and 26 ppb total xylenes. The current benzene concentration of 4.2 ppb is the only BTEX constituent above the "Maximum Contaminate Level for Drinking Water" (MCL) established in CCR Title 22. **(see Tables 9, 10 and 11 and Appendix XIV for the laboratory report).**

Subsequent chemical analyses conducted on groundwater samples collected by Aqua Science Engineers from well W-2 on 2/12/93 confirm the presence of petroleum contamination in groundwater beneath the steam cleaner area and sump/clarifier. **(see Appendix XIV for analytical report for sampling conducted on 2/12/93)** The chemical analyses conducted on groundwater samples collected from well W-2 by Aqua Science Engineers on October 12 & 14, 1993 indicated N.D. levels for TRVH. BTEX concentrations in this sample were detected at N.D. for benzene, 0.6 ppb toluene, 0.7 ppb ethyl benzene, and 2.2 ppb total xylenes. Trace concentrations of halogenated volatile organics were detected consisting of 2.4 ppb chlorobenzene, and 19 ppb 1,2-dichlorobenzene. As for the CAM 17 metals, only Barium was detected at 0.15 ppm **(see Tables 9, 10 and 11 and Appendix XIV for the laboratory report).**

The chemical analyses conducted on groundwater samples collected by Aqua Science Engineers on October 14, 1993 from well W-3 indicated N.D. levels for TPH as gasoline, TPH as diesel, and the BTEX constituents. 3.6 ppm TRVH was detected. No detectable levels of halogenated volatile organics were detected in the W-3 sample. As for the CAM 17 metals, only Barium and Zinc were detected at 0.19 ppm and 0.22 ppm respectively (see **Appendix XIV for the laboratory report**). A summary of the groundwater chemical analysis data is provided in **Tables 9, 10 and 11.**

3.0 HUMAN HEALTH AND ENVIRONMENTAL THREAT ASSESSMENT

3.1 Screening Values

Specific screening values for contamination may be developed for the subject area by the Cal-EPA DTSC. The screening values will tentatively be used by the DTSC as a preliminary method in determining whether or not the level of contamination in the subject area are significant. The screening values are expected to be "area specific" and "land usage" specific. The screening values were not available at the time of this report.

3.2 Characteristics of the Hazardous Substance/Wastes

3.2.1 Discussion of Potential Human Exposure Routes

The primary pathways of human exposure to the contamination discovered at the TASCO site is expected to be: 1) direct physical contact with contaminated soil, 2) breathing of volatile vapors emitted from exposed soil or groundwater, 2) direct physical contact of contaminated groundwater (accumulation in open excavation).

Human exposure pathways related to groundwater contact are expected to be very limited for the following reasons:

- The concentrations of TRPH, TVPH-gasoline, and volatile organics detected in groundwater are considered low to insignificant.
- Groundwater in the area is not used for domestic supply.
- There is no evidence that groundwater beneath the site is in contact with any nearby surface water source that is used for domestic, agricultural or industrial supply.
- Net lateral flow of groundwater from the subject site is fairly minimal. ASE has conducted several Phase II site assessments at nearby sites. As at this site, the groundwater elevations are not stable and the gradient is quite flat.

Human exposure pathways related to soil contact are expected to be low to very limited for the following reasons:

- Gasoline and diesel impacted soil located in the area of the UST has been effectively removed. The residual concentrations of gasoline and diesel in soil are considered insignificant.
- Contaminated shallow fill soil and contaminated soil beneath the steam cleaning area is capped with eight to 12 inches of concrete. Human exposure under current site conditions should not occur. Removal of the concrete cover during construction will increase the potential for human exposure to contaminated soil via dust inhalation and direct soil contact with exposed skin.

3.2.2 Relative Toxicity for Human Exposure Route and Toxicity Assessment

The following information if provided for hazardous substances or wastes which are documented to be present in soil beneath the subject site according to the findings of the PEA. Hazardous substances used and/or stored at the site which are known to have been released to the environment are limited to gasoline and diesel fuel no. 2 (see Table 1). Hazardous substances which are used and/or stored at the subject which are not known to have been released to the environment are methylethylketone (MEK), toluene, stoddard-type solvent (Chevron 360), gear lubrication oil, cutting and machining oil, and bronze valve parts and cuttings which contain copper and zinc. Hazardous substances detected in soil that are not documented as being use or stored at the site are 1,1-dichloroethene, 1,1-dichloroethane, chloroform, 1,1,1-trichloroethane, 2-chloroethylvinylether, chlorobenzene, 1,4-dichlrorbenzene, and 1,2-dichlorobenzene (see Table 6). CAM 17 metals that were detected in soil above concentrations which are normally considered as naturally occurring were lead, copper and zinc (see Table 7).

Toxicity information is provided below for the hazardous substances that were detected in soil by the chemical analyses conducted during the PEA. Toxicity information for the volatile aromatic constituents of gasoline: benzene, toluene, ethyl benzene, and xylene are provided separately from gasoline. Information used for the toxicity evaluation was derived from MSDS sheets, Sax's Dangerous Properties of Industrial Materials Volume 1, and OSHA Regulated Hazardous Substances - Health, Toxicity, Economic and Technological Data.

Diesel Fuel No. 2:
100.0% Petroleum Mid-Distillate
CAS Number: 68476346
Dermal LD50 in rabbits: >5 ml/kg, Oral LD50 in rats: >5 ml/kg

In terms of immediate health effects, if absorbed through the skin, this substance is considered practically non-toxic to internal organs. Prolonged breathing of vapors can cause central nervous system effects. This hazard evaluation is based in data from similar materials. If swallowed, this substance is considered practically non-toxic to internal organs. Inhalation of liquid can cause severe injury to the lungs. All of the components of this material are on the Toxic Substance Control Act Chemical Substance Inventory. Toxicology data developed for similar mid-distillates for long term health effects support the conclusion that this material may pose an increased risk of skin cancer following prolonged or repeated skin contact.

Unleaded Regular Gasoline:
100.0% Unleaded Gasoline
ACGIH TLV: TWA 100 ppm; STEL 500 ppm
OSHA PEL: TWA 300 ppm; STEL 500 ppm
Dermal LD50 in rabbits: >5 ml/kg, Oral LD50 in rats: 18.75 ml/kg

In terms of immediate health effects, if adsorbed through the skin, this substance is considered practically non-toxic to internal organs. This substance is slightly toxic to internal organs if inhaled. The target organ(s) is the nervous system. This substance is slightly toxic to internal organs if swallowed. Brief exposures to high vapor concentrations may also cause pulmonary edema. Inhalation of liquid can cause severe injury to the lungs. All of the components of this material are on the Toxic Substance Control Act Chemical Substance Inventory. This product contains benzene (CAS71432). Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia. This product contains n-hexane (CAS110543). Prolonged or repeated contact with n-hexane may cause nerve damage. This product contains toluene (CAS108883). Toluene has been reported to decrease immunological responses in test animals. This product contains xylene (CAS106423, 108383, 95476) which has been reported to be embryotoxic and cause developmental disturbances in rats and mice exposed before birth.

Benzene

CAS Number: 71-43-2

RCRA Waste Number: U019

ACGIH TLV: TWA 10 ppm; Suspected Human Carcinogen (Proposed TWA 0.1 ppm; Confirmed Human Carcinogen) BEI: 50 mg(total phenol)/L in urine at end of shift recommended as mean value.

OSHA PEL: (Transitional: TWA 10 ppm; CL 25 ppm; Pk 50 ppm/10M) TWA 1 ppm; STEL 5 ppm; Pk 5 ppm/15M/8H; Cancer Hazard

NIOSH/REL: TWA 0.32 mg/m^3; CL 3.2 mg/m^3/15M

DFG TRK: 5 ppm (16 mg/m^3) Human Carcinogen

Oral LD50 in rats: 3,306 mg/kg

Inhalation LC50 in rats : 10,000 ppm/7H

Benzene is a confirmed human carcinogen producing myeloid leukemia, Hodgkin's disease, and lymphomas. Experimental carcinogenic neoplastigenic, and tumorigenic data. A human poison by inhalation. An experimental poison by skin contact, intraperitoneal, intravenous, and possibly other routs. Moderately toxic by ingestion and subcutaneous routes. Human systemic effects by inhalation and ingestion: blood changes, increased body temperature. Experimental teratogenic and reproductive effects. Human mutation data reported. In industry, inhalation is the primary rout of chronic benzene poisoning. Poison by skin contact has been reported. Skin and severe eye irritant. Recent (1987) research indicates that effects are seen at less than 1 ppm. Exposures needed to be reduced to 0.1 ppm before no toxic effects were observed. Elimination is chiefly through lungs. Benzene is considered a common air contaminant.

Toluene

CAS Number: 108-88-3

RCRA Waste Number: U220

ACGIH TLV: TWA 100 ppm; STEL 150 ppm; (Proposed: TWA 50 ppm); BEI: 1 mg(toluene)/L in venous blood at end of shift; 20 ppm toluene in end-exhaled air during shift.

OSHA PEL: (Transitional: TWA 200 ppm; CL 300 ppm; Pk 500 ppm/10M/8H) TWA 100 ppm; STEL 150 ppm

NIOSH/REL: (Toluene) TWA 100 ppm; CL 200 ppm/10M

DFG MAK: 100 ppm (380 mg/m^3) BAT: 340 µg/dl in blood at end of shift.

Oral LD50 in rats: 5,000 mg/kg, Dermal LD50 in rabbits: 12,124 mg/kg

Inhalation LC50 in mice: 5,320 ppm/8H

Toluene is a poison by intraperitoneal rout. Moderately toxic by intravenous and subcutaneous routs. Mildly toxic by inhalation. An experimental teratogen. Human systemic effects by inhalation: CNS recording changes, hallucinations or distorted perceptions, motor activity changes, antipsychotic, psychophysiological test changes and bone marrow changes. Experimental reproductive effects. Mutation data reported. An experimental shin and severe eye irritant An occasional report of chronic poisoning describes an anemia and leucopenia, with biopsy showing a bone marrow hypoplasia. A common air contaminant emitted from modern building materials.

Ethyl Benzene

CAS Number: 100-41-4

ACGIH TLV: TWA 100 ppm; STEL 125 ppm; BEI: 2g(mandelic acid)/L in urine at end of shift; 2 ppm ethyl benzene in end-exhaled air prior to next shift.

OSHA PEL: [Transitional: TWA 100 ppm (skin)]; TWA 100 ppm; STEL 125 ppm

DFG MAK: 100 ppm (440 mg/m^3)

Oral LD50 in rats: 3,500 mg/kg

Dermal LD50 in rabbits: 17,800 mg/kg

Ethyl benzene is moderately toxic by ingestion and intraperitoneal rout. Mildly toxic by inhalation and skin contact. An experimental teratogen. Other experimental reproductive effects. Human systemic effects by inhalation: eye, sleep and pulmonary changes. An eye and skin irritant. Human mutation data reported.

Xylene

CAS Number 1330-20-7

RCRA Waste Number: U239

ACGIH TLV: TWA 100 ppm; STEL 150 ppm; BEI: 1.5g (methyl hippuric acids)/g creatitine in urine at end of shift

OSHA PEL: (Transitional: TWA 100 ppm); TWA 100 ppm; STEL 150 ppm

DFG MAK: (all isomers) 100 ppm (440 mg/m^3); BAT: 150 µg/dL in blood at end of shift.

NIOSH REL: (Xylene) TWA 100 ppm; CL 200 ppm/10M

Oral LD50 in rats: 4,300 mg/kg

Inhalation LC50 in rats: 5,000 ppm/4H

Moderately toxic by interperitoneal and subcutaneous routs. Mildly toxic by ingestion and inhalation. An experimental teratogen. human systemic effects by inhalation: olfactory changes, conjunctiva irritation and pulmonary changes. Experimental reproductive effects. Mutation data reported. A human eye irritant. An experimental skin and severe eye irritant.

1,1-Dichloroethane
CAS Number 75-34-3
RCRA Waste Number: U076
ACGIH TLV: TWA 200 ppm; STEL 250 ppm (Proposed: 100 ppm)
OSHA PEL: TWA 100 ppm
DFG MAK: 100 ppm (400 mg/m^3)
NIOSH REL: (1,1-Dichloroethane) handle with caution
Oral LD50 in rats: 725 mg/kg

Moderately toxic by ingestion. Experimental teratogenic effects. Questionable carcinogen with experimental tumorigenic data. Liver damage reported in experimental animals.

1,1-Dichloroethene
CAS Number 75-35-4
RCRA Waste Number: U078
ACGIH TLV: TWA 5 ppm; STEL 20 ppm
OSHA PEL: TWA 1 ppm
DFG MAK: Suspected Carcinogen
NIOSH REL: (Vinyl Halides)TWA reduce to lowest detectable level
Oral LD50 in rats: 200 mg/kg
Inhalation LC50 in rats: 6,350

Suspected carcinogen with experimental carcinogenic, neoplastigenic, tumorigenic, and teratogenic data. Poison by inhalation, ingestion, and intravenous routes. Moderately toxic by subcutaneous rout. Human systemic effects by inhalation: general anesthesia, liver and kidney changes. Experimental reproductive effects. Mutation data reported.

Chloroform

CAS Number: 67-66-3

RCRA Waste Number: U044

ACGIH TLV: TWA 10 ppm; Suspected Human Carcinogen

OSHA PEL: (Transitional: CL 50 ppm) TWA 2 ppm

DFG MAK: Suspected Carcinogen

NIOSH REL: (Waste Anesthetic Gasses and Vapors) CL 2 ppm/1H; (Chloroform) CL 2 ppm/60M

Oral LD50 in rats: 908 mg/kg

Inhalation LC50 in dogs: 100 g/m^3

Inhalation LC50 in rats: 47,702 mg/m^3/4H

Confirmed carcinogen with experimental carcinogenic, neoplastigenic, and tumorigenic data. A human poison by ingestion and inhalation. An experimental poison by ingestion and intravenous routs. Human systemic effects by inhalation: hallucinations and distorted perceptions, nausea, vomiting, and other unspecified gastrointestinal effects. Human mutation data reported. Experimental teratogenic and reproductive effects. Prolonged inhalation will bring on paralysis accompanied by cardiac respiratory failure and finally death. Chloroform has been widely used as a anesthetic. However, due to its toxic effects, this use is being abandoned. Concentrations of 68,000-82,000 ppm in air can kill most animals in a few minutes. The maximum concentration tolerated for several hours or for prolonged exposure with slight symptoms is 2,000-2,500 ppm.

1,1,1-Trichlotoethane

CAS Number: 71-55-6

RCRA Waste Number: U226

ACGIH TLV: TWA 350 ppm; STEL 450 ppm; BEI: 10 mg/L trichloroacetic acid in urine at end of work week.

OSHA PEL: (Transitional: TWA 350 ppm) TWA 350 ppm; STEL 450 ppm

DFG MAK: 200 ppm (1,080 mg/m^3); BAT: 55µg/dL in blood after several shifts.

NIOSH REL: (1,1,1-Trichloroethane) CL350 ppm/15M

Oral LD50 in rats: 10,300 mg/kg

Oral LD50 in dogs: 750 mg/kg

Inhalation LC50 in rats: 18,000 mg/m^3/4H

Poison by intravenous rout. Moderately toxic by ingestion, inhalation, skin contact, subcutaneous, and intraperitoneal routs. An experimental teratogen. Human systemic effects by ingestion: conjuntivia irritation, hallucinations or distorted perceptions, motor activity changes, irritability, aggression, hypermotility, diarrhea, nausea or vomiting and other gastrointestinal changes. Experimental reproductive effects. Questionable carcinogen. Mutation data reported. A human skin irritant. An experimental skin and severe eye irritant.

1,4-Dichlorobenzene
CAS Number: 106-46-7
RCRA Waste Number: U072
ACGIH TLV: TWA 75 ppm; STEL 110 ppm; (Proposed: 10 ppm; Suspected Human Car.)
OSHA PEL: (Transitional: TWA 75 ppm) TWA 75 ppm; STEL 110 ppm
DFG MAK: 75 ppm (450 mg/m^3)
Oral LD50 in rats: 500 mg/kg
Oral LD50 in rabbits: 2,830 mg/kg

Confirmed carcinogen with experimental carcinogenic data. An experimental teratogen. A human poison by an unspecified rout. Moderately toxic to humans by ingestion. Moderately toxic experimentally by ingestion, subcutaneous, and intraperitoneal routs. Mildly toxic by subcutaneous rout. Other experimental reproductive effects. Human systemic effects by ingestion: unspecified changes in the eyes, lungs, thorax, and respiration, and decreased motility or constipation. Can cause liver injury in humans. A human eye irritant. Mutation data reported.

Chlorobenzene
CAS Number: 108-90-7
RCRA Waste Number: U037
ACGIH TLV: TWA 10 ppm
OSHA PEL: TWA 75 ppm
DFG MAK: 50 ppm (230 mg/m^3)
Oral LD50 in rabbits: 2,830 mg/kg

Moderately toxic by ingestion and intraperitoneal routs. Experimental teratogenic and reproductive effects. Mutation data reported. Strong narcotic with slight irritant qualities. Dichlorobenzols are strongly narcotic. Little known of the effects of repeated exposures at lower concentrations, but it may cause kidney and liver damage.

1,2-Dichlorobenzene

CAS Number: 95-50-1

RCRA Waste Number: U070

ACGIH TLV: CL 50 ppm; (Proposed: TWA 25 ppm; STEL 50 ppm)

OSHA PEL: CL 50 ppm

DFG MAK: 50 ppm (300 mg/m^3)

Oral LD50 in rats: 500 mg/kg Oral LD50 in rabbits: 500 mg/kg

Poison by ingestion and intravenous routs. Moderately toxic by inhalation and intraperitoneal routs. An experimental teratogen. Other experimental reproductive effects. An eye, skin, and mucus membrane irritant. Causes liver and kidney injury. Questionable carcinogen. Mutation data reported.

Lead (Pb)

CAS Number: 7439-92-1

ACGIH TLV: CL 50 ppm; (Proposed: TWA 25 ppm; STEL 50 ppm)

OSHA PEL: TWA 0.15 mg/(Pb)/m^3; BEI: 50 µg/(lead)/L in blood; 150 µg/(lead)/g creatinine in urine.

DFG MAK: 0.1 mg/m^3; BAT: 70µg/(lead)/L in blood, 30 µg/(lead)/L in blood of women less than 45 years old.

Suspected carcinogen. Poison by ingestion. Moderately toxic by intraperitoneal rout. Human systemic effects by ingestion and inhalation: loss of appetite, anemia, malaise, insomnia, headache, irritability, muscle and joint pains, tremors, flaccid paralysis without anesthesia, hallucinations and distorted perceptions, muscle weakness, gastritis and liver changes. The major organ systems affected are the nervous system, blood system, and kidneys. Lead encephalopathy is accompanied by severe cerebral edema, increase in cerebral spinal fluid pressure, proliferation and swelling of endothelial cells in capillaries and arterioles, proliferation of glial cells, neuronal degeneration and areas of focal cortical necrosis in fatal cases. Experimental evidence now suggests that blood levels of lead below 10 µg/dl can have the effect of diminishing the IQ scores of children. Low levels of lead impair neurotransmission and immune system function and may increase systolic blood pressure. Reversible kidney damage can occur from acute exposure. Chronic exposure can lead to irreversible vascular sclerosis. Severe toxicity can cause sterility, abortion and neonatal mortality and morbidity.

An experimental teratogen. Experimental reproductive effects. Human mutation data reported. Very heavy intoxication effects. Human mutation data reported. Very heavy intoxication can sometimes be detected by formation of dark line on the gum margins, the so-called "lead line".

Copper (Cu)
CAS Number: 7440-50-8
ACGIH TLV: TWA (dust, mist) 1 mg (Cu)/m^3; (fume) 0.2 mg/m^3
OSHA PEL: TWA (dust, mist) 1 mg (Cu)/m^3; (fume) 0.1 mg/m^3
DFG MAK: (dust) 1 mg/m^3; (fume) 0.1 mg/m^3

Questionable carcinogen with experimental tumorigenic data. Experimental teratogenic and reproductive effects. Human systemic effects by ingestion: nausea and vomiting. As the sublimed oxide, copper may be responsible for one form of metal fume fever. In animals, inhalation of copper dust has caused hemolysis of the red blood cells, deposition of hemofuscin in the liver and pancreas, and injury to the lung cells. There is an excess of cancer cases reported in the copper smelting industry. Symptoms attributed to damage to the nervous system and kidney have been recorded, jaundice has been observed and, in some cases, the liver has been enlarged. Deaths have been reported to have occurred following the ingestion of as little as 27 grams of salt, while other victims have recovered after have taken up to 120 grams.

Zinc (Zn)
CAS Number: 7440-66-6

Human systemic effects by ingestion: cough, dyspnea, and sweating. A human skin irritant. Pure zinc powder, dust, fume is relatively nontoxic to humans by inhalation. Zinc is not inherently a toxic element. However, when heated, it evolves a fume of zinc oxide which, when inhaled fresh, can cause a disease known as "brass founders" "ague," or "brass chills," sweet taste, throat dryness, cough, weakness, general aching, fever, nausea, and vomiting. Zinc oxide dust that is not freshly formed is virtually innocuous.

3.3 Environmental Threat Assessment

The State of California Department of Fish and Game "Natural Diversity Data Base (NDDB) for the Oakland West 7.5 minute quadrangle" indicates four threatened or endangered species or sensitive ecosystems exist within a 1-mile radius of the TASCO Facility; *Northern California Salt Marsh.* (Natural Community 2/10 of 1-mile west of the TASCO facility), *Reithrodontomys Ravinentris* - Salt Marsh Harvest Mouse (Federal and state endangered species is approximately 3/10 of 1-mile west of the TASCO facility), *Laterallus Jamaicensis Coturniculus* - California Black Rail (State threatened species is within 3/10 of 1-mile west of the TASCO facility), *Holocarpha Macradenia* - Santa Cruz Tarplant (State endangered plant is approximately 5/10 of 1-mile west of the TASCO facility).

It is the opinion of Aqua Science Engineers that the contamination discovered in soil and groundwater at the TASCO during this investigation should not adversely impact any flora, fauna, or sensitive ecosystem as identified by the NDDB. There is no data indicating the presence of national/state parks or reserve, historic landmarks sites, agricultural lands, or designated scenic areas within one mile of the site.

Soil containing residual contaminants is currently capped with concrete and is immobile in terms of distribution by wind or other physical means.

Soil containing elevated concentrations of gasoline and diesel fuel has been effectively removed and is no longer considered a threat to local shallow groundwater or adjacent soil. The UST excavation has been backfilled with clean, imported material and compacted; thereby making the path of contaminant flow incomplete.

Soil containing elevated concentrations of metals, petroleum hydrocarbons and VOCs identified on-site appear to have not significantly impacted the groundwater downgradient (across Wood Street) from the site (see data regarding W-3 groundwater sample chemical analyses).

4.0 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

The following conclusions are made by Aqua Science Engineers regarding contamination a the TASCO site based on the results of visual site inspection, site and governmental agency files and database research, physical soil and groundwater sampling, and chemical analysis of soil and groundwater for specific contaminates (petroleum hydrocarbons, halogenated and nonhalogenated volatile organics, and CAM 17 Title 22 metals).

- The past storage and handling of gasoline and diesel fuel has resulted in releases of these compounds to soil and groundwater. The primary pathway for soil and groundwater contamination was subsurface piping and possibly underground storage tank leakage. According to the ACHCSA, the release of gasoline and diesel fuel to soil posed a significant threat to public health and the environment. The concentrations of gasoline and diesel fuel detected in soil were above acceptable levels and required remediation according to ACHCSA regulations for underground fuel storage tank releases. Remediation of the impacted soil by excavation, or other approved means, is required as soon as possible whether or not the release poses an immediate health or environmental threat. Soil containing significant concentrations of gasoline and diesel has been successfully excavated and stockpiled under the supervision of the ACHCSA (see section 2.6.3 of this report).

- The underground fuel storage tanks and related piping has been removed from the site. Furthermore, the fuel impacted soil has been adequately removed and stockpiled according to ACHCSA regulations and should not require any further soil excavation. The clean imported fill material used to backfill the excavation of the former USTs has now made the path of contaminant flow incomplete.

- The practice of steam cleaning metal valves and related parts may have resulted in release of hazardous substances including oil and grease to soil. The primary pathway for soil contamination is suspected to be oily water seepage through cracks in surface concrete, and possibly leakage of the subsurface sump and clarifier beneath the steam cleaning area. Continued use of the steam cleaning facility, as currently operated, poses a possible continued threat of hazardous substance/waste release to soil and possibly groundwater.

- The releases of hazardous substances or wastes in relation to the steam cleaning operation is not expected to pose an immediate potential hazard to health or the environment. Past releases of hazardous materials in this area appear to be localized to soil directly beneath the steam cleaning/sump area; recent groundwater analytical data show only minor levels of the constituents in groundwater that were found in various zones of soil. The steam cleaning operation has been in use at the TASCO site for over 15 years. According to TASCO personnel, the steam cleaner is used approximately five hours per month. Individual releases in this area expected to have been small with possible accumulation of contamination in soil occurring over an extended period of time. Future releases of hazardous substances are also expected to be small and should not pose immediate health or environmental threats in themselves and should not necessitate emergency removal action.

- The TASCO facility is underlain by approximately five feet of fill material. The fill material contains elevated concentrations of petroleum hydrocarbons, chlorinated hydrocarbons and Title 22 metals. The contamination in the fill material is not related to any particular release of hazardous materials or wastes at the site. This material is covered with concrete and does not appear to pose an immediate threat to health or the environment. Equally, recent groundwater analytical data show only minor levels of the constituents in groundwater that were found in various zones of soil at the site. However, if the concrete is removed and the soil is excavated, the material generated may be considered a regulated waste and may require additional testing, appropriate handling precautions, and appropriate disposal.

- Current data shows that groundwater flows in a westerly direction across the site, toward the downgradient monitoring well W-3 (see Figure 6). Current groundwater sampling and chemical analytical data show that those contaminants which were found on-site both in the soil and groundwater do not appear to be moving off-site, per the analytical results for both soil and groundwater samples collected from W-3.

4.2 Recommendations

Aqua Science Engineers recommends the following action for the TASCO site:

- Periodic groundwater sampling and chemical analysis for the monitoring wells at the site. The sampling and intervals should be conducted according to requirements of the ACHCSA and the RWQCB-San Francisco Bay Region. The groundwater samples should be chemically analyzed by a Cal-EPA approved laboratory for TPH-gasoline, for the volatile aromatic constituents benzene, toluene, ethyl benzene, and total xylenes, total recoverable petroleum hydrocarbons (TRPH), VOCs, and CAM 17 metals.

- No further action is recommended for soil in the area of the removed UST. Sampling of post excavation samples indicate the residual concentration of gasoline, diesel and BTEX are insignificant (see sections 2.6.3 and Appendix X of this report for rational).

- Approximately 175 cubic yards of gasoline and diesel impacted soil has been excavated and stockpiled at the site. It is recommended that this soil be transported to an appropriate recycling or disposal facility. On-site remediation of the soil is not recommended because of the elevated concentration of total lead (140 ppm).

- If the steam cleaning facility will continue to be used, it is recommended that the sump and clarifier be emptied, cleaned, and thoroughly inspected for cracks and possible leakage. The material removed from the sump and clarifier should be disposed of properly. Any cracks should be sealed and the concrete surfaces should be sealed with an appropriate industrial coating which is resistant to the chemicals used at the site. If the sump and clarifier are to be removed in the future, removal should be conducted according to ACHCSA and local fire department regulations. Significant soil contamination associated with the sump and clarifier should be excavated at the time of the sump and clarifier removal.

- Approximately five feet of fill material exists immediately beneath the TASCO facility. The fill material contains elevated concentrations contamination including metals, and petroleum hydrocarbons. The fill also contains construction debris. This material is currently covered by concrete and does not pose an immediate health threat. However, if the fill material is excavated during construction of the freeway, proper disposal will be required. This material is probably not suitable for use as clean fill. A contingency plan is recommended for handling of the shallow fill material prior to construction in this area.

5.0 REFERENCES

Reference Material

THE BAY AREA AIR QUALITY MANAGEMENT DISTRICT Permit to Operate Plant #5336, valid through August 1, 1993.

CHEVRON ENVIRONMENTAL HEALTH CENTER, INC., Material Safety Data Sheets for: diesel No. 2, and unleaded gasoline.

de MARSILY, G., 1986, Quantitative Hydrology: Groundwater Hydrology for Engineers, Academic Press, Inc., New York

FREEZE, R.A., AND CHERRY, J.A., 1979, Groundwater, Prentice-Hall, Inc., New Jersey

HEATH, RALPH C., 1983, Basic Ground-Water Hydrology, Water Supply Paper 2220, United States Geological Survey, United States Governmental Printing Office

LEWIS, RICHARD J., JR., 1992, Sax's Dangerous Properties of Industrial Materials, Volume 1, Library of Congress Catalog Card Number 92-3896, Van Nostrand Reinhold, New York, 8th edition

NATIONAL FLOOD INSURANCE FIRM, map entitled Flood Insurance, City of Oakland, Community Panel #0690480015B, effective 9-30-82.

THE CITY OF OAKLAND FIRE PREVENTION BUREAU, Permit Number 9652, permit for tanks removal, issued January 27, 1993, Ms. Valida Holmes, Inspector, Fire Prevention Bureau.

CITY OF OAKLAND PUBLIC WORKS DEPARTMENT, Planning, Zoning and Engineering Maps, Oakland, California.

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION, 1990, OSHA Regulated Substances; Health, Toxicity, Economic, and Technological Data, Library of Congress Catalog Card number: 90-6751, Noyes Data Corporation, New Jersey

PIPKEN, B.W., 1982, Unified Soil Classification System: in, R.V. Dietrich, J.T. Dutro, Jr. and Foose, R.M., (compilers) AGT Data Sheet 26.1, The American Geological Institute, Falls Church, VA, 2nd edition.

STATE OF CALIFORNIA Department of Fish and Game, Natural Heritage Division, Natural Diversity Data Base for the Oakland, West California Region. Dated 11-March-93.

STATE OF CALIFORNIA Administrative Code: Title 22 - Social Security, Division IV - Environmental Health, Article 11 - Criteria for Identification of Hazardous and Extremely Hazardous Waste

STATE OF CALIFORNIA, 1988, Leaking Underground Fuel Tank (LUFT) Field Manual, State Water Resources Control Board

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, 1986, SW846 Test Methods for Evaluation Solid Wastes: Physical/Chemical Methods, volume 2, 3rd edition

UNITED STATES GEOLOGICAL SURVEY PROFESSIONAL PAPER 943, Flatland Deposits of the San Francisco Bay Region, California - their Geology and Engineering Properties, and their Importance to Comprehensive Planning, by E.J. Helley and K.R. Lajoie - USGS, and W.E. Spangle and M.L. Blair - William Spangle and Associates.

ZONE 7 - ALAMEDA COUNTY , FLOOD CONTROL AND WATER CONSERVATION DISTRICT, Alameda County - Bay Plain Groundwater Study - Well Inventory Report, dated 3/10/93.

ZONE 7 - ALAMEDA COUNTY , FLOOD CONTROL AND WATER CONSERVATION DISTRICT, Pleasanton Office, Permit Number 93023, issued January 25, 1993.

PRIORITY ENVIRONMENTAL LABS, Martinez, California, Laboratory Director, David Duong.

SUPERIOR PRECISION ANALYTICAL INC., Martinez, California, Laboratory Manager, Richard Srna, Ph.D.

Personal Communications

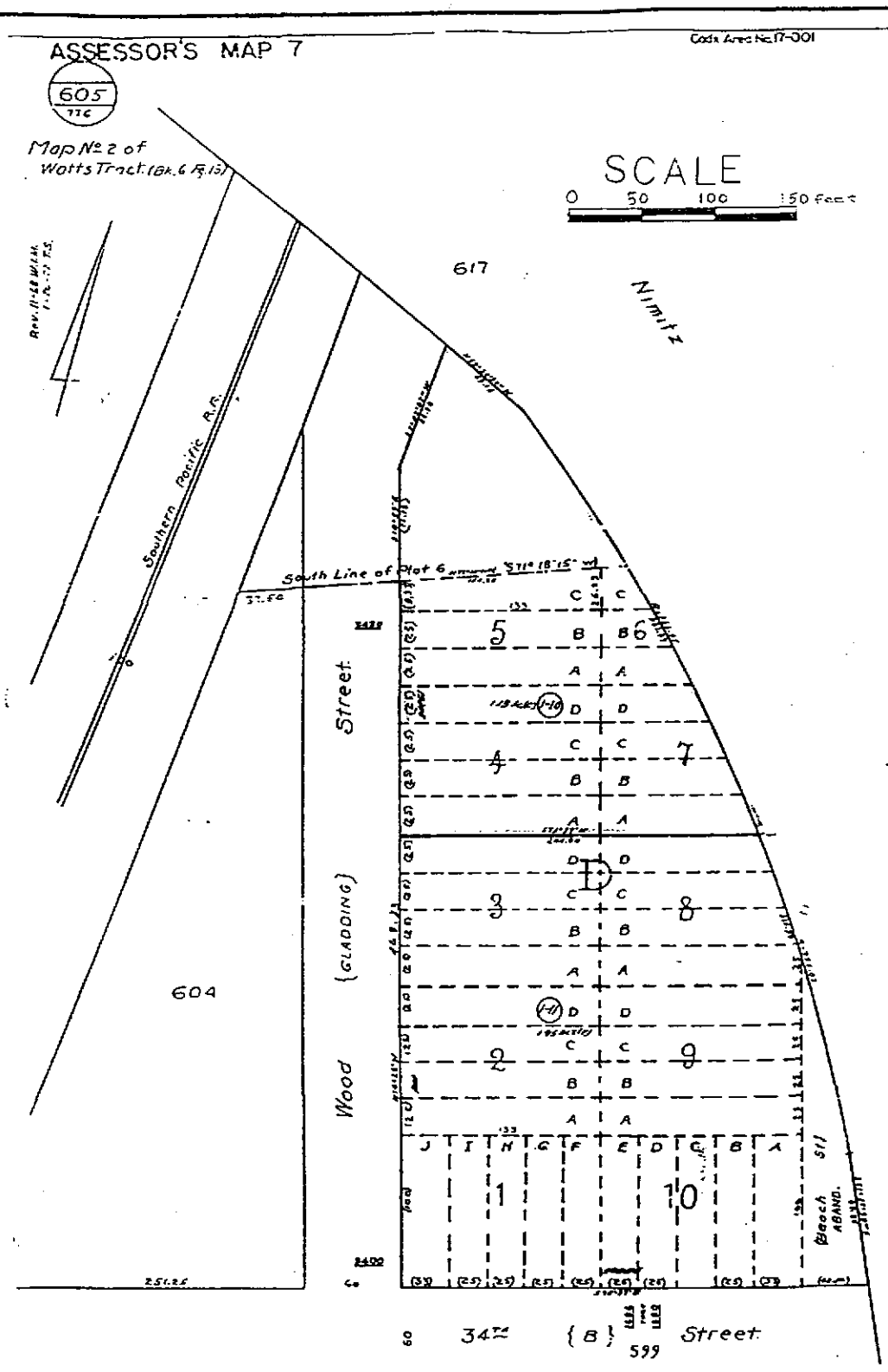
THE THOMAS A. SHORT COMPANY, Oakland California, personnel:
Thomas D. LaFlamme, President
Tom Hazeltine, General Manager
Gary Keeler, Shop Materials Manager
April Ivery, Accounting Assistant

ZONE 7 - ALAMEDA COUNTY , FLOOD CONTROL AND WATER CONSERVATION DISTRICT, Hayward and Pleasanton Offices, Personal communication: Mr. Wyman Hong and Mr. Andreas Godfrey, Water Resources Technicians.

REGIONAL WATER QUALITY CONTROL DISTRICT, SAN FRANCISCO BAY REGION, Oakland, California, Personal communication: Mr. Rich Hiett, Oakland Area Representative.

DEPARTMENT OF HEALTH SERVICES, PUBLIC WATER SUPPLY BRANCH, Berkeley, California, Personal communication: Mr. Cliff Bowen, District Engineer.

THE ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY, Oakland, California, Personal communication: Mr. Don Hwang and Ms. Jennifer Eberle - Hazardous Material Specialists.



Thomas Short Company
Occupies Lots 5,4,6,7

FIGURE 2
County of Alameda Tax Assessor's
Map No. 7 Book 605, Lot 1-10
Site: Thomas Short Company
3430 Wood Street
Oakland, California

Drawn by:	Date:	Scale: See Bar

Aqua Science Engineers, Inc.

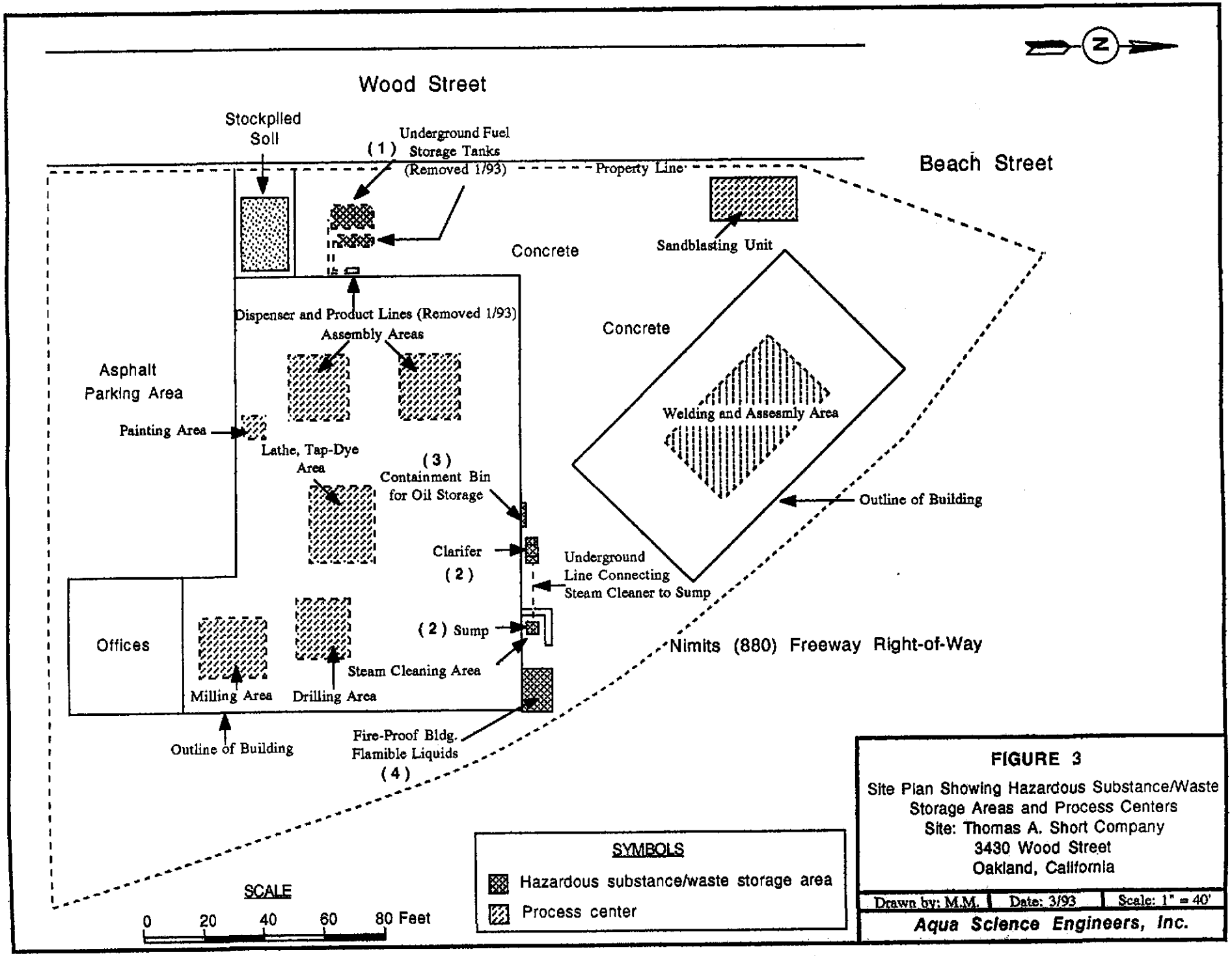


FIGURE 3

Site Plan Showing Hazardous Substance/Waste Storage Areas and Process Centers
Site: Thomas A. Short Company
3430 Wood Street
Oakland, California

Drawn by: M.M.	Date: 3/93	Scale: 1" = 40'

Aqua Science Engineers, Inc.

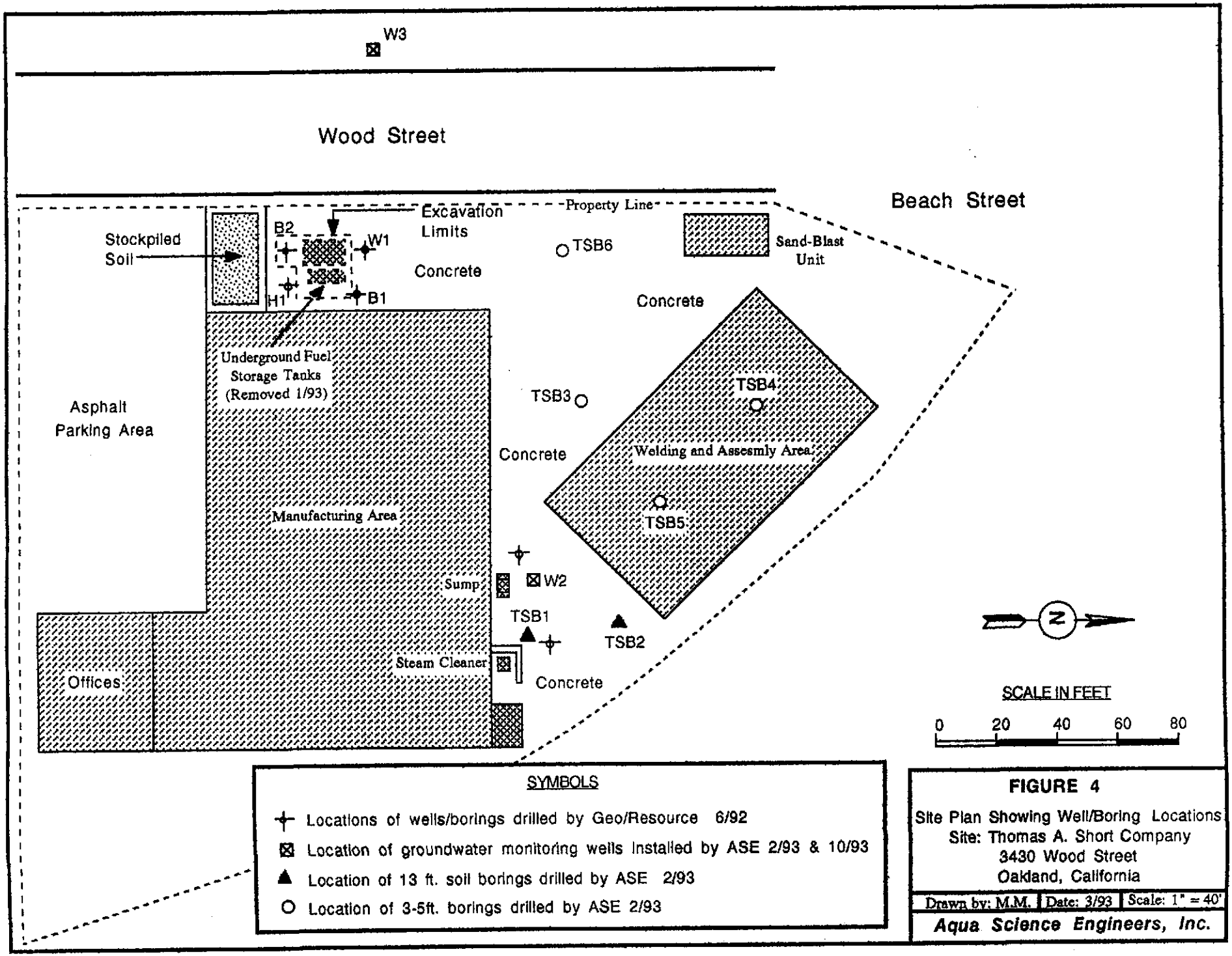


FIGURE 4

Site Plan Showing Well/Boring Locations
Site: Thomas A. Short Company
3430 Wood Street
Oakland, California

Drawn by: M.M.	Date: 3/93	Scale: 1" = 40'

Aqua Science Engineers, Inc.

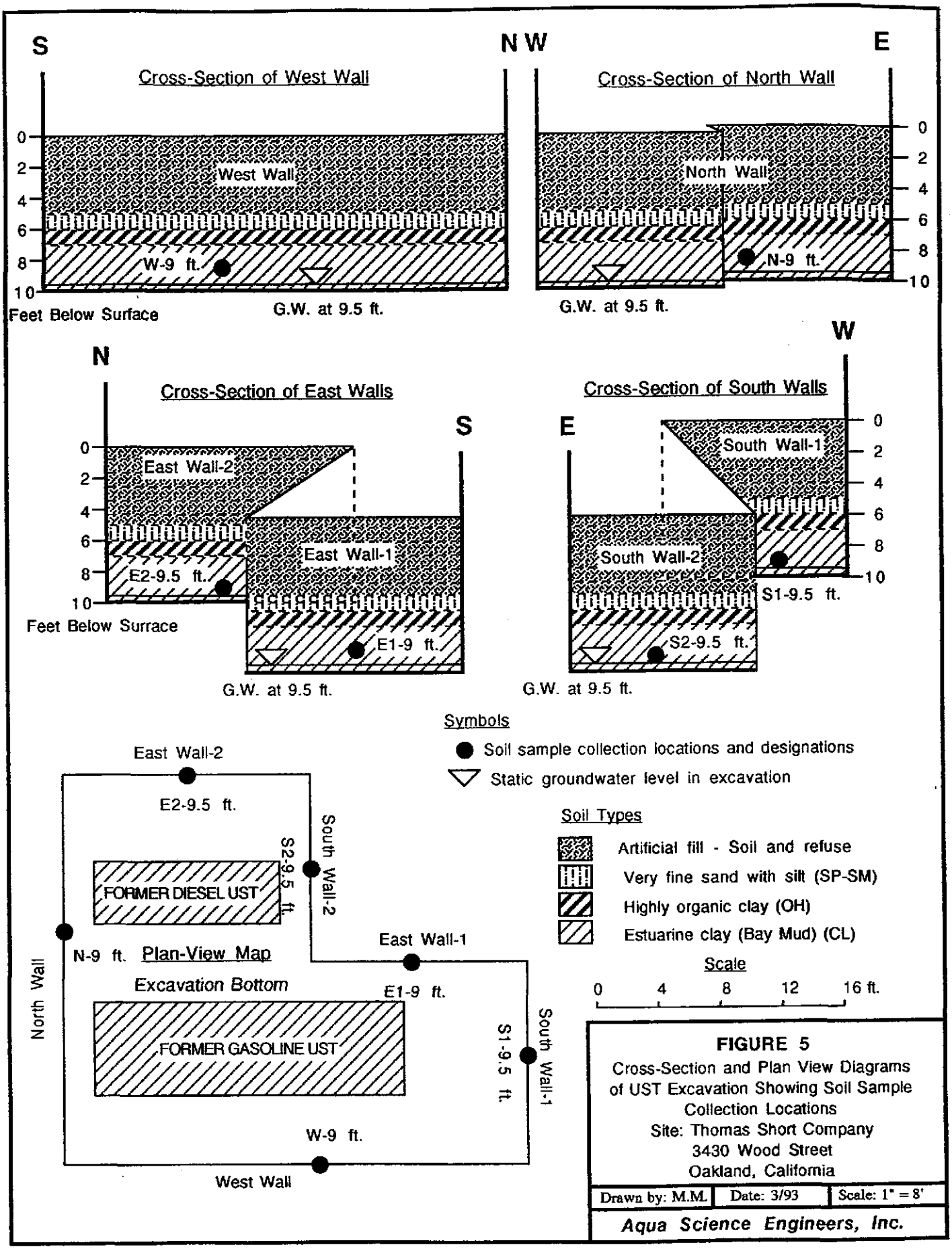


FIGURE 5

Cross-Section and Plan View Diagrams of UST Excavation Showing Soil Sample Collection Locations
Site: Thomas Short Company
3430 Wood Street
Oakland, California

Drawn by: M.M.	Date: 3/93	Scale: 1" = 8'

Aqua Science Engineers, Inc.

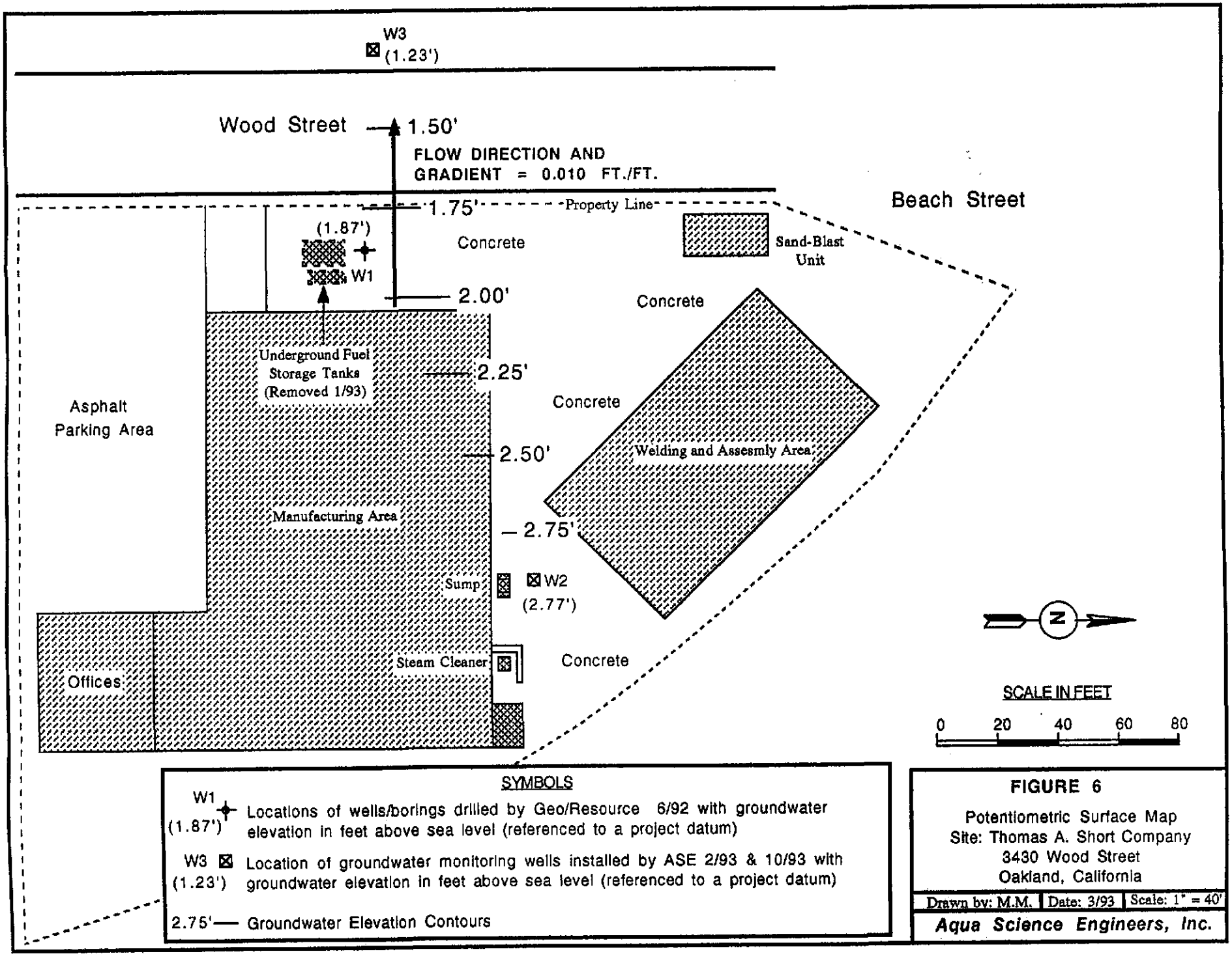


FIGURE 6

Potentiometric Surface Map
Site: Thomas A. Short Company
3430 Wood Street
Oakland, California

Drawn by: M.M. | Date: 3/93 | Scale: 1" = 40'

Aqua Science Engineers, Inc.

TABLE 1

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS, GASOLINE, DIESEL FUEL, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
CHEMICAL ANALYSES RESULTS OF SOIL SAMPLES
COLLECTED BY *GEO/RESOURCE CONSULTANTS*
AT THE *THOMAS SHORT COMPANY*, OAKLAND, CALIFORNIA
DURING JUNE, 1992

Soil Boring ID	Soil Boring Sample Depth [ft.]	TRPH EPA 418.1 [mg/Kg]	Gasoline EPA 5030/8015 [mg/Kg]	Diesel Fuel EPA 3550/8015 [mg/Kg]	Benzene EPA 8020 [ug/Kg]	Toluene EPA 8020 [ug/Kg]	Ethyl-benzene EPA 8020 [ug/Kg]	Xylenes EPA 8020 [ug/Kg]
A-1	1	6,600	NA	NA	NA	NA	NA	NA
A-2	1.5	66	NA	NA	NA	NA	NA	NA
A-2	3	180	NA	NA	NA	NA	NA	NA
B-1	5	NA	1,500	520	1,400	2,400	4,500	8,400
B-1	8	NA	ND	ND	35	7	ND	ND
B-1	13.5	NA	ND	ND	20	7	10	30
B-2	5	NA	14,000	700	500	10,000	8,000	60,000
B-2	8	NA	ND	ND	210	5	ND	ND
B-2	13.5	NA	1,700	ND	1,000	1,500	8,300	36,000
H-1	2	NA	ND	ND	ND	ND	ND	ND
H-1	5	NA	ND	ND	ND	ND	ND	ND
H-1	8	NA	6	ND	230	80	200	420
W-1	5	NA	ND	ND	10	ND	15	ND
W-1	8	NA	ND	ND	ND	ND	ND	ND
W-1	14	NA	24	ND	10	7	70	110

Note: TRPH is total recoverable petroleum hydrocarbons.
mg/Kg is milligrams of compound per kilogram of soil.
ug/Kg is micrograms of compound per kilogram of soil.
NA is not analyzed.
ND is not detected

TABLE 2

CAM 17 METALS CHEMICAL ANALYSIS RESULTS OF SOIL SAMPLES
COLLECTED BY *GEO/RESOURCE CONSULTANTS*
AT *THOMAS A. SHORT COMPANY*, OAKLAND, CALIFORNIA
DURING JUNE, 1992

Soil Boring ID	Sample Depth [ft.]	Sb mg/Kg	As mg/Kg	Ba mg/Kg	Be mg/Kg	Cd mg/Kg	Cr mg/Kg	Co mg/Kg	Cu mg/Kg	Pb mg/Kg	Hg mg/Kg	Mo mg/Kg	Ni mg/Kg	Se mg/Kg	Ag mg/Kg	Th mg/Kg	V mg/Kg	Zn mg/Kg
A-1	1	11	28	980	0.73	9.2	57	12	560	2,400*	0.28	6.3	65	ND	ND	ND	38	1,600
A-2	1.5	ND	15	530	0.89	4.2	17	11	21	49	0.09	0.80	20	ND	ND	18	30	62
A-2	3	7	18	18	0.82	8.3	47	19	48	210	0.26	0.70	66	ND	ND	ND	48	550

Note: mg/Kg is milligrams per kilogram (ppm)
ND is not detected
* is greater than TTLC for haz. waste classification by CCR Title 22

TABLE 3

GASOLINE, DIESEL FUEL, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES
CHEMICAL ANALYSES RESULTS OF GROUNDWATER SAMPLES
COLLECTED BY *GEO/RESOURCE CONSULTANTS*
AT THE *THOMAS A. SHORT COMPANY,* OAKLAND, CALIFORNIA
ON JULY 1, 1992

Ground Water Well ID	Gasoline EPA 5030/8015 [mg/L]	Diesel Fuel EPA 3510/8015 [mg/L]	Benzene EPA 602 [ug/L]	Toluene EPA 602 [ug/L]	Ethyl-benzene EPA 602 [ug/L]	Xylenes EPA 602 [ug/L]
W -1	1.3	ND	80	6	ND	15
H-1	16	ND	320	100	380	380
MCL	NL	NL	1	NL (100)	680	1,750

Note: mg/L is milligrams of compound per liter of groundwater.
ug/L is micrograms of compound per liter of groundwater.
ND is not detected
Volatile halogenated organic compounds were chemically analyzed by EPA method 601.
NL is not listed in *California Code of Regulations Title 22.*
MCL is maximum contaminant level for primary drinking water constituent.

TABLE 4

GASOLINE, DIESEL FUEL, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES CHEMICAL ANALYSES RESULTS OF **SOIL** SAMPLES COLLECTED BY ASE FOR UST CLOSURE AND EXCAVATION CONFIRMATION AT THE *THOMAS A. SHORT COMPANY*, OAKLAND, CALIFORNIA **ON JANUARY 29, 1993**

Soil Sample ID	Soil Boring Sample Depth [ft.]	Gasoline Boring EPA 5030/8015 [mg/Kg]	Diesel EPA 3550/8015 [mg/Kg]	Benzene Fuel EPA 8020 [ug/Kg]	Toluene EPA 8020 [ug/Kg]	Ethyl- EPA 8020 [ug/Kg]	Xylenes benzene EPA 8020 [ug/Kg]	TTLC Lead EPA 7000 [mg/Kg]
GSWN	NA	2.6	<1.0	5.0	8.4	10	25	6.3
GSWS	NA	3.5	<1.0	7.1	10	14	32	10
DSB 1	NA	49	<1.0	27	49	65	240	10
DSB 2	NA	17	<1.0	18	26	37	130	8.9
E-1	NA	19	<1.0	31	88	160	280	15
E-2	NA	5.4	<1.0	5.5	15	21	61	14
N	NA	3.3	<1.0	5.0	13	18	48	15
S-1	NA	13	<1.0	9.1	22	37	89	10
S-2	NA	10	<1.0	6.2	16	17	84	9.8
W	NA	1.8	<1.0	<5.0	6.2	12	24	14
STKP-E*	NA	510	28	180	250	480	1,900	140
STKP-W*	NA	280	<1.0	90	160	320	990	75

Note: Samples GSWN, GSWN, DSB 1 & DSB 2 collected for tank closure
Samples E-1, E-2, N, S-1, S-2 and W collected for excavation confirmation
Samples STKP-E & STKP-W collected from soil stockpile
"mg/Kg" is milligrams of compound per kilogram of soil.
"ug/Kg" is micrograms of compound per kilogram of soil.
"NA" is not available
"<" is less than detection limit.

TABLE 5

TOTAL RECOVERABLE PETROLEUM HYDROCARBONS, GASOLINE, DIESEL FUEL, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES CHEMICAL ANALYSES RESULTS OF **SOIL** SAMPLES COLLECTED FROM SOIL BORINGS BY ASE AT THE *THOMAS A. SHORT COMPANY*, OAKLAND, CALIFORNIA

ON FEBRUARY 3 AND OCTOBER 8, 1993

Soil Boring ID	Soil Boring Sample Depth [ft.]	TRPH EPA 418.1 [mg/Kg]	Gasoline EPA 5030/8015 [mg/Kg]	Diesel Fuel EPA 3550/8015 [mg/Kg]	Benzene EPA 8020 [ug/Kg]	Toluene EPA 8020 [ug/Kg]	Ethyl-benzene EPA 8020 [ug/Kg]	Xylenes EPA 8020 [ug/Kg]
W-2	2.5	480	NA	NA	<5.0	<5.0	<5.0	<5.0
W-2	5	53	NA	NA	NA	NA	NA	NA
W-2	7.5	<10	<1.0	<1.0	<5.0	<5.0	<5.0	<5.0
W-2	10	39	NA	NA	NA	NA	NA	NA
W-2	13	48	NA	NA	<5.0	<5.0	<5.0	<5.0
W-3	6	22	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
W-3	11	16	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
TSB-1	2.5	2,400	NA	NA	<5.0	6.6	<5.0	<5.0
TSB-1	5	680	NA	NA	NA	NA	NA	NA
TSB-1	7.5	280	NA	NA	<5.0	7.4	<5.0	<5.0
TSB-1	10	<10	NA	NA	NA	NA	NA	NA
TSB-1	13	<10	NA	NA	<5.0	<5.0	<5.0	<5.0
TSB-2	2.5	230	NA	NA	<5.0	5.7	<5.0	<5.0
TSB-2	5	<10	NA	NA	NA	NA	NA	NA
TSB-2	7.5	<10	NA	NA	<5.0	12	<5.0	<5.0
TSB-2	10	<10	NA	NA	NA	NA	NA	NA
TSB-2	13	<10	NA	NA	<5.0	<5.0	<5.0	<5.0
TSB-3	2.5	28	NA	NA	<5.0	<5.0	<5.0	<5.0
TSB-3	5	<10	NA	NA	<5.0	11	<5.0	<5.0
TSB-4	2.5	18	NA	NA	<5.0	13	<5.0	<5.0
TSB-4	5	3,200	NA	NA	<5.0	9.2	<5.0	<5.0
TSB-5	2.5	67	NA	NA	<5.0	13	<5.0	<5.0
TSB-5	5	1,400	NA	NA	<5.0	14	<5.0	<5.0
TSB-6	2.5	510	NA	NA	<5.0	<5.0	<5.0	<5.0

Note: "TRPH" is total recoverable petroleum hydrocarbons.
"mg/Kg" is milligrams of compound per kilogram of soil.
"ug/Kg" is micrograms of compound per kilogram of soil.
"NA" is not analyzed.
"<" is less than detection limit.

TABLE 6

VOLATILE HALOGENATED ORGANIC COMPOUNDS CHEMICAL ANALYSES RESULTS OF **SOIL** SAMPLES COLLECTED FROM SOIL BORINGS BY ASE AT THE *THOMAS A. SHORT COMPANY*, OAKLAND, CALIFORNIA **ON FEBRUARY 3 AND OCTOBER 8, 1993**

Soil Boring ID	Soil Boring Sample Depth [ft.]	1,1-Dichloroethene [ug/Kg]	1,1-Dichloroethane [ug/Kg]	Chloroform [ug/Kg]	1,1,1-Trichloroethane [ug/Kg]	2-Chloroethylvinylether [ug/Kg]	Chlorobenzene [ug/Kg]	1,4-Dichlorobenzene [ug/Kg]	1,2-Dichlorobenzene [ug/Kg]
W-2	2.5	<5.0	<5.0	<5.0	<5.0	<5.0	73	17	37
W-2	7.5	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
W-2	13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
W-3	6	ALL	CONSTITUENTS			RESULTED		IN <5.0	
W-3	11	ALL	CONSTITUENTS			RESULTED		IN <5.0	
TSB-1	2.5	83	64	100	130	12	81	6.0	23
TSB-1	7.5	61	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-1	13	97	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-2	2.5	13	<5.0	<5.0	<5.0	<5.0	5.3	<5.0	<5.0
TSB-2	7.5	23	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-2	13	23	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-3	2.5	19	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-3	5	21	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-4	2.5	7.6	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-4	5	38	7.4	<5.0	180	<5.0	<5.0	<5.0	<5.0
TSB-5	2.5	13	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-5	5	9.9	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0
TSB-6	2.5	12	<5.0	<5.0	<5.0	<5.0	12	<5.0	<5.0

Note: Volatile halogenated organic compounds were chemically analyzed by EPA method 8010.
"mg/Kg" is milligrams of compound per kilogram of soil.
"ug/Kg" is micrograms of compound per kilogram of soil.
"<" is less than the detection limit.
Chloromethane, vinyl chloride, bromomethane, chloroethane, trichlorofluoromethane, methylene chloride, 1,2-dichloroethenes, 1,1-dichloroethane, carbon tetrachloride, 1,2-dichloroethane, trichloroethene, 1,2-dichloropropane, bromodichloromethane, trans-1,3-dichloropropene, cis-1,3-dichloropropene, 1,1,2-trichloroethane, tetrachloroethene, dibromochloromethane, bromoform, 1,1,2,2-tetrachloroethane, and 1,3-dichlorobenzene were less than <5.0 ug/Kg in the soil boring samples listed above.

TABLE 7

CAM 17 METALS CHEMICAL ANALYSES RESULTS OF **SOIL** SAMPLES COLLECTED FROM SOIL BORINGS BY ASE AT THE *THOMAS A. SHORT COMPANY*, OAKLAND, CALIFORNIA **ON FEBRUARY 3 AND OCTOBER 8, 1993**

Soil Boring ID	Soil Boring Sample Depth [ft.]	As [mg/Kg]	Ba [mg/Kg]	Cd [mg/Kg]	Co [mg/Kg]	Cr [mg/Kg]	Cu [mg/Kg]	Hg [mg/Kg]	Ni [mg/Kg]	Pb [mg/Kg]	Sb [mg/Kg]	V [mg/Kg]	Zn [mg/Kg]
W-2	2.5	2	160	<1	<10	34	29	0.12	47	63	<5	34	93
W-2	7.5	2	19	<1	<10	35	14	<0.05	32	<5	<5	24	42
W-2	13	2	61	<1	<10	17	13	<0.05	25	<5	<5	30	<20
W-3	6	1.9	60	<0.01	7	42	8.1	<0.002	36	<0.1	<0.1	30	24
W-3	11	1.1	53	<0.01	8	38	8.7	<0.002	31	<0.1	<0.1	32	21
TSB-1	2.5	4	280	3	<10	47	180	0.24	37	420*	<5	22	1,000
TSB-1	7.5	2	46	<1	<10	41	21	<0.05	29	5	<5	33	49
TSB-1	13	3	76	<1	<10	23	12	0.06	47	<5	<5	18	30
TSB-2	2.5	3	180	1	<10	28	88	0.16	35	220*	<5	20	450
TSB-2	7.5	2	21	<1	<10	42	16	<0.05	36	<5	6	30	48
TSB-2	13	<1	61	<1	<10	14	12	0.06	40	<5	<5	15	24
TSB-3	2.5	2	37	<1	<10	7	<10	<0.05	<10	<5	<5	12	<20
TSB-3	5	<1	170	<1	10	20	14	<0.05	15	8	<5	33	24
TSB-4	2.5	1	65	<1	<10	30	<10	<0.05	27	<5	<5	22	27
TSB-4	5	1	40	<1	<10	11	<10	0.19	15	31	<5	13	95
TSB-5	2.5	3	160	<1	10	34	43	0.20	45	220*	<5	29	220
TSB-5	5	3	22	<1	<10	<5	47	0.14	13	29	<5	<10	62
TSB-6	2.5	9	1,600*	3	10	29	320*	0.11	30	250*	15	29	4,800*
TTLC		500	10,000	100	8,000	2,500	2,500	20	2,000	1,000	500	2,400	5,000
STLC		5.0	100	1.0	80	560	25	0.2	20	5.0	15	24	250

Note: CAM 17 Metals were chemically analyzed by EPA SW-846 6000 & 7000 Series Methods.
"mg/Kg" is milligrams of metal per kilogram of soil.
"<" is less than the detection limit.
"*" is greater than ten times the STLC for the metal
Silver (<5 mg/Kg), berylium (<0.5 mg/Kg), molybdenum (<10 mg/Kg), selenium (<1 mg/Kg), and thallium (<5 mg/Kg) were less than the detection limits for the soil boring samples listed above.

TABLE 8

CAM 17 METALS, SOLUBLE THRESHOLD LIMIT CONCENTRATION (STLC) CHEMICAL ANALYSES RESULTS OF **SOIL** SAMPLES COLLECTED FROM SOIL BORINGS BY ASE AT THE *THOMAS A. SHORT COMPANY,* OAKLAND, CALIFORNIA **ON FEBRUARY 3, 1993**

Soil Boring ID	Soil Boring Sample Depth [ft.]	STLC Copper [mg/Kg]	STLC Lead [mg/Kg]
TSB-1	2.5	NA	1.1
TSB-5	2.5	NA	1.4
TSB-6	2.5	0.6	1.2
STLC	25	5.0	

Note: "mg/Kg" is milligrams of metal per kilogram of soil.
"STLC" is Soluble Threshold Limit Concentration.
STLC for copper was chemically analyzed by EPA method 1310/7210.
STLC for lead was chemically analyzed by EPA method 1310/7420.

TABLE 9

PH, CONDUCTIVITY, OIL AND GREASE, GASOLINE, DIESEL FUEL, BENZENE, TOLUENE, ETHYLBENZENE, AND XYLENES CHEMICAL ANALYSES RESULTS OF **GROUNDWATER** SAMPLES COLLECTED BY ASE AT THE *THOMAS A. SHORT COMPANY,* OAKLAND, CA **ON FEBRUARY 12, AND OCTOBER 12 & 14, 1993**

Ground Water Well ID	pH EPA 9040	Conductivity EPA 120.1 [uS]	Oil and Grease EPA 418.1 [mg/L]	Gasoline EPA 5030/8015 [ug/L]	Diesel Fuel EPA 3510/8015 [ug/L]	Benzene EPA 602 [ug/L]	Toluene EPA 602 [ug/L]	Ethyl-benzene EPA 602 [ug/L]	Xylenes EPA 602 [ug/L]
2/12/93									
W 1	6.7	14,000	NA	4,600	<50	15	16	22	64
W 2	6.7	1,300	8.1	NA	NA	<0.5	<0.5	<0.5	<0.5
10/12/93 & 10/14/93									
W 1	6.6	6,200	NA	3,700	<50	4.2	6.8	7.2	26
W 2	7.0	6,600	<0.5	320	<50	<50	0.6	0.7	2.2
W 3	6.9	1,430	3.6	<50	<50	<50	<50	<50	<50
MCL	NL	NL	NL	NL	NL	1	NL	680	1,750

Note: "uS" is micromhos per centimeter
"mg/L" is milligrams of compound per liter of groundwater.
"ug/L" is micrograms of compound per liter of groundwater.
"NA" is not analyzed. - "<" is less than detection limit.
"NL" is not listed in *California Code of Regulations Title 22.*
"MCL" is maximum contaminant level for primary drinking water constituent.

TABLE 10

VOLATILE HALOGENATED ORGANIC COMPOUNDS
CHEMICAL ANALYSES RESULTS OF GROUNDWATER SAMPLES
COLLECTED BY ASE AT THE *THOMAS A. SHORT COMPANY*, OAKLAND, CA.
ON FEBRUARY 12, 1993

Ground Water Well ID	1,1-Dichloroethene [ug/L]	1,1-Dichloroethane [ug/L]	Chloroform [ug/L]	1,2-Dichloropropane [ug/L]	Tetrachloro-ethene [ug/L]	ALL OTHER CONSTIT.
W 2	1.1	2.6	0.9	0.9	1.4	<0.5
MCL	6	5	NL	5	5	

TABLE 10, CONTINUED

VOLATILE HALOGENATED ORGANIC COMPOUNDS
CHEMICAL ANALYSES RESULTS OF GROUNDWATER SAMPLES
COLLECTED BY ASE AT THE *THOMAS A. SHORT COMPANY*, OAKLAND, CA.
ON OCTOBER 12 & 14, 1993

Ground Water Well ID	1,2-Dichlorobenzene [ug/L]	Chlorobenzene [ug/L]	ALL OTHER CONTITUENTS
W 2	1.1	2.6	<0.5
W 3	<0.5	<0.5	<0.5
MCL	6	5	

Note: "mg/L" is milligrams of compound per liter of groundwater.
"ug/L" is micrograms of compound per liter of groundwater.
"NA" is not analyzed. - "<" is less than detection limit.
Volatile halogenated organic compounds were chemically analyzed by EPA method 601.
"NL" is not listed in *California Code of Regulations Title 22.*
"MCL" is maximum contaminant level for primary drinking water constituent.

TABLE 11

CAM 17 METALS CHEMICAL ANALYSIS RESULTS OF GROUNDWATER SAMPLES COLLECTED BY ASE AT THE *THOMAS A. SHORT COMPANY*, OAKLAND, CALIFORNIA ON OCTOBER 12 & 14, 1993

Well ID	Date	Sb mg/L	As mg/L	Ba mg/L	Be mg/L	Cd mg/L	Cr mg/L	Co mg/L	Cu mg/L	Pb mg/L	Hg mg/L	Mo mg/L	Ni mg/L	Se mg/L	Ag mg/L	Th mg/L	V mg/L	Zn mg/L
W 2	10/12/93	ND	ND	ND	0.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
W 3	10/14/93	ND	ND	ND	0.19	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.22

Note: mg/L is milligrams per Liter (ppm)
ND is not detected above detection limits

APPENDICES

APPENDIX 1

BAAQMD DISTRICT PERMIT TO OPERATE

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CALIFORNIA 94109
(415) 771-6000

PERMIT TO OPERATE

Plant# 5336 Page: 1 Expires: AUG 1, 1993

This document does not permit the holder to violate any District regulation or other law.

Thomas A Short Company
P O Box 8127
Emeryville, CA 94608

Location: 3430 Wood Street
Oakland, CA 94608

S#	DESCRIPTION	[Schedule]	PAID
1	CHEM/MISC> Abrasives blasting, Gravel/sand Sandblast Room Abated by: A1 Baghouse, Shaking Emissions at: P1 Stack	[F, 376 days]	86
2	Spray booth, Air atomized, 10.54 gal/yr solvent Spray Paint Booth Abated by: A2 Simple Cyclone Emissions at: P2 Stack	[exempt]	0
4	Solvent cleaning, 25 gal/yr net solvent, 68 deg F Wipe Cleaning	[E, 376 days]	86

2 Permit Sources, 1 Exempt Source
Total Fees $172.00
Invoice #1445 Paid

*** See attached Permit Conditions ***

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CALIFORNIA 94109
(415) 771-6000

PERMIT TO OPERATE

Plant# 5336 Page: 2 Expires: AUG 1, 1993

This document does not permit the holder to violate any District regulation or other law.

*** PERMIT CONDITIONS ***

Source# 1 subject to condition ID# 5768

BAY AREA AIR QUALITY MANAGEMENT DISTRICT
939 ELLIS STREET
SAN FRANCISCO, CALIFORNIA 94109
(415) 771-6000

PERMIT TO OPERATE

*** PERMIT CONDITIONS ***

CONDITION ID #5768

THOMAS A. SHORT CO; PLANT 5336

CONDITIONS FOR S-1:

1. S-1 shall be abated by the A-1 baghouse at all times.

2. The A-1 baghouse shall be maintained in good operating condition at all times.

CONDITIONS FOR S-4:

1. Net solvent usage for wipe cleaning shall not exceed 65 gallons during any consecutive 12 month period.

2. Only Shell Solvent 360 shall be used as a wipe cleaning solvent and only used in the quantity indicated in condition #1 unless the District provides written authority to use other solvents.

3. An accurate District approved logbook shall be maintained on a monthly basis for the type and quantity of wipe cleaning solvent used in this operation. These records shall be retained for a period of at least two years from the date of the first entry. The log shall be kept on-site

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~ END OF CONDITIONS ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

S#	Source Description	Annual Average lbs/day PART	ORG	NOx	SO2	CO
1	Sandblast Room	-	-	-	-	-
[illegible]	Spray Paint Booth	-	-	-	-	-
[illegible]	Wipe Cleaning	-	-	-	-	-
	T O T A L S					

APPENDIX II

SOIL/WELL BORING LOGS BY GEO/RESOURCE CONSULTANTS

LOG OF BORING TSC/B-1

Equipment Hollow Stem Auger

Elevation N.A. Date 6/25/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
	31		1	0		SILTY CLAY (CL) light brown, damp, loose to medium dense, rock fragments
	3		60	5		color changes to black, damp to moist, very soft, organics
	2		17	10		wet
	24		180	15		color changes to gray, moist to wet, trace rock fragments
				20		Boring terminated @ 14.0 feet. No free standing groundwater was encountered during drilling.
				25		
				30		

Fill

Geo/Resource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: Date 7/6/92

LOG OF BORING TSC/B-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

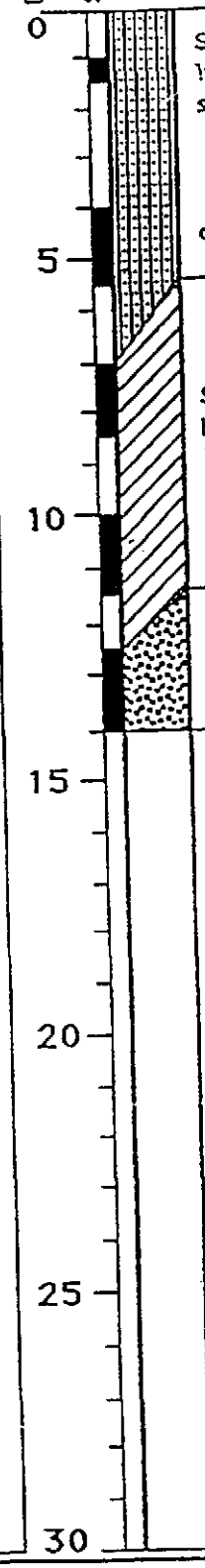
FIGURE B-7

LOG OF BORING TSC/B-2

Equipment Hollow Stem Auger

Elevation N.A. Date 6/25/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.
	37		0	0	
	6		180	5	
	2		80		
	10		60	10	
	5|0		200		
				15	
				20	
				25	
				30	



SILTY SAND (SM)
light brown, wet, loose to medium dense, some rock fragments

color changes to black, moist, very loose

Fill

SILTY CLAY (CL)
black, wet, soft

GRAVEL (GM)
black, saturated, some silt

Boring terminated @ 14.0 feet.
No free standing groundwater was encountered during drilling.

GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: _____ Date 7/6/92

LOG OF BORING TSC/B-2
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-8

LOG OF BORING TSC/H-1

Equipment Hollow Stem Auger

Elevation N.A. Date 6/25/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
	54		0	0		SILTY CLAY (CL) light brown, dry, loose to medium dense, rock fragments
	3			5		damp — Fill
	2		0	10		SILT (OL) black-gray, saturated, very soft
				15		
				20		Boring terminated @ 18.0 feet. No free standing groundwater was encountered during drilling.
				25		
				30		

Geo/Resource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: _____ Date 7/6/92

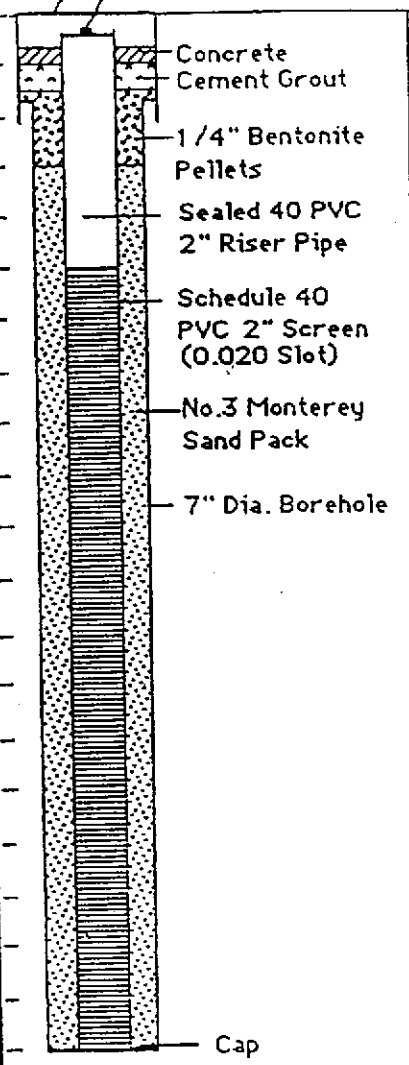
LOG OF BORING TSC/H-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-9

LOG OF BORING TSC/W-1

Equipment Hollow Stem Auger

Elevation N.A. Date 6/23/92



Depth (ft.)	Sample pnts	Blows/ft.	Hnu Readings (ppm)	
0		32	2	SILTY CLAY (CL) light brown, damp, medium dense, rock fragments, debris (concrete)
5		3	2	color changes to dark brown, very soft
		3	6	color changes to black, wet, very soft
10		8	4	Fill
15		30	7	color changes to light brown, some rock fragments, very stiff
20				Boring terminated @ 20.0 feet. No free standing groundwater was encountered during drilling.
25				
30				

Geo/Resource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: _____ Date 7/6/92

LOG OF BORING TSC/W-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-10

LOG OF BORING TSA-1

Equipment Hand Auger

Elevation N.A. Date 6/23/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
				0		8" CONCRETE PAD
						GRAVELLY SANDY CLAY (CL) black to dark gray, moist to wet, soft to firm, gravel to 6" dia.
				5		Boring terminated @ 1.8 feet. No free standing groundwater was encountered during drilling.
				10		
				15		
				20		
				25		
				30		

GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: Date 7/7/92

LOG OF BORING TSA-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-11

LOG OF BORING TSA-2

Equipment Hand Auger

Elevation N.A. Date 6/23/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
				0		10" CONCRETE PAD
						GRAVELLY SANDY CLAY (CL) dark brown to black, moist to wet, soft, gravel to 3" dia.
				5		Boring terminated @ 3.5 feet. No free standing groundwater was encountered during drilling.
				10		
				15		
				20		
				25		
				30		

GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: _____ Date 7/7/92

LOG OF BORING TSA-2
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-12

APPENDIX III

SOIL/WELL BORING LOGS BY AQUA SCIENCE ENGINEERS

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS

BORING NO. TSB-1

Project Name: Thomas Short | Project Location: 3430 Wood St., Oakland | Page 1 of 1

Driller: Gregg Drilling | Type of Rig: Simco 2400 | Type and Size of Auger: 8.00" OD HS

Logged By: M. Marello RG#5339 | Date Drilled: 2-3-93 | Checked By:

WATER AND WELL DATA

Depth of Water First Encountered: ≈13'

Static Depth of Water in Well: NA

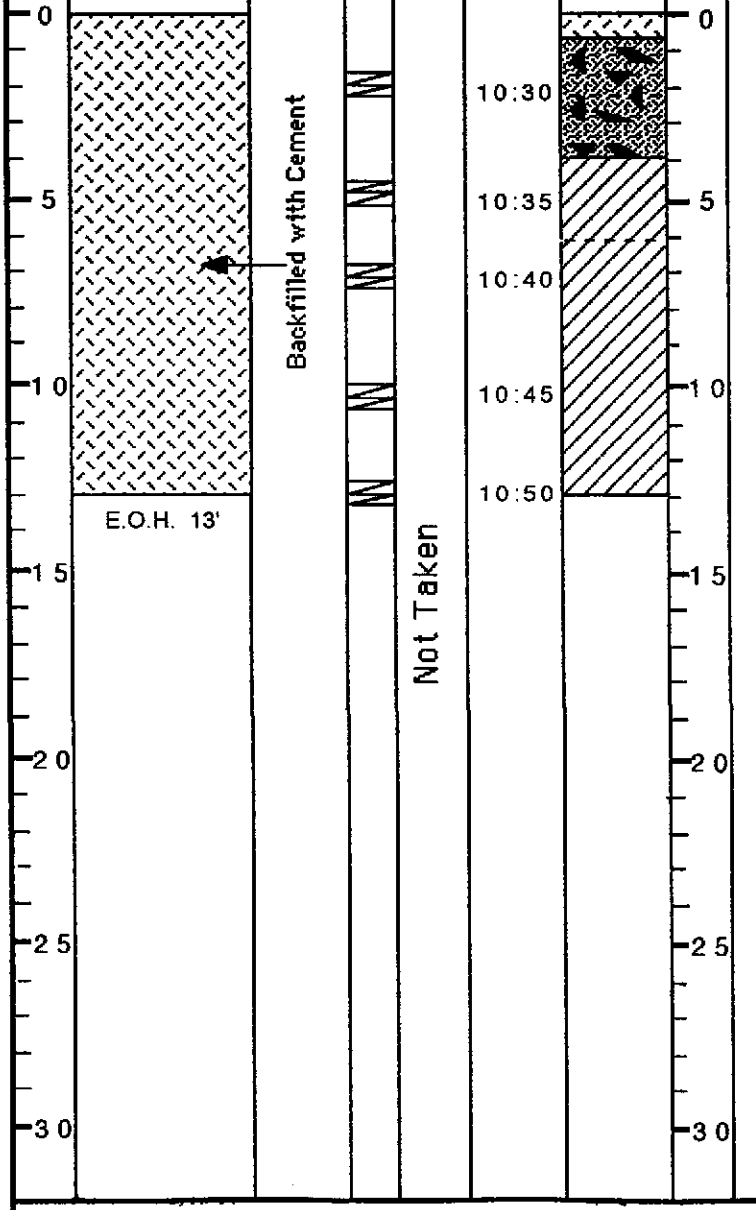
Total Depth of Boring: 13'

Total Depth of Well Completed: 13'

Well Screen Type and Diameter: .020"

Well Screen Slot Size: NA

Type and Size of Soil Sampler: 1.5" CA Split Spoon



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

And (40-50%) | With (40-25%) | Some (25-10%) | Trace (10-0%)

Concrete ≈ 6"

Silt with clay, sand & gravel (Fill), dark gray to black, moist, sl. odor

Clay, some silt (OL), black, highly organic, moist, some odor (oil sheen?)

Clay and silt (CL), olive to olive-gray, moist, some humus, no odor

Clay and silt (CL), olive to olive-gray, moist, some humus, no odor

Clay (CL), olive-gray to olive green mottled, mod. stiff, moist, no odor

Free standing water in boring at 13' after ≈ 1/2 hour

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS

BORING NO. TSB-2

Project Name: Thomas Short | Project Location: 3430 Wood St., Oakland | Page 1 of 1

Driller: Gregg Drilling | Type of Rig: Simco 2400 | Type and Size of Auger: 3.25" OD HS

Logged By: M. Marello RG#5339 | Date Drilled: 2-3-93 | Checked By:

WATER AND WELL DATA

Depth of Water First Encountered: ≈10'

Static Depth of Water in Well: NA

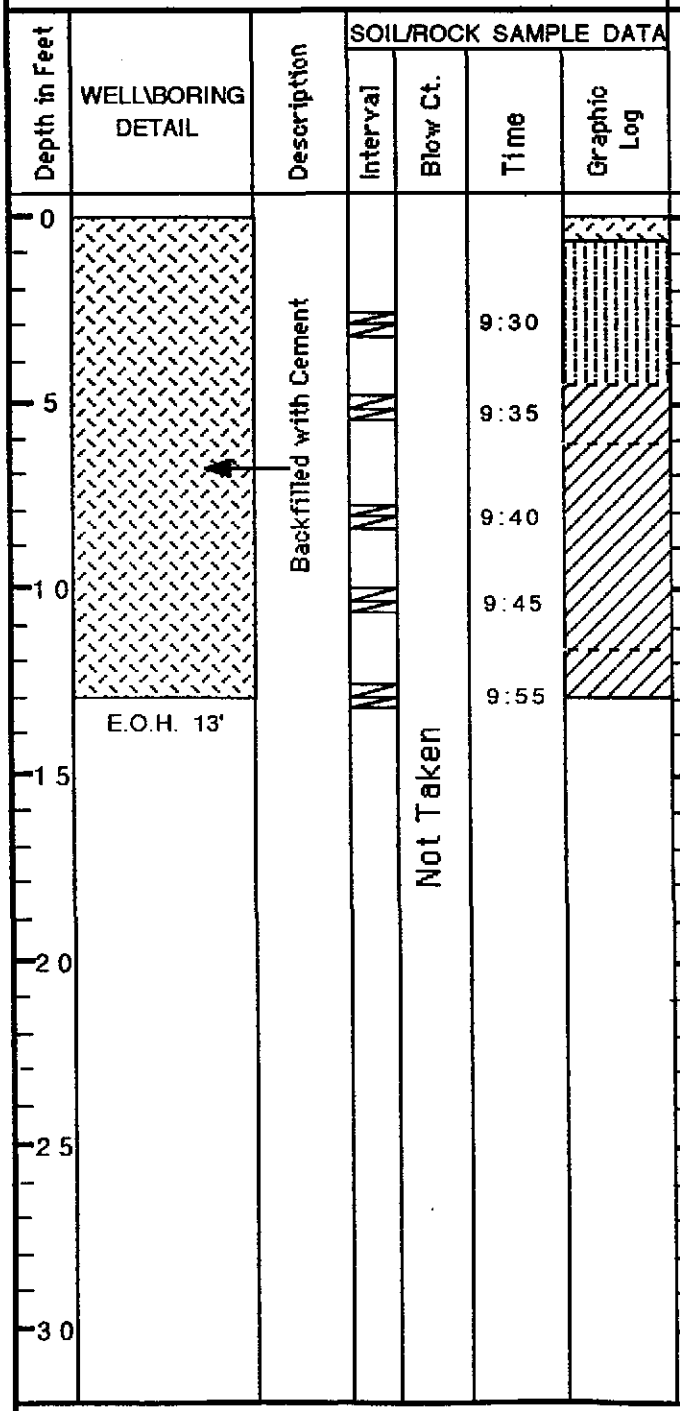
Total Depth of Boring: 13'

Total Depth of Well Completed: NA

Well Screen Type and Diameter: NA

Well Screen Slot Size: NA

Type and Size of Soil Sampler: 1.5" CA Split Spoon



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

And (40-50%) With (40-25%) Some (25-10%) Trace (10-0%)

Concrete ≈ 6"

Silt with gravel & sand (Fill) olive-brown, sl. moist, no odor

Clay (OL), black, highly organic, moist, H_2S odor

Clay (CL), olive-gray, moist, no odor

Clay (CL), olive-gray, wet, no odor

Clay (CL), olive, sticky, moist, no odor

Free standing water at 13' after ≈ 1 hour

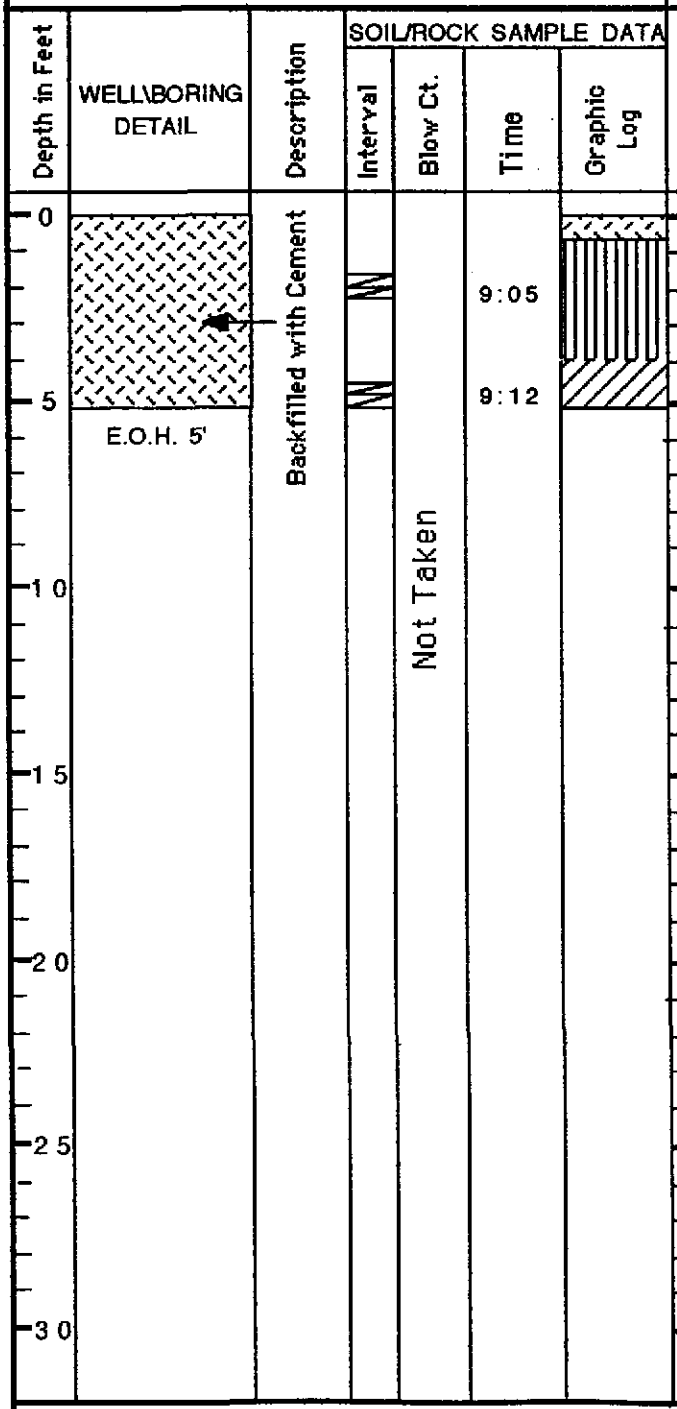
SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS

BORING NO. TSB-3

Project Name: Thomas Short	Project Location: 3430 Wood St., Oakland	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Simco 2400	Type and Size of Auger: 3.25" OD HS
Logged By: M. Marello RG#5339	Date Drilled: 2-3-93	Checked By:

WATER AND WELL DATA

Depth of Water First Encountered: Not Encountered	Total Depth of Well Completed: NA
Static Depth of Water in Well: NA	Well Screen Type and Diameter: NA
Total Depth of Boring: 5'	Well Screen Slot Size: NA
	Type and Size of Soil Sampler: 1.5" CA Split Spoon



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

And	With	Some	Trace
(40-50%)	(40-25%)	(25-10%)	(10-0%)

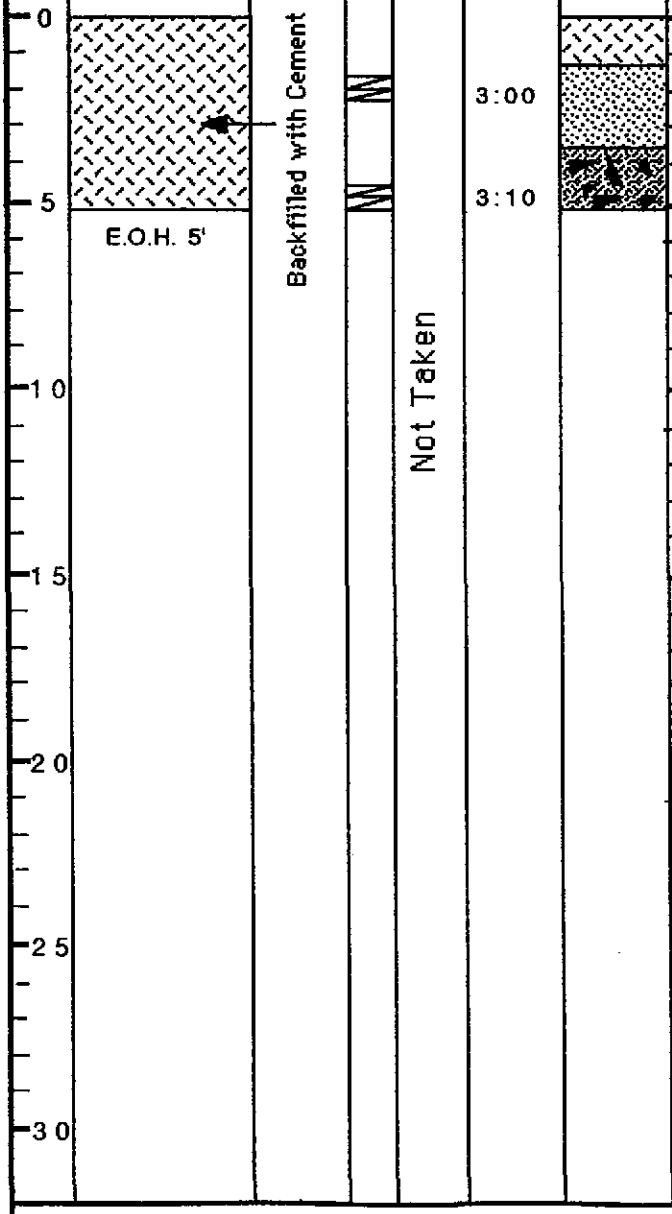
Concrete ≈ 6"

Silt with clay, some sand, abundant brick,asphalt, wire, concrete (Fill). Dark gray to black, sl. moist, H_2S odor

Clay, some silt, highly organic (OL), dark gray to black, moist H_2S odor

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS		BORING NO. TSB-4
Project Name: Thomas Short	Project Location: 3430 Wood St., Oakland	Page 1 of 1
Driller: Gregg Drilling	Type of Rig: Simco 2400	Type and Size of Auger: 3.25" OD HS
Logged By: M. Marello RG#5339	Date Drilled: 2-3-93	Checked By:

WATER AND WELL DATA			
Depth of Water First Encountered:	Not Encountered	Total Depth of Well Completed:	NA
Static Depth of Water in Well:	NA	Well Screen Type and Diameter:	NA
Total Depth of Boring:	5'	Well Screen Slot Size:	NA
		Type and Size of Soil Sampler:	1.5" CA Split Spoon



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

And (40-50%) With (40-25%) Some (25-10%) Trace (10-0%)

Concrete ≈ 14"

Med. sand, some silt (SP-SM), tan dry, no odor (Fill?)

Clay, some silt & sand, (Fill), dark gray to black, dry no odor, some metalic "ash"?

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS

BORING NO. TSB-5

Project Name: Thomas Short | Project Location: 3430 Wood St., Oakland | Page 1 of 1

Driller: Gregg Drilling | Type of Rig: Simco 2400 | Type and Size of Auger: 3.25" OD HS

Logged By: M. Marello RG#5339 | Date Drilled: 2-3-93 | Checked By:

WATER AND WELL DATA

Depth of Water First Encountered: Not Encountered

Static Depth of Water in Well: NA

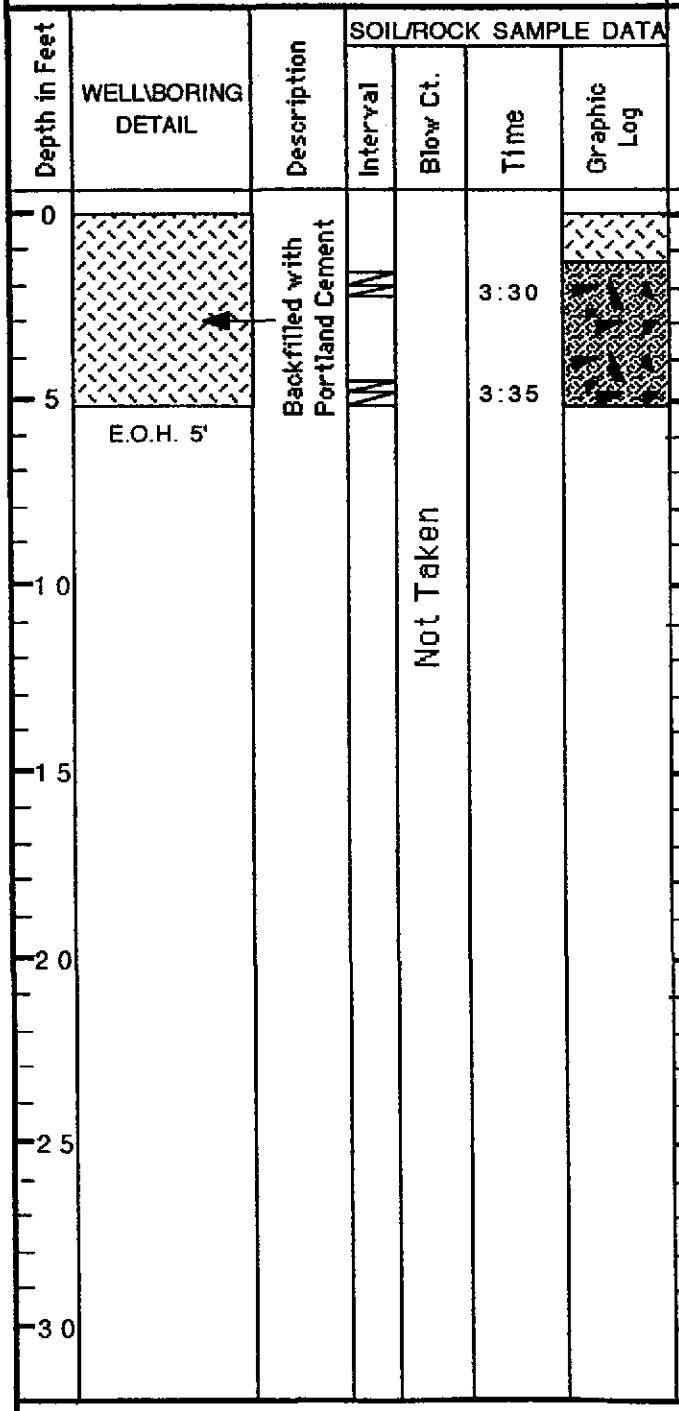
Total Depth of Boring: 5'

Total Depth of Well Completed: NA

Well Screen Type and Diameter: NA

Well Screen Slot Size: NA

Type and Size of Soil Sampler: 1.5" CA Split Spoon



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

And (40-50%) With (40-25%) Some (25-10%) Trace (10-0%)

Concrete ≈ 14"

Sand, gravel, silt (Fill), abundant red brick, asphalt & wood

Sand, gravel (Fill), abundant asphalt & brick

ASE Form 20A

AQUA SCIENCE ENGINEERS, INC.

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS

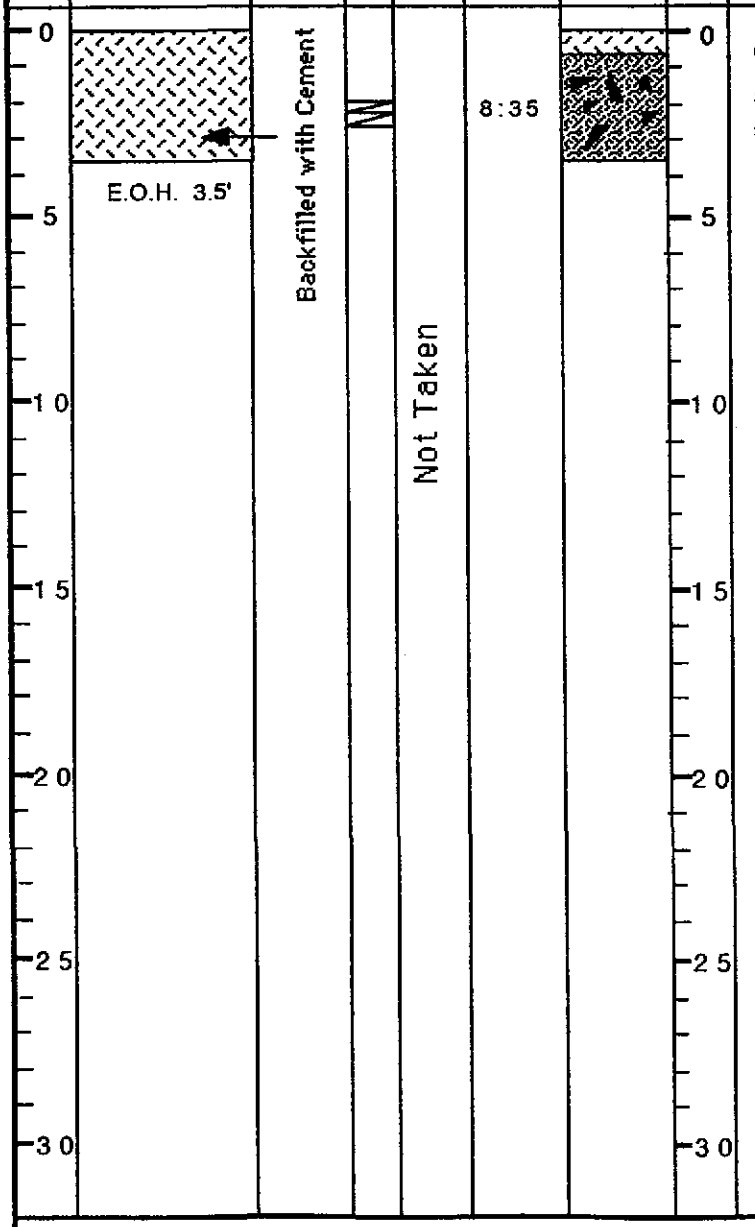
BORING NO. TSB-6

Page 1 of 1

Project Name: Thomas Short	Project Location: 3430 Wood St., Oakland	
Driller: Gregg Drilling	Type of Rig: Simco 2400	Type and Size of Auger: 3.25" OD HS
Logged By: M. Marello RG#5339	Date Drilled: 2-3-93	Checked By:

WATER AND WELL DATA

Depth of Water First Encountered: Not Encountered	Total Depth of Well Completed: NA
Static Depth of Water in Well: NA	Well Screen Type and Diameter: NA
Total Depth of Boring: 3.5' (Refusal)	Well Screen Slot Size: NA
	Type and Size of Soil Sampler: 1.5" CA Split Spoon



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

And	With	Some	Trace
(40-50%)	(40-25%)	(25-10%)	(10-0%)

Concrete ≈ 6"

Silt with clay, some sand, dark gray to black, concrete scrap & brick abundant (Fill)
Refusal at 3.5' in 4 areas
Discontinue drilling

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS

BORING NO. W-2

Project Name: Thomas Short | Project Location: 3430 Wood St., Oakland | Page 1 of 1

Driller: Gregg Drilling | Type of Rig: Simco 2400 | Type and Size of Auger: 8.00" OD HS

Logged By: M. Marello RG#5339 | Date Drilled: 2-3-93 | Checked By:

WATER AND WELL DATA

Depth of Water First Encountered: ≈13'

Static Depth of Water in Well: 8.81' (2-12-93)

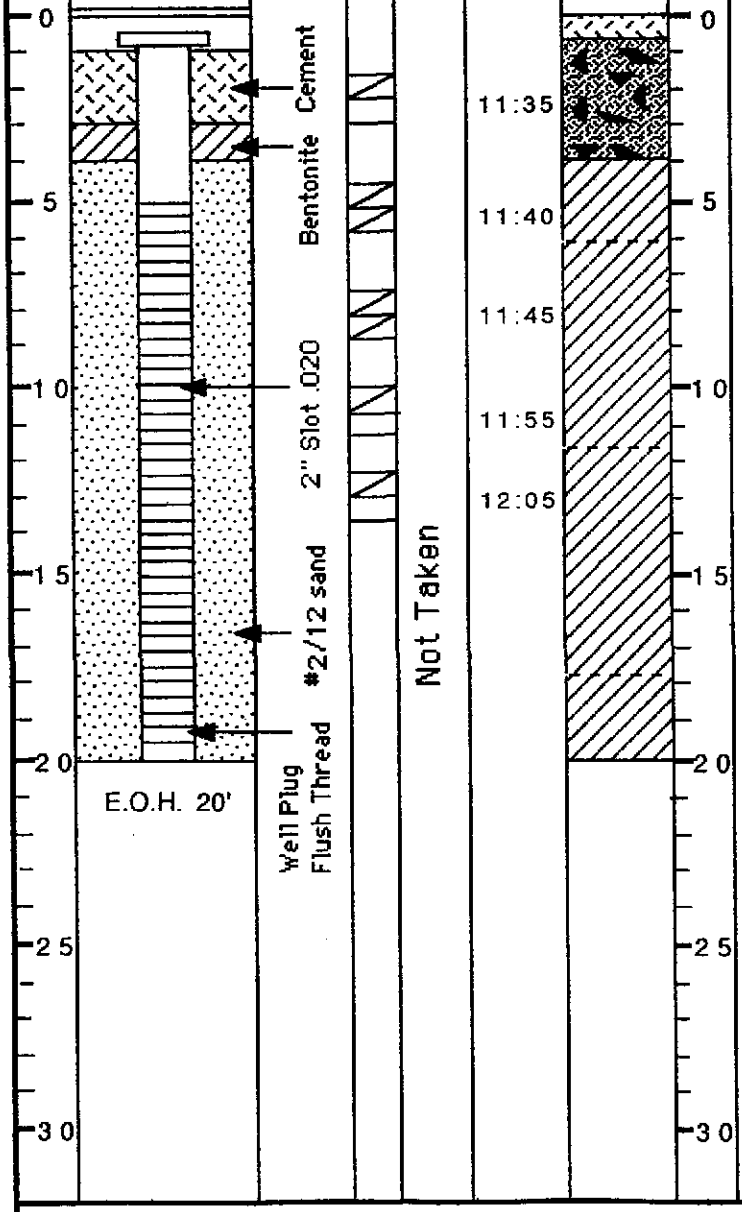
Total Depth of Boring: 20'

Total Depth of Well Completed: 20'

Well Screen Type and Diameter: Sch 40 PVC 2"

Well Screen Slot Size: .020"

Type and Size of Soil Sampler: 1.5" CA Split Spoon



DESCRIPTION OF LITHOLOGY

standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.

And (40-50%) | With (40-25%) | Some (25-10%) | Trace (10-0%)

Concrete ≈ 6"

Sand, clay, gravel & silt (Fill), black to dark gray, moist, oil odor, oil staining

Clay some silt (OL), black, highly organic, H_2S odor, moist

Clay with silt (CL), olive gray to olive green mottled, moist to wet, H_2S odor

Clay with silt (CL), olive gray to olive green, mottled, wet, H_2S odor, (Bay mud)

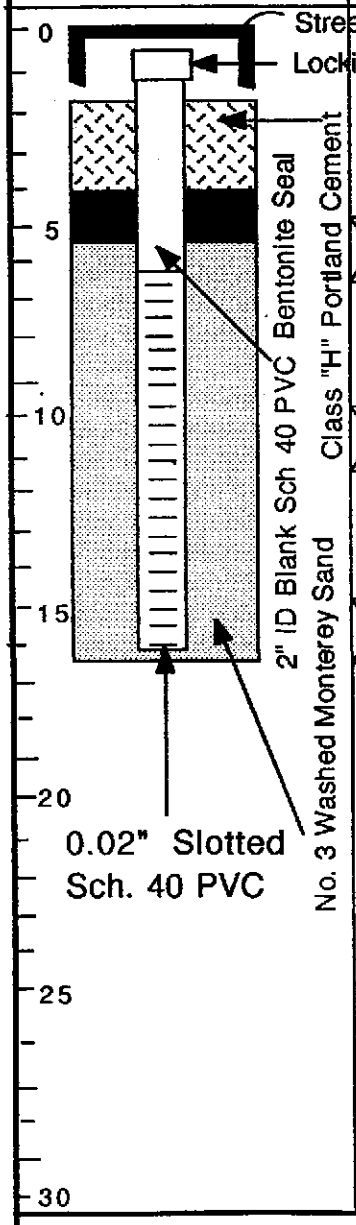
Clay, some silt (CL), olive-gray and olive-green mottled, moist, sticky, mod. stiff

Clay, some silt & v. fine sand (CL), tan, water saturated, no odor

SOIL BORING LOG AND MONITORING WELL CONSTRUCTION DETAILS		Well W-3
Project Name: Thomas A. Short Company	Project Location: 3430 Wood St., Oakland	Page 1 of 1
Driller: Soils Exploration Services	Type of Rig: Simco-type	Type and Size of Auger: 8-inch O.D. Hollow-stem.
Logged By: Robert E. Kitay	Date Drilled: October 8, 1993	Checked By: David M. Schultz, P.E.

WATER AND WELL DATA

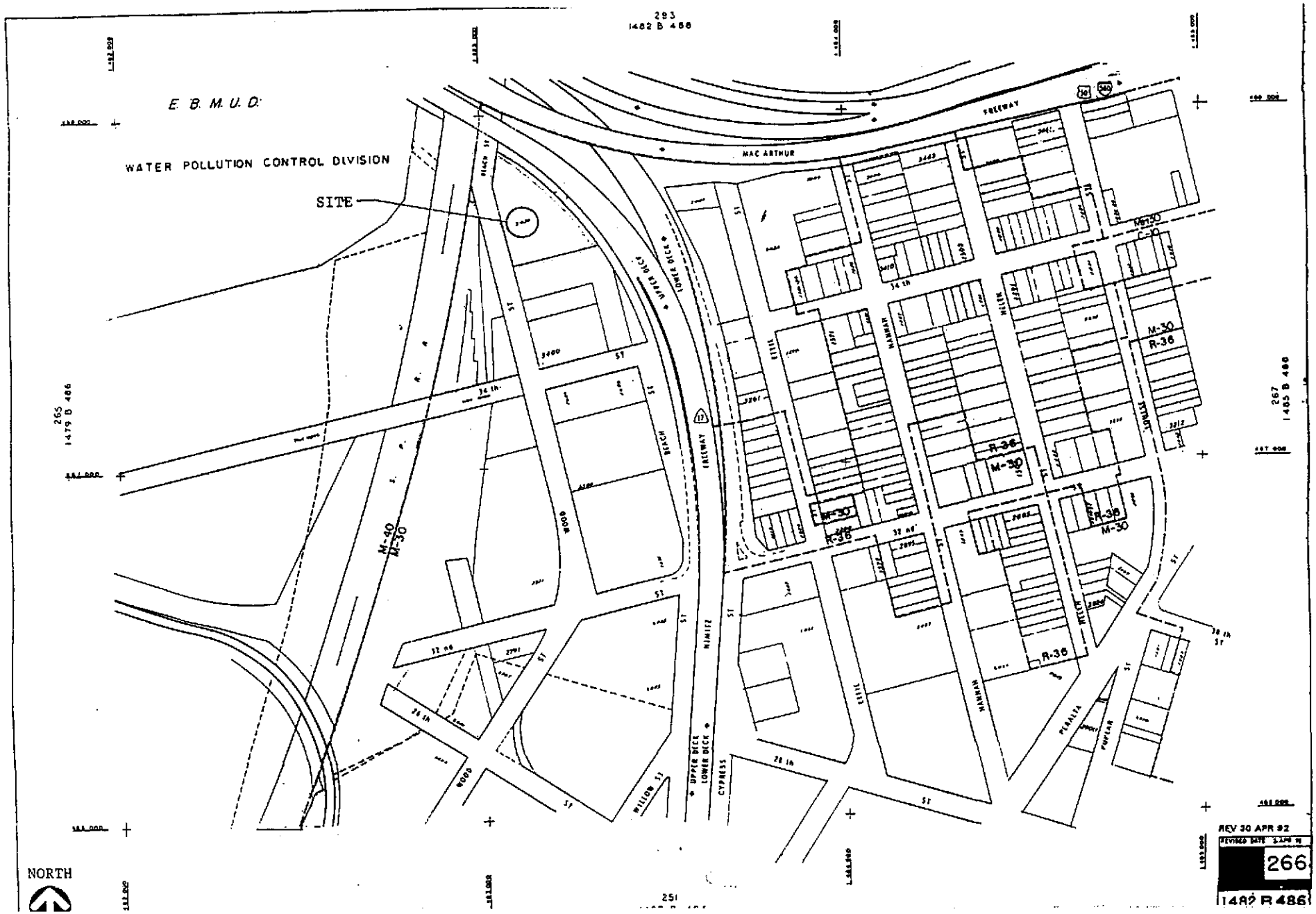
Depth of Water First Encountered: ≈ 13'	Total Depth of Well Completed: 15.5'
Static Depth of Water in Well: 11.5'	Well Screen Type and Diameter: 2" Diameter Schedule 40 PVC
Total Depth of Boring: 15.5'	Well Screen Slot Size: 0.020"
	Type and Size of Soil Sampler: 2" I.D., Calif. Split-barrel

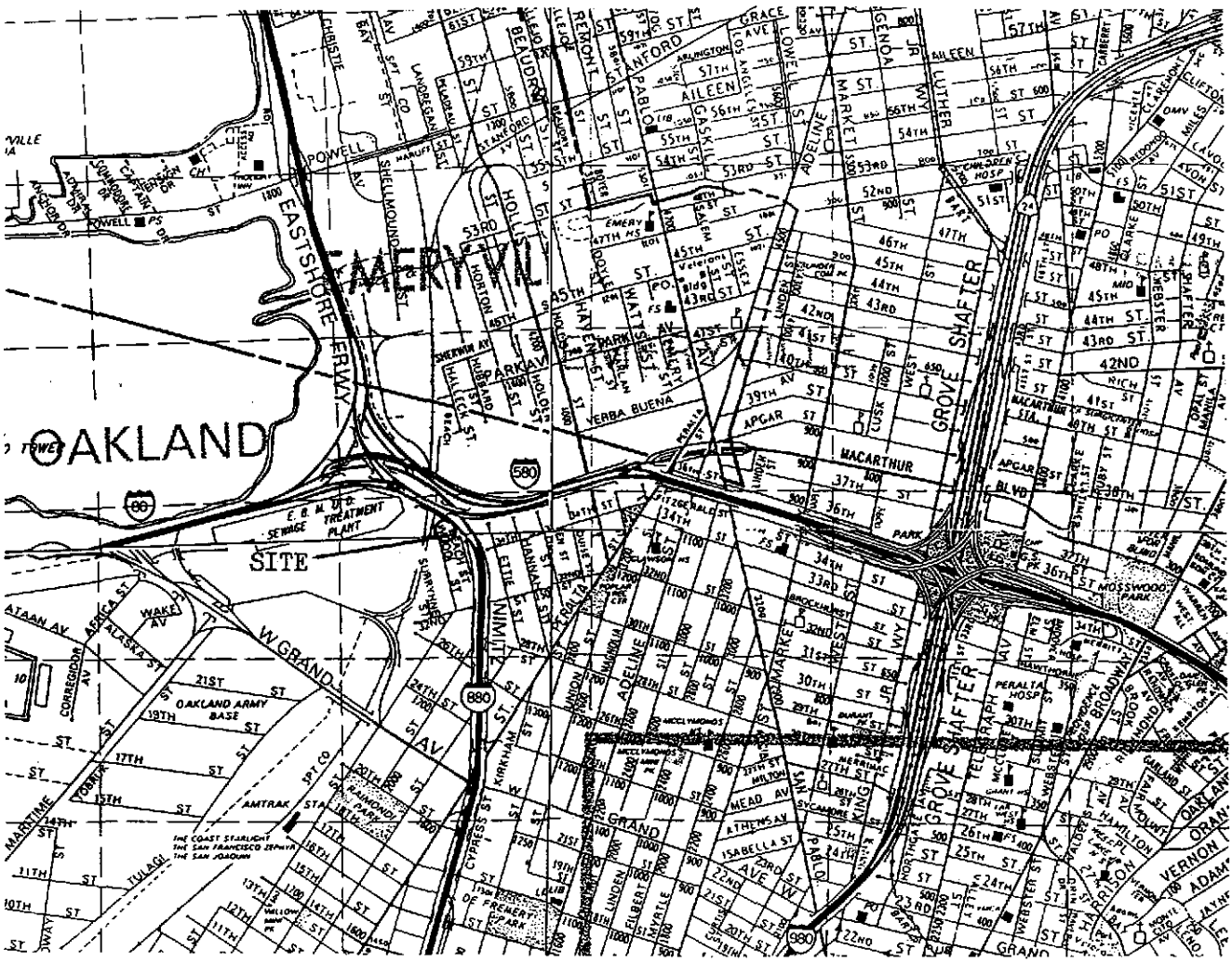


SOIL/ROCK SAMPLE DATA					DESCRIPTION OF LITHOLOGY
Depth in Feet	Interval	Blow Ct.	Time	Graphic Log	standard classification, texture, relative moisture, density, stiffness, odor-staining, USCS designation.
0					Sandy GRAVEL (GW); yellow brown; damp; medium dense; 60-65% angular to subrounded pebbles to 4" diameter; 25-30% fine to course sand; 10% silt; high estimated K; no odor
5		4 6 6	10:10		Gravely SAND (SW); olive-brown; moist; dense; 75-80% fine to course sand; 10-15% subangular to subrounded pebbles to 4' diameter; 10% silt; high estimated K; no odor
10		2 3 3	10:35		Silty SAND (SM); yellow brown; wet; medium dense; 90% medium sand; 10% silt; high estimated K; no odor olive at 8'; no odor 85% medium sand; 10% silt; 5% subrounded pebbles to 3" diameter free water at 13'
15					
20					
25					
30					

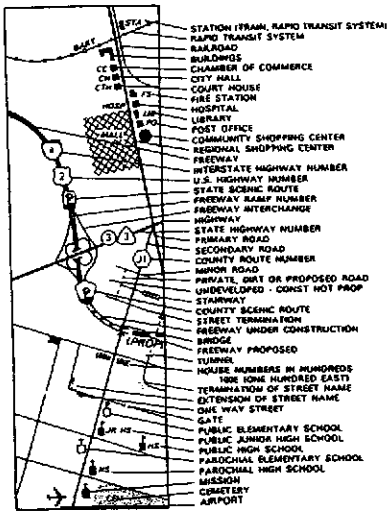
APPENDIX IV

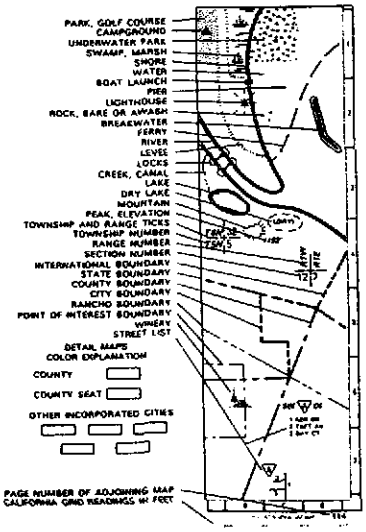
CITY OF OAKLAND PLANNING/ZONING MAPS


E. B. M. U. D.
WATER POLLUTION CONTROL DIVISION
SITE
MAC ARTHUR
FREEWAY
M-40
M-30
R-36
NORTH
REV 30 APR 92
266
1482 B 486



LEGEND





SITE SURROUNDINGS MAP

TASCO Facility
3430 Wood Street
Oakland, California

Aqua Science Engineers | Appendix IV

APPENDIX V

CALIFORNIA DEPARTMENT OF FISH AND GAME
NATURAL DIVERSITY DATA BASE

**** California Department of Fish and Game **** Natural Diversity Data Base ***

LATERALLUS JAMAICENSIS COTURNICULUS
CALIFORNIA BLACK RAIL

-------Status----------	NDDB Element Ranks	------ Other Lists ---------
Federal: Category 1	Global: G4T1S1	CDFG:
State: Threatened	State: S1	Audubon:
		CNPS List:
--Habitat Associations---		CNPS RED Code:

General: MAINLY INHABITS SALT-MARSHES BORDERING LARGER BAYS.

Microhabitat: OCCURS IN TIDAL SALT MARSH HEAVILY GROWN TO PICKLEWEED; ALSO IN FRESH-WATER AND BRACKISH MARSHES, ALL AT LOW ELEVATION.

***** Element Code: ABNME03041 ********** Map Index Number: 09164 **********

Occurrence Number: 48
Quality: Unknown
Type: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Info Source: MANOLIS, T. D. 1977 (LIT)
Location: BERKELEY.

--Dates Last Seen--
Element: 1922/08/23
Site: 1922/08/23

Distribution:

Ecological:

Threats:

General: ONE RAIL.

Lat/Long: 37 d 50 m 41 s / 122 d 17 m 50 s
UTM: Zone 10 N 4188614 E 561833
Mapping Precision: NON-SPECIFIC (1)
Symbol Type: POINT
Elevation: ft
Area: 0 ac
Owner/Manager:

Township: 01S
Range: 04W
Section: UN XX Qtr
Meridian: M
More Map Detail? N
More Information? N

County Name	Quad Code	Quad Name
ALAMEDA	3712273	OAKLAND WEST

**** California Department of Fish and Game **** Natural Diversity Data Base ***

NORTHERN COASTAL SALT MARSH
NORTHERN COASTAL SALT MARSH

-------Status----------	NDDB Element Ranks	------ Other Lists ---------
Federal: None	Global: G3	CDFG:
State: None	State: S3	Audubon:
		CNPS List:
--Habitat Associations---		CNPS RED Code:

General:

Microhabitat:

***** Element Code: CTTS2110CA ********** Map Index Number: 09166 **********

Occurrence Number: 19 --Dates Last Seen--
Quality: Unknown Element: 1977/06/XX
Type: Natural/Native occurrence Site: 1977/06/XX
Presence: Presumed Extant
Trend: Unknown
Main Info Source: JONES & STOKES, 1979 (LIT)
Location: (EMERYVILLE, E SAN FRANCISCO BAY).

Distribution:

Ecological:

Threats: NEXT TO INDUSTRY & FREEWAY.

General:

Lat/Long: 37 d 49 m 42 s / 122 d 17 m 49 s Township: 01S
UTM: Zone 10 N 4186805 E 561869 Range: 04W
Mapping Precision: SPECIFIC (0) Section: UN XX Qtr
Symbol Type: POLYGON Meridian: M
Elevation: ft More Map Detail? N
Area: 106 ac More Information? N
Owner/Manager:

County Name	Quad Code	Quad Name
ALAMEDA	3712273	OAKLAND WEST

**** California Department of Fish and Game **** Natural Diversity Data Base ***

REITHRODONTOMYS RAVIVENTRIS
SALT MARSH HARVEST MOUSE

-------Status----------	NDDB Element Ranks	------ Other Lists ---------
Federal: Endangered	Global: G1	CDFG:
State: Endangered	State: S1	Audubon:
		CNPS List:
--Habitat Associations---		CNPS RED Code:

General: ONLY IN THE SALINE EMERGENT WETLANDS OF SAN FRANCISCO BAY AND ITS TRIBUTARIES.

Microhabitat: PICKLEWEED IS PRIMARY HABITAT. DO NOT BURROW, BUILD LOOSELY ORGANIZED NESTS. REQUIRE HIGHER AREAS FOR FLOOD ESCAPE.

***** Element Code: AMAFF02040 ********** Map Index Number: 09168 **********

Occurrence Number: 102
Quality: Unknown
Type: Natural/Native occurrence
Presence: Presumed Extant
Trend: Unknown
Main Info Source: OLSON, D. 1982 (LIT)
Location: EMERYVILLE CRESCENT MARSH, ADJACENT TO OAKLAND STORM DRAIN AND BAY BRIDGE APPROACH.
Distribution: 1 SMHM CAPTURE IN SCULPTURE MARSH ON 2/22/82; 2 IN SHELLMOUND MARSH ON 2/23 AND 2/27/82. TRAPPED BY WESCO IN SPRING 1986 BUT NO SMHM CAPTURES; HOUSE MICE W/SMHM PELAGE COLORATION COLLECTED.
Ecological: HABITAT DOMINATED BY PICKLEWEED (SALICORNIA); GRINDELIA, SPARTINA, AND CATTAILS ALSO PRESENT.

--Dates Last Seen--
Element: 1982/02/27
Site: 1986/06/XX

Threats:

General:

Lat/Long: 37 d 49 m 52 s / 122 d 17 m 46 s
UTM: Zone 10 N 4187104 E 561942
Mapping Precision: NON-SPECIFIC (1/5)
Symbol Type: POINT
Elevation: 3 ft
Area: 0 ac
Owner/Manager: PVT-SANTA FE PACIFIC REALTY

Township: 01S
Range: 05W
Section: UN XX Qtr
Meridian: M
More Map Detail? Y
More Information? Y

County Name	Quad Code	Quad Name
ALAMEDA	3712273	OAKLAND WEST

**** California Department of Fish and Game **** Natural Diversity Data Base ***

HOLOCARPHA MACRADENIA
SANTA CRUZ TARPLANT

-------Status----------	NDDB Element Ranks	------ Other Lists ---------
Federal: Category 1	Global: G1	CDFG:
State: Endangered	State: S1.1	Audubon:
		CNPS List: 1B
--Habitat Associations---		CNPS RED Code: 233

General: COASTAL PRAIRIE, VALLEY AND FOOTHILL GRASSLAND

Microhabitat: SANDY CLAY SOIL, 40-400 FT.

***** Element Code: PDAST4X020 ********** Map Index Number: 09212 **********

Occurrence Number: 14
Quality: None
Type: Natural/Native occurrence
Presence: Extirpated
Trend: Unknown
Main Info Source: TRACY, J. P. #1990 UC (HERB)
Location: FIELD AT ADELINE STATION, NEAR BERKELEY.

--Dates Last Seen--
Element: 1903/XX/XX
Site: 1976/XX/XX

Distribution:

Ecological:

Threats: AREA COMPLETELY DEVELOPED.

General:

Lat/Long: 37 d 49 m 48 s / 122 d 16 m 42 s
UTM: Zone 10 N 4186993 E 563508
Mapping Precision: NON-SPECIFIC (1/5)
Symbol Type: POINT
Elevation: 100 ft
Area: 0 ac
Owner/Manager:

Township: 01S
Range: 04W
Section: UN XX Qtr
Meridian: M
More Map Detail? N
More Information? N

County Name	Quad Code	Quad Name
ALAMEDA	3712273	OAKLAND WEST

APPENDIX VI

Z7ACFCWCD BAY PLAIN GROUNDWATER REPORT
WELL INVENTORY REPORT

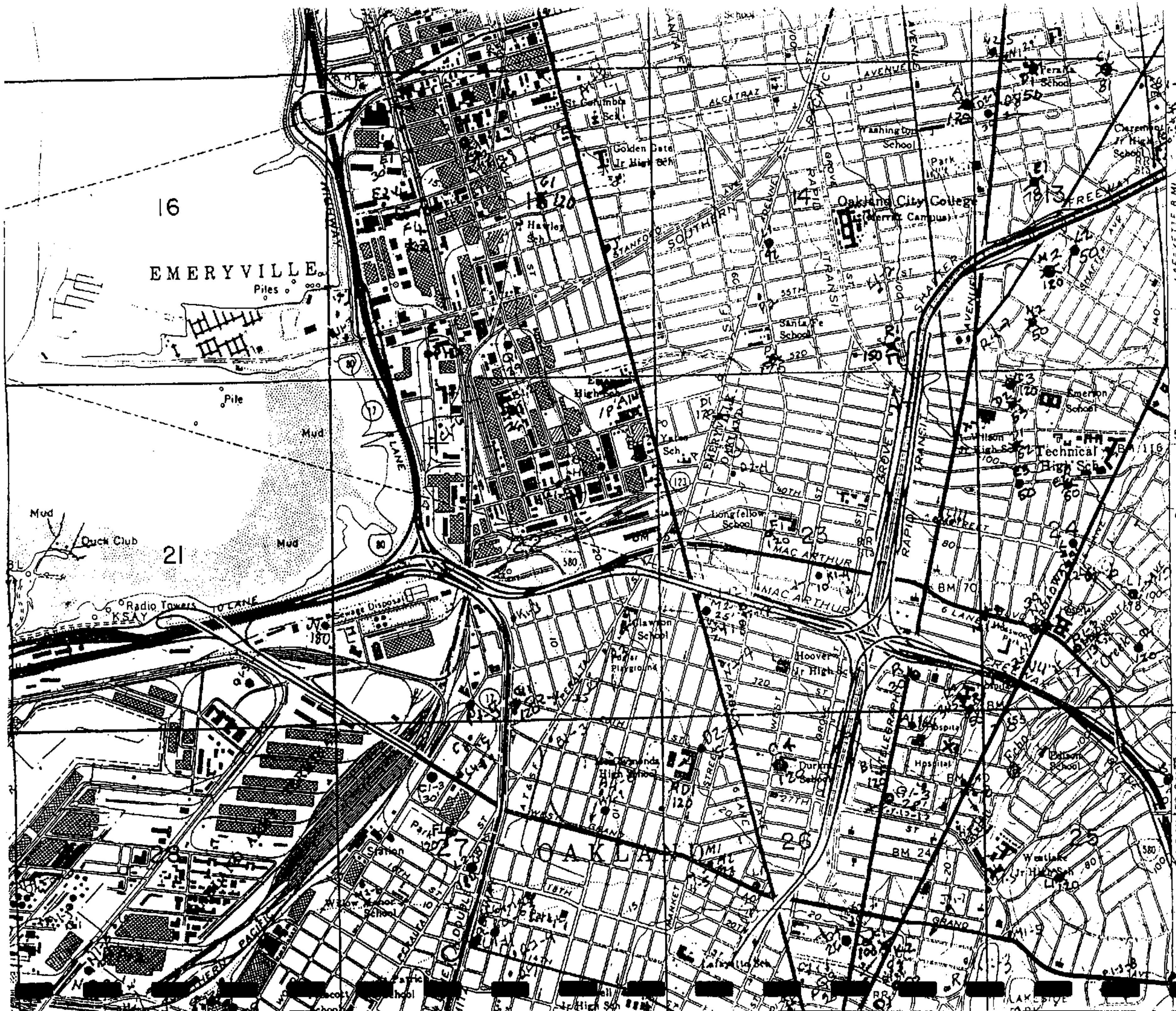
ALAMEDA COUNTY--GROUNDWATER WELLS---LOCATIONS

WELL NUMBER	WELL OWNER	WELL ADDRESS	CITY	PHONE NUMBER	DATE OF LAST UPDATE
1S/4W 22A 1	A/C TRANSIT	45TH ST/SAN PABLO AVE	E	Ø	3/ 6/1987
1S/4W 22B 1	CITY OF EMERYVILLE	4520 HORTON	EME	Ø	2/23/1988
1S/4W 22B 2	CITY OF EMERYVILLE	4520 HORTON ST	E	Ø	6/ 3/1988
1S/4W 22B 3	45TH ST. ARTISTS CO-OP	1401 45TH ST.	EM	Ø	6/21/1989
1S/4W 22C 1	Myers Container Corp.	4500 Shellmound St.	EME	Ø	2/27/1991
1S/4W 22C 2	Myers Container Corp.	4500 Shellmound St.	EME	Ø	2/27/1991
1S/4W 22C 3	Myers Container Corp.	4500 Shellmound St.	EME	Ø	2/27/1991
1S/4W 22C 4	Myers Container Corp.	4500 Shellmound St.	EME	Ø	2/27/1991
1S/4W 22C 5	Myers Container Corp.	4500 Shellmound St.	EME	Ø	2/27/1991
1S/4W 22C 6	Myers Container Corp.	4500 Shellmound St.	EME	Ø	2/27/1991
1S/4W 22F 1	JUDSON PACIFIC MURPHY	4200 PARK AV	O	Ø	7/31/1984
1S/4W 22G 1	DEL MONTE CORP	1250 PARK AVE	EME	Ø	1/11/1990
1S/4W 22G 2	DEL MONTE CORP.	1250 PARK AVE	EME	Ø	1/11/1990
1S/4W 22G 3	DEL MONTE CORP.	1250 PARK AVE	EME	Ø	1/11/1990
1S/4W 22G 4	DEL MONTE CORP.	1250 PARK AVE	EME	Ø	1/11/1990
1S/4W 22G 5	DEL MONTE CORP.	1250 PARK AVE	EME	Ø	1/11/1990
1S/4W 22H 1	DEL MONTE CORP PLANT 35	1250 PARK AVE	E	Ø	7/22/1986
1S/4W 22H 2	DEL MONTE	HOLLIS ST. & PARK AV.	EME	Ø	6/15/1989
1S/4W 22H 3	DEL MONTE	HOLLIS ST. & PARK AV.	EME	Ø	6/15/1989
1S/4W 22H 4	DEL MONTE	HOLLIS ST. & PARK AV.	EME	Ø	6/15/1989
1S/4W 22H 5	DEL MONTE	45TH & WATTS ST.	EME	Ø	6/15/1989
1S/4W 22H 6	DEL MONTE	45TH & WATTS ST.	EME	Ø	6/15/1989
1S/4W 22H 7	SFPRC	Hollis / Yerba Buena	OAK	Ø	7/30/1990
1S/4W 22H 8	SFPRC	Hollis / Yerba Buena	OAK	Ø	7/30/1990
1S/4W 22J 1	E. E. COSTOLLO	3423 HARLAN ST	O	Ø	7/31/1984
1S/4W 22K	GOLDEN & TOBY	3425 ETTIE ST	OAK	Ø	11/ 6/1989
1S/4W 22K 1	GOLDEN & TOBY	3425 ETTIE ST	OAK	Ø	11/ 6/1989
1S/4W 22K 2	GOLDEN & TOBY	3425 ETTIE ST	OAK	Ø	11/ 6/1989
1S/4W 22K 3	GOLDEN & TOBY	3425 ETTIE ST	OAK	Ø	11/ 6/1989
1S/4W 22P 1	PACIFIC SUPPLY	1735 24TH STREET	OAK	Ø	9/25/1989
1S/4W 22P 2	PACIFIC SUPPLY COMPANY	1735 24TH AVE	OAK	Ø	9/25/1989
1S/4W 22P 3	PACIFIC SUPPLY	1735 24TH STREET	OAK	Ø	9/25/1989
1S/4W 22P 4	PACIFIC SUPPLY COMPANY	1735 24TH AVE	OAK	Ø	9/25/1989
1S/4W 22Q 1	PACIFIC GAS AND ELELTRIC	28 & CYPRESS	O	Ø	7/23/1984
1S/4W 22Q 2	L & B Arrighi Investments	2792 Cypress Street	OAK	Ø	7/16/1990
1S/4W 22Q 3	L & B Arrighi Investments	2792 Cypress Street	OAK	Ø	7/16/1990
1S/4W 22Q 4	L & B Arrighi Investments	2792 Cypress Street	OAK	Ø	7/16/1990
1S/4W 22Q 5	PG&E	30th & Peralta Streets	OAK	Ø	6/13/1991

3/10/93

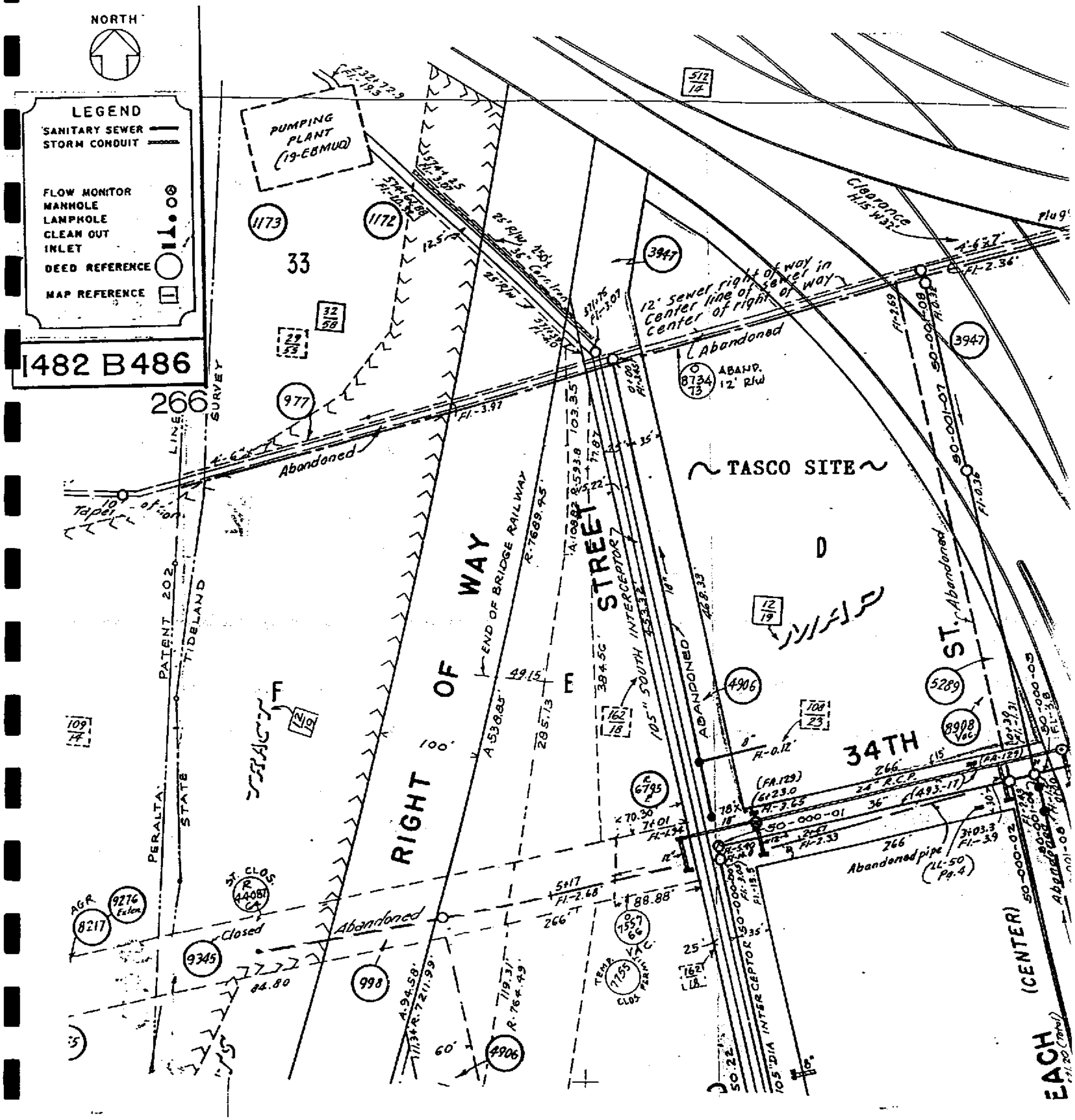
ALAMEDA COUNTY -- BAY PLAIN GROUNDWATER STUDY -- WELL INVENTORY REPORT

WELL NUMBER	DATE (MO/YR)	SURFACE ELEV. (FT)	TOTAL WELL DEPTH (FT)	DEPTH TO WATER (FT)	DTW (MSL)	WELL USE	LOG	WQ	WL	YIELD (GPM)	DIA. (IN)
1S/4W 22A 1	01/87	0	18	7	0	MON	D	0	0	0	2
1S/4W 22B 1	7/87	0	26	11	0	DES	D	0	0	0	2
1S/4W 22B 2	12/87	0	24	10	0	DES	D	0	0	0	2
1S/4W 22B 3	11/88	0	25	8	0	MON	D	0	0	0	2
1S/4W 22C 1	10/90	0	11	5	0	TES	X	0	0	0	2
1S/4W 22C 2	10/90	0	8	6	0	TES	X	0	0	0	2
1S/4W 22C 3	10/90	0	10	3	0	TES	X	0	0	0	2
1S/4W 22C 4	10/90	0	4	2	0	TES	X	0	0	0	2
1S/4W 22C 5	10/90	0	10	5	0	TES	X	0	0	0	2
1S/4W 22C 6	10/90	0	10	7	0	TES	X	0	0	0	2
1S/4W 22F 1	?	0	487	0	0	IRR	?	0	2	0	0
1S/4W 22G 1	05/89	0	25	13	0	TES	D	0	0	0	2
1S/4W 22G 2	05/89	0	25	9	0	TES	D	0	0	0	2
1S/4W 22G 3	07/89	0	20	8	0	MON	D	0	0	0	2
1S/4W 22G 4	07/89	0	20	8	0	MON	D	0	0	0	2
1S/4W 22G 5	07/89	0	20	8	0	MON	D	0	0	0	2
1S/4W 22H 1	5/86	0	19	4	0	TES	D	0	0	0	2
1S/4W 22H 2	01/89	0	20	10	0	MON	D	Y	0	0	2
1S/4W 22H 3	01/89	0	24	10	0	MON	D	Y	0	0	2
1S/4W 22H 4	01/89	0	25	11	0	MON	D	Y	0	0	2
1S/4W 22H 5	01/89	0	20	10	0	MON	D	Y	0	0	2
1S/4W 22H 5	01/89	0	20	10	0	MON	D	Y	0	0	2
1S/4W 22H 6	01/89	0	24	16	0	MON	D	Y	0	0	0
1S/4W 22H 7	02/90	9	20	6	0	MON	X	0	0	0	4
1S/4W 22H 8	02/90	15	20	8	0	MON	X	0	0	0	4
1S/4W 22J 1	/29	0	163	16	0	ABN	?	0	2	0	10
1S/4W 22K	08/89	0	16	13	0	BOR	G	0	0	0	0
1S/4W 22K	08/89	0	16	0	0	BOR	G	0	0	0	0
1S/4W 22K 1	08/89	0	21	0	0	MON	G	0	0	0	4
1S/4W 22K 2	08/89	0	21	0	0	MON	G	0	0	0	4
1S/4W 22K 3	08/89	0	21	0	0	MON	G	0	0	0	4
1S/4W 22P	9/88	0	21	0	0	BOR	G	0	0	0	0
1S/4W 22P 1	9/88	9	20	10	0	MON	G	0	0	0	2
1S/4W 22P 1	9/88	0	20	0	0	MON	G	0	0	0	2
1S/4W 22P 2	9/88	9	20	10	0	MON	G	0	0	0	4
1S/4W 22P 2	9/88	0	20	0	0	MON	G	0	0	0	4
1S/4W 22P 3	9/88	9	20	0	0	MON	G	0	0	0	2
1S/4W 22P 3	9/88	0	20	0	0	MON	G	0	0	0	2
1S/4W 22P 4	9/88	9	20	10	0	MON	G	0	0	0	2
1S/4W 22P 4	09/89	0	20	0	0	MON	G	0	0	0	2
1S/4W 22Q 1	2/75	0	120	0	0	CAT	D	0	0	0	0
1S/4W 22Q 2	12/89	9	20	13	-4	MON	X	0	1	0	4
1S/4W 22Q 3	12/89	9	15	13	-4	MON	X	0	1	0	4
1S/4W 22Q 4	12/89	9	20	13	-4	MON	X	0	1	0	4
1S/4W 22Q 5	12/90	0	120	0	0	CAT	D	0	0	0	2


EMERYVILLE
Piles
Pile
Mud
Duck Club
Radio Towers
KSAY
Sewage Disposal
St Columba Sch
Golden Gate Jr High Sch
Hawley Sch
Washington School
Oakland City College
(Merritt Campus)
Santa Fe School
ALCATRAZ
AVENUE
STANFORD
SOUTHERN
FREEWAY
Emerson School
Technical High Sch
Longfellow School
MAC ARTHUR
Clawson School
Hoover Jr High Sch
Durant School
Westlake Jr High Sch
OAKLAND
Station
Willow Manor School
Lafayette Sch
LAKESIDE
LAFAYETTE 8 MI
WALNUT CREEK 11 MI
4.8 MI. TO CALIF. 13
HAYWARD 16 MI.
50'
4187
16
21

APPENDIX VII

CITY OF OAKLAND PUBLIC WORKS DEPARTMENT
STORM DRAIN LOCATION MAP


NORTH
LEGEND
SANITARY SEWER
STORM CONDUIT
FLOW MONITOR
MANHOLE
LAMPHOLE
CLEAN OUT
INLET
DEED REFERENCE
MAP REFERENCE
1482 B486
266
PUMPING PLANT (19-EBMUD)
33
TASCO SITE
D
E
F
TRACT
MAP
RIGHT OF WAY
END OF BRIDGE RAILWAY
STREET
105" SOUTH INTERCEPTOR
ABANDONED
34TH ST.
Abandoned
12' sewer right of way in Center line of sewer Center of right of way
Clearance
PERALTA
PATENT 202
STATE TIDELAND
SURVEY LINE
Closed
Abandoned pipe
24" R.C.P.
105" DIA INTERCEPTOR
(CENTER)
EACH
100'
60'
ABAND. 12' R/W
AGR
TEMP. CLOS PERM
VAC.
ST. CLOS.

APPENDIX VIII

GEO/RESOURCE CONSULTANTS PRELIMINARY INVESTIGATION REPORT

CC TO WHITE / CC TO AQUA SCIENCES

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, Governor

DEPARTMENT OF TRANSPORTATION
BOX 7310
SAN FRANCISCO, CA 94120
(415) 923-4444

August 21st, 1992

04-Ala-880-32.7/36.7
04-190271
Cypress Reconstruction

Mr. Tom D. La Flamme
Thomas A. Short Co.
3430 Wood Street,
Oakland, CA 94608

Dear Mr. La Flamme:

Please find enclosed Preliminary Test Data extracted from draft Report which was done by the consultant for above property. A copy of the final report which is due in two weeks will be furished to you when available. Your cooperation throughout this investigation is appreciated. Thank you very much.

If you have any questions, please call me at (415)904-9758.

AUG 24 1992

Sincerely,

PRESTON W. KELLY
District Director

by: James W. Ross

James W. Ross
District Hazardous Waste Coordinator

Thomas A. Short Company
3430 Wood Street
Oakland, California 94607

There are two underground storage tanks (USTs) on the property, one 1,000-gallon diesel tank that is currently in use and one 4,000-gallon gasoline tank that is not in use. The tanks are located side by side. Both tanks are relatively new and have no history of leaks, according to internal tests performed by the company. There is also a sump tank located near a former steam-cleaning operation.

2.2 THOMAS A. SHORT COMPANY

On June 23 and 25, 1992, four soil borings (TSC/B-1, TSC/B-2, TSC/H-1, and TSC/W-1 were completed using a drill rig equipped with 8-inch diameter hollow-stem augers. In addition, two borings (TSA-1 and TSA-2) were completed using hand-auger techniques and equipment. The locations of the borings are shown in Figure 3. Borings TSC/B-1 and TSC/B-2 were terminated at 14 feet bgs. Boring TSC/H-1 was terminated at 18 feet bgs and boring TSC/W-1 was terminated at 20 feet bgs. Borings TSA-1 and TSA-2 were terminated at 1.8 and 3.5 feet bgs, respectively. Soil samples were collected generally at 2.0, 5.0, 8.0, and 14-feet bgs for borings TSC/B-1, TSC/B-2, TSC/H-1, and TSC/W-1. A soil sample was collected at 1 foot bgs in TSA-1 and at 1.0 and 3.0 feet bgs in TSA-2. Specific sampling locations are depicted in the Lithologic Logs included in Appendix B.

One ground-water sample was collected from boring TSC/H-1 at a depth of approximately 18 feet using the "Hydropunch" technique.

Upon completion of the soil and ground-water sampling, all borings, with the exception of TSC/W-1, were backfilled with cement grout and the cuttings were disposed of in 55-gallon DOT drums.

A 2-inch-diameter monitoring well was constructed at boring TSC/W-1. The well was screened between 5 feet and 20 feet bgs and was constructed of 0.020-inch slotted Polychloride Vinyl (PVC). The annular space was filled with No. 3 Monterey sand to a depth of 3 feet bgs and bentonite pellets were placed to a depth of approximately 1.5 feet bgs. The remainder of the annular space was filled with cement grout and an underground locking monument well box was cemented into place.

The monitoring well was developed on June 30, 1992, using the surge and bail technique. Approximately 50 gallons of water were purged from the well during development. Well development logs are included in Appendix C.

The monitoring well was sampled on July 1, 1992. Prior to sampling, the water level was measured and the well was subsequently purged of 15 gallons of water. Ground-water parameters including pH, electrical conductivity, and temperature were measured during purging. Water sampling logs are included in Appendix C.

Development water and purge water were disposed of in 55-gallon DOT drums.

3.0 FINDINGS

3.1.2 Thomas A. Short Company

The area investigated at Thomas Short is underlain predominantly by light brown to black silty clay with the exception of TSC/A-1 and TSC/A-2 where gravelly sandy clay was encountered from the surface to the termination depth (See Appendix B). Soils were intermixed with rock fragments and debris at each boring location. The presence of the rock fragments and debris at depth

suggests that the material within the area of investigation is fill.

Saturated soil conditions were generally observed at approximately 7 feet bgs. However, free-standing ground water was measured in TSC/W-1 on July 1, 1992, at 12.7 feet bgs. Saturated soils were not observed in borings TSC/A-1 and TSC/A-2.

HnU readings were less than 10 ppm for all samples collected from TSC/W-1, TSC/H-1, TSC/A-1, and TSC/A-2. HnU readings peaked at 180 and 200 ppm for soil samples from TSC/B-1 and TSC/B-2, respectively. These levels were from soils collected at a depth of 14 feet bgs.

[illegible] samples. Soil

3.2.2 Thomas A. Short Company

Soil borings TSC/B-1, TSC/B-2, TSC/H-1, and TSC/W-1 were drilled to depths ranging from 14 to 20 feet bgs. Hand-auger borings TSA-1 and TSA-2 were completed to depths ranging from 1.8 to 3.5 feet bgs. One to three soil samples were collected from the unsaturated zone at each boring location for a total of fifteen samples. Soil samples from TSA-1 and TSA-2 were chemically analyzed for total recoverable petroleum hydrocarbons (TRPH; EPA Method 418.1), Title 26 metals (EPA method 6010), and volatile organic compounds (VOC; EPA Method 8240). All other soil samples were chemically analyzed for total petroleum hydrocarbons, gasoline and diesel fraction (TPH-G,D; 8015 modified), Title 26 metals (EPA Method 6010), and benzene, toluene, ethlybenzene, and xylenes (BTEX; EPA Method 8020).

A "grab" ground-water sample was collected from TSC/H-1 and a ground-water sample was collected from monitoring well TSC/W-1 (for a total of two samples). The ground-water samples were chemically analyzed for TPH-G, TPH-D and BTEX.

Soils

Concentrations of TRPH and volatile organics were detected in all the hand-auger soil samples. The most significant concentration of TRPH and volatile organics was found to be associated with the TSA-1-1' sample (6,600 mg/kg; acetone, 200 microgram/kilogram (ug/kg); benzene, 33 ug/kg; chlorobenzene, 220 ug/kg; ethlybenzene, 25 ug/kg; toluene, 14 ug/kg; and xylene, 55 ug/kg)

TPH-G , TPH-D, and/or BTEX were detected in at least one soil boring sample, generally at or below five feet, from each soil boring with the exception of TSC/H-1 at 2 feet and 5 feet, and TSC/W-1 and 8 feet, which had concentrations below detection

limits. The most significant concentrations of petroleum contaminants were found to be associated with TSC/B-2 at 5 feet: 14,000 mg/kg TPH-G and 700 mg/kg TPH-D.

In general, metals were detected within background concentrations expected within an alluvial environment. One sample result exceeded the TTLC; lead in TSA-1 at 1 foot at 2,400 mg/kg (TTLC of 1,000 mg/kg). Several sample results exceeded ten times the STLC including copper in TSA-1 at 1 foot (560 mg/kg; STLC of 25 mg/kg) and lead at TSA-2 at 3 feet (210 mg/kg, STLC of 5 mg/l). Other elevated results include Barium in TSA-1 at 1 foot at a concentration of 980 mg/kg (STLC 100 mg/kg) and Cadmium in TSA-1 at 1 foot at a concentration of 9.2 mg/kg (STLC 1.0 mg/kg). Based on the aforementioned concentrations of barium, cadmium, lead, and copper, the cooresponding samples were re-submitted for STLC analysis.

Ground Water

A "grab" ground-water sample collected from "Hydropunch" TSC/H-1 contained 16 mg/l TPH-G, 320 ug/l benzene, 100 ug/l toluene, 380 ug/l ethyl benzene, and 380 ug/l xylenes. TPH-D was not detected. Detectable concentrations of TPH-G, benzene, toluene, and xylenes were also found associated with the monitoring well ground-water sample from TSC/W-1 at 1.3 mg/l, 80 mg/l, 6 ug/l, non detectable (ND), and 15 ug/l, respectively. The lower concentration within the monitoring well propably represents the effects of purging prior to sampling.

4.2 THOMAS A. SHORT COMPANY

Soil

Concentrations of TRPH and TPH-G/D found in soil borings TSA-1, TSA-2, TSC/B-1, and TSC/B-2 at Thomas Short may be considered hazardous waste (greater than 1,000 mg/kg) by the RWQCB.

Elevated concentrations of barium, cadmium, copper, and lead were detected in hand-auger soil samples. The measured copper and lead values are in excess of ten times the STLC of 25 mg/l and 5.0 mg/l, respectively. The concentration of lead in sample TSA-1 at 1 foot exceeded the TTLC.

Ground Water

TPH-G/D was detected in ground water at Thomas Short in soil boring TSC/H-1 and monitoring well sample TSC/W-1 at 16.0 and 1.3 mg/l, respectively. The relative significance of this concentration, as viewed by CalEPA and RWQCB, is not known.

BTEX concentrations were detected in ground water at Thomas Short. Benzene and toluene concentrations from TSC/W-1 and the Benzene concentration from TSC/H-1 were in excess of MCLs.

5.2 THOMAS A. SHORT COMPANY

Soil in proximity to the USTs at Thomas Short were found to contain elevated concentrations of TPH-G and TPH-D, as well as associated fuel additives of benzene, toluene, ethyl benzene, and xylenes. Concentrations of TPH-G, benzene, toluene, ethyl benzene, and xylenes were detected in ground water. Soils in proximity to the sump tank and former steam cleaning operation were found to contain elevated concentrations of TRPH and volatile organics, as well as metals.

TABLE 1
AREA 5
DOT - CYPRESS
SUMMARY OF ANALYTICAL RESULTS - SOIL
GENERAL

ppm ppb

UNITS EPA No.	TRPH mg/kg 418.1	TPH-G mg/kg 8015m	TPH-D mg/kg 8015m	BENZENE ug/kg 8020	TOLUENE ug/kg 8020	ETHYL-BENZENE ug/kg 8020	XYLENES ug/kg 8020	VOLATILE ORGANICS ug/kg 8240
THOMAS A. SHORT CO.								
-Hand Auger								
TSC/A-1-1	6,600(150)	-	-	-	-	-	-	-
TSC/A-2-1.5	66	-	-	-	-	-	-	-
TSC/A-2-3	180	-	-	-	-	-	-	-
-Boring								
TSC/B-1-5	-	1,500(500)	520	1,400(500)	2,400(500)	4,500(500)	8,400(500)	-
TSC/B-1-8	-	ND	ND	35	7	ND	ND	-
TSC/B1-13.5	-	ND	ND	20	7	10	30	-
TSC/B-2-5	-	14,000(500)	700	500(500)	10,000(500)	8,000(500)	60,000(500)	-
TSC/B-2-8	-	ND	ND	210	5	ND	ND	-
TSC/B-2-13.5	-	1,700(500)	ND	1,000(500)	1,500(500)	8,300(500)	36,000(500)	-
-Hydropunch								
TSC/H-1-2	-	ND	ND	ND	ND	ND	ND	-
TSC/H-1-5	-	ND	ND	ND	ND	ND	ND	-
TSC/H-1-8	-	6	ND	230	80	200	420	-
-Well								
TSC/W-1-5	-	ND	ND	10	ND	15	ND	-
TSC/W-1-8	-	ND	ND	ND	ND	ND	ND	-
TSC/W-1-14	-	24	ND	10	7	70	110	-

TABLE 2
AREA 5
DOT - CYPRESS
SUMMARY OF ANALYTICAL RESULTS - SOIL
METALS

UNITS EPD No.	ANTIMONY mg/kg 6010	ARSENIC mg/kg 6010	BARIUM mg/kg 6010	BERYLLIUM mg/kg 6010	CADMIUM mg/kg 6010	CHROMIUM TOTAL mg/kg 6010	COBALT mg/kg 6010	COPPER mg/kg 6010	LEAD mg/kg 6010	MERCURY mg/kg 6010	MOLYBDENUM mg/kg 6010	NICKEL mg/kg 6010	SELENIUM mg/kg 6010	SILVER mg/kg 6010	THALLIUM mg/kg 6010	VANADIUM mg/kg 6010	ZINC mg/kg 6010
THOMAS A. SHORT CO.																	
-Hand Auger																	
TSC/A-1-1	11	28	980	0.73	9.2	57	12	560	2,400**	0.28	6.3	65	ND	ND	ND	38	1,600
TSC/A-2-1.5	ND	15	530	0.89	4.2	17	11	21	49	0.09	0.80	20	ND	ND	18	30	62
TSC/A-2-3	7	18	18	0.82	6.3	47	19	48	210	0.26	0.70	66	ND	ND	ND	48	550

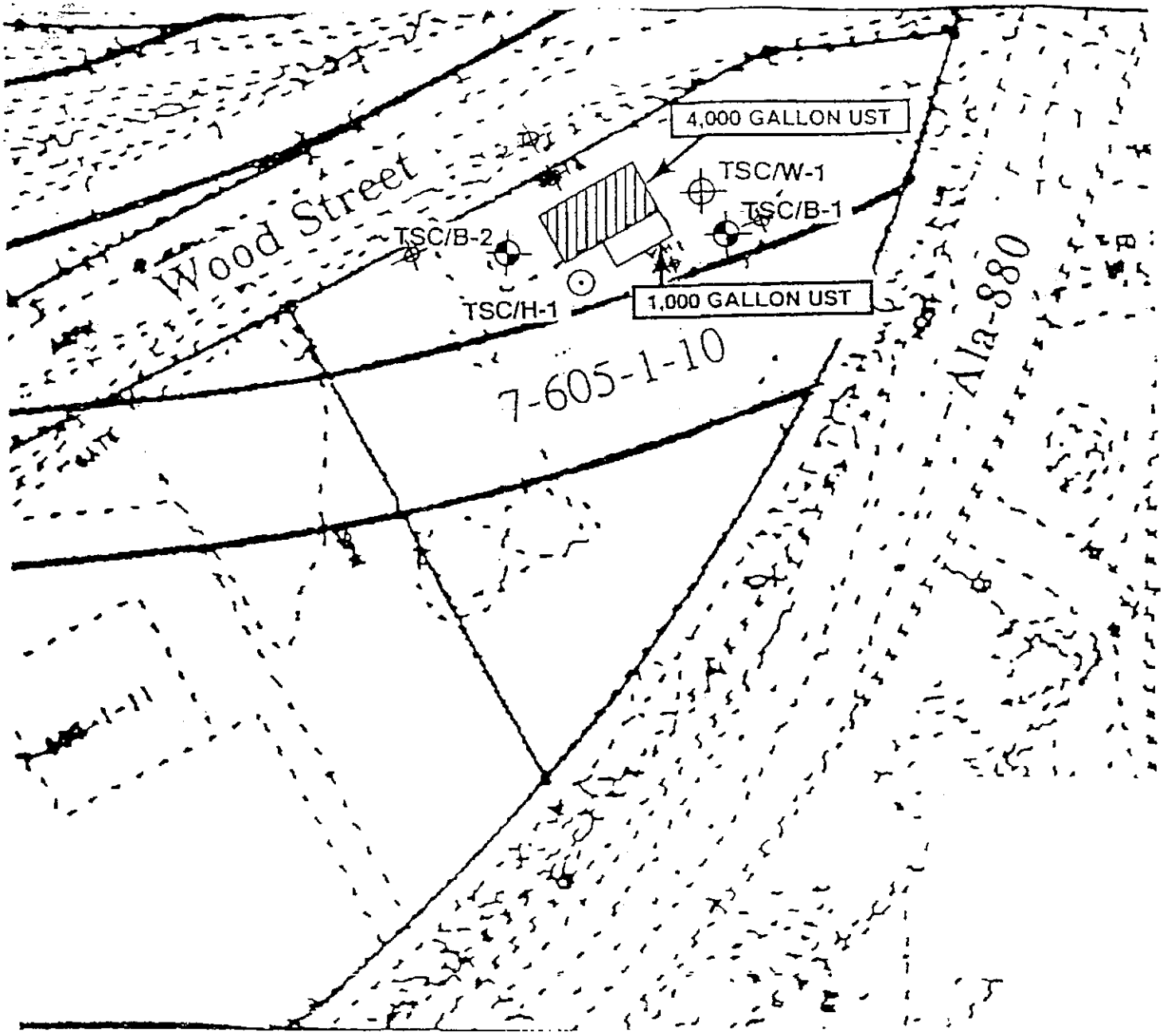
TABLE 3
AREA 5

DOT - CYPRESS

SUMMARY OF ANALYTICAL RESULTS - GROUND WATER

	EPD No.	TSC/H-1	TSC/W-1	ETECTION LIMIT	UCLs
Antimony	6010	-		0.10	NA
Arsenic	6010	-		0.20	0.050
Barium	6010	-		0.05	1.0
Beryllium	6010	-		0.01	NA
Cadmium	6010	-		0.01	0.010
Chromium	6010	-		0.01	NA
Cobalt	6010	-		0.02	NA
Copper	6010	-		0.01	1.0
Lead	6010	-		0.10	0.005
Mercury	6010	-		0.0002	0.002
Molybdenum	6010	-		0.01	NA
Nickel	6010	-		0.05	NA
Selenium	6010	-		0.20	0.010
Silver	6010	-		0.01	0.050
Thallium	6010	-		0.20	NA
Vanadium	6010	-		0.02	NA
Zinc	6010	-		0.01	NA
TPH-G (mg/L)	8015m	16			NA
TPH-D (mg/L)	8015m	ND			NA
Benzene (ug/L)	602	320			
Toluene (ug/L)	602	100			
Ethyl Benzene (ug/L)	602	380			
Xylenes (ug/L)	602	380			
Volatile Organics (ug/L)	624	-			

NOTES: ND = Not Detected at Detection Limit Concentration Per Specific
- = Not analyzed
TRPH = Total Recoverable Petroleum Hydrocarbons
TPH-G = Total Petroleum Hydrocarbons Gasoline
TPH-D = Total Petroleum Hydrocarbons Diesel
MCLs = State Maximum Concentration Levels, Primary and Secondary, provided for comparison purposes only. State Action Levels included
Laboratory Analyses performed by CKY



Reference : Caltrans, May 4, 1992

EXPLANATION

TSC/B-1	Boring Location
TSC/H-1	Boring/Hydropunch Location
TSC/W-1	Monitoring Well Location

0 70

APPROXIMATE SCALE IN FEET

Geo/ Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
505 BEACH STREET, SAN FRANCISCO, CALIFORNIA 94133

Job No. 1689-019-00 Appr. _____ Date 7/21/92

SITE PLAN - AREA 5
THOMAS A. SHORT COMPANY - PARCEL 21
D.O.T. - INTERSTATE 880
CYPRESS RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGUR 3

LOG OF BORING TSC/B-1

Equipment Hollow Stem Auger

Elevation N.A. Date 6/25/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
	31		1	0		SILTY CLAY (CL) light brown, damp, loose to medium dense, rock fragments
	3		60	5		color changes to black, damp to moist, very soft, organics
	2		17	10		wet
	24		180	15		color changes to gray, moist to wet, trace rock fragments
				20		Boring terminated @ 14.0 feet. No free standing groundwater was encountered during drilling.
				25		
				30		

Fill

Geo/Resource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: _____ Date 7/6/92

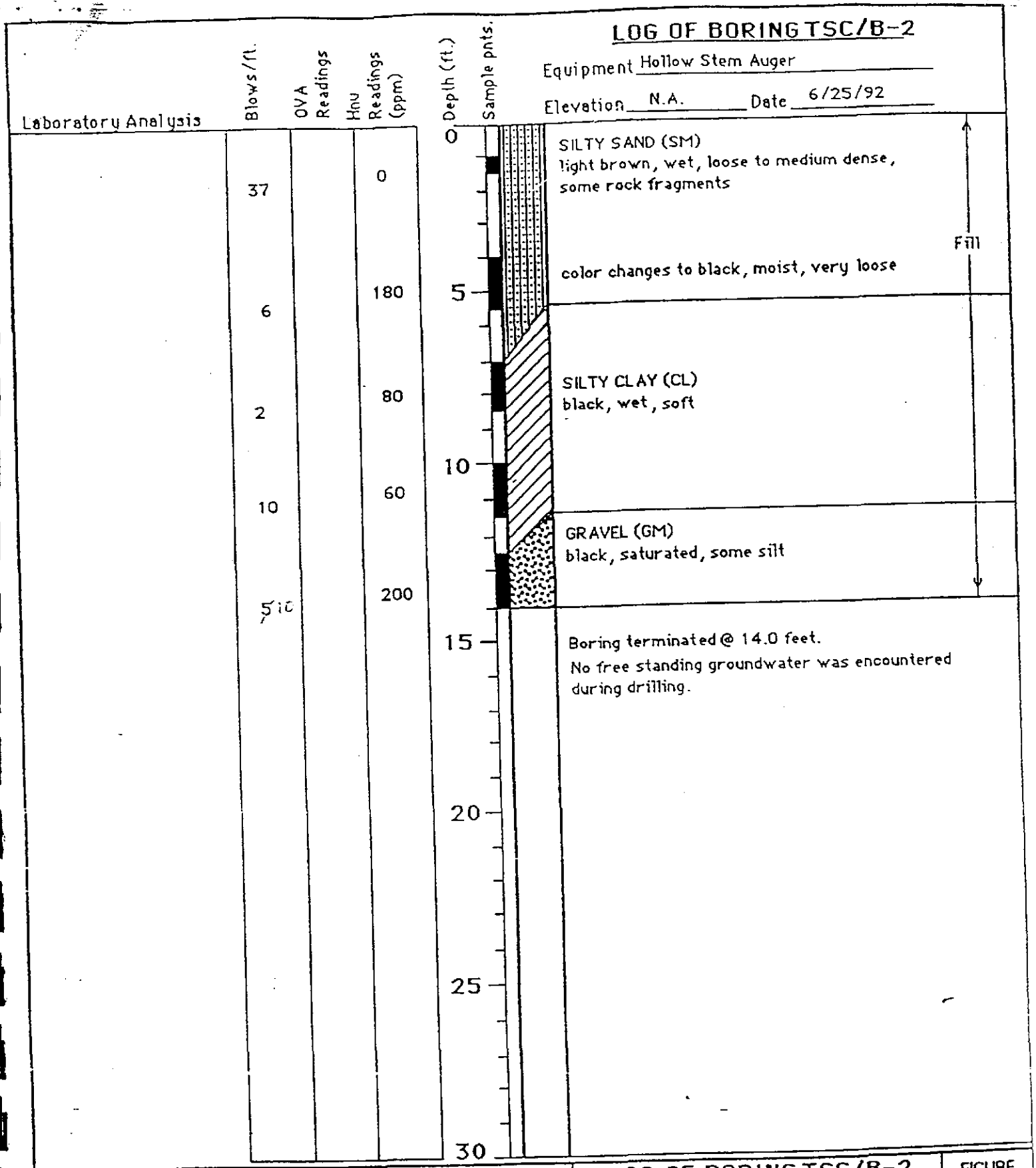
LOG OF BORING TSC/B-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-7

LOG OF BORING TSC/B-2

Equipment Hollow Stem Auger

Elevation N.A. Date 6/25/92



Geo/Resource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: Date 7/6/92

LOG OF BORING TSC/B-2
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-8

LOG OF BORING TSC/H-1

Equipment: Hollow Stem Auger

Elevation: N.A. Date: 6/25/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
	54		0	0		SILTY CLAY (CL) light brown, dry, loose to medium dense, rock fragments
	3			5		damp — Fill
	2		0	10		SILT (OL) black-gray, saturated, very soft
				15		
				20		Boring terminated @ 18.0 feet. No free standing groundwater was encountered during drilling.
				25		
				30		

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Job No. 1689-019-00 Appr: _____ Date 7/6/92

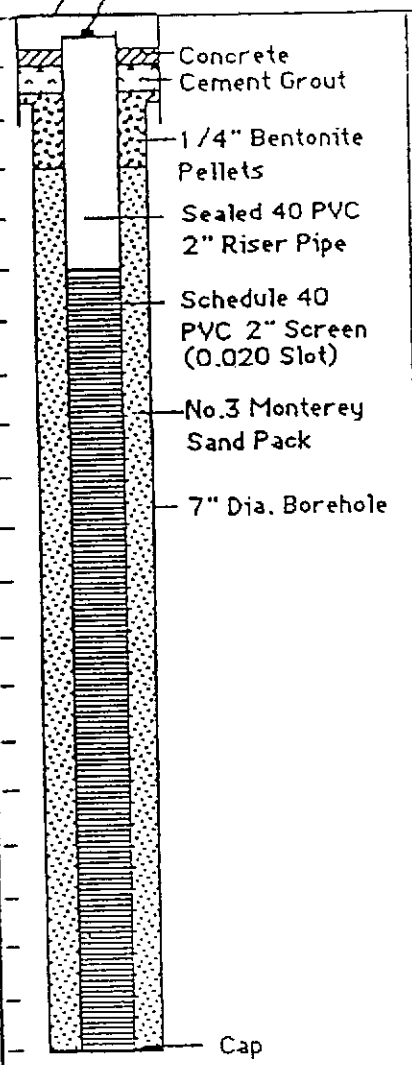
LOG OF BORING TSC/H-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE B-9

LOG OF BORING TSC/W-1

Equipment Hollow Stem Auger

Elevation N.A. Date 6/23/92



Depth (ft.)	Sample pnts	Blows/ft.	Hnu Readings (ppm)	
0		32	2	SILTY CLAY (CL) light brown, damp, medium dense, rock fragments, debris (concrete)
5		3	2	color changes to dark brown, very soft
		3	6	color changes to black, wet, very soft
10		8	4	Fill
		30	7	color changes to light brown, some rock fragments, very stiff
15				
20				Boring terminated @ 20.0 feet. No free standing groundwater was encountered during drilling.
25				
30				

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Job No. 1689-019-00 Appr: _____ Date 7/6/92

LOG OF BORING TSC/W-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-10

LOG OF BORING TSA-1

Equipment Hand Auger

Elevation N.A. Date 6/23/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
				0		8" CONCRETE PAD
						GRAVELLY SANDY CLAY (CL) black to dark gray, moist to wet, soft to firm, gravel to 6" dia.
				5		Boring terminated @ 1.8 feet. No free standing groundwater was encountered during drilling.
				10		
				15		
				20		
				25		
				30		

GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: _____ Date 7/7/92

LOG OF BORING TSA-1
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-11

LOG OF BORING TSA-2

Equipment Hand Auger

Elevation N.A. Date 6/23/92

Laboratory Analysis	Blows/ft.	OVA Readings	Hnu Readings (ppm)	Depth (ft.)	Sample pnts.	
				0		10" CONCRETE PAD
						GRAVELLY SANDY CLAY (CL) dark brown to black, moist to wet, soft, gravel to 3" dia.
				5		Boring terminated @ 3.5 feet. No free standing groundwater was encountered during drilling.
				10		
				15		
				20		
				25		
				30		

GeolResource Consultants, Inc.
Geologists / Engineers / Environmental Scientists

Job No. 1689-019-00 Appr: _____ Date 7/7/92

LOG OF BORING TSA-2
SITE INVESTIGATION REPORT
DEPARTMENT OF TRANSPORTATION
INTERSTATE 880, CYPRESS
STRUCTURE RECONSTRUCTION
OAKLAND, CALIFORNIA

FIGURE
B-12

APPENDIX IX

PEA SAMPLE PLAN BY AQUA SCIENCE ENGINEERS

aqua science engineers inc.

December 17, 1992

Mr. Thomas D. La Flamme
Thomas A. Short Company (TASCO)
3430 Wood Street
Oakland, CA 94608

RE: Proposal for Environmental Assessment of Soil and Groundwater at the Thomas A. Short Company, Oakland California.

Dear Mr. La Flamme:

Thank you for the opportunity to submit the following proposal for the Environmental Assessment of soil and groundwater at the TASCO site. The scope of work that Aqua Science Engineers has developed for this project is intended to: a) to legally remove the underground fuel storage tanks at the site, b) to excavate gasoline and diesel impacted soil in the tank locations c) to assess the nature and magnitude of soil and groundwater contamination in the steam cleaning and sump area, d) to assess the extent and chemical content of the shallow fill material located directly beneath the facility.

The development of an assessment workplan, a health and safety plan, and the securing of drilling permits will be conducted as Task I. The underground fuel storage tank closure and fuel impacted soil excavation project will be conducted as Task II. The soil and groundwater investigation in the steam cleaning area will be designated Task III. The assessment of shallow fill material will be designated Task IV. The compilation of the investigative data collected from Tasks II through Task IV into a final project report.

Please contact my self at (714) 833-3667, or Gerald Sasse at (510) 820-9391 if you have any questions regarding this project.

Sincerely,

Aqua Science Engineers, Inc.

Michael Marello, R.G.
Vice President
Principal Geologist

17895 Sky Park Circle, Suite F, Irvine, CA 92714 • Tel 714/833-3667 • Fax 714/833-3468

December 17, 1992

AQUA SCIENCE ENGINEERS, INC
PROPOSAL FOR ENVIRONMENTAL ASSESSMENT OF SOIL AND GROUNDWATER
ASE PROPOSAL NO. 2270

SITE: Thomas A Short Company (TASCO)
3430 Wood Street
Oakland, California

CLIENT: Thomas D. La Flamme
President
Thomas A. Short Company

TASK I

SCOPE OF WORK: Prepare a Workplan and Health and Safety Plan for the assessment project. Secure groundwater monitoring well installation and underground storage tank removal permits from the Alameda County Water District.

TASK II

SCOPE OF WORK: Excavate and remove the two underground fuel storage tanks and related plumbing. Excavate gasoline and diesel impacted soil beneath and adjacent to USTs. Collect and analyze soil samples to confirm impacted soil removal. Collect and analyze a groundwater sample from the existing well (W-1) for gasoline and BTEX.

1) Mobilize on site and endorse site specific Health and Safety plan.

2) Remove product pump and associated piping and concrete over underground tanks.

3) As necessary, remove residual product and tank rinseate from tanks and properly manifest, transport and dispose of fluid.

4) Excavate overburden soils surrounding tops and sides of tanks.

5) Inert the tanks with dry ice at a rate of at least 1.5 pounds per 100 gallons of tank capacity. Monitor "lower explosion limit" of tank atmosphere.

6) Secure approval to remove tanks from City of Oakland Fire Department inspector present on site. By use of a crane, secure and hoist tanks from the excavtion pit to an area covered by plastic sheeting where the tanks will be cleaned and inspected for cracks, holes and corrosion.

7) Transport tanks under manifest by a licensed hazardous waste hauler to the Erickson facility licensed in Richmond, CA where they will be properly disposed.

8) Collect soil samples from beneath the former tank locations and from surrounding sidewalls. Soil samples will be collected per environmental sampling requirements issued by the RWQCB and the ACHCSA. Soil samples will be analyzed by a Cal-EPA certified environmental testing laboratory for Total Petroleum Hydrocarbons as Gasoline and Diesel (EPA methods 5030/8015M and 3550/8015M), and BTEX (EPA method 8020).

9) Once analytical test results are obtained from the tank removal phase, over-excavation activities will be implemented as necessary to remove soil containing elevated concentrations of petroleum hydrocarbons. Soil samples will be collected during the excavation process and screened for volatile organic carbon using Photovac PID. The PID readings will be used as a guide for continued excavation. The excavated soil will be stockpiled on plastic for future remediation or off-site disposal.

10) Collect post-excavation soil samples from the side-walls and bottom of the excavation to confirm adequate removal of petroleum hydrocarbons impacted soil. Sample collection will be performed in accordance with ACHCSA requirements. The soil samples will be collected by driving pre-cleaned two-inch diameter brass sample tubes into freshly exposed soil. The tube ends will be secured with double thickness aluminum foil, plastic end caps and tape and immediately placed in an ice chest with ice.

11) Collect a groundwater sample from the existing well (MW-1) at the subject area.

12) Submit soil and groundwater samples to a CAL-EPA certified laboratory for chemical analysis. All of the soil samples will be analyzed for total petroleum hydrocarbons as gasoline by EPA method 5030/8015M, diesel by EPA method 3550/8015M and for BTEX by EPA method 8020. The groundwater sample will be analyzed for gasoline and BTEX.

13) Once removal of the petroleum hydrocarbon impacted soil is confirmed by laboratory analysis, the excavation will be backfilled to existing grade.

TASK III

SCOPE OF WORK: Conduct a subsurface soil and groundwater assessment in the steam cleaning and underground sump/clairfier area.

1) Core concrete for drilling of three (3) soil borings.

2) Drill one 20 foot soil boring, and two 13 foot soil borings at pre-selected locations in the steam cleaning/ sump area.

3) Collect soil samples at 2.5 ft., 5 ft., 7.5 ft., 10 ft. and 13 feet below the ground surface in each boring. The soil samples will be collected using a California split-spoon sampler loaded with pre-cleaned brass sample tubes. The sample tube nearest the end of the sampler will be secured with double-thickness aluminum foil, plastic end-caps and tape and immediately place in an ice chest with ice.

4) Convert 20 foot boring to a two-inch diameter PVC groundwater monitoring well. Backfill 13 foot borings with neat cement and cap with concrete. Place all drill cuttings in 55-gallon steel 17H drums for temporary on-site storage.

5) Develop well and collect a groundwater sample from well.

6) Submit soil and groundwater samples to a CAL-EPA certified laboratory for chemical analysis. All of the soil samples will be analyzed for total recoverable petroleum hydrocarbons (TRPH) by EPA method 418.1. Selected samples will be analyzed for TTLC CAM 17 Title 22 Metals, and volatile organics by EPA methods 8010 and 8020. The groundwater sample will analyzed for TRPH by EPA method 418.1 and volatile organics by EPA methods 601 and 602.

TASK IV

SCOPE OF WORK: Conduct shallow subsurface soil assessments at various areas of the site to investigate the extent and contamination content of the shallow fill material located directly beneath the facility.

1) Core concrete for drilling of four (4) soil borings.

2) Drill four 5 foot soil borings at pre-selected elevated risk areas of the site.

3) Collect soil samples at 2 feet and 5 feet below the ground surface. The soil samples will be collected as described in Task III above.

4) Backfill soil borings with neat cement and cap with concrete. Place all drill cuttings in 55-gallon steel 17H drums.

5) Submit soil samples to a CAL-EPA certified laboratory for chemical analysis. All of the soil samples will be analyzed for TRPH by EPA method 418.1, volatile organics by EPA methods 8010 and 8020, and for TTLC CAM 17 Title 22 Metals.

TASK V

SCOPE OF WORK: Compile investigative data, prepare and complete a final project report which will include descriptions and findings of Tasks I through VI described above.

APPENDIX X

UST CLOSURE REPORT BY AQUA SCIENCE ENGINEERS

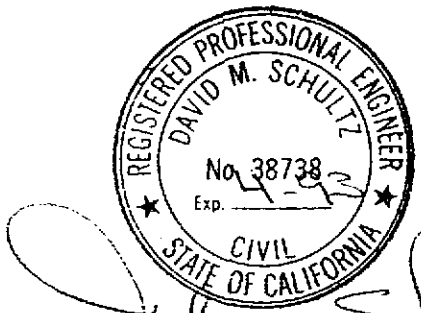
aqua science engineers inc.

March 18, 1993

FINAL REPORT
UNDERGROUND STORAGE TANKS REMOVAL

at

The Thomas A. Short Company (TASCO)
3430 Wood Street
Oakland, CA 94608



Submitted by:

Aqua Science Engineers
2411 Old Crow Canyon Road, #4
San Ramon, California 94583
(510) 820-9391

TABLE OF CONTENTS

1.0 INTRODUCTION

This report documents the removal, disposal and related activities of the underground storage tanks closure performed at the Thomas A. Short Company (TASCO), 3430 Wood Street in Oakland, California (see Figure 1, Location Map). The following tanks were removed from the site: one (1) fiberglass, 4000 gallon gasoline tank, and one (1) steel, 1000 gallon diesel underground storage tank (see Figure 2, Site Plan). The scope of services provided by Aqua Science Engineers, Inc. (ASE) was in accordance with ASE proposal No. 2270 and its addendum and included the following tasks:

- o Obtain necessary permits from appropriate agencies.
- o Remove and dispose of liquids from the tanks.
- o Remove and dispose of the underground storage tanks.
- o Sample and analyze the soil beneath the tanks.
- o Sample and analyze the excavation sidewalls.
- o Overexcavate contaminated soil and re-sample.
- o Backfill excavation to grade.
- o Prepare a report of methods and findings.

2.0 PERMITS

The approvals/permits to remove the underground storage tanks were obtained from the City of Oakland Fire Prevention Bureau (COFPB), the Alameda County Health Care Services Agency (ACHCSA), CAL-OSHA, and the Bay Area Air Quality Management District (BAAQMD). Originals of the permits, applications, forms and notification documents are contained in Appendix C.

3.0 LIQUID REMOVAL

The two tanks contained approximately 275 gallons total of residual product along with rinseate water used to clean the tanks' insides. The liquid was pumped out and transported to the Demenno Kerdoon Facility in Compton, California under a hazardous waste manifest by Waste Oil Recovery (WORS), a licensed hazardous waste hauler.

4.0 MOBILIZATION

ASE mobilized for on-site work on January 28, 1993. Project personnel included: Dave Allen - Project Manager, Steve DeHope - Construction Manager, and Field Personnel- Steve LaBar and John Sabia. Field operations were conducted by trained technicians who are certified per the mandatory 40-hour safety program as specified in the OSHA Hazardous Waste Operations and Emergency Response Standard (29 CFR 1910.120).

5.0 EXCAVATION

On January 28, ASE personnel began tank pulling exercises by removing the concrete cover overlying the underground tanks. The material was stockpiled on site, and excavation activities began.

After removing the ground cover (approximately 6 inches of rebar-enforced concrete), approximately 12 inches of base rock was encountered. Native material was comprised of a sandy, silty material from the ground surface to approximately 5-6 feet below ground surface. Below that, a firm, dense clay was encountered. As the tank excavation activities continued, the associated piping and vent lines were removed. Air sampling was conducted throughout excavation activities at the edge of the excavation by use of a hand-held organic vapor monitor (OVM 580A); no action levels were encountered, work proceeded. Tank bottoms were measured at approximately 8-9 feet below grade. Excavated soils were stockpiled on site and covered with plastic. Groundwater was encountered at approximately 9.5 feet below ground surface.

6.0 TANKS REMOVAL

Prior to tank removal on January 28, 1993, ASE inerted the tanks by adding dry ice at the rate of at least 1.5 pounds per 100 gallons of tank volume. The tank removal operations were witnessed by Mr. Don Hwang of the Alameda County Health Care Services Agency (ACHCSA) and Ms. Valida Holmes of the City of Oakland Fire Prevention Bureau. After verifying a safe LEL of each of the the tank's atmosphere, by use of a backhoe, the tanks were lifted from the excavation, placed on plastic, hand cleaned, and inspected prior to being loaded onto the transport vehicle. A petroleum odor was detected after the tanks were removed from their resting place; equally, minor soil staining was observed in the soil beneath the tanks. The two tanks were inspected

by the regulatory agency representatives and determined that no holes were present. Upon removal of the tanks, groundwater was exposed in the excavation.

Tanks were transported to the Erickson Facility in Richmond, CA (a licensed recycling facility) by Dexanna, Inc., a licensed hazardous waste hauler, where they were properly disposed. See Appendix B for copies of the Manifests, and see Appendix D for Tank Recycling Certificates.

7.0 OVEREXCAVATION

During tank removal operations, it was apparent that soil petroleum contamination was present in the excavation. In an effort to remediate this petroleum-contaminated soil, overexcavation activities were conducted. The use of a hand-held organic vapor monitor (OVM 580A) was used to monitor each bucket full of overexcavated material to delineate the non-contaminated zones from the contaminated zones. The overexcavated material was stockpiled near the excavation and covered with plastic. Once it appeared that the contaminated soil had been appropriately removed, sampling activities were performed to verify that the overexcavation activities were successful. The following section discusses the sampling activities.

8.0 SAMPLING AND ANALYSIS

Soil samples were collected from the former tanks excavation and stockpiled soil as follows:

TABLE ONE
SAMPLE LOCATIONS - EXCAVATION PIT and STOCKPILE

Sample Identification	Location	Depth
GSWN	North Sidewall under Gas Tank	9.0'
GSWS	South Sidewall under Gas Tank	9.0'
DSB-1	Soil from beneath Diesel Tank	8.5'
DSB-2	Soil from beneath Diesel Tank	8.5'
E-1	East Sidewall	9.0'
E-2	East Sidewall	9.5'
N	North Sidewall	9.0'
S-1	South Sidewall	9.5'
S-2	South Sidewall	9.5'
W	West Sidewall	9.0'
STKP-E (composited)	Stockpiled soil, East Side	
STKP-W (composited)	Stockpiled Soil, West Side	

For locations of these sample locations, see Figure 3, Sampling Plan. The soil samples listed above were collected by use of the backhoe bucket, then a 2" x 6" brass sample tube was inserted to collect a sample. The soil samples were secured using aluminum foil, capped, and sealed with tape and transported directly to the analyzing laboratory under proper chain of custody procedures. The stockpile samples (STKP-E and STKP-W) were composited by the laboratory. The composite sample consisted of four (4) discrete samples which were combined by the lab to form one (1) sample for analysis. Samples were submitted for analysis to the state certified laboratory, Priority Environmental Labs in Milpitas, California. The soil samples were analyzed for Total Petroleum Hydrocarbons (TPH) as Gasoline (EPA 5030/8015), TPH as Diesel (EPA 3550/8015), the fractions BTEX (EPA 8020), and Total Extractable Lead (EPA 7420). Analysis results are shown below (Table Two) and copies can be found in Appendix A.

TABLE TWO
EXCAVATION PIT SOIL SAMPLE RESULTS

Sample ID.	TPH Gasoline (ppm)	TPH Diesel (ppm)	Benzene (ppb)	Toluene (ppb)	Ethyl Benzene (ppb)	Total Xylenes (ppb)	Lead (ppm)
GSWN	2.6	N.D.	5.0	8.4	10	25	6.3
GSWS	3.5	N.D.	7.1	10	14	32	10
DSB-1	49	N.D.	27	49	65	240	10
DSB-2	17	N.D.	18	26	37	130	8.9
E-1	19	N.D.	31	88	160	280	15
E-2	5.4	N.D.	5.5	15	21	61	14
N	3.3	N.D.	5.0	13	18	48	15
S-1	13	N.D.	9.1	22	37	89	10
S-2	10	N.D.	6.2	16	17	84	9.8
W	1.8	N.D.	N.D.	6.2	12	24	14
STKP-E*	510	28	180	250	480	1900	140
STKP-W*	280	N.D.	90	160	320	990	75
EPA METHOD	5030/ 8015	3550/ 8015	8020	8020	8020	8020	7420

* - Composited sample (performed at the lab)
ND - Non Detectable at analytical method limits
ppm - parts per million
ppb - parts per billion

9.0 BACKFILLING AND RESURFACING

The excavation was backfilled and compacted with a clean, imported material once verbal approval from the ACHCSA was received. The approval was granted once soil sample analytical results were available. The excavation was backfilled to grade; however, resurfacing to match existing surroundings was determined not to be necessary.

10.0 STOCKPILED SOIL

The material that was overexcavated remains on site, covered. Based on analytical results, this soil must be handled as hazardous material and disposed of properly. Due to the levels of lead, it appears that this material will require recycling at an appropriately licensed, Class II landfill.

11.0 DISCUSSION AND CONCLUSIONS

Two underground tanks were were removed from the site and properly disposed of: 1 - 4,000 gallon fiberglass tank, previously containing gasoline (tank #10537), and 1 - 1,000 gallon steel tank, previously containing diesel fuel (tank #10536). The tanks were transported as hazardous waste to the Erickson Facility in Richmond California, to be cleaned and disposed of as scrap. See Appendix D for copies of the Tank Recycling Certificates.

Overexcavation of petroleum-contaminated soils was conducted to remove and stockpile areas of elevated levels of contamination within the excavation pit. Sampling and subsequent analytical testing verified that overexcavation of contaminated soils was sufficient in removing the appropriate amounts of contaminated soil. Although detectable levels of petroleum and lead contamination still existed in the excavation (based on soil sampling required by the ACHCSA), it was determined by the ACHCSA representative that these levels did not warrant any further soil remediation activities. The excavation was backfilled, and the stockpiled material remains on site.

A groundwater monitoring well, located adjacent to the former excavation, will be sampled to investigate the possibility of the presence of petroleum contamination in the groundwater. Results of such sampling and subsequent analysis will be made available to the appropriate agencies in the very near future.

12.0 REPORT LIMITATIONS

The results of this investigation represent conditions at the time and specific location at which soil samples were collected, and for the specific parameters analyzed for by the laboratory. It does not fully characterize the site for contamination resulting from sources other than the former underground storage tanks at the site, or for parameters not analyzed for by the laboratory. All of the laboratory work cited in this report was prepared under the direction of independent CSDHS certified laboratory. The independent laboratory is solely responsible for the contents and conclusions of the chemical analysis data.

ASE appreciates having the opportunity to provide our services to you. If you have any questions or comments, please feel free to give us a call at (510) 820-9391.

Respectfully submitted,

AQUA SCIENCE ENGINEERS, INC.

David Allen
Project Manager

Enclosures: Figure 1 - Location Map
Figure 2 - Site Plan
Figure 3 - Sampling Plan
Appendices A - D

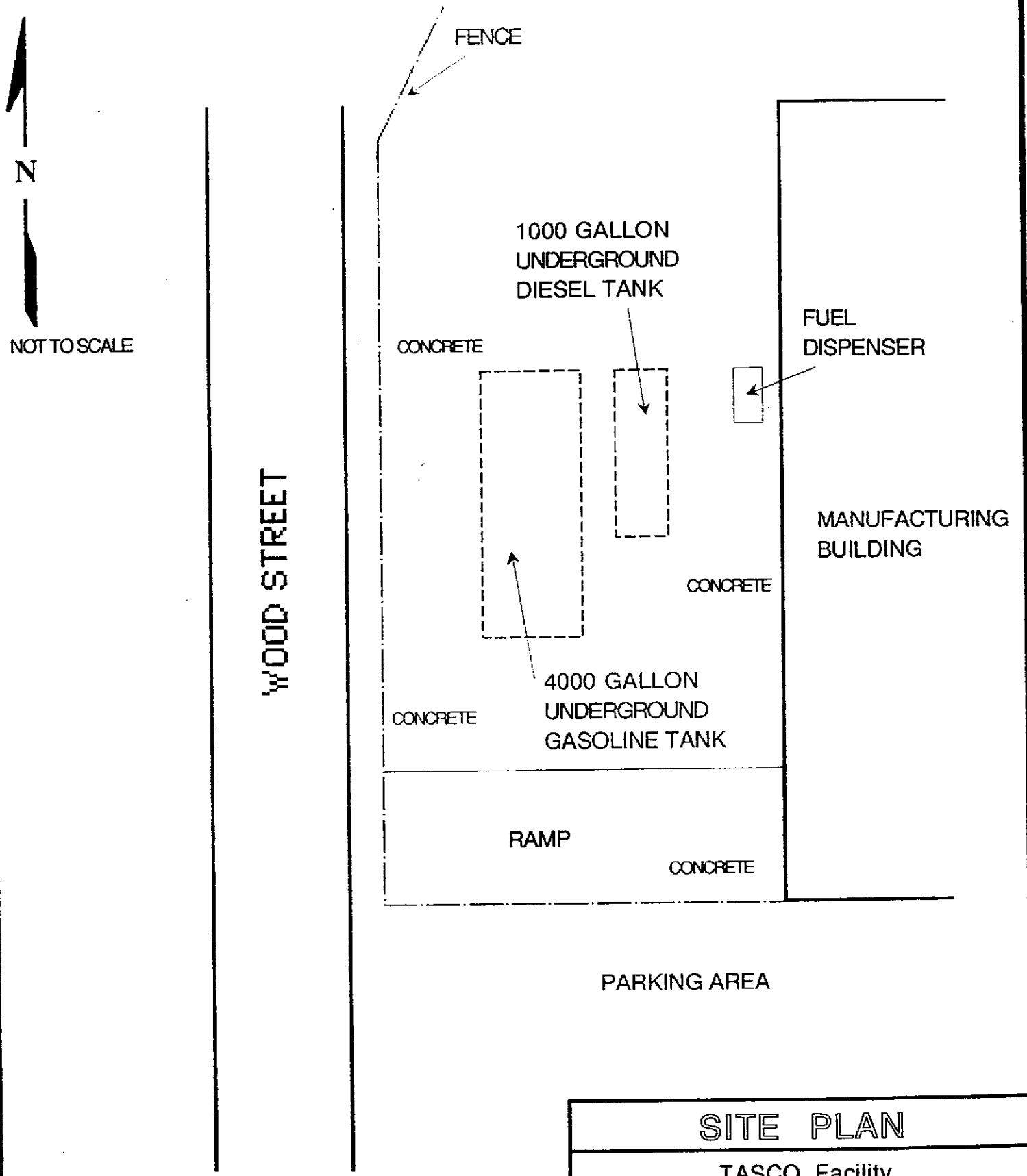
cc: Mr. Don Hwang, ACHCSA
RWQCB, San Francisco Bay Region, Mr. Rich Hiett

SITE LOCATION MAP

TASCO Facility
3430 Wood Street
Oakland, California

Aqua Science Engineers | Figure 1

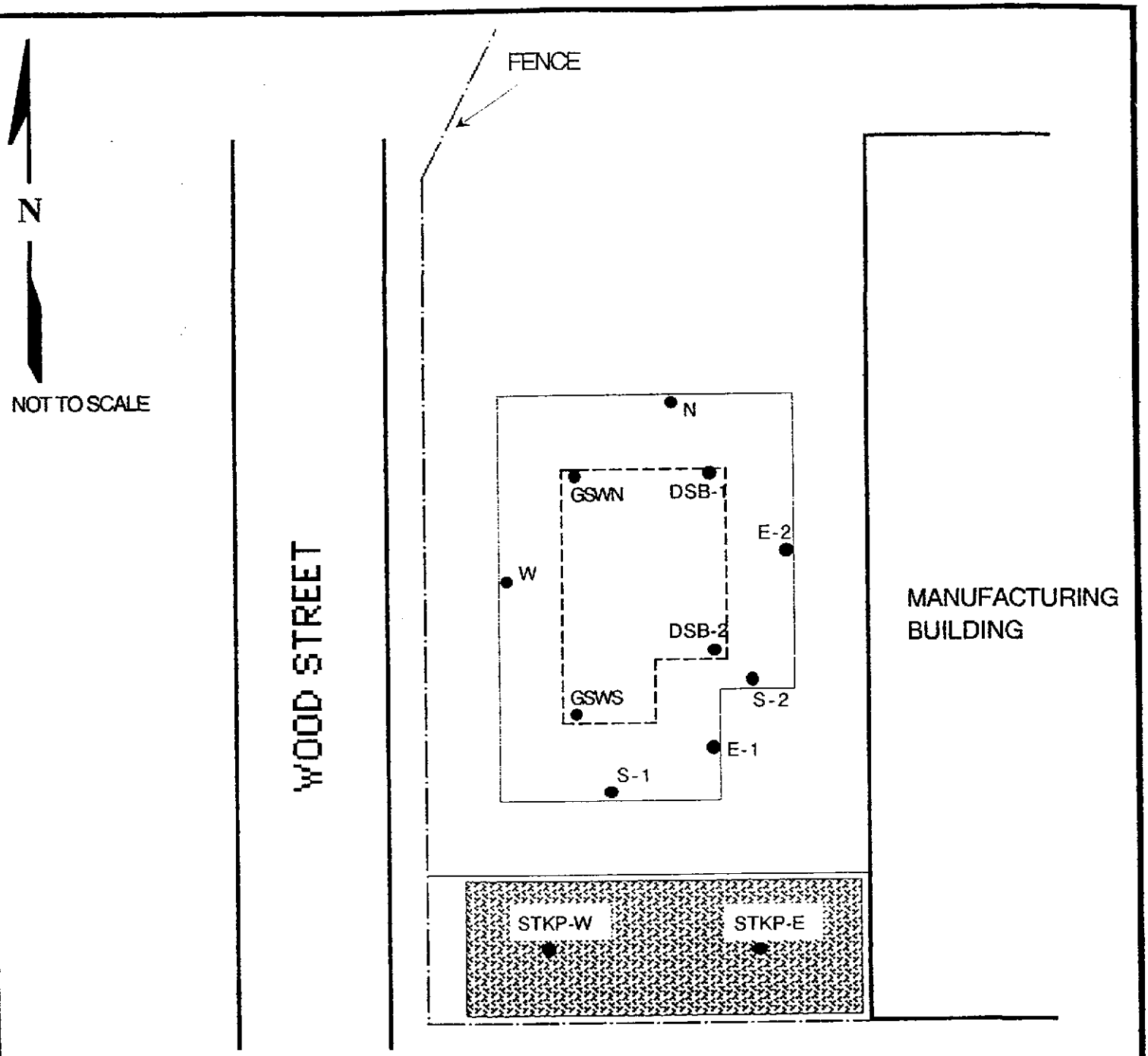
BASE: Oakland West 7.5 minute quadrangle topographic map, dated 1980, scale 1:24,000.



SITE PLAN

TASCO Facility
3430 Wood Street
Oakland, California

Aqua Science Engineers | Figure 2



LEGEND

EXCAVATION LIMITS AFTER INITIAL TANK REMOVAL

EXCAVATION LIMITS AFTER OVEREXCAVATION ACTIVITIES

STOCKPILED, CONTAMINATED SOIL

GSWS — SOIL SAMPLE LOCATION

SAMPLING PLAN

TASCO Facility
3430 Wood Street
Oakland, California

Aqua Science Engineers | Figure 3

APPENDIX A

LABORATORY ANALYSIS
and
CHAIN OF CUSTODY SHEETS

PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical Laboratory

February 01, 1993 PEL # 9301042

AQUA SCIENCE ENGINEERS, INC.

Attn: David Allen
Re: Four soil samples for Gasoline/BTEX and Diesel analyses.

Project name: Tasco
Project location: 3430 Wood St., -Oakland
Project number: 2602

Date sampled: Jan 28, 1993 Date submitted: Jan 29, 1993
Date extracted: Jan 29-31, 1993 Date analyzed: Jan 29-31, 1993

RESULTS:

SAMPLE I.D.	Gasoline (mg/Kg)	Diesel (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
GSWN	2.6	N.D.	5.0	8.4	10	25
GSWS	3.5	N.D.	7.1	10	14	32
DSB 1	49	N.D.	27	49	65	240
DSB 2	17	N.D.	18	26	37	130
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	101.8%	91.6%	98.3%	103.2%	94.6%	105.7%
Duplicate Spiked Recovery	97.6%	92.2%	90.4%	94.2%	89.5%	97.0%
Detection limit	1.0	1.0	5.0	5.0	5.0	5.0
Method of Analysis	5030 / 8015	3550 / 8015	8020	8020	8020	8020

David Duong
Laboratory Director

PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical Laboratory

February 02, 1993 PEL # 9301042

AQUA SCIENCE ENGINEERS,INC.

Attn: David Allen
Re: Four soil samples for total Lead analysis.

Project name: Tasco
Project location: 3430 Wood St.,- Oakland
Project number: 2602

Date sampled: Jan 28, 1993 Date submitted: Jan 29, 1992
Date extracted: Feb 01-02, 1993 Date analyzed: Feb 01-02, 1993

RESULTS:

SAMPLE I.D.	Lead (mg/Kg)
GSWN	6.3
GSWS	10
DSB 1	10
DSB 2	8.9
Blank	N.D.
Detection limit	1.0
Method of Analysis	7420

David Duong
Laboratory Director

PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical Laboratory

PEL # 9301045

February 01, 1993

AQUA SCIENCE ENGINEERS, INC.

Attn: Steve DeHope
Re: Eight soil samples for Gasoline/BTEX and Diesel analyses.

Project name: Tasco
Project location: 3430 Wood St., -Oakland
Project number: 2602

Date sampled: Jan 29, 1993
Date extracted: Jan 30-31, 1993

Date submitted: Jan 30, 1993
Date analyzed: Jan 30-31, 1993

RESULTS:

SAMPLE I.D.	Gasoline (mg/Kg)	Diesel (mg/Kg)	Benzene (ug/Kg)	Toluene (ug/Kg)	Ethyl Benzene (ug/Kg)	Total Xylenes (ug/Kg)
E-1	19	N.D.	31	88	160	280
E-2	5.4	N.D.	5.5	15	21	61
N	3.3	N.D.	5.0	13	18	48
S-1	13	N.D.	9.1	22	37	89
S-2	10	N.D.	6.2	16	17	84
W	1.8	N.D.	N.D.	6.2	12	24
STKP-E*	510	28	180	250	480	1900
STKP-W*	280	N.D.	90	160	320	990
Blank	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Spiked Recovery	101.8%	91.6%	98.3%	103.2%	94.6%	105.7%
Duplicate Spiked Recovery	97.6%	92.2%	90.4%	94.2%	89.5%	97.0%
Detection limit	1.0	1.0	5.0	5.0	5.0	5.0
Method of Analysis	5030 / 8015	3550 / 8015	8020	8020	8020	8020

* Composited soil samples.

David Duong
Laboratory Director

PRIORITY ENVIRONMENTAL LABS

Precision Environmental Analytical laboratory

February 02, 1993 PEL # 9301045

AQUA SCIENCE ENGINEERS,INC.

Attn: Steve DeHope
Re: Eight soil samples for total Lead analysis.

Project name: Tasco
Project location: 3430 Wood St.,- Oakland
Project number: 2602

Date sampled: Jan 29, 1993 Date submitted: Jan 30, 1992
Date extracted: Feb 01-02, 1993 Date analyzed: Feb 01-02, 1993

RESULTS:

SAMPLE I.D.	Lead (mg/Kg)
E-1	15
E-2	14
N	15
S-1	10
S-2	9.8
W	14
STKP-E*	140
STKP-W*	75
Blank	N.D.
Detection limit	1.0
Method of Analysis	7420

* Composited soil samples.

David Duong
Laboratory Director