STID 3980

TC 0637-08

FINAL REPORT

UNDERGROUND TANK REMOVAL AND SITE INVESTIGATION
ETTIE STREET MAINTENANCE FACILITY
3465 ETTIE STREET
OAKLAND, CALIFORNIA

Contract No. 56S067
Work Order No. 04-56S067-17

Prepared for

Caltrans
District 4
111 Grand Avenue
Oakland, CA 94623

June 1996

Prepared by

Tetra Tech
180 Howard Street, Suite 250
San Francisco, CA 94105

TETRA TECH

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June 11, 1996

Subhash Agarwall

Mr. ~~Michael Hilliard~~
California Department of Transportation
~~District 4~~ Office of Environ. Engineering
111 Grant Avenue
P.O. Box 23660
Oakland, CA 94623

Subject: Submittal of the Final Report for the Underground Storage Tank Removal at the Ettie Street Maintenance Facility, Contract No. 56S067, Work Order No. 04-56S067-17, TC 0637-08

Dear Mr. Hilliard:

I have enclosed five copies of the final report for the Ettie Street Maintenance Facility tank removal project. If you have any questions, please do not hesitate to call me at (415) 974-1221.

Very truly yours,

Bob Cotton

Bob Cotton, PE
Senior Hydrogeologist

Michael Wopat, RG
Project Manager

enclosures

STATE OF CALIFORNIA

MINI-MEMO

STD 100-B (REV. 9-70)

TO: Susan Hugo
DEP - Dept of Environ.

SUBJECT: Site Plans, UST Regulations and Tank Regulations

DATE 9-5-56

MESSAGE

This is a followup to our meeting at SFOBB Toll Bridge for UST Closure on Tuesday, Sept. 3, 1996. Enclosed is a copy of the Site Plans at the Toll Plaza, UST Closure Report from Caltrans Ethel St. Main Station and California UST Regulations. If you need further assistance call me.

RETURN TO

SIGNED	ADDRESS	PHONE
► Mike Kleeman	DOT - Caltrans 111 Grand Ave, Oak	(510) 286-4495

REPLY

SIGNED	ADDRESS	DATE
►		

SEND PARTS 1 AND 3 INTACT — PART 3 WILL BE RETURNED WITH REPLY

93514

TC 0637-08

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ETTIE STREET MAINTENANCE FACILITY
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Contract No. 56S067
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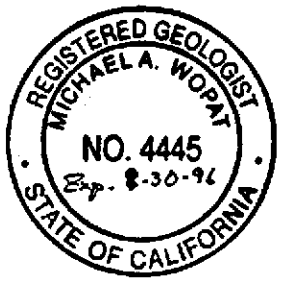
Prepared for

Caltrans
District 4
111 Grand Avenue,
Oakland, CA 94623-0660

Prepared by:

W. Robert Cotton, PE
Senior Hydrogeologist

Michael Wopat, RG
Senior Geologist and Project Manager



Tetra Tech
180 Howard Street, Suite 250
San Francisco, CA 94105

June 1996

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1. INTRODUCTION

This final report has been prepared to document an underground storage tank (UST) removal and disposal at the Ettie Street Maintenance Facility, 3465 Ettie Street, Oakland, Alameda County, California. The work was requested by Caltrans District 4 pursuant to Contract No. 56S067, Work Order No. 56S067-17

1.1 WORK COMPLETED

The work completed during this project, as presented in the work order and discussed during the pre-work site visit, included the following:

- Conducting an initial site visit, including file review, and preparing a work plan and health and safety plan for the tank removal;
- Removing one 4,000-gallon and one 7,500-gallon underground fuel tank and ancillary piping, vent lines, dispenser islands, and fill ports on October 19 and 20, 1995;
- Sampling the soil beneath the tanks and the ground water in the excavation; and
- Backfilling the excavation and bringing the ground surface up to grade with road base rock on November 11, 1995.

Following receipt of the analytical results from the soil and ground water, additional work was requested. The additional work included the following:

- Preparing a UST Unauthorized Release Report (Appendix A) and submitting the report to the RWQCB and Alameda County.
- Excavating TPH-d contaminated soil from beneath the former diesel fuel dispenser island.
- Backfilling the dispenser island excavation with clean fill material.
- Arranging transport and disposal of the fuel-contaminated excavated soil in compliance with applicable state and federal regulations.
- Drilling and sampling two soil borings to depths of 13 to 15 feet below ground surface (bgs).

- Collecting grab ground water samples from temporary monitoring wells installed in the borings.
- Containerizing rinse water from the drilling in U.S. Department of Transportation approved containers, pending waste characterization.
- Backfilling all soil borings with cement/bentonite grout and repairing the ground surface to its original condition.
- Arranging transport and disposal of rinse water in compliance with applicable state and federal regulations.

The following sections describe the historical background and environmental setting of the site and the procedures used in meeting the project objectives.

1.2 SITE DESCRIPTION

The site is located at the north end of Ettie Street, directly under the Interstate 580 structure (Figures 1-1 and 1-2). The site is in northwest Oakland, approximately one-half mile southeast of San Francisco Bay and one-quarter mile south of the Emeryville city limit.

The maintenance facility was built in 1959, and the property is owned and formerly operated by Caltrans; the site is presently unused. The property is about 240 feet (ft) wide and about 480 ft long and covers an area of about three acres.

The elevation of the site is approximately 10 ft above mean sea level (msl). The eastbound and westbound lanes of Interstate 580 are elevated on support structures about 40 to 50 ft above the ground level at the site.

1.2.1 Land Use

The site is located on the Oakland West 7.5 minute U.S. Geological Survey Quadrangle (1979). Topographic relief is about 50 ft within a radius of one mile of the site. The land use in the vicinity of the site is predominantly urban and is relatively densely populated. The East Bay Municipal Utility District sewage treatment plant is located one-third mile west-northwest of the facility, and the Oakland Army Base is located one-half mile to the west.

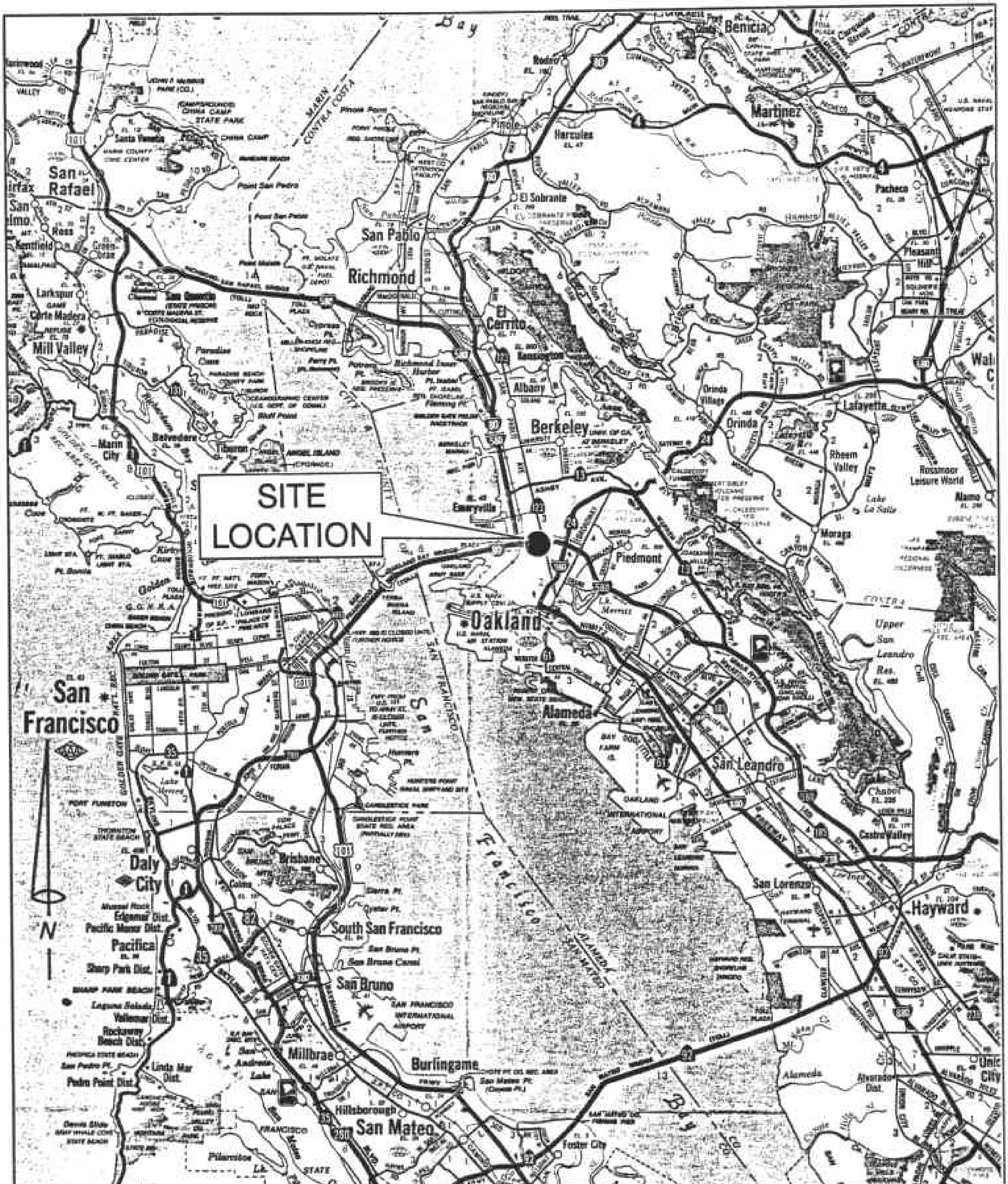


Figure 1-1 Regional Site Location

Scale: 1" = 4 miles

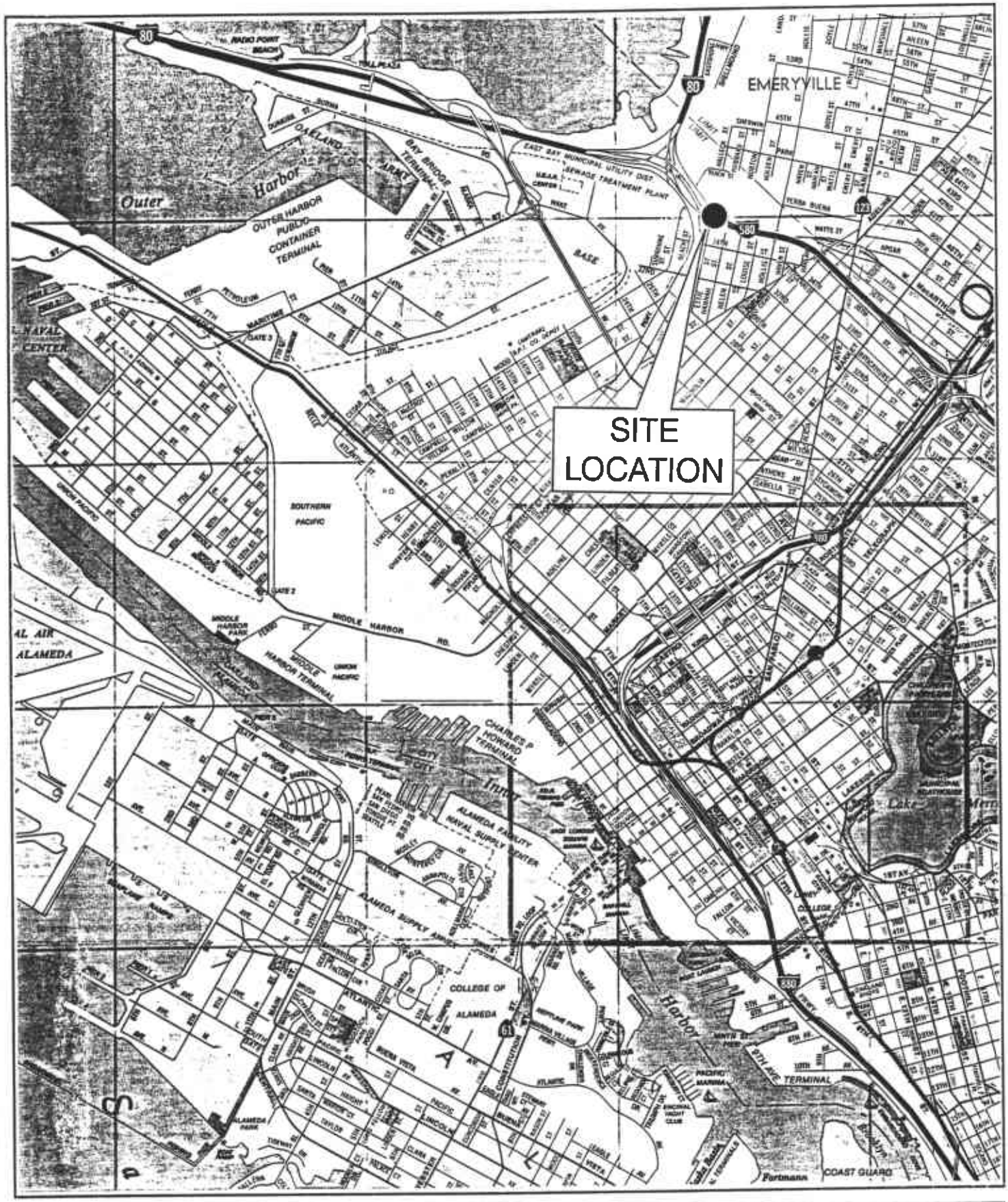


Figure 1-2 Site Location

N

Scale: 1" = 1/2 mile

1.2.2 Geologic Setting

Soils

The surface soils at the site have been mapped as urban land (USDA 1980), a miscellaneous area consisting of land improved with urban structures. The soil material is mostly heterogeneous fill. The Clear Lake complex soils may also underlie portions of the site. Typically, the surface layer of the Clear Lake soil is a very dark clay. The underlying material is dark gray and grayish brown calcareous clay and silty clay that extends to a depth of 60 inches or more. The Clear Lake soil is very deep, poorly drained, and has a low permeability.

Geology

The local geology in the area is primarily artificial fill and Quaternary Bay Mud (Radbruch 1957). Several potentially active faults have been identified in the area; the closest is the Hayward Fault, which follows a northwesterly trend at the foot of the Oakland and Berkeley Hills.

The site geology is interpreted as being composed of artificial fill and Bay Mud, similar to the geology of the local area. The artificial fill generally consists of miscellaneous refuse, or Bay Mud, or sand dredged from the bay. Its thickness is variable, and it typically lies above the Bay Mud. The Bay Mud is of Holocene age and consists of unconsolidated, water-saturated, dark plastic clay and silty clay rich in organic material. Its thickness in coastal lagoons and estuaries is estimated to be approximately 10 feet (Helley et al. 1979).

1.2.3 Hydrogeology

Ground water in the vicinity of the site is found at sea level near the shore and roughly follows the topography in higher areas. Recharge is primarily through rainfall and infiltration. Ground water levels may be tidally influenced due to the proximity to San Francisco Bay, located one-half mile to the northwest. Ground water closest to the surface is believed to be present in an unconfined water table aquifer, with ground water flow generally west and northwest towards the bay. During the tank removals, advancement of soil borings, and soil excavations ground water was encountered at depths of five to eight feet below ground surface.

2. TANK REMOVAL

2.1 DESCRIPTION OF UNDERGROUND STORAGE TANKS

The two underground storage tanks reportedly were installed in 1959 when the Ettie Street Maintenance Facility was built. One tank had a 7,500-gallon capacity, was constructed of single-walled steel, and was used to store gasoline. The second tank had a 4,000-gallon capacity, was constructed of single-walled fiberglass, and was used to store diesel fuel. No plans showing the construction details of the tanks were available. A site plan is presented as Figure 2-1.

2.2 SITE PREPARATION

Site preparation activities included obtaining all applicable permits, notifying the county health department and fire department, and locating underground utilities. A staging area for excavated soil was prepared near the tank removal site. Pea gravel was staged near the excavation.

2.2.1 Permits

An underground storage tank removal permit was obtained from the Alameda County Department of Health for closure of the underground storage tanks. Permits also were obtained from the Oakland Fire Department and the Bay Area Air Quality Management District.

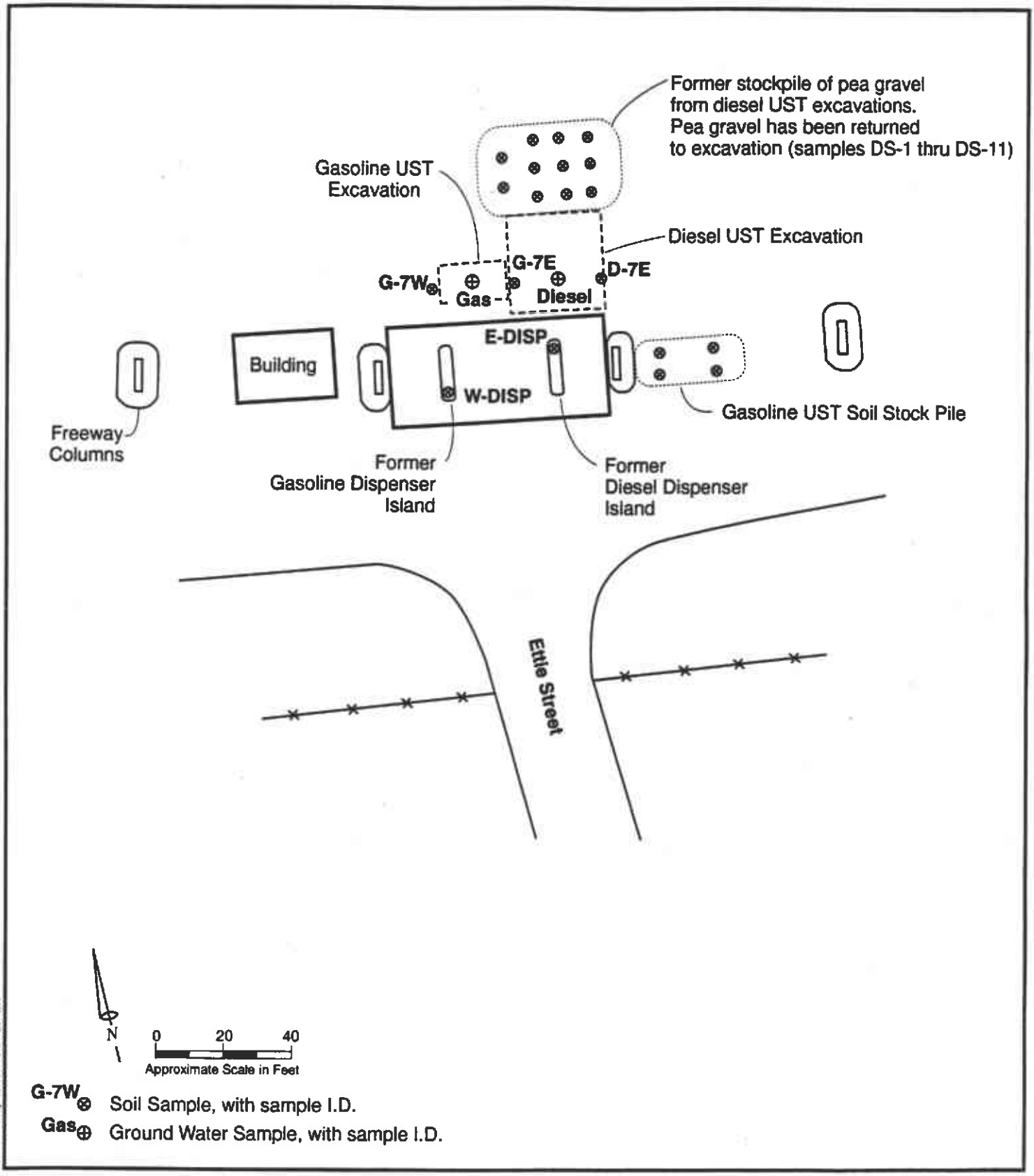
2.2.2 Utilities

Prior to beginning the excavation, utilities were located and marked by Underground Service Alert (USA). [redacted]

2.3 TANK REMOVAL

The procedure for the tank removals was as follows:

- The electric power was shut off and no smoking signs and barricades were placed in conspicuous areas;



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TETRA TECH

Site Plan Showing Locations of Soil and Ground Water Samples Collected October 19 and 20, 1995

Caltrans Ettie Street Maintenance Facility
Oakland, California

Figure 2-1

- Pumpable contents of the tanks were placed in 55-gallon drums;
- The concrete/asphalt surface was removed;
- The soil was excavated to expose the top of the tank;
- After removal of the liquids remaining in the dispenser piping, the piping, fixtures, the drop tube, and pump were removed from the tank;
- The tanks were purged with dry ice;
- Soil was excavated to the bottom of the tank to free the sides of the tank;
- The tanks were hoisted from the excavation; and
- The tanks were labeled, manifested, and hauled as hazardous waste to Erickson, Inc., in Richmond, California.

2.3.1 Cleaning

A total of 250 gallons of gasoline and diesel fuel were pumped out of the tanks. These liquids were removed from the site October 24, 1995, by Enviropur West, Inc., of Patterson, California, and were transported to the Napa Transfer Station in Napa, California (see Appendix B).

2.3.2 Excavation to Expose the Top of the Tank

The asphalt and concrete surfacing were cut using a jackhammer. After removing the concrete and asphalt, the top of each tank was uncovered by the backhoe operator who took care not to disturb the external piping. The fill pipes were located directly over the tanks. The product lines from the valve boxes to the dispenser island were drained of remaining fuel, disconnected, and pulled from underneath the pad. Also, the vent lines from the tanks were cut at the bridge columns, the aboveground portion removed, and the underground portion pulled from the ground. The remaining external piping, the drop tube, and submersible pumps were removed. The two dispenser islands and crash bollards were broken up and removed.

2.3.3 Purging

The tanks were rendered inert in place by pouring crushed dry ice into each tank (20 lb./1000 gallons of tank volume), as required by the Alameda County Health

Department. The atmosphere within the tanks was monitored by the excavation contractor using a combustible gas meter until it was maintained at less than 10 percent of the lower explosive limit, and the oxygen content was less than 10 percent. Susan Hugo of the Alameda County Health Department monitored this process and gave authorization to proceed after the proper atmosphere had been achieved. The tanks were then removed from the excavation.

2.3.4 Tank Removal

The soil along one side of the tanks was removed to the depth of the bottom of the tanks (approximately 11 ft below the ground surface) to a distance of approximately two feet from the wall of the gasoline tank. It was necessary to remove more sidewall soils from around the diesel tank since pea gravel that had been placed around the tank was sloughing against the tank. The soil from around the gasoline UST was placed in the staging area prepared for this purpose.

Approximately 50 to 70 cubic yards of soil were removed from the gasoline UST excavation and stockpiled. The soil removed from around the former diesel storage tank was composed almost entirely of pea gravel. Eleven soil samples were collected from the pea gravel, as directed by the Susan Hugo. Her approval to replace the soil into the diesel UST excavation is contained within the hazardous materials inspection form attached in Appendix A.

2.3.5 Removal of Underground Piping

Underground vent and product piping were removed by pulling them out from under the pavement. After inspection, the tank and lines were placed on a truck licensed to carry hazardous waste.

2.3.6 Tank Disposal

The tanks were inspected, labeled, and properly manifested (Manifest #95592426) as hazardous waste. They were transported by Erickson, Inc., a state-licensed hazardous waste hauler, for disposal at Erickson's permitted facility in Richmond, California. The hazardous waste manifest was signed by a representative of Caltrans. Copies of all manifests for all wastes are attached as Appendix B.

2.4 SAMPLE COLLECTION PROCEDURE

The following sections describe soil and ground water sample collection procedures.

2.4.1 Soil Samples from Tank Pits

Samples were collected of the soil around the tanks to confirm the presence or absence of contamination and to help identify the source(s) of the contamination, if present. LUFT Manual and Regional Water Quality Control Board guidelines require that at least two samples be collected from each tank pit, one from under each end of the tank, within two ft of the bottom of the tank. The underground piping from each tank was less than 20 feet in length; therefore one soil sample was collected from beneath each dispenser island.

Soil samples were collected in stainless steel sample liners. As directed by Susan Hugo, one soil sample was collected from each end of the gasoline excavation from a depth of approximately seven feet. This depth was chosen as there was ground water present in both tank excavations at a depth of approximately eight feet. Samples were collected from the east and west end of the gasoline UST pit and from the east end of the diesel UST pit. No sample was collected from the west end of the diesel pit as this was a point common to the west end of the gasoline UST. The samples were collected by pushing a liner tube into soil excavated and removed to the surface with a backhoe bucket.

Each sample was prepared by placing Teflon film over the ends of the sample liner covering the film with plastic end caps, and then sealing the tube with cohesive silicon rubber tape. Each sample was labeled with the sample ID number, the date, and time collected, and stored on ice in a cooler under chain of custody until received by the laboratory.

All soil samples were analyzed by a state-certified laboratory using the methods specified in Section 2.6.

2.4.2 Ground Water Samples from Tank Pits

Ground water samples were collected from the water, which collected in the excavation pits, using a glass sample container. The water samples were then transferred to containers supplied by the laboratory. No sheen or odor was observed on the samples or the water in the excavations. Samples were labeled, stored, and shipped as described in the previous section and were analyzed by the methods specified in Section 2.6.

2.4.3 Soil Samples from Stockpiled Soil

Four discrete soil samples were collected from the stockpile of soil excavated from the gasoline pit. The purpose of these samples was to obtain a preliminary characterization of the stockpiled soil for evaluation of soil disposal options. The

laboratory was instructed to composite the discrete samples. The samples were collected at selected representative locations by removing about 1 foot of soil to expose fresh material and then pushing a sample liner into the newly exposed soil. The sample liners were sealed and labeled as described in Section 2.4.1. A sketch of the sample points on the soil pile was recorded in the field log. The approximate locations of the samples are shown on Figure 2-1. The 220 cubic yards of samples were analyzed as specified in Section 3.0.

Eleven discrete samples were collected from the soil removed from around the diesel UST. Susan Hugo requested that one discrete sample be collected for every 20 cubic yards of soil removed. These samples were required as Caltrans preferred to replace the soil into the excavation. As an estimated 220 cubic yards of soil were removed, 11 samples were necessary (see Figure 2-1 for approximate locations). The sampling procedure was the same as described in the preceding paragraph. The 220 cubic yards of excavated pea gravel was then replaced into the diesel UST pit.

2.4.4 Soil Samples from Under Dispenser Islands

Following removal of the dispenser islands, a single soil sample was collected from under each island at a location approved by Susan Hugo. Each sample was collected by first scraping away several inches of soil, then driving a soil sampler containing a 2 inch x 6 inch sample liner into the ground using a slide hammer. The sample liner then was retrieved and was sealed and labeled as described in Section 2.4.1.

2.5 BACKFILL AND COMPACTION

The remaining diesel tank excavation and the gasoline excavation were backfilled with clean pea gravel to within 15 inches of the ground surface. The excavation was then filled to grade with compacted road base. At the instruction of Caltrans, the ground surface was not paved with asphalt or concrete because additional excavation and/or drilling may be required.

2.6 LABORATORY ANALYSIS

Samples were analyzed by Entech Analytical Labs (formerly Hull Development Labs), a California-certified laboratory in Sunnyvale, California. Samples were shipped to Entech under a chain of custody that identified the samples, the date collected, and the analyses to be performed. The samples were analyzed by the following methods:

- Soil samples collected from the diesel tank excavation, underneath the diesel dispenser island, and from the stockpile were analyzed by EPA

Method 3550/8015 modified, for total petroleum hydrocarbons as diesel (TPH-d), and by EPA Method 8020 for benzene, toluene, ethylbenzene, and total xylenes (BTEX);

- The ground water sample collected from the diesel tank excavation was analyzed by EPA Method 602 for BTEX and by EPA Method 3550/8015 modified, to determine TPH-d;

- Soil samples collected from the gasoline tank excavation, underneath the gasoline dispenser island and from the stockpile of soil from the gasoline UST pit were analyzed by EPA Method 5030/8015 modified, for total petroleum hydrocarbons as gasoline (TPH-g), by EPA Method 7420 for total lead, and by EPA Method 8020 to determine BTEX and methyl-tert-butyl ether (MTBE) concentrations;

- The ground water sample collected from the gasoline tank excavation was analyzed by EPA Method 602 for BTEX and MTBE, total lead by EPA Method 239.1 and by EPA Method 5030/8015 modified, to determine TPH-g; and

- Analysis for reactivity, corrosivity, and ignitability (RCI) were performed to characterize for disposal the soil stockpile from the gasoline UST pit.

2.7 ANALYTICAL RESULTS FROM INITIAL SOIL AND GROUND WATER SAMPLING

2.7.1 Soil Samples

The results of soil sample analyses are summarized in Table 1.

- Confirmation soil samples collected from the west and east ends of the gasoline UST tank pit (G-7W and G-7E) contained no total petroleum hydrocarbons as gasoline (TPH-g), BTEX compounds, or methyl-tert-butyl ether (MTBE) above the method detection limits. Total lead concentrations were 6.5 and 11 mg/kg, and probably represent normal soil concentrations.

- Confirmation soil samples collected from the west and east ends of the diesel UST tank pit (G-7E and D-7W) contained no TPH as diesel (TPH-d) or BTEX compounds above the method detection limits. The samples did contain 23 and 13 mg/kg TPH as motor oil (TPH-oil). The source and volume of the motor oil release is unknown.

Table 1
Analytical results for soil samples collected October 19 and 20, 1995, at Caltrans' Ettie Street Maintenance Facility
3465 Ettie Street, Oakland, California

Sample ID	Date Collected	TPH-oil (8015 mod) (mg/kg)	TPH-d (8015 mod) (mg/kg)	TPH-gas (8015 mod) (mg/kg)	Benzene (8020) (mg/kg)	Toluene (8020) (mg/kg)	Ethylbenzene (8020) (mg/kg)	Xylenes (8020) (mg/kg)	MTBE (8020) (mg/kg)	Lead (7420) (mg/kg)
Samples collected from beneath USTs										
G-7W	10/19/95	na	na	ND	ND	ND	ND	ND	ND	*6.5*
G-7E	10/19/95	*23*	ND	ND	ND	ND	ND	ND	ND	*11*
D-7E	10/19/95	*13*	ND	na	ND	ND	ND	ND	na	na
Samples collected from beneath dispensers										
W-DISP	10/20/95	na	na	ND	ND	ND	ND	ND	ND	*18*
E-DISP	10/20/95	na	*64000*	na	ND	ND	ND	ND	na	na
Sample composited from soil from gasoline UST excavation										
COMP	10/20/95	na	na	ND	ND	ND	ND	ND	ND	*26*
Samples collected from pea gravel removed from around diesel UST										
DS-1	10/19/95	ND	*35*	na	ND	ND	ND	ND	ND	na
DS-2	10/19/95	ND	*71*	na	ND	ND	ND	ND	ND	na
DS-3	10/19/95	ND	*31*	na	ND	ND	ND	ND	ND	na
DS-4	10/19/95	*110*	*39*	na	ND	ND	ND	ND	ND	na
DS-5	10/19/95	*62*	*39*	na	ND	ND	ND	ND	ND	na
DS-6	10/19/95	*29*	*12*	na	ND	ND	ND	ND	ND	na
DS-7	10/19/95	*72*	ND	na	ND	ND	ND	ND	ND	na
DS-8	10/19/95	*560*	ND	na	ND	ND	ND	ND	ND	na
DS-9	10/19/95	*91*	*24*	na	ND	ND	ND	ND	ND	na
DS-10	10/19/95	*49*	ND	na	ND	ND	ND	ND	ND	na
DS-11	10/19/95	*30*	ND	na	ND	ND	ND	ND	ND	na
Method Detection Limit		1.0	1.0	1.0	0.005	0.005	0.005	0.005	0.05	0.5

NOTES:

mg/kg	milligrams per kilogram (ppm)
TPH-oil	total petroleum hydrocarbons quantified as motor oil
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
na	not applicable, analysis not performed for this analyte
ND	analyte not detected (ND) at or above the laboratory reporting limits
COMP	composite of four samples (SP-SW, SP-SE, SP-NW, SP-NE) collected from the soil removed from the gasoline UST excavation

- The confirmation soil sample collected from beneath the gasoline dispenser island (W-DISP) did not contain TPH-g, BTEX compounds, or MTBE above the method detection limits. Total lead content was 18 mg/kg.

- The confirmation soil sample collected from beneath the diesel dispenser island (E-DISP) contained TPH-d at a concentration of 64,000 mg/kg and no BTEX compounds above the method detection limits.

This indicates that there was a release of diesel fuel in the vicinity of the sample collection point and is the reason why additional soil excavation and confirmatory sampling, as described below in this report, was necessary.

- The composite soil sample collected from the stockpile of soil excavated from around the gasoline UST (COMP) contained no detectable concentration of TPH-g, BTEX compounds, or MTBE. Total lead content is 26 mg/kg, well below concentrations of regulatory concern. Therefore, this soil can be treated as ordinary clean fill material.

- Most of the soil samples collected from the pea gravel removed from around the diesel UST (OS-1-DS-11) contained quantifiable concentrations of TPH-d and TPH-oil. The average concentration of TPH-d was 23.0 mg/kg, and the average concentration of TPH-oil was 91.3 mg/kg. This pea gravel was returned to the tank pit.

2.7.2 Ground Water Samples

The results of ground water sample analyses are summarized in Table 2.

Table 2
Analytical results for petroleum hydrocarbons in grab ground water samples collected October 19, 1995, at Caltrans' Ettie Street Maintenance Facility

Sample ID	TPH-oil (8015 mod) (µg/L)	TPH-d (8015 mod) (µg/L)	TPH-g (8015 mod) (µg/L)	Benzene (602) (µg/L)	Toluene (602) (µg/L)	Ethylbenzene (602) (µg/L)	Xylenes (602) (µg/L)	MTBE (602) (µg/L)	Lead (602) (mg/L)
Gas	na	na	ND	ND	ND	ND	*36*	*260*	ND
Diesel	170*	*2000*	na	ND	ND	ND	ND	na	na
Method Detection Limit	50	50	50	0.5	0.5	0.5	0.5	5.0	0.05

Notes:

TPH-oil	total petroleum hydrocarbons quantified as motor oil.
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
µg/L	micrograms per liter (= ppb)
mg/L	milligrams per liter (= ppm)
na	not applicable, analysis not performed for this analyte
ND	analyte not detected (ND) at or above the laboratory reporting limit
Gas	ID for water sample from pit resulting from removal of gasoline UST
Diesel	ID for water sample from pit resulting from removal of diesel UST
*	TPH in motor oil range does not match typical motor oil pattern (see Appendix C).

- The ground water sample collected from the gasoline UST tank pit (Sample ID = "Gas") contained no TPH-g, benzene, toluene, ethylbenzene, or dissolved lead above the method detection limits. The

analyses did detect 36 µg/L xylenes and 260 µg/L MTBE. The California Department of Public Services Primary Maximum Contaminant Level (MCL, also known as the drinking water standard) for xylenes is 1,750 µg/L, well above the level found in the Ettie Street sample; therefore it should not be an issue of concern. There is no primary or secondary MCL for MTBE; therefore it is not an issue of concern.

- The water sample collected from the diesel UST pit (Sample ID = "Diesel") contained 170 µg/L TPH-oil and 2,000 µg/L TPH-d. The TPH-d concentration could trigger a requirement for additional ground water assessment by the lead regulatory agency. The TPH-oil concentration represents a carry over from the adjacent diesel fuel range rather than the presence of motor oil (see December 21, 1995, report in Appendix C). Concentrations of BTEX compounds were below the method detection limits.

3. SOIL EXCAVATION FROM BENEATH FORMER DIESEL DISPENSER ISLAND AND SOIL DISPOSAL

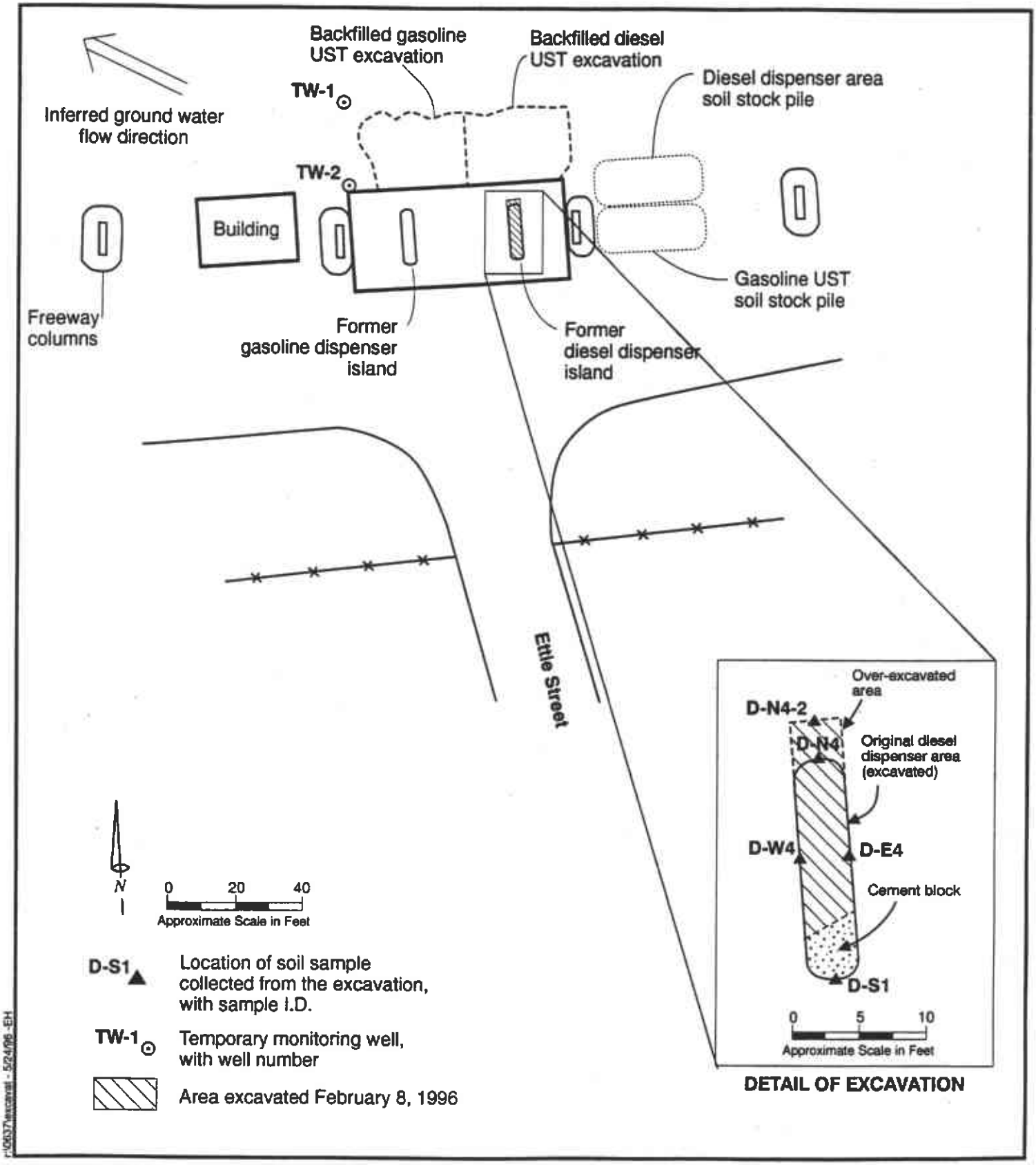
The following sections describe the methods used during the excavation, stockpiling, transport, and disposal of soil removed from beneath of the former diesel dispenser island. The soil excavation and stockpiling was completed on February 8, 1996. On April 16, 1996, the soil was loaded and transported to REMCO in Richmond, California, for treatment.

3.1 SOIL STAGING AREA

A soil staging area for the soils excavated from under the former diesel dispenser island was prepared in the vicinity of the tank excavation site at the location shown on Figure 3-1. The staging area was constructed by first placing 6-mil plastic sheeting on the ground surface. Contaminated soil was placed on the plastic sheeting and was covered with plastic sheeting at the end of the work day.

3.2 SOIL EXCAVATION UNDER THE FORMER DIESEL DISPENSER

When the cement diesel dispenser island was removed on October 19, 1995, the resulting shallow excavation was brought to grade by backfilling with clean road base sized gravel. This material was removed and separately staged before removing the contaminated soil. Soil was then removed from beneath the former diesel dispenser using a backhoe. Excavation work was directed by a Tetra Tech representative. Excavated soils were visually inspected and screened with a photoionization detector (PID). Obviously contaminated soils were placed on the soil staging area. The depth of excavation extended to the depth of the water table, which was encountered at 5.5 feet from ground surface. A plan view of the location and size of the initial excavation is shown on Figure 3-1. A large cement block was encountered in the southern end of the excavation. The top of the block was at 2.25 feet bgs and the block extended downward below the base of the excavation at 5.5 feet. This cement block was left in place in the excavation. After all obviously contaminated soils were removed, samples were collected from the four sidewalls (see Figure 3-1 for sample locations). The samples collected from the north, east, and west excavation walls were collected from a depth of four feet. The presence of the cement block on the south end prohibited sampling below its top face; therefore



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TETRA TECH

Site Plan Showing Locations of Temporary Monitoring Wells and Excavation Sampled February 8, 1996

Caltrans Ettie Street Maintenance Facility
Oakland, California

Figure 3-1

the southern soil sample was collected from a depth of one foot. These samples were analyzed for the parameters described in Section 2.7. Results of the north sample analysis was 180 mg/kg TPH-d, greater than the proposed closure goal (Section 5.1), therefore the excavation was extended three feet to the north and the excavation wall was resampled. The results of soil analyses from the south, west, and east sidewalls and the resampling of the north sidewall were all less than the analysis method detection limit and the proposed closure goals; therefore the soil removal was halted at that point. The total estimated volume of removed soils is 12 cubic yards.

After completion of the soil excavation, the resulting pit was backfilled with clean pea gravel to a depth of approximately 15 inches. The excavation was then brought to grade by filling with the previously removed clean roadbase sized gravel, and the gravels were compacted using the backhoe.

3.3 SOIL SAMPLE COLLECTION AND ANALYSIS PROCEDURES

3.3.1 Soil Samples from the Excavation

Soil samples collected from the excavation were labeled with a sample number descriptive of the location and depth of the sample and the date and time of collection. Sample numbers were composed of the sample or tank pit location followed by a number corresponding to the depth of the sample and a letter corresponding to the direction (N,E,S,W) from the center of the pit that the sample was taken from.

After the samples were described, labeled, and packaged, they were transported to the on-site mobile laboratory where they were logged in, placed in a cooler or refrigerator, and maintained at a temperature of about 4 degrees Celsius until analysis. A chain of custody was maintained at the on-site laboratory.

Soil samples were collected by pushing a liner tube into soil excavated and brought to the surface with a backhoe bucket. All soil samples were analyzed for TPH-d using modified EPA Method 8015/3550 by a mobile state-certified laboratory operated by Geochem Environmental Laboratories of San Jose, California.

3.3.2 Composite Soil Samples from the Soil Stockpile

Four discrete soil samples were collected from the stockpile of soil excavated from under the former diesel dispenser island. The purpose of the soil samples was to obtain a preliminary characterization of the stockpiled soil for evaluation of soil disposal options. The samples were collected by pushing a sample liner into the

stockpiled soil at four quadrants within the stockpile. The discrete samples were identified with separate sample numbers. A sketch of the sample points on the soil pile was recorded in the field log. The laboratory was instructed to composite the discrete samples and analyze the composite.

The composite sample was analyzed for TPH-d using modified EPA Method 8015/3550 by the mobile state-certified laboratory operated by Geochem Environmental Laboratories. Analyses for BTEX compounds, reactivity (cyanide and sulfide), corrosivity (pH), and ignitability (flash point), the LUFT metals (cadmium, chromium, lead, nickel, and zinc), and soluble lead were conducted by Entech Analytical Labs.

3.4 BACKFILL AND COMPACTION

The excavation was backfilled with clean pea gravel and was compacted to Caltrans' specifications as soon as the excavation was completed and all samples were collected and analyzed. Backfill was staged on site prior to the start of work. The upper one foot of fill consisted of compacted road base.

3.5 RESULTS OF ANALYSES FROM DIESEL DISPENSER ISLAND EXCAVATION AND SOIL STOCKPILE

The results of the soil analyses are summarized on Table 3.

- The soil samples collected from the south, west, and east ends (D-S1, D-E4, and D-W4) of the diesel dispenser island excavation contained no TPH-d above the method detection limit.

- The first soil sample collected from the north end (D-N4) of the diesel dispenser island excavation contained 180 mg/kg TPH as diesel. After excavating an additional three feet northward, another soil sample (D-N4-2) was collected. This sample contained no detectable TPH-d.

- The composite sample (SS-NW, NE, SW, SE) was collected from the stockpile composed of soil removed from beneath the former diesel dispenser for the purpose of characterizing the soil for disposal. The composite sample was found to contain 150 mg/kg TPH-d and no detectable BTEX compounds. None of the other parameters shown on Table 3 were at levels that would qualify the soil as a hazardous waste.

Table 3
Analytical results for soil samples collected February 8, 1996 at Caltrans' Ettie Street Maintenance Facility
3465 Ettie Street, Oakland, California

Sample ID	TPH-d (8015 mod) (mg/kg)	Benzene (8020) (mg/kg)	Toluene (8020) (mg/kg)	Ethylbenzene (8020) (mg/kg)	Xylenes (8020) (mg/kg)	Cyanide (9030) (mg/kg)	Sulfide (9030) (mg/kg)	pH (9045) (units)	Flash Point (1010) (°F)
Confirmation samples collected from the excavation beneath the former diesel dispenser island									
D-S1 → 1 ft. bgs	ND	na	na	na	na	na	na	na	na
D-E4 } 4 ft. bgs	ND	na	na	na	na	na	na	na	na
D-W4 } 4 ft. bgs	ND	na	na	na	na	na	na	na	na
D-N4 } 4 ft. bgs	*180*	na	na	na	na	na	na	na	na
D-N4-2 } 4 ft. bgs	ND	na	na	na	na	na	na	na	na
Composite sample collected from the diesel soil stockpile									
SS-NW,NE,SW,SE	*150*	ND	ND	ND	ND	ND	ND	9.1	>200
Method Detection Limit	10	0.005	0.005	0.005	0.005	0.2	0.5	na	na

Sample ID	Cadmium (7130) (mg/kg)	Chromium (7190) (mg/kg)	Lead (7420) (mg/kg)	Soluble Lead* (7420) (mg/l)	Nickel (7520) (mg/kg)	Zinc (7950) (mg/kg)
Composite sample collected from the diesel soil stockpile (cont'd)						
SS-NW,NE,SW,SE	0.61	19	74	2.7	26	120
Method Detection Limit	0.5	0.5	0.5	0.10	0.5	0.5

NOTES:

mg/kg	milligrams per kilogram (ppm)
TPH-d	total petroleum hydrocarbons quantified as diesel
na	not applicable; analysis not performed for this analyte
ND	analyte not detected (ND) at or above the laboratory reporting limits
*	soluble lead extracted following procedures of the California waste extraction test (Cal WET)

3.6 DISPOSAL OF SOIL EXCAVATED FROM BENEATH THE FORMER DIESEL DISPENSER ISLAND

On April 16, 1996, Tetra Tech supervised the loading of the soil onto two roll-off boxes. The soil was transported by Alhambra Environmental Services of Richmond, California, to the rotary kiln disposal facility owned and operated by Remedial Environmental Marketing Company, Inc., in Richmond, California. The weight of the soil was 20.6 tons, indicating a total soil volume of about 16 cubic yards. The soil was remediated by passing it through the rotary kiln. A copy of the nonhazardous waste manifest is included in Appendix B.

4. DRILLING AND SAMPLING SOIL BORINGS

Two soil borings were placed downgradient of the tank pit and the diesel dispenser island to permit collection of soil and grab ground water samples. The northernmost boring (TW-1) was located near the former gasoline UST tank pit in what was inferred to be the hydraulically downgradient direction from both the gasoline and diesel former USTs. The other soil boring (TW-2) was located further south in an area inferred to be the hydraulically downgradient direction from the diesel dispenser island. Figure 3-1 shows the proposed soil boring locations.

4.1 DRILLING

The two soil borings were installed by Precision Sampling, Inc., a California licensed drilling company (License No. C-57 636387). The borings were installed using the Enviro-Core™ continuous soil sampling system, which uses a 2.375-inch diameter drive casing to drill the soil borings and a 3-foot long, 1.5-inch diameter inner sample barrel containing six 6-inch long stainless-steel sample liners to collect the soil samples. The 3-foot sample barrel is simultaneously advanced with the drive casing. Soil samples were collected continuously in each borehole for the entire length of the soil boring. After collection of each 3-foot sample, the amount of recovery was recorded in the boring log. Soil was field-screened for contamination by visual examination and with a PID. All PID readings were recorded on the boring logs. All soils descriptions were recorded in the boring log. Soil boring logs are presented in Appendix D.

The soil generated during drilling was placed on the soil stockpile that resulted from excavating beneath the former diesel fuel dispenser island. Upon completion of the ground water sampling (described below), the boreholes were backfilled with cement/bentonite grout that was tremied to the bottom of the borehole. After backfilling, the ground surface was repaired with asphalt patch to match the original condition.

4.1.1 Drilling Permits

Alameda County requires that all soil borings be permitted prior to drilling. A drilling permit was obtained from Alameda County Flood Control and Water Conservation District. A copy of the permit is shown in Appendix D.

4.2 SAMPLING AND ANALYSIS

4.2.1 Soil Sampling and Analysis

Because native soil in the tank pit walls was shown by confirmation samples to contain only low concentrations of TPH-d and TPH-motor oil below the proposed cleanup goals (PCGs), only one soil sample was collected from each boring for chemical analysis. Each soil sample was collected across the interval where the top of the saturated zone was found in the boring.

Samples were collected within the 1.5-inch diameter core barrel in 1.5-inch diameter by 6-inch long stainless steel sample sleeves. After the sample sleeves were screened with a PID, the sample sleeve containing the appropriate soil interval was chosen by the geologist and prepared for shipment to the laboratory by covering the ends of the sleeves with Teflon film, securing the file with plastic caps, and sealing the film and caps with adhesiveless (cohesive) tape. Each sample sleeve was then labeled with the site name, date, time, samples number, and sampler's initials and placed in a cooler with sufficient blue ice to lower the sample temperature to 4° C for transport to the state-certified laboratory for analysis. The soil samples were submitted to Entech Analytical Laboratories for analysis for TPH-g, TPH-d, and TPH-motor oil using EPA Method 8015 modified, BTEX using EPA Method 8020, and total lead using either EPA method 7420 or 6010.

4.2.2 Ground Water Sampling and Analysis

Grab ground water samples were collected from both monitoring wells. After completion of the boring, 10 feet of one-inch inner diameter PVC screen was attached to one-inch diameter PVC casing and lowered into each borehole to create a temporary well. Ground water samples were collected by lowering a 0.75-inch diameter stainless-steel bailer into the casing until it was filled and then retrieving the full bailer.

Ground water samples were collected into the appropriate containers for each analysis. Each container was labeled with the sample ID, date and time collected, site name, and sampler's initials and placed in a cooler with sufficient blue ice to lower the sample temperature to 4° C for transport to the state-certified laboratory for analysis. The samples were submitted to Entech Analytical Laboratories for analysis for TPH-g, TPH-d, and TPH-motor oil using EPA Method 8015 modified, BTEX using EPA Method 602, and dissolved lead using EPA Method 7420. The lead sample was filtered by the laboratory prior to analysis to eliminate any lead resulting from suspended sediment in the water. The natural background lead concentration in soil and sediment is several-fold higher than the Cal/EPA MCL for

lead in drinking water of 0.05 mg/l and can cause significantly elevated lead concentrations in water samples unless the sediment is removed.

4.2.3 Sample Documentation

The depth of each soil sample is shown on the soil boring log (Appendix D) and is coded into the soil-sample ID along with the boring number. The boring from which each water sample was collected is also coded into the water-sample ID. All samples from the borings were accompanied by chain-of-custody documentation from the time of collection until their delivery to Entech Analytical Laboratories.

4.3 DECONTAMINATION

The drilling tools, such as the drive casing and shoe, were steam-cleaned prior to use in each soil boring and after the final boring. Soil and ground water sampling equipment, such as sample barrels and the bailer, also were decontaminated by steam cleaning prior to each use and following the final use. Steam cleaning of portable equipment was done in a portable wash rack. Liquids generated during steam cleaning activities were pumped into a DOT-approved 55-gallon drum, which was labeled and staged on site pending disposal (see Section 4.5).

4.4 ANALYTICAL RESULTS

4.4.1 Soil Samples

The soil samples collected from each soil boring contained no concentrations above the practical quantitation limit (PQL) of TPH-d, TPH-g, or BTEX compounds (Table 4). TPH as motor oil (TPH-oil) was detected in elevated concentrations of 1,200 mg/kg in TW1-6.5 and 380 mg/kg in TW2-09. Lead was present at a background concentration of 11 mg/kg in TW1-6.5 and at an elevated concentration of 120 mg/kg in TW2-09.

4.4.2 Ground Water Samples

The ground water samples contained no TPH-d or dissolved lead above their respective PQLs (Table 4). Sample TW1-W1 contained low concentrations of TPH-g (52 µg/l) and BTEX compounds (3.9 µg/l benzene, 8.9 µg/l toluene,

Table 4
Analytical results for soil and ground water samples collected February 8, 1996
from soil borings and temporary wells at
Caltrans' Ettie Street Maintenance Facility
3465 Ettie Street, Oakland, California

Sample ID	Depth (feet)	TPH-oil (8015 mod) (mg/kg)	TPH-d (8015 mod) (mg/kg)	TPH-gas (8015 mod) (mg/kg)	Benzene (8020) (mg/kg)	Toluene (8020) (mg/kg)	Ethylbenzene (8020) (mg/kg)	Xylenes (8020) (mg/kg)	Lead (7420) (mg/kg)
Soil samples									
TW1-6.5	6.5-7.0	*1,200*	ND < 25	ND	ND	ND	ND	ND	*11*
TW2-09	9.0-9.5	*380*	ND < 5	ND	ND	ND	ND	ND	*20*
Method Detection Limit		*1.0*	*1.0*	*1.0*	*0.005*	*0.005*	*0.005*	*0.005*	*0.50*

Sample ID	Depth to water (feet)	TPH-oil (8015 mod) (µg/l)	TPH-d (8015 mod) (µg/l)	TPH-gas (8015 mod) (µg/l)	Benzene (8020) (µg/l)	Toluene (8020) (µg/l)	Ethylbenzene (8020) (µg/l)	Xylenes (8020) (µg/l)	Lead (7420) (mg/l)
Ground water samples									
TW1-W1	3.8	*2,400*	ND	*52*	*3.9*	*8.9*	*1.3*	*2.4*	ND
TW2-~~W2~~ W1	3.8	*2,300,000*	ND ~~< 62,500~~	ND	ND	ND	ND	ND	ND
Method Detection Limit		50.0	50.0	50.0	*0.5*	*0.5*	*0.5*	*0.5*	*0.005*

NOTES:

µg/kg	milligrams per kilogram (ppm)
TPH-oil	total petroleum hydrocarbons quantified as motor oil
TPH-d	total petroleum hydrocarbons quantified as diesel
TPH-g	total petroleum hydrocarbons quantified as gasoline
na	not applicable, analysis not performed for this analyte
ND	analyte not detected (ND) at or above the laboratory reporting limits

1.3 µg/l ethylbenzene, and 2.4 µg/l total xylenes), and 2,400 µg/l (2.4 mg/l) TPH-oil. Sample TW2-W1 contained no concentrations of TPH-g or BTEX compounds above their respective PQLs but did contain 2,300,000 µg/l (2,300 mg/l) TPH-oil.

4.5 DISPOSAL OF RINSATE FROM DECONTAMINATION

On April 16, 1996, Tetra Tech supervised the removal of the DOT-approved 55-drum in which the rinsate was stored and the contents of the drum, which totaled 37 gallons. The drum and its contents were removed by personnel of Armour Petroleum Service and Equipment Corporation, who transported the rinsate to Solano Community College in Vacaville, California (see Appendix B), where the rinsate will be used in a fire-fighting training program.

5. PROPOSED CLEANUP GOALS AND HANDLING OF STOCKPILED SOIL

Section 5 presents the rationales for the proposed cleanup goals for TPH-d and TPH-oil and for handling the stockpile of soil excavated from the gasoline UST pit.

5.1 PROPOSED CLEANUP GOALS (PCG) FOR TPH-D AND TPH-OIL

Tetra Tech proposes the following PCGs for soil at this site:

TPH-d	PCG = 100 mg/kg
TPH-oil	PCG = 1,000 mg/kg

Tetra Tech proposes these PCGs for the following reasons:

1. The October 1995 report "Recommendations to Improve the Cleanup Process for California's Leaking Underground Fuel Tanks," prepared by Lawrence Livermore National Laboratory (LLNL) and submitted to the State Water Resources Control Board (SWRCB), concluded that fuel hydrocarbons have limited impacts on human health, the environment, or California's ground water resources. The costs of cleaning up LUFT fuel hydrocarbons are often inappropriate when compared to the magnitude of the impact on ground water resources.

2. The major chemicals of concern in gasoline and diesel fuel are the BTEX compounds. No BTEX compounds were detected in any of the soil samples.

3. The PCG of 100 mg/kg for TPH-d in soil is based on the concentration of BTEX compounds in diesel fuel and their potential impact on ground water. According to the LUFT Field Manual (LUFT Task Force, 1989, p. 27-28, Table 2-1), concentrations of 100 mg/kg TPH-d in soil are sufficiently low that resulting ground water BTEX concentrations should not exceed California DHS action levels or primary MCLs for drinking water.

   Analytical results for the ground water sample collected from the diesel UST pit support the 100 mg/kg PCG for TPH-d in soil. Even though the diesel-contaminated pea gravel is in contact with the ground water in the pit and a sample of the ground water from the pit contained 2,000

µg/l TPH-d, BTEX compounds were not present in the sample in detectable concentrations.

4. The TPH-oil PCG value of 1,000 mg/kg for soil is proposed because motor oil contains even lower concentrations of BTEX compounds than diesel fuel, and because the ground water samples collected from the diesel UST tank pit contained no TPH-oil that is attributable to motor oil, even though the pea gravel in the pit contains up to 560 mg/kg TPH oil.

5. Any TPH contamination is unlikely to migrate off site. Shallow ground water at the site lies within the low-permeability Bay Mud. The low permeability of the mud and the inferred low hydraulic gradient at the site will result in very slow ground water flow rates. The migration rate of any TPH in the ground water will be even slower because of the high concentration of organic matter and clay in the mud. The constituents of fuel hydrocarbons bind to the organic material and clay and therefore migrate several times more slowly than the ground water. Such slow movement of the fuel hydrocarbons will allow abundant time for mitigation of the contamination by intrinsic *in-situ* aerobic bioremediation before the contaminant plume, if any, could migrate any substantial distance. Consequently, any fuel hydrocarbon contamination from this site is not likely to migrate off site or into nearby surface waters.

6. Because shallow ground water at the site lies within the low-permeability Bay Mud, the ground water at the site is not likely to meet the California State Water Resources Control Board (SWRCB) criterion for municipal or private water supplies of "... provid(ing) sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day" (SWRCB Res. No. 88-63). Therefore, contamination of such water would not impact a potential source of drinking water.

7. At present, the site is completely paved with asphalt or cement concrete except for the backfilled excavations where the UST and dispenser island were removed. These unpaved areas will be paved following the imminent retrofitting of the adjacent freeway support footings. The paving at the site serves as a surface seal to prevent precipitation from infiltrating and leaching contaminants from the soil. This significantly reduces the possibility that any TPH remaining in unexcavated soil will be leached and transported to the saturated zone.

On the basis of the above reasons, Tetra Tech believes that PCGs for TPH-d and TPH-oil are sufficiently protective of potential sources of drinking water and

requests that the PCGs be adopted for this site by Alameda County Environmental Protection (ACEP). If ACEP accepts these PCGs, the slightly contaminated pea gravel in the diesel UST pit will be left in place.

5.2 HANDLING OF STOCKPILED SOIL FROM GASOLINE UST PIT

Tetra Tech proposes that the 50 cubic yards or so of soil excavated from the gasoline UST pit and stockpiled on the site be considered clean and be used as ordinary fill material. Therefore, no soil management plan will be required by ACEP.

Analytical results show that the stockpiled soil from the gasoline UST pit contains no detectable petroleum hydrocarbons and 26 mg/kg total lead. Although the lead concentration of the stockpiled soil is somewhat higher than the lead concentrations in the confirmation samples collected from the gasoline UST pit, the concentrations are well below the total threshold limit concentration (TTLC) for total lead of 1,000 mg/kg. The concentrations are also below the threshold of 50 mg/kg total lead above which the soluble lead content could conceivably exceed the soluble threshold limit concentration (STLC) for lead of 5.0 mg/l. Wastes containing total lead exceeding the TTLC or soluble lead exceeding the STLC are defined as hazardous wastes on the basis of the characteristic of toxicity (CCR title 22, Section 6626.24). It is clear the soil cannot be considered hazardous on the basis of its lead content.

The lead content of the stockpiled soil is not believed to be a threat to drinking water supplies for the following reasons:

1. The lead concentrations in the soil are low, being only 1.5 times the mean concentration of 17 mg/kg for lead in soils of the western United States (Shacklette and Boerngen 1984, Table 2) and therefore should not significantly affect the ground water. This is supported by the analytical results for the water sample collected from the gasoline UST pit following excavation of stockpiled soil. The water sample contained no detectable lead above the California DHS primary MCL for drinking water of 50 µg/l.

2. Because shallow ground water at the site lies within the low-permeability Bay Mud, the ground water at the site is not likely to meet the SWRCB criterion for municipal or private water supplies of "...provid(ing) sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day" (SWRCB Res. No. 88-63). Therefore, contamination of such water would not impact a potential source of drinking water.

On the basis of the above discussion, Tetra Tech proposes that the 50 cubic yards or so of soil excavated from the gasoline UST pit and stockpiled on the site be used as ordinary fill material.

6. DISCUSSION

Confirmation sampling demonstrates that the remaining native soil contains no detectable TPH-d, TPH-g, BTEX compounds, or MTBE. Pea gravel excavated from and returned to the diesel UST pit contains low concentrations (less than 100 mg/kg) of TPH-d and TPH-oil.

Low concentrations (<25 mg/kg) of TPH-oil were detected in soil adjacent to the former diesel UST pit, and moderate concentrations (380 to 1,200 mg/kg) were detected in soil from near the top of the saturated zone in the soil borings downgradient from the former UST pits and near the small building.

Total lead concentrations in soil were all below regulatory thresholds. The maximum soil lead concentration was 120 mg/kg in boring TW-2; all other soil lead concentrations were less than 27 mg/kg.

Ground water in the former UST pits contained no TPH-g or BTEX compounds, except for a very low concentration (36 µg/l) of xylenes in water from the gasoline UST pit. Ground water from the diesel UST pit contained 2,000 µg/l of TPH-d.

Ground water from the two soil borings contained elevated concentrations (2,400 to 2,300,000 µg/l) of TPH-oil and no detectable TPH-d or dissolved lead, demonstrating that the elevated soil lead observed in boring TW-2 apparently does not affect ground water. Ground water in the northern well (TW-2), downgradient of the former gasoline UST tank, also contained low concentrations of TPH-g and BTEX compounds. The TPH-g concentration in the TW-2 water was approximately 10 times greater than the 5 µg/l taste and odor threshold for gasoline, and the benzene concentration was approximately 4 times greater than the DHS MCL for benzene in drinking water.

7. CONCLUSIONS AND RECOMMENDATIONS

Tetra Tech concludes that soil contamination associated with the gasoline and diesel USTs and dispensers has been successfully addressed. No further remedial activity is recommended for the soil in the area of the USTs and the dispensers.

The stockpile of soil removed from the former gasoline UST pit contained no detectable TPH-g, BTEX compounds, or MTBE, and a low concentration of total lead. Tetra Tech recommends that this soil be considered clean and usable by Caltrans as ordinary fill material.

Ground water downgradient of the tank pits has been shown to contain elevated concentrations of TPH-oil, TPH-g, and BTEX compounds. Elevated concentrations of TPH-oil also are found in soil from the same area.

The source of the oil in the soil and ground water is not known. TPH-oil concentrations are higher downgradient of the former UST pits, suggesting that the source of the oil is located downgradient of the pits. Possible sources include spillage or leakage from a hydraulic lift near the small building or from present or former above-ground or underground oil storage tanks or from an unknown source.

The TPH observed in the ground water and soil is unlikely to migrate off site or to impact potential sources of drinking water. The TPH is unlikely to migrate off site because the shallow ground water at the site lies within the organic-rich low-permeability Bay Mud and is inferred to have a low hydraulic gradient. These factors result in very slow ground water flow rates and even slower TPH migration rates. Furthermore, the site is almost completely paved with asphalt or cement concrete and will be completely paved following imminent retrofitting of the adjacent freeway support columns. The paving serves as a surface seal to prevent precipitation from infiltrating and leaching into the saturated zone any TPH remaining in the soil.

Sources of ground water are not threatened by the TPH because shallow ground water at the site lies within the low-permeability Bay Mud, and therefore is not likely to meet the SWRCB criterion for municipal or private water supplies of "... provid(ing) sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day" (SWRCB Res. No. 88-63). Therefore, contamination of such water would not impact a potential source of drinking water.

Tetra Tech therefore recommends that closure be requested for the Ettie Street UST site because the soil contamination associated with the USTs has been addressed, ground water in this area is not a drinking water source, and because the remaining TPH contamination at the site is unlikely to migrate off site or to impact sources of drinking water.

→ Confirm source & extent of contamination to make sure that the source has been removed.

→ Analyze for PNAs.

→ Develop a site management plan to mitigate exposure to or migration of residual contamination

8. REFERENCES CITED

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APPENDIX A

HAZARDOUS MATERIALS INSPECTION FORM AND UST UNAUTHORIZED RELEASE REPORT

white	-env.health
yellow	-facility
pink	-files

ALAMEDA COUNTY, DEPARTMENT OF ENVIRONMENTAL HEALTH

1131 Harbor Bay Pkwy
Alameda CA 94502
510/567-6700

Hazardous Materials Inspection Form

II, III

Site ID # 3980 Site Name CAL TRANS Today's Date 10/19/95

Site Address 3465 ETTIE STREET

City OAKLAND Zip 94608 Phone ______

_____ MAX AMT stored > 500 lbs, 55 gal., 200 cft.?

Inspection Categories:

_____ I. Haz. Mat/Waste GENERATOR/TRANSPORTER

_____ II. Hazardous Materials Business Plan, Acutely Hazardous Materials

✓ III. Underground Storage Tanks

* Calif. Administration Code (CAC) or the Health & Safety Code (HS&C)

Comments:

On Site: 2 UGTS Removed

Oakland Fire Dept requested ACDH to oversee tanks [illegible] due to shortage of staff (per Gary Collins).

Tanks Hauler – Erickson # 616584 exp 5/96

Tanks Manifests – 95592426

# Tank 1 7500 gal gasoline - steel tank; coated with tar.
LEL = 0% O_2 = 9%; tank appeared to be in good shape.
3 Soil samples collected; one from each end of the tank with the 3rd sample collected for the common end for both tanks since the tanks lie end to end

# Tank 2 4000 gal diesel - fiberglass Corning
LEL = 0% & O_2 = 8%
Water present in the excavation - a grab H_2O sample collected
Hole in the side due to backhoe. The fiberglass tank appeared to be in good shape.
Stockpiled soil must be characterized for disposal; one sample per 20 yds for on site use to back fill the excavation & must have prior approval by the county.
All piping associated with the tanks must be removed. Samples must be collected (1 per 20 lineal ft)

II, III

Contact: [illegible]

Title: Senior Engineer

Signature: [illegible]

Inspector: SUSAN L HUGO

Signature: ______

* Soil samples must be collected underneath the dispenser

UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE (LEAK) / CONTAMINATION SITE REPORT

EMERGENCY: ☐ YES ☒ NO — HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED? ☐ YES ☒ NO	FOR LOCAL AGENCY USE ONLY: I HEREBY CERTIFY THAT I HAVE DISTRIBUTED THIS INFORMATION ACCORDING TO THE DISTRIBUTION SHOWN ON THE INSTRUCTION SHEET ON THE BACK PAGE OF THIS FORM.
REPORT DATE: 02 01 96 — CASE #:	SIGNED: — DATE:

REPORTED BY

NAME OF INDIVIDUAL FILING REPORT: Michael A. Wopat	PHONE: (415) 974-1221	SIGNATURE: [signature]
REPRESENTING: ☐ OWNER/OPERATOR ☐ REGIONAL BOARD ☐ LOCAL AGENCY ☒ OTHER Consultant		COMPANY OR AGENCY NAME: Tetra Tech, Inc.
ADDRESS: 180 Howard St. STREET Suite 250	CITY San Francisco	STATE CA ZIP 94105

RESPONSIBLE PARTY

NAME: Caltrans, District 4 ☐ UNKNOWN	CONTACT PERSON: Michael Hillrad	PHONE: (510) 286-4495
ADDRESS: 111 Grand Ave. STREET	CITY Oakland	STATE CA ZIP 94612

SITE LOCATION

FACILITY NAME (IF APPLICABLE): Ettie St. Maintenance Facility	OPERATOR: N/A (No longer in operation)	PHONE: ( ) ———
ADDRESS: 3465 Ettie St STREET	CITY Oakland, CA	COUNTY Alameda ZIP 94608
CROSS STREET: 34th St is nearest city St. Site is at N. end of Ettie St., under elevated portion of Interstate 580		

IMPLEMENTING AGENCIES

LOCAL AGENCY — AGENCY NAME: Alameda County Dept of Env. Health	CONTACT PERSON: Susan Hugo	PHONE: (510)
REGIONAL BOARD: San Francisco Bay RWQCB	Kevin Graves	PHONE: (510) 286-0485

SUBSTANCES INVOLVED

NAME	QUANTITY LOST (GALLONS)
(1) Diesel fuel	☒ UNKNOWN
(2)	☐ UNKNOWN

DISCOVERY/ABATEMENT

DATE DISCOVERED: 10 19 95

HOW DISCOVERED: ☐ TANK TEST ☐ INVENTORY CONTROL ☒ TANK REMOVAL ☐ SUBSURFACE MONITORING ☐ OTHER ☐ NUISANCE CONDITIONS

DATE DISCHARGE BEGAN: M M D D Y Y ☒ UNKNOWN

METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY): ☐ REMOVE CONTENTS ☒ CLOSE TANK & REMOVE ☐ REPAIR PIPING ☐ REPAIR TANK ☐ CLOSE TANK & FILL IN PLACE ☐ CHANGE PROCEDURE ☐ REPLACE TANK ☒ OTHER Remove islands + piping

HAS DISCHARGE BEEN STOPPED? ☒ YES ☐ NO IF YES, DATE Unknown M M D D Y Y

SOURCE/CAUSE

SOURCE OF DISCHARGE: ☐ TANK LEAK ☒ UNKNOWN ☐ PIPING LEAK ☐ OTHER

CAUSE(S): ☐ OVERFILL ☐ RUPTURE/FAILURE ☐ SPILL ☐ CORROSION ☒ UNKNOWN ☐ OTHER

CASE TYPE — CHECK ONE ONLY: ☐ UNDETERMINED ☒ SOIL ONLY ☐ GROUNDWATER ☐ DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)

CURRENT STATUS — CHECK ONE ONLY: ☐ NO ACTION TAKEN ☐ PRELIMINARY SITE ASSESSMENT WORKPLAN SUBMITTED ☐ POLLUTION CHARACTERIZATION ☐ LEAK BEING CONFIRMED ☒ PRELIMINARY SITE ASSESSMENT UNDERWAY ☐ POST CLEANUP MONITORING IN PROGRESS ☐ REMEDIATION PLAN ☐ CASE CLOSED (CLEANUP COMPLETED OR UNNECESSARY) ☐ CLEANUP UNDERWAY

REMEDIAL ACTION — CHECK APPROPRIATE ACTION(S) (SEE BACK FOR DETAILS): ☐ EXCAVATE & DISPOSE (ED) ☐ REMOVE FREE PRODUCT (FP) ☐ ENHANCED BIO DEGRADATION (IT) ☐ CAP SITE (CD) ☒ EXCAVATE & TREAT (ET) ☐ PUMP & TREAT GROUNDWATER (GT) ☐ REPLACE SUPPLY (RS) ☐ CONTAINMENT BARRIER (CB) ☐ NO ACTION REQUIRED (NA) ☐ TREATMENT AT HOOKUP (HU) ☐ VENT SOIL (VS) ☐ VACUUM EXTRACT (VE) ☐ OTHER (OT)

COMMENTS

Tanks appeared to be in good condition. Soil under diesel dispenser island sig. contaminated, & will be excavated. Pea gravel backfill in diesel UST pit contains low-mod conc. of TPH-d + motor oil. Water in pit had some TPH-d.

HSC 05 (8/90)

APPENDIX B

WASTE MANIFESTS AND RECEIPTS

Appendix B-1

UST Transportation and Disposal

State of California Environmental Protection Agency
Form Approved OMB No. 2050-0039 (Expires 9-30-96)
Please print or type. Form designed for use on elite (12-pitch) typewriter.

See Instructions on back of page 6. 966344

Department of Toxic Substances Control
Sacramento, California

955992426

IN CASE OF EMERGENCY OR SPILL, CALL THE NATIONAL RESPONSE CENTER 1-800-424-8802; WITHIN CALIFORNIA, CALL 1-800-852-7550

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law.
CAD982929084	92426	1 of 1	

3. Generator's Name and Mailing Address
CAL TRANS MAINTENANCE YARD
3455 GITE STREET OAKLAND CA 94604

4. Generator's Phone (510) 286 0315

5. Transporter 1 Company Name	6. US EPA ID Number
BYARS TRUCKING	CAD982346201?

7. Transporter 2 Company Name	8. US EPA ID Number

9. Designated Facility Name and Site Address	10. US EPA ID Number
Erickson, Inc. 255 Parr Blvd. Richmond, CA. 94801	CAD009466392

State Facility's ID: CAD00

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol
a. NON-RCRA Hazardous Waste Solid Waste Empty Storage Tank.	0012	TP	0811000	P
b.				
c.				
d.				

1000 Gallon

15. Special Handling Instructions and Additional Information
Keep away from sources of ignition. Always wear hardhats when working around U.G.S.T.'s 24 Hr. Contact Name, CHIDCROFT & Phone (510) 286-0315
Manuel Maranda

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
Mike Heiligers	[signature]	10 11 95

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
AL BYARS	Al Byars	10 11 95

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
[signature]		

19. Discrepancy Indication Space

20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year
DAVID SATO	DAVE SATO	10 20 95

DO NOT WRITE BELOW THIS LINE.

DTSC 8022A (1/98)
EPA 8700—22

White: ... mail this copy to DTSC within 30 days
To: ... Sacramento, CA 95812

DAY OR NIGHT TELEPHONE (510) 235-1393

CERTIFICATE

CERTIFIED SERVICES COMPANY

256 Parr Boulevard • Richmond, California 94801

NO. 18138

CUSTOMER ACCUTITE

JOB NO. 966844

FOR: ERICKSON, INC. TANK NO. 16711

LOCATION: RICHMOND DATE: 95/10/23 TIME: 16:35

TEST METHOD VISUAL GASTECH/1314 SMPN LAST PRODUCT D

This is to certify that I have personally determined that this tank is in accordance with the American Petroleum Institute and have found the condition to be in accordance with its assigned designation. This certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

TANK SIZE 8000 GALLON TANK CONDITION SAFE FOR FIRE

REMARKS: OXYGEN 20.9% LOWER EXPLOSIVE LIMIT LESS THAN 0.1%
ERICKSON, INC. HEREBY CERTIFIES THAT THE ABOVE NUMBERED TANK HAS BEEN CUT OPEN, PROCESSED, AND THEREFORE DESTROYED AT OUR PERMITTED HAZARDOUS WASTE FACILITY.
ERICKSON, INC. HAS THE APPROPRIATE PERMITS FOR, AND HAS ACCEPTED THE TANK SHIPPED TO US FOR PROCESSING.

In the event of any physical or atmospheric changes affecting the gas-free conditions of the above tanks, or if in any doubt, immediately stop all hot work and contact the undersigned. This permit is valid for 24 hours if no physical or atmospheric changes occur.

STANDARD SAFETY DESIGNATION

SAFE FOR MEN: Means that in the compartment or space so designated (a) The oxygen content of the atmosphere is at least 19.5 percent by volume; and that (b) Toxic materials in the atmosphere are within permissable concentrations; and (c) In the judgment of the Inspector, the residues are not capable of producing toxic materials under existing atmospheric conditions while maintained as directed on the Inspector's certificate.

SAFE FOR FIRE: Means that in the compartment so designated (a) The concentration of flammable materials in the atmosphere is below 10 percent of the lower explosive limit; and that (b) In the judgment of the Inspector, the residues are not capable of producing a higher concentration that permitted under existing atmospheric conditions in the presence of fire and while maintained as directed on the Inspector's certificate, and further, (c) All adjacent spaces have either been cleaned sufficiently to prevent the spread of fire, are satisfactorily inerted, or in the case of fuel tanks, have been treated as deemed necessary by the Inspector.

The undersigned representative acknowledges receipt of this certificate and understands the conditions and limitations under which it was issued.

REPRESENTATIVE TITLE INSPECTOR

CPS99

DAY OR NIGHT TELEPHONE (510) 235-1393

CERTIFICATE

CERTIFIED SERVICES COMPANY

255 Parr Boulevard • Richmond, California 94801

NO. 18140

CUSTOMER
ACCUTITE
JOB NO.
956844

FOR: ERICKSON INC. TANK NO. 16712

LOCATION: RICHMOND DATE: 95/10/23 TIME: 16:38

TEST METHOD VISUAL GASTECH/4314 SMPN LAST PRODUCT ULG

This is to certify that I have personally determined that this tank is in accordance with the American Petroleum Institute and have found the condition to be in accordance with its assigned designation. This certificate is based on conditions existing at the time the inspection herein set forth was completed and is issued subject to compliance with all qualifications and instructions.

TANK SIZE 7000 GALLON TANK CONDITION SAFE FOR FIRE

REMARKS: OXYGEN 20.93 LOWER EXPLOSIVE LIMIT LESS THAN 0.13
ERICKSON, INC. HEREBY CERTIFIES THAT THE ABOVE NUMBERED TANK HAS BEEN CUT OPEN, PROCESSED, AND THEREFORE DESTROYED AT OUR PERMITTED HAZARDOUS WASTE FACILITY.
ERICKSON, INC. HAS THE APPROPRIATE PERMITS FOR, AND HAS ACCEPTED THE TANK SHIPPED TO US FOR PROCESSING.

In the event of any physical or atmospheric changes affecting the gas-free conditions of the above tanks, or if in any doubt, immediately stop all hot work and contact the undersigned. This permit is valid for 24 hours if no physical or atmospheric changes occur.

STANDARD SAFETY DESIGNATION

SAFE FOR MEN: Means that in the compartment or space so designated (a) The oxygen content of the atmosphere is at least 19.5 percent by volume; and that (b) Toxic materials in the atmosphere are within permissable concentrations; and (c) In the judgment of the inspector, the residues are not capable of producing toxic materials under existing atmospheric conditions while maintained as directed on the inspector's certificate.

SAFE FOR FIRE: Means that in the compartment so designated (a) The concentration of flammable materials in the atmosphere is below 10 percent of the lower explosive limit; and that (b) In the judgment of the inspector, the residues are not capable of producing a higher concentration that permitted under existing atmospheric conditions in the presence of fire and while maintained as directed on the inspector's certificate, and further, (c) All adjacent spaces have either been cleaned sufficiently to prevent the spread of fire, are satisfactorily inerted, or in the case of fuel tanks, have been treated as deemed necessary by the inspector.

The undersigned representative acknowledges receipt of this certificate and understands the conditions and limitations under which it was issued.

REPRESENTATIVE TITLE INSPECTOR

CPSE

Appendix B-2

UST Rinsate Transportation and Disposal

23580.50 UCC 16194_E

DATE: 10-24-95

HAZ WASTE HAULERS #2381

ACC 07

ENVIROPUR WEST
13331 N. HWY 33 • PATTERSON, CA 95363
(209) 892-6742 • (800) 933-9194
FACILITY EPA# CAD083166728

INVOICE

REMIT TO:

CUSTOMER INFORMATION:

NAME Cal Trans
ADDRESS 3465 Ettie
CITY Oakland ZIP
PHONE #

BILL TO:

NAME Ablitie
ADDRESS 35 S
CITY S. San Fran
PHONE # 415-952-5551

CASH/CHECK #	NET 30 DAYS	PO#	INTERVAL	DRIVER	ROUTE

DESCRIPTION	QUANTITY	UNIT PRICE	AMOUNT
X WASTE PETROLEUM OIL, COMBUSTIBLE LIQUID NA1270 (221)	250		52.50
UNSPECIFIED OIL CONTAINING WASTES (WATER, OIL) (223) CUSTOMER EPA#			
NON RCRA HAZARDOUS WASTE LIQUID (ANTIFREEZE) (134) CUSTOMER EPA#			
DRAINED, USED OIL FILTERS, NON-HAZARDOUS WASTE			
OTHER 01-16-004-574-			

POSTED

MANIFEST # 95224963 T. Burda

PAY FROM THIS INVOICE $52.50

CUSTOMER SIGNATURE ____ DRIVER SIGNATURE

PAYMENT DUE UPON RECEIPT OF THIS INVOICE. IN THE EVENT THIS ACCOUNT BECOMES DELINQUENT AND ... INSTITUTE LEGAL PROCEEDINGS, PURCHASER AGREES TO PAY REASONABLE ATTORNEY FEES AND COURT COSTS.

- [ ] SACRAMENTO TRSF. STN. 8280 14TH AVE SACRAMENTO, CA 95826 CAL000051079
- [ ] PARLIER TRSF. STN. 14257 E. MANNING PARLIER, CA 93648 CAD981424807
- [x] NAPA TRSF. STN. 800 TOWER RD. NAPA, CA 94558 CAL000020456
- [ ] BAKERSFIELD TRSF. STN. 801 S. UNION AVE. BAKERSFIELD, CA 93307 CAD980883645

WHITE: CUSTOMER YELLOW & PINK: ACCTG GOLDENROD: ROUTED

FROM : ACCUTITE PHONE NO. : 4159525551

Appendix B-3

Transportation and Disposal of Soil Excavated from under Former Diesel Dispenser Island

"THESE CHARGES INCLUDE (1) FEES TO PAY FOR REGULATION OF TRANSPORTATION COMPANIES BY THE CALIFORNIA PUBLIC UTILITIES COMMISSION AND (2) TAXES PAID TO CALIFORNIA CITIES INSTEAD OF EXCISE OR BUSINESS LICENSE TAXES THEY COULD OTHERWISE IMPOSE."

Alhambra ENVIRONMENTAL Services, Inc.

612 23rd Street
Richmond, CA 94804
(510) 215-7033 • FAX (510) 215-7072

CAL T 174682

№ 3896

☐ Private Prop.

CONSIGNOR State of Calif-Caltrans	UNDERLYING CARRIER
ADDRESS 3465 Ettie St.	ADDRESS
CITY Oakland, Ca.	CITY
CONSIGNEE Remco	DEBTOR Tetra Tech
ADDRESS Goodrick Ave.	ADDRESS 180 Howard St. 94105
CITY Richmond Ca.	CITY San Fran., Ca.
Precise Point of Origin Cal-Trans Oakland	Precise Point of Destination Remco - Rich

Date 4-16 19 96
Truck Number A2 RATE
License No. 4V72446
No. Axles 5
Capacity of Body _____ Cubic Yards
Unladen Wt. _____
Legal Payload Capacity _____
Type of Loading (at origin) _____

DESCRIPTION OF COMMODITIES	WEIGHT	RATE	CHARGES
Petro. Soil	20.6 TONS	650	650 00
500.00 for under 18 tons)			
650 for over 18 tons)			
DEDUCT TIME _____ (Basis) _____		TOTAL CHARGES	650 00

STARTING TIME		ENDING TIME		NET TRUCK HRS.	NET DRIVER HRS.

Time Driver Reported to Work _____
Time Commenced First Loading _____
Time Completed Last Loading _____
Time Arrived to Dump Last Load _____
Time Finished Last Dump _____
Allowance for Completion of Last Trip _____
Total Elapsed Time _____
Dump Charges _____
Bridge Tolls _____
Overtime Charges _____

Driver _____ Received By _____
Consignee (or agent) Consignor (or agent)

001621

NON-HAZARDOUS

MATERIALS MANIFEST

20.60 TONS

GENERATOR CAL TRANS MAINT FACILITY

Site Address 3465 ETTIE ST.

Mailing OAKLAND CA.

Phone :(510 286-4495 Contact: MIKE HILLIARD

TRANSPORTER ALHAMBRA ENVIRONMENTAL

Address 617 23rd St.

Richmond, Ca.

Phone :( )215-7033 Contact: Jim Gardner

I hereby certify that the above named material was picked up at the generator site listed above.

Driver Name: DAVID LENZI Signature

Truck No. A2 Ship Date 4/16/96

Time of Pick-Up: TC-0637-04 Time of Delivery:

Consultant/Owner DEPT. OF TRANSPORTATION / TETRA TECH

Address 111 W GRAND AVE. / MIKE HEPAT

OAKLAND CA. -04 / 415-974-1221

Phone :(510) 286 4495 Contact: MIKE HILLIARD

I herby certify that the above named material is consistent with the information presented in the Waste Characterization Form and Contaminated Soil Description Form, and has been properly described, classified and packaged, and is in proper condition for transport according to applicable regulation.

Name Date:

Recycling Facility REMEDIAL ENVIRONMENTAL MARKETING CO. INC.
2717 GOODRICK AVENUE RICHMOND, CA 94801

RECEIVED BY:

DATE: 4/16/96

Control No: P-250

A COPY OF THIS SHEET MUST ACCOMPANY EVERY LOAD, AND MUST BE SUBMITTED AT THE GATE FOR ENTRY. ALL LOADS MUST BE SCHEDULED AT LEAST 24 HOURS IN ADVANCE. DELIVERIES MUST BE SCHEDULED ON A DAILY BASIS. ANY UNSCHEDULED LOADS MAY BE REFUSED AT THE GATE.

Appendix B-4

Transportation and Disposal of Rinsate from Soil Boring Activities

ARMOUR PETROLEUM SERVICE AND EQUIPMENT CORPORATION

☐ FAIRFIELD (707) 437-6668 — P.O. Box 507 VACAVILLE, CA 95696 — ☐ SACRAMENTO (916) 441-2885

NAME: Caltrans Luft Site — DATE: 4-16-96

ADDRESS: 3465 Ettie St

CITY: Oakland Ca — PHONE:

MAKE: — MODEL: — SERIAL NO: — ☐ C.O.D. ☐ CHARGE

NATURE OF SERVICE:

PROMISED / /

QUAN.		PART NO.	DESCRIPTION	PRICE	AMOUNT	
37	1		gallons acid			
1	2		Drum removed from site			
	3					
	4					
	5					
	6					
	7					
	8					
	9					
	10					
	11					
	12					

COMMENTS

TOTAL MATERIALS

TECHNICAL SERVICE TIME

DATE COMPLETED 4/16/96 — TAX

TECHNICIAN Charly — CASH ON COMPLETION OF WORK → TOTAL

COPY

24585

Signature below constitutes acceptance of above service performed as being satisfactory — and that equipment has been left in good condition.

N. Wiest Cal-

Thank You

See reverse side for Guaranty

548755

ARMOUR PETROLEUM SERVICE
AND EQUIPMENT CORPORATION
P.O. BOX 507 • VACAVILLE, CA 95696-0507
PHONE: (707) 437-6668 FAX: (707)437-4357

24-HOUR EMERGENCY NUMBER: CHEMTREC (800)424-9300

SHIPPING PAPER

PAGE # 1 OF 1

TO: SOLANO COMMUNITY COLLEGE
1600 California Drive
Vacaville, California

FROM: CalTrans Lot site
3465 ETTIE St
Oakland Ca

No. Shipping Units	HM	Description of Articles (IF HAZARDOUS MATERIALS - PROPER SHIPPING NAME)	Hazard Class	I.D. Number	Packing Group	Weight/Gallons (subject to correction)	Labels Required (or exemption)
( ) Drum		Gasoline	3	UN1203	II		Flammable Liquid
( ) Drum		Diesel fuel	3	NA1993	III		Flammable Liquid
( ) Drum		Flammable liquid n.o.s. (Gasoline/Water Mixture)	3	UN1993	II		Flammable Liquid
( ) Drum		Flammable liquid n.o.s. (Diesel fuel/Water Mixture)	3	UN1993	III		Flammable Liquid
( ) Drum		Flammable liquid n.o.s. Residue (Gasoline/Water Mixture)	3	UN1993	II		Flammable Liquid
(1) Drum		water				37 gallons	

[ ] PLACARDS PROVIDED FOR THIS LOAD

This is to certify that the above named materials are properly classified, described, packaged, marked and labeled; and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

SIGNED: Charlyn McKinney
SHIPPER: CalTrans
PER: Tetra Tech
DATE: 4-16-96

DATE: 4-16-96
CARRIER'S #: CA 10759
VEHICLE #: 8

APPENDIX G

LABORATORY ANALYTICAL REPORTS

1 of 3

Hull Development Labs

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech

Address: 180 Howard St, Ste 250

S.F., CA 94105

Contact: Bob Cotton / Mike Wagat

Telephone #: (415) 974-1221

Date Received:

Turn Around: std

Project ID: TC-0637-03

Purchase Order #:

Sampler/Company: Bob Cotton / Tetra Tech — Telephone #:

Special Instructions/Comments

LAB USE ONLY

Samples arrived chilled and intact: Yes No

Notes:

Sample Information								Requested Analysis							
Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	BTEX/MTBE Gas	Pb	TPH-D	TPH-G	Gas	BTEX		
B11197	Gas	Grab	H_2O	10/19/95	1500	No	2 VOA's	X			X	X			
B11198	Diesel	Grab	H_2O	10/19/95	1530	No	2 VOA's						X		
B11197	Gas	Grab	H_2O	10/19/95	1502	HNO_3	1		Pb hold						
B11197	Gas	Grab	H_2O	10/19/95	1500	No	1 Liter		X	TPH-D			filter first		
B11198	Diesel	Grab	H_2O	10/19/95	1530	No	1 Liter			X					
B11199	DS-1	Grab	Soil	10/19/95	1600	No	Brass Sleeve			X			X		
B11200	DS-2	↓	↓	↓	1601	↓	↓			X			X		
B11201	DS-3	↓	↓	↓	1602	↓	↓			X			X		

Relinq. By: L. Bob Cotton	Received By: Mike Wagat	Date 10/19/95	Time 1800
Relinq. By: Mike Wagat	Received By: Don Gentua	Date 10/20/95	Time 846
Relinq. By: Don Gentua	Received By: Brenda Daly	Date 10-20-95	Time 1200

2063

Hull Development Labs

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech

Address: 180 Howard St, Ste 250

SF. CA 94105

Contact: B. Cotton / M. Wyatt

Telephone #: (415) 974-1221

Date Received:

Turn Around: std.

Project ID: TC 0637-61

Purchase Order #:

Sampler/Company: Bob Cotton / Tetra Tech

Telephone #: Same

Special Instructions/Comments

LAB USE ONLY

Samples arrived chilled and intact: Yes No

Notes:

Sample Information								Requested Analysis							
Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-D	BTEX / TPH-G						
B11202	DS-4	Grab	Soil	10/19/95	1603	None	Brass Sleeve								
B11203	DS-5				1604										
B11204	DS-6				1605										
B11205	DS-7				1606										
B11206	DS-8				1607										
B11207	DS-9				1608										
B11208	DS-10				1609										
B11209	DS-11				1610										

Relinq. By: W. Bob Cotton	Received By: Mike Wyatt	Date 10/19/95	Time 1800
Relinq. By: Mike Wyatt	Received By: Don Gentner	Date 10/20/95	Time 845
Relinq. By: Don Gentner	Received By: Brenda Ortiz	Date 10-20-95	Time 1:00 pm

Hull Development Labs

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetratech
Address: 180 Howard, Suite 250
S.F. CA 94105
Contact: Bob Cotton / Mike Wyatt
Telephone #: (415) 974-1221
Date Received:
Turn Around: Std.

Project ID: 0637
Purchase Order #: ↓

Sampler/Company: Mike Wyatt ~~Bob Cotton~~, TT
Telephone #: Same.
Special Instructions/Comments

LAB USE ONLY
Samples arrived chilled and intact:
Yes No
Notes:

Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-G	BTEX/ MTBE	Pb	TPH-D	BTEX			
B11210	G-7W	Grab	Soil	10/19/95	1615	No	Steel Sleeve	X	X	X					
B11211	G-7E	↓	↓	↓	1620	↓		X	X	X	X				
B11212	D-7E	↓	↓	↓	1625	↓			~~X~~		X	X			

Relinq. By:	Received By:	Date	Time
Mike Wyatt	Don Gentine	10/20/95	845
Don Gentine	Brenda [illegible]	10.20.95	1:00 p.m.

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/25/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Water Sample Analysis:

Test	*Gas*	*Diesel*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Water	Water			
Sample Date	10/19/95	10/19/95			
Sample Time	1500	1530			
Lab #	B11197	B11198			
Lead, Dissolved	**ND[3]**	**na**	mg/liter	0.05 mg/l	239.1
DF-Diesel		1			
TPH-Diesel	**na**	**2,000**	µg/liter	50.0 µg/l	8015M
DF-MTBE	1	1			
MTBE	**260**	**na**	µg/liter	5.0 µg/l	8020
DF-Gas/BTEX	1	1			
TPH-Gas	**ND**	**na**	µg/liter	50.0 µg/l	8015M
Benzene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Toluene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Ethyl Benzene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Xylenes	**36**	**ND**	µg/liter	0.5 µg/l	8020

1. na: not analyzed
2. PQL=DF x MDL
3. Sample filtered prior to analysis
4. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Environmental Analysis Since 1983

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-1*	*DS-2*	*DS-3*	*DS-4*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95	10/19/95			
Sample Time	1600	1601	1602	1603			
Lab #	B11199	B11200	B11201	B11202			
DF-Diesel/M.O.	1	1	1	1			
TPH-Diesel	**35**	**71**	**31**	**39**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**ND**	**ND**	**ND**	**110**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1	1			
MTBE	**ND**	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1	1			
Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

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Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-5*	*DS-6*	*DS-7*	*DS-8*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95	10/19/95			
Sample Time	1604	1605	1606	1607			
Lab #	B11203	B11204	B11205	B11206			
DF-Diesel/M.O.	1	1	1	10			
TPH-Diesel	**39**	**12**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**62**	**29**	**72**	**560**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1	1			
MTBE	**ND**	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1	1			
Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-9*	*DS-10*	*DS-11*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95			
Sample Time	1608	1609	1610			
Lab #	B11207	B11208	B11209			
DF-Diesel/M.O.	1	1	1			
TPH-Diesel	**24**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**91**	**49**	**30**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1			
MTBE	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1			
Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Environmental Analysis Since 1983

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*DS-5*	*DS-6*	*DS-7*	*DS-8*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95	10/19/95			
Sample Time	1604	1605	1606	1607			
Lab #	B11203	B11204	B11205	B11206			
DF-Diesel/M.O.	1	1	1	10			
TPH-Diesel	**39**	**12**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**62**	**29**	**72**	**560**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1	1	1	1			
MTBE	**ND**	**ND**	**ND**	**ND**	mg/kg	0.05 mg/kg	8020
DF-BTEX	1	1	1	1			
Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Environmental Analysis Since 1983

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/30/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*G7-W*	*G-7E*	*D-7E*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil			
Sample Date	10/19/95	10/19/95	10/19/95			
Sample Time	1615	1620	1625			
Lab #	B11210	B11211	B11212			
Lead	**6.5**	**11**	**na**	mg/kg	0.50 mg/kg	7420
DF-MTBE	1	1	1			
MTBE	**ND**	**ND**	**na**	mg/kg	0.05 mg/kg	8020
DF-Diesel/M.O.		1	1			
TPH-Diesel	**na**	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**na**	**23**	**13**	mg/kg	1.0 mg/kg	8015M
DF-Gas/BTEX	1	1	1			
TPH-Gas	**ND**	**ND**	**na**	mg/kg	1.0 mg/kg	8015M
Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. na: not analyzed
2. PQL=DF x MDL
3. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

HULL DEVELOPMENT LABS INC.
525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR DIESEL ANALYSIS

DIESEL
QC sample No.: BLANK SPIKE & DUP

Date analyzed: 10-16-95
Date extracted: 10-13-95
QC batch: DW109503

Matrix: WATER

Units: ug/L

Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
DIESEL	950	0	840	88	1100	116	28	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR DIESEL ANALYSIS

DIESEL
QC sample No.: BLANK SPIKE & DUP

Date analyzed: 10-16-95
Date extracted: 10-13-95
QC batch: DS109503

Matrix: SOIL

Units: mg/Kg

Dilution factor: 1

COMPOUND	SA mg/Kg	SR mg/Kg	MS mg/Kg	MS PR	MSD mg/Kg	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
DIESEL	25	0	19	76	20	80	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR GASOLINE ANALYSIS

GASOLINE
QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
GASOLINE	235	0	257	109	248	106	3	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
BTEX

QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
BENZENE	20	0	22	110	23	115	4	25	50-150
TOLUENE	20	0	21	105	20	100	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: 95102
Matrix: Soil
Units: mg/kg

Date Analyzed: 10/18/95
Extraction Method: TTLC

PARAMETER	Method #	SA mg/kg	SR mg/kg	MS mg/kg	MS %R	MSD mg/kg	MSD %R	QC LIMITS %R
Antimony	7040	7.4	3.2	9.9	89%	10.7	101%	50- 150
Barium	7080	19.7	18.5	27.9	48%	31.3	65%	50- 150
Beryllium	7090	9.1	0.0	6.6	72%	6.4	70%	50- 150
Cadmium	7130	12.3	0.2	10.8	86%	10.7	85%	50- 150
Chromium	7190	7.8	28.5	38.8	132%	34.5	77%	50- 150
Cobalt	7200	14.1	0.0	17.2	122%	16.4	116%	50- 150
Copper	7210	10.6	59.4	66.5	67%	67.0	72%	50- 150
Lead	7420	18.2	30.9	41.4	58%	41.5	58%	50- 150
Molybdenum	7480	12.4	0.0	9.8	79%	9.7	78%	50- 150
Nickel	7520	7.0	20.0	27.8	111%	24.7	68%	50- 150
Silver	7760	11.7	0.2	10.3	86%	9.9	83%	50- 150
Thallium	7840	8.7	0.0	9.6	110%	10.2	117%	50- 150
Vanadium	7910	18.3	0.0	16.8	92%	17.2	94%	50- 150
Zinc	7950	26.5	232.8	266.3	126%	248.4	59%	50- 150

Note: Recoveries of Zinc above QC Limits due to sample concentration > Matrix Spike (confirmed by duplicate analysis)

Definition of Terms:

- na: Not Analyzed in QC batch
- SA: Spike Added
- SR: Sample Result
- MS: Matrix Spike Result
- MS (%R) Matrix Spike % Recovery
- MSD Matrix Spike Duplicate Result
- MSD (%R) Matrix Spike Duplicate % Recovery

LAB DIRECTOR: M. Golden

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: WM-9548
Matrix: Water
Units: mg/l

Date Analyzed: 10/24/95

PARAMETER	Method #	SA mg/l	SR mg/l	MS mg/l	MS %R	MSD mg/l	MSD %	QC LIMITS %R	RPD
Antimony	204.1	na	na	na	na	na	na	70- 130	20.00
Barium	208.1	na	na	na	na	na	na	70- 130	20.00
Beryllium	210.1	na	na	na	na	na	na	70- 130	20.00
Cadmium	213.1	1.00	0.02	1.03	101	1.03	101	70- 130	20.00
Chromium	218.1	1.00	0.18	1.19	101	1.20	102	70- 130	20.00
Cobalt	219.1	na	na	na	na	na	na	70- 130	20.00
Copper	220.1	1.00	0.68	1.66	99	1.68	101	70- 130	20.00
Lead	239.1	1.00	0.04	1.05	101	1.03	99	70- 130	20.00
Molybdenum	246.1	na	na	na	na	na	na	70- 130	20.00
Nickel	249.1	1.00	0.13	1.14	101	1.12	99	70- 130	20.00
Silver	270.1	1.00	0.02	1.03	101	1.02	100	70- 130	20.00
Thallium	279.1	na	na	na	na	na	na	70- 130	20.00
Vanadium	286.1	na	na	na	na	na	na	70- 130	20.00
Zinc	289.1	1.00	0.28	1.30	101	1.30	101	70- 130	20.00
Iron	236.1	na	na	na	na	na	na	70- 130	20.00
Magnesium	242.1	1.00	0.00	0.94	94	0.93	93	70- 130	20.00

Definition of Terms:

na: Not analyzed in QC batch
SA: Spike Added
SR: Sample Result
MS: Matrix Spike Result
MS (%R) Matrix Spike % Recovery
MSD Matrix Spike Duplicate Result
MSD (%R) Matrix Spike % Recovery

LAB DIRECTOR: M. Golden

Entech Analytical Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

December 21, 1995

Mr. Mike Wopat
Tetra Tech, Inc.
180 Howard St.
San Francisco, CA 94105

Dear Mr. Wopat:

I am writing in response to your questions regarding analytical results submitted on October 27, 1995 for the Ettie Street project (Tetra Tech Project #TC0637-03).

At your request we have reviewed the chromatogram for lab #B11198 (sample ID: 'Diesel') and provided a calibrated value for TPH-Motor Oil. This value is 170 µg/liter and has been added to this report. It should be noted, however, that the chromatogram for this sample analysis (attached) clearly indicates that this represents a carry over from the adjacent Diesel fuel range rather than the presence of Motor Oil. This is a common occurrence with TPH analyses by Gas Chromatography. The amended report (attached) includes our standard annotation for such a finding.

I hope that this information is helpful. Please feel free to call me at (408) 735-1550 X30 if you have questions or need more information regarding this report or other Entech services.

Sincerely,
Entech Analytical Labs, Inc.

Michael N. Golden
CEO/Lab Director

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/25/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Water Sample Analysis:

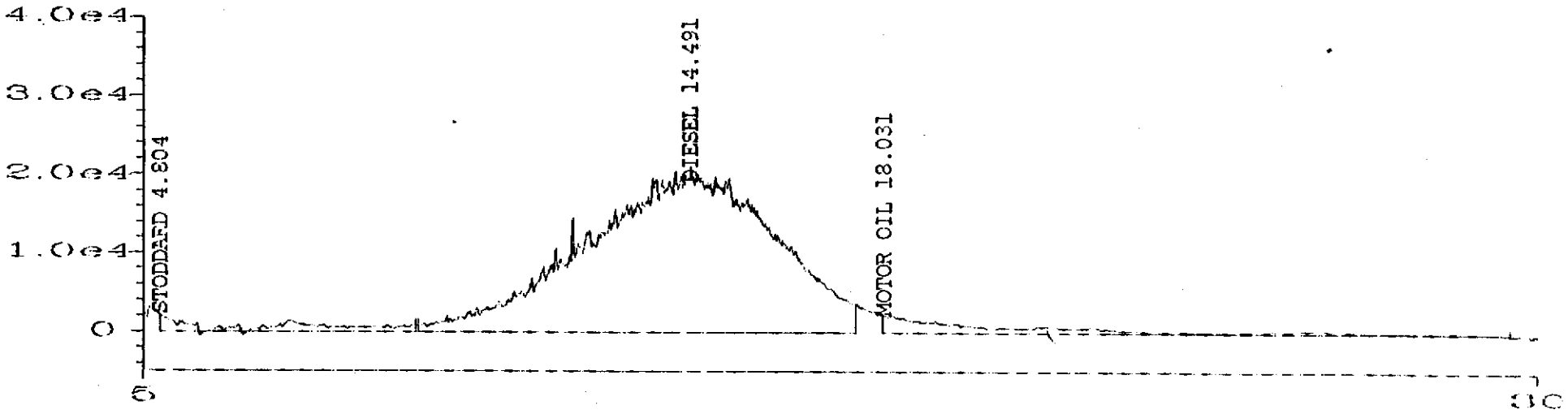
Test	*Gas*	*Diesel*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Water	Water			
Sample Date	10/19/95	10/19/95			
Sample Time	1500	1530			
Lab #	B11197	B11198			
Lead, Dissolved	**ND**[4]	**na**	mg/liter	0.05 mg/l	239.1
DF-Diesel		1			
TPH-Diesel	**na**	**2,000**	µg/liter	50.0 µg/l	8015M
TPH-Motor Oil	**na**	**170**[3]	µg/liter	50.0 µg/l	8015M
DF-MTBE	1	1			
MTBE	**260**	**na**	µg/liter	5.0 µg/l	8020
DF-Gas/BTEX	1	1			
TPH-Gas	**ND**	**na**	µg/liter	50.0 µg/l	8015M
Benzene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Toluene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Ethyl Benzene	**ND**	**ND**	µg/liter	0.5 µg/l	8020
Xylenes	**36**	**ND**	µg/liter	0.5 µg/l	8020

1. na: not analyzed
2. PQL=DF x MDL
3. TPH-Motor Oil chromatogram for Lab #B11198, although within the reporting range, does not match the typical Motor Oil pattern
4. Sample filtered prior to analysis
5. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

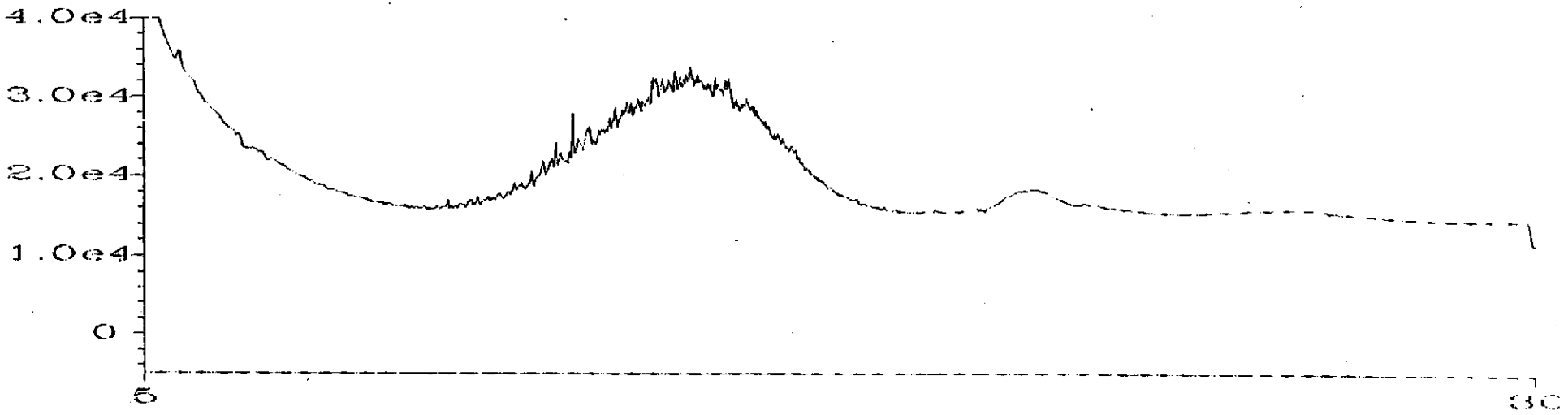
Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL



Chromatographic Diff.



Sig. 1 in C:\HPCHEM\1\DATA\DEA16302.D

External Standard Report

Data File Name : C:\HPCHEM\1\DATA\DEA15302.D
Operator : MARIO B. LARI
Instrument : ANALYZER1
Sample Name : 11198
Run Time Bar Code:
Acquired on : 27 Oct 95 02:17 PM
Report Created on: 27 Oct 95 02:49 PM
Last Recalib on : 18 OCT 95 02:02 PM
Multiplier : 2

Page Number : 1
Vial Number : 2
Injection Number : 1
Sequence Line : 1
Instrument Method: DSTEST.MTH
Analysis Method : DSTEST.MTH
Sample Amount : 1
ISTD Amount : 1

Sig. 1 in C:\HPCHEM\1\DATA\DEA15302.D

Ret Time	Area	Type	Width	Ref#	Amount %	Name
7.125 *	not found *			1		STODDARD
13.254 *	not found *			1		DIESEL
23.750 *	not found *			1		MOTOR OIL

Data File Name : C:\HPCHEM\1\DATA\DEA15302.D
Operator : MARIO B. LARI
Instrument : ANALYZER1
Sample Name : 11198
Run Time Bar Code:
Acquired on : 27 Oct 95 02:17 PM
Report Created on: 27 Oct 95 02:49 PM
Last Recalib on : 18 OCT 95 02:02 PM
Multiplier : 2

Page Number : 1
Vial Number : 2
Injection Number : 1
Sequence Line : 1
Instrument Method: DSTEST.MTH
Analysis Method : DSTEST.MTH
Sample Amount : 1
ISTD Amount : 1

Chromatographic Diff.

Ret Time	Area	Type	Width	Ref#	Amount %	Name
4.804	192749	MM	1.067	1	7915.805	STODDARD
14.491	4904491	MM	3.888	1	195865.7	DIESEL
18.031	324382	MM	2.434	1	17226.62	MOTOR OIL

Not all calibrated peaks were found

User Modified

Hull Development Labs

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech

Address: 180 Howard St, Suite 250

San Francisco, CA 94105

Contact: Bob Cotton or Mike Wogat

Telephone #: (415) 974-1221

Date Received:

Turn Around: Std.

Project ID: Ellie Ethic St.

Purchase Order #: TC-0637-03

Sampler/Company: Mike Wogat TT

Telephone #:

Special Instructions/Comments

FAX (415) 974-5914

Results, please

LAB USE ONLY

Samples arrived chilled and intact:

Yes No

Notes:

Sample Information								Requested Analysis							
Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-G	BTEX + MTBE	TPH-D	Pb	BTEX			
B11229	W-DISP	Grab	Soil	10/20/95	1052	NJ	SS sleeve	X	X		X				
B11230	E-DISP				1100					X		X			
B11231	SP-SW				1019					Composite, analyze for TPH-D, BTEX, RCI, MTBE & Pb					
	SP-SE				1036										
	SP-NW				1135										
	SP-NE				1130										

Relinq. By: Mike Wogat	Received By: Joost Chatten	Date 10/20/95	Time 1428
Relinq. By: Joost Chatten	Received By: Phillip Hoyt	Date 10-20-95	Time 1655
Relinq/ By:	Received By:	Date	Time

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	10/26/95
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*W-DISP*	*E-DISP*	*Comp of SP-SW,SE,NW&NE*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil	Soil			
Sample Date	10/20/95	10/20/95	10/20/95			
Sample Time	1052	1100	1019-1130			
Lab #	B11229	B11230	B11231			
Lead	**18**	**na**	**26**	mg/kg	0.50 mg/kg	7420
DF-Diesel		37.5				
TPH-Diesel	**na**	**64,000**	**na**	mg/kg	1.0 mg/kg	8015M
DF-MTBE	1		1			
MTBE	**ND**	**na**	**ND**	mg/kg	0.05 mg/kg	8020
DF-Gas/BTEX	1	1	1			
TPH-Gas	**ND**	**na**	**ND**	mg/kg	1.0 mg/kg	8015M
Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. na: not analyzed
2. PQL=DF x MDL
3. Analysis performed by Hull Development Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Hull Development Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105
Attn: Bob Cotton/Mike Wopat

Date:	10/27/95
Date Received:	10/20/95
Date Analyzed:	See Report
Project Name:	Ettie Street
Project Number:	TC0637-03
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*Comp of SP-SW,SE,NW&NE*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil			
Sample Date	10/20/95			
Sample Time	1019-1130			
Lab #	B11231			
pH	**8.43**	Units		9045
Sulfide	**ND**	mg/kg	0.5 mg/kg	9030
Cyanide	**ND**	mg/kg	0.5 mg/kg	9010
Flash Point	**>200**	°F	0.1 °F	1010

Reactivity, Corrosivity, and Ignitability analyses performed by Advanced Technology Labs (CAELAP #1838); see attached reports for analysis details.

Michael N. Golden, Lab Director

MDL=Method Detection Limit

ND=None Detected at or above MDL

Advanced Technology Laboratories

October 26, 1995 ELAP No.: 1838

Hull Development Labs, Inc.
525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

ATTN: Mr. Mike Golden

Client's Project: Ettie Street
Lab No.: 8386-001

Gentlemen:

Enclosed are the results for sample(s) received by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (310) 989 – 4045 if I can be of further assistance to your company.

Sincerely,

Edgar P. Caballero
Laboratory Director
EPC/cb

Enclosures

This cover letter is an integral part of this analytical report.

Mailing Address: P.O. Box 9108 Newport Beach, CA 92658
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 310 989-4045 Fax: 310 989-4040

Client: Hull Development Labs, Inc.
Attn: Mr. Mike Golden

Client's Project: Ettie Street

Date Received: 10/24/95
Date Sampled: 10/20/95

Lab No.	Sample I.D.	Analysis	Date Analyzed	Results,	Matrix, Units	MDL	DLR	Analyst Initials
8386-001	B11231	EPA 9010 (Reactive Cyanide)	10/26/95	ND	Soil, mg/kg	0.2	0.2	JD
8386-001	B11231	EPA 9030 (Reactive Sulfide)	10/25/95	ND	Soil, mg/kg	0.5	0.5	IG
8386-001	B11231	EPA 1010 (Flashpoint)	10/25/95	>200	Soil, deg. F	—	—	LP
8386-001	B11231	EPA 9045 (pH)	10/25/95	8.43	Soil, pH units	—	—	OL

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DF = Dilution Factor (DLR/MDL)

Reviewed/Approved By: Cheryl de los r Date: 10/26/95
Cheryl De Los Reyes
Department Supervisor

The cover letter is an integral part of this analytical report.

Advanced Technology Laboratories
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 310 989-4045 Fax: 310 989-4040

Spike Recovery and RPD Summary Report

Method: . 9010
Analyst: JD
Data File: 5299-1S

Date: 10/26/95
Sample ID: 8386-001
Matrix: SOIL

ANALYTE	UNITS	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	DLR
Reac. Cyanide	mg/Kg	ND	ND	0.4	0.16	0.20	40	50	40-150	22	50	0.5

Approved by: Cheryl De Los Reyes
Cheryl De Los Reyes
Inorganics Supervisor

Date: 10/26/95

Advanced Technology Laboratories

Spike Recovery and RPD Summary Report

Method: 9030
Analyst: IG
Data File: 5298-1S

Date: 10/25/95
Sample ID: BLANK
Matrix: SOIL

ANALYTE	UNITS	LCS Conc	LCS Res	% Rec	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	DLR
SULFIDE	mg/kg	10	9.3	93	ND	ND	10	9.3	9.2	93	92	70 - 120	1	20	0.50

Approved by: Cheryl deLos rv
Cheryl De Los Reyes
Inorganics Supervisor

Date: 10/26/95

Advanced Technology Laboratories

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Subcontract Chain of Custody

Subcontract Lab: ATL		Date Sent: 10/23/95	Project Name: Ettie Street		Due Date: 10-27-95	
Sample ID and Source	Matrix	Required Analysis	Date Taken	Time Taken	Containers	Pres?
B11231 SP-SW, SE	soil	RCI	10-20-95	1019-1130	4oz jar	No
NW, NE						

Relinquished By:	Received By:	Date:	Time:
Shellie Hoyt	California Overnight	10-23-95	1545
Relinquished By: California Overnight	Received By: Tri Nguyen	Date: 10/24/95	Time: 12:10 pm
Relinquished By:	Received By:	Date:	Time:

Notes: _____

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR DIESEL ANALYSIS

DIESEL
QC sample No.: BLANK SPIKE & DUP

Date analyzed: 10-16-95
Date extracted: 10-13-95
QC batch: DS109503

Matrix: SOIL

Units: mg/Kg

Dilution factor: 1

COMPOUND	SA mg/Kg	SR mg/Kg	MS mg/Kg	MS PR	MSD mg/Kg	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
DIESEL	25	0	19	76	20	80	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
FOR GASOLINE ANALYSIS

GASOLINE
QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
GASOLINE	235	0	257	109	248	106	3	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

HULL DEVELOPMENT LABS INC. 525 Del Rey Avenue suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY
BTEX

QC sample No.: BLANK SPIKE & DUP Date analyzed: 10-17-95

Matrix: WATER

Units: ug/L Dilution factor: 1

COMPOUND	SA ug/L	SR ug/L	MS ug/L	MS PR	MSD ug/L	MSD PR	RPD	QC LIMITS (ADVISORY) RPD	QC LIMITS (ADVISORY) PR
BENZENE	20	0	22	110	23	115	4	25	50-150
TOLUENE	20	0	21	105	20	100	5	25	50-150

MS = Spike sample
MSD = Spike sample duplicate
SR = Sample result
SA = Spike added

NC = Not calculated
** = Out of limits

RPD = 100 x (MS-MSD)/((MS+MSD)/2)

PR = 100 x ((MS or MSD) - SR)/SA

Hull Development Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: 95102
Matrix: Soil
Units: mg/kg

Date Analyzed: 10/18/95
Extraction Method: TTLC

PARAMETER	Method #	SA mg/kg	SR mg/kg	MS mg/kg	MS %R	MSD mg/kg	MSD %R	QC LIMITS %R
Antimony	7040	7.4	3.2	9.9	89%	10.7	101%	50- 150
Barium	7080	19.7	18.5	27.9	48%	31.3	65%	50- 150
Beryllium	7090	9.1	0.0	6.6	72%	6.4	70%	50- 150
Cadmium	7130	12.3	0.2	10.8	86%	10.7	85%	50- 150
Chromium	7190	7.8	28.5	38.8	132%	34.5	77%	50- 150
Cobalt	7200	14.1	0.0	17.2	122%	16.4	116%	50- 150
Copper	7210	10.6	59.4	66.5	67%	67.0	72%	50- 150
Lead	7420	18.2	30.9	41.4	58%	41.5	58%	50- 150
Molybdenum	7480	12.4	0.0	9.8	79%	9.7	78%	50- 150
Nickel	7520	7.0	20.0	27.8	111%	24.7	68%	50- 150
Silver	7760	11.7	0.2	10.3	86%	9.9	83%	50- 150
Thallium	7840	8.7	0.0	9.6	110%	10.2	117%	50- 150
Vanadium	7910	18.3	0.0	16.8	92%	17.2	94%	50- 150
Zinc	7950	26.5	232.8	266.3	126%	248.4	59%	50- 150

Note: Recoveries of Zinc above QC Limits due to sample concentration > Matrix Spike (confirmed by duplicate analysis)

Definition of Terms:

- na: Not Analyzed in QC batch
- SA: Spike Added
- SR: Sample Result
- MS: Matrix Spike Result
- MS (%R) Matrix Spike % Recovery
- MSD Matrix Spike Duplicate Result
- MSD (%R) Matrix Spike Duplicate % Recovery

LAB DIRECTOR: M. Golden

GEOCHEM Environmental Laboratories
780 Montague Expressway, Suite 404
San Jose, CA 95131
(408) 955-9988 • FAX (408) 955-9538

CHAIN OF CUSTODY RECORD

Date 2/8/96 Page 1 of 1

CLIENT: Tetra Tech
ADDRESS: 180 Howard Street, Suite 250
San Francisco, CA 94105

PROJECT NAME: Caltrans Ettie St. Facility
PROJECT MANAGER: Mike Wopat
PHONE NUMBER: 415-974-1221

TESTS REQUIRED

SAMPLE I.D.	LOCATION DESCRIPTION	DATE	TIME	MATRIX AIR	MATRIX WATER	MATRIX SOIL	NO. OF CTNR	418.1/TRPH	8010 (601)	8015 E/TPH-diesel	8015 M/TPH-gasoline	8020 (602) BTEX	7420/Total Lead	Organic Lead			Archive
D-S1	Diesel Dis. Excavation	2/8/96	0950			X	1			X							
D-E4	" " "	2/8/96	1000			X	1			X							
D-W4	" " "	2/8/96	1010			X	1			X							
D-N4	" " "	2/8/96	1030			X	1			X							
D-N4-2	" " "	2/8/96	1455			X	1			X							
SS-NW	Diesel stockpile - northwest	2/8/96	1140			X	1			X							
SS-NE	" " northeast	2/8/96	1140			X	1			X							
SS-SW	" " Southwest	2/8/96	1140			X	1			X							
SS-SE	" " southeast	2/8/96	1140			X	1			X							

Composite - Analyze composite for TPH-d.

Sampled/Relinquished by: W. Matt Cotte
Received by: [signature]
Date: 2-8-96 Time: 9:30 AM

Relinquished by:
Received by: [signature]
Date: Time:

Relinquished by:
Received by:
Date: Time:

Turnaround time:
24 hr. 48 hr. Normal (3-5 days)

Special Instructions:
SS-NW, SS-NE, SS-SW, SS-SE to be composited.

Geochem ENVIRONMENTAL LABORATORIES

Mobile & In-House Laboratories Certified by State of California
Phone: (408) 955-9988 / FAX: (408) 955-9538

Analytical Report

Client: **Tetra Tech**
180 Howard Street, Suite 250
San Francisco, CA 94105

Attention: Mike Wopat

Proj. Name: **Caltrans Ettie St. Facility**

Date Sampled: 2/8/96
Date Received: 2/8/96
Date Analyzed: 2/8/96
Batch: SA-527
Matrix: Soil
Conc. Unit : mg/kg (ppm)

ND: not detected at indicated detection limits.

Sample ID	8015 E/TPH Diesel
Detection Limit	10 ppm
D-S1	ND
D-E4	ND
D-W4	ND
D-N4	180
SS-NW,NE,SW,SE	150
D-N4-2	ND

Reviewed and approved by: George Tsai Date: 2/8/96
George Tsai, Laboratory Director

Geochem ENVIRONMENTAL LABORATORIES

Mobile & In-House Laboratories Certified by State of California
Phone: (408) 955-9988 / FAX: (408) 955-9538

Quality Control Status

Client: Tetra Tech
180 Howard Street, Suite 250
San Francisco, CA 94105

Date Sampled: 2/8/96
Date Received: 2/8/96
Date Analyzed: 2/8/96
Batch: SA-527
Matrix: Soil

Attention: Mike Wopat

Proj. Name: Caltrans Ettie St. Facility

TESTS	SP1 % Recovery	SP2 % Recovery	% Diff.	Control	Status
8015 E/TPH	91	90	1	20	PASS

Reviewed and approved by: George Tsai Date: 2/8/96
George Tsai, Laboratory Director

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech
Address: 180 Howard St, Suite 250, San Francisco, CA 94105
Contact: Mike Wojcik / Bob Cotton
Telephone #: (415) 974-1221
Date Received:
Turn Around: Standard

Project ID: TC-0637-07
Purchase Order #: "

Sampler/Company: Mike Wojcik, T.T.
Telephone #: (415) 974-1221

Special Instructions/Comments: Have a great day!! Filter H_2O before analyzing for dissolved lead.

LAB USE ONLY

Samples arrived chilled and intact: Yes No

Notes:

Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-g (8015 mod)	BTEX (8020)	TPH-D + motor oil (8015 mod)	Total Lead	Dissolved Lead
C2419	TW1-6.5	Grab	Soil	2/8/96	0850	—	1.5"x6" brass	↓	↓	↓	↓	
C2420	TW2-09	↓	↓	↓	0930	—	"	↓	↓	↓	↓	
C2421 →	TRIP Blank							x	x			
C2422	TW1-W1	↓	H_2O	↓	1015	VOAs HCl	3 VOAs, 2 Am 1 liter, 1 Plastic	↓	↓	↓		↓
C2423	TW2-W1	↓	H_2O	↓	1030	Others, None	"	↓	↓	↓		↓
C2424 - 4:1 Comp.	SS-NW		Soil		1140		2x6 Sample Sleeves	Composite all four samples. Analyze for BTEX (8020) and RCI				
	-SE	↓	↓	↓	↓	↓	↓					
	-SW	↓	↓	↓	↓	↓	↓					
	-NE	↓	↓	↓	↓	↓	↓					

Relinq. By:	Received By:	Date	Time
Mike Wojcik (Mike Wojcik)	Wayne	2/8/96	
Wayne	Shellie Hoyt	2-8-96	1655

Entech Analytical Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Attn: Mike Wopat
Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105

Date:	2/20/96
Date Received:	2/8/96
Date Analyzed:	2/14/96
Project Number:	TC-0637-07
P.O.#	TC-0637-07
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*TW1-6.5*	*TW2-09*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Soil	Soil			
Sample Date	2/8/96	2/8/96			
Sample Time	0850	0930			
Lab #	C2419	C2420			
Total Lead	**11**	**120**	mg/kg	0.50 mg/kg	7420
DF-Diesel	25	5			
TPH-Diesel	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
TPH-Motor Oil	**1,200**	**380**	mg/kg	1.0 mg/kg	8015M
DF-Gas/BTEX	1	1			
TPH-Gas	**ND**	**ND**	mg/kg	1.0 mg/kg	8015M
Benzene	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Analysis performed by Entech Analytical Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Attn: Mike Wopat
Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105

Date:	2/20/96
Date Received:	2/8/96
Date Analyzed:	2/14/96
Project Number:	TC-0637-07
P.O.#	TC-0637-07
Sampled By:	Client

Certified Analytical Report

Water Sample Analysis:

Test	*Trip Blank*	*TW1-W1*	*TW2-W1*	*Units*	*MDL*	*EPA Method #*
Sample Matrix	Water	Water	Water			
Sample Date	2/8/96	2/8/96	2/8/96			
Sample Time		1015	1030			
Lab #	C2421	C2422	C2423			
Dissolved Lead	**na**	**ND**	**ND**	mg/liter	0.005 mg/l	7420
DF-Diesel/M.O.		1	1,250			
TPH-Diesel	**na**	**ND**	**ND**	µg/liter	50.0 µg/l	8015M
TPH-Motor Oil	**na**	**2,400**	**2,300,000**	µg/liter	50.0 µg/l	8015M
DF-Gas/BTEX	1	1	1			
TPH-Gas	**ND**	**52**	**ND**	µg/liter	50.0 µg/l	8015M
Benzene	**ND**	**3.9**	**ND**	µg/liter	0.5 µg/l	8020
Toluene	**ND**	**8.9**	**ND**	µg/liter	0.5 µg/l	8020
Ethyl Benzene	**ND**	**1.3**	**ND**	µg/liter	0.5 µg/l	8020
Xylenes	**ND**	**2.4**	**ND**	µg/liter	0.5 µg/l	8020

1. na: not analyzed
2. PQL=DF x MDL
3. Samples filtered prior to Lead analysis
4. Analysis performed by Entech Analytical Labs, Inc. (CAELAP #1369)

↳ dilution factor
1,250 × 50 = 62,500 ppb
MDL
↑ actual detection limit

Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

PQL=Practical Quantitation Limit
ND=None Detected at or above PQL

Entech Analytical Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Attn: Mike Wopat
Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105

Date:	2/20/96
Date Received:	2/8/96
Date Analyzed:	2/14/96
Project Number:	TC-0637-07
P.O.#	TC-0637-07
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

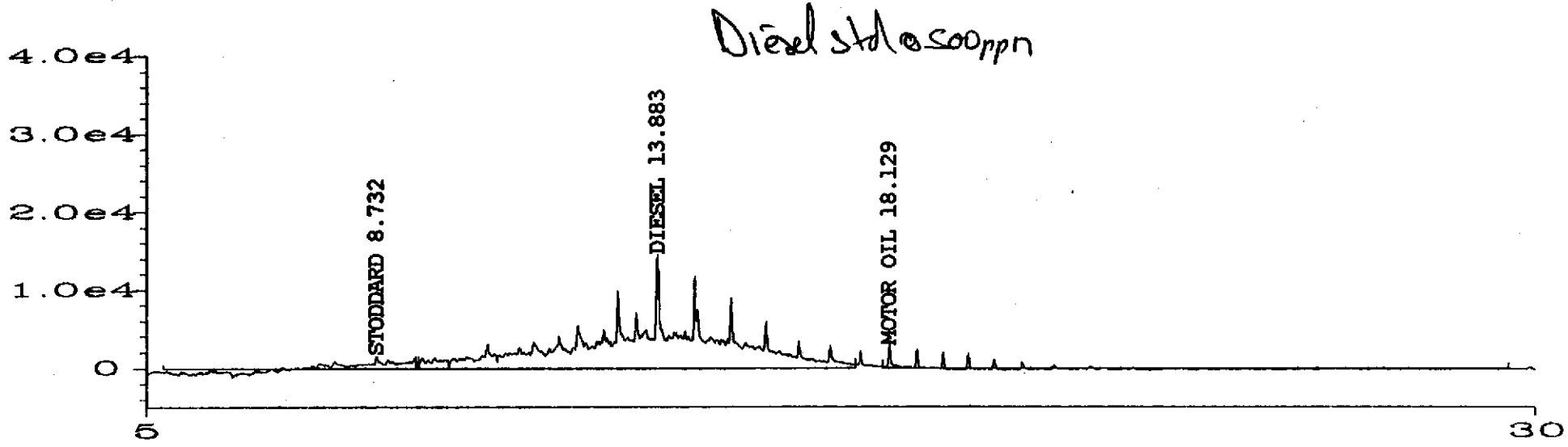
Test	*SS-NW, SE, SW, NE*	*Units*	*MDL*	*EPA Method #*
Sample Method	Composite			
Sample Date	2/8/96			
Sample Time	11:40			
Lab #	C2424			
pH	**9.1**	Units		9045
Sulfide	**ND**	mg/kg	0.5 mg/kg	9030
Cyanide	**ND**	mg/kg	0.2 mg/kg	9010
Flash Point	**>200**	°F		1010
DF-BTEX	1			
Benzene	**ND**	mg/kg	0.005 mg/kg	8020
Toluene	**ND**	mg/kg	0.005 mg/kg	8020
Ethyl Benzene	**ND**	mg/kg	0.005 mg/kg	8020
Xylenes	**ND**	mg/kg	0.005 mg/kg	8020

1. PQL=DF x MDL
2. Reactivity, Corrosivity, and Ignitability analyses performed by Advanced Technology Labs (CAELAP #1838); see ATL report for analyis details
3. Remaining analysis performed by Entech Analytical Labs, Inc. (CAELAP #1369)

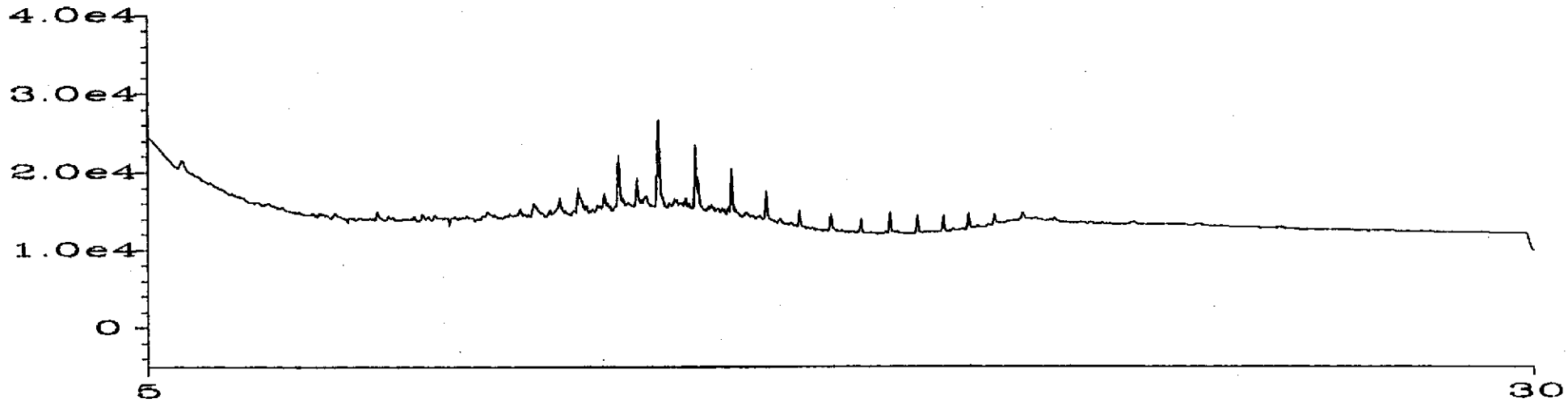
Michael N. Golden, Lab Director

DF=Dilution Factor
MDL=Method Detection Limit

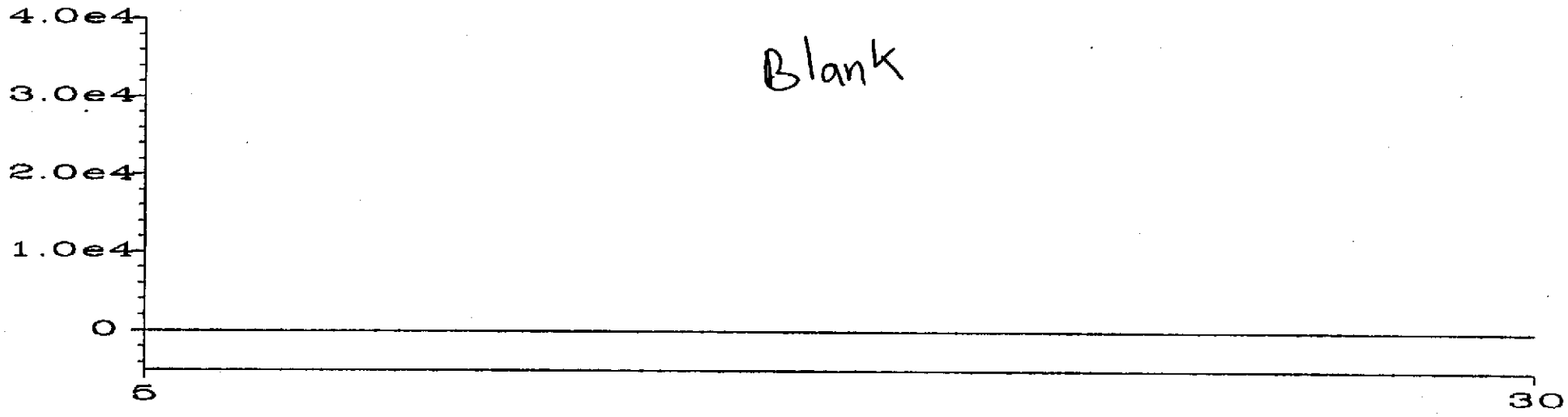
PQL=Practical Quantitation Limit
ND=None Detected at or above PQL



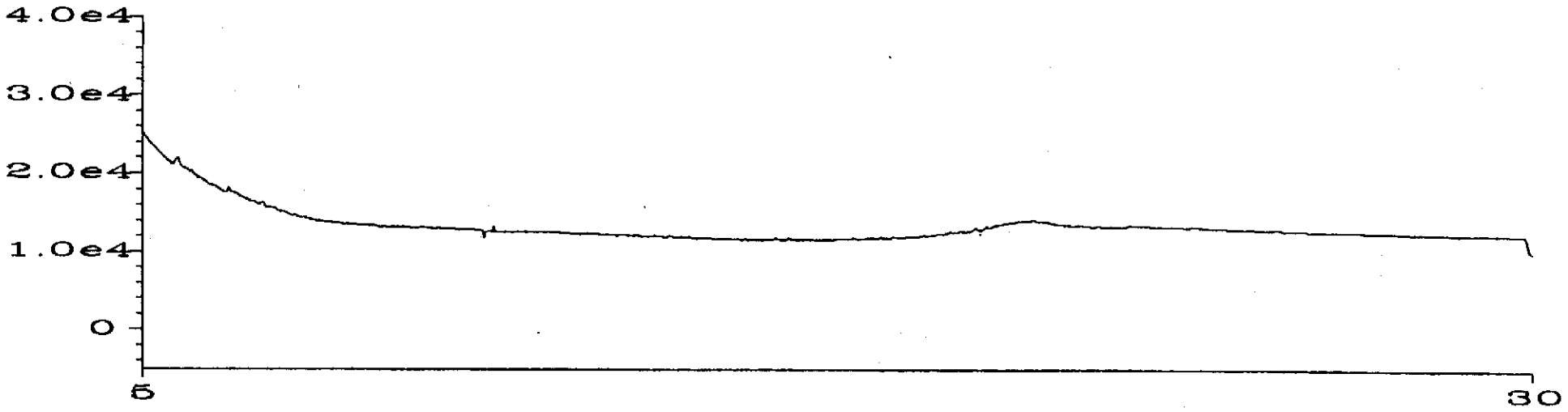
Chromatographic Diff.



Sig. 1 in C:\HPCHEM\1\DATA\DEA21502.D



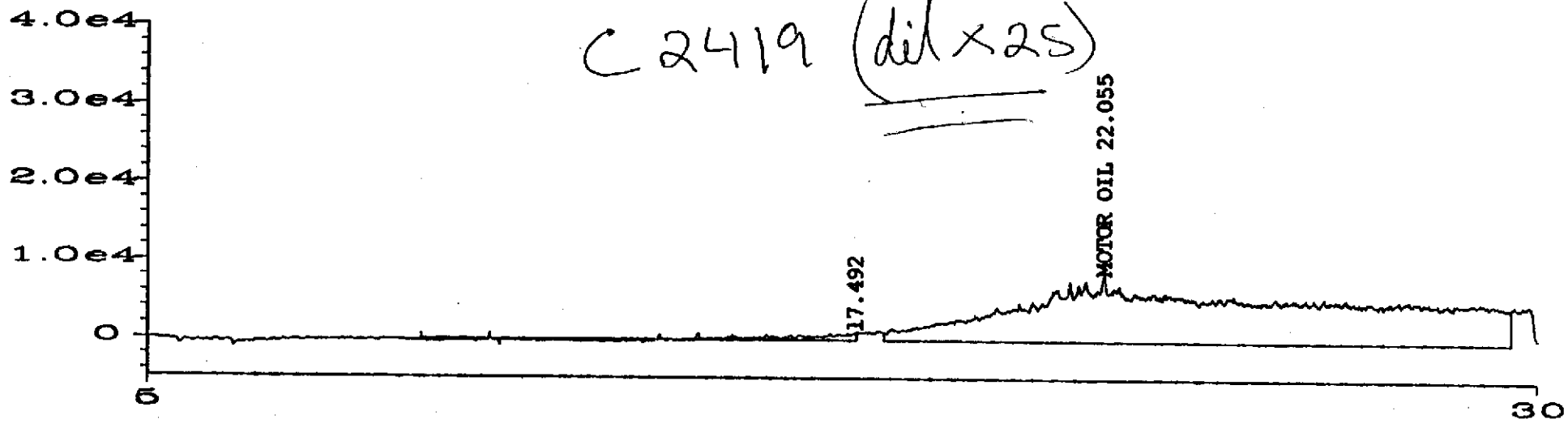
Chromatographic Diff.



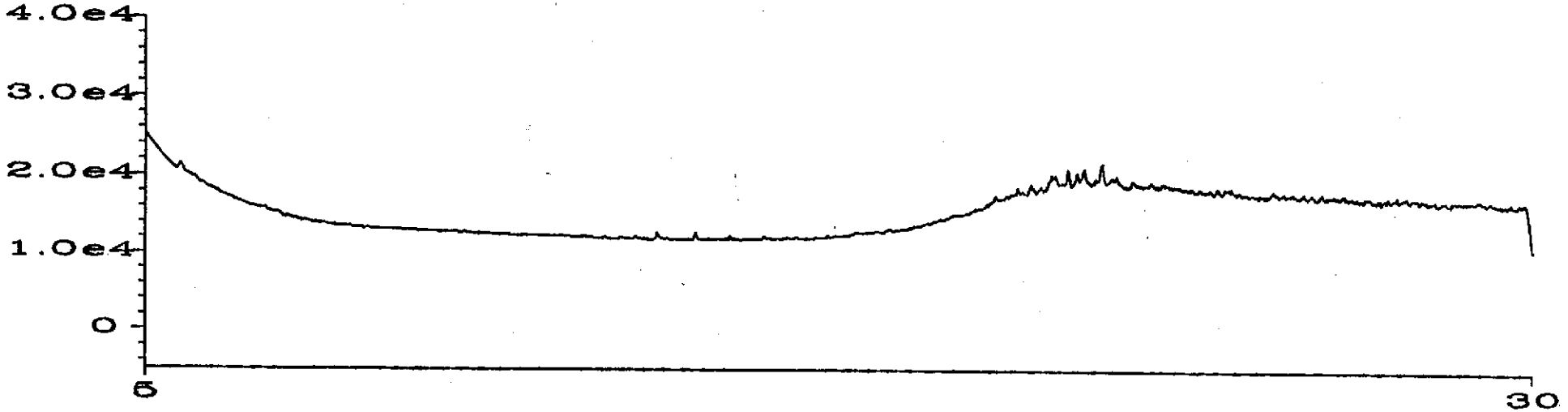
Sig. 1 in C:\HPCHEM\1\DATA\DEA21501.D

TW1-6.5 (soil)

C2419 (dil x25)



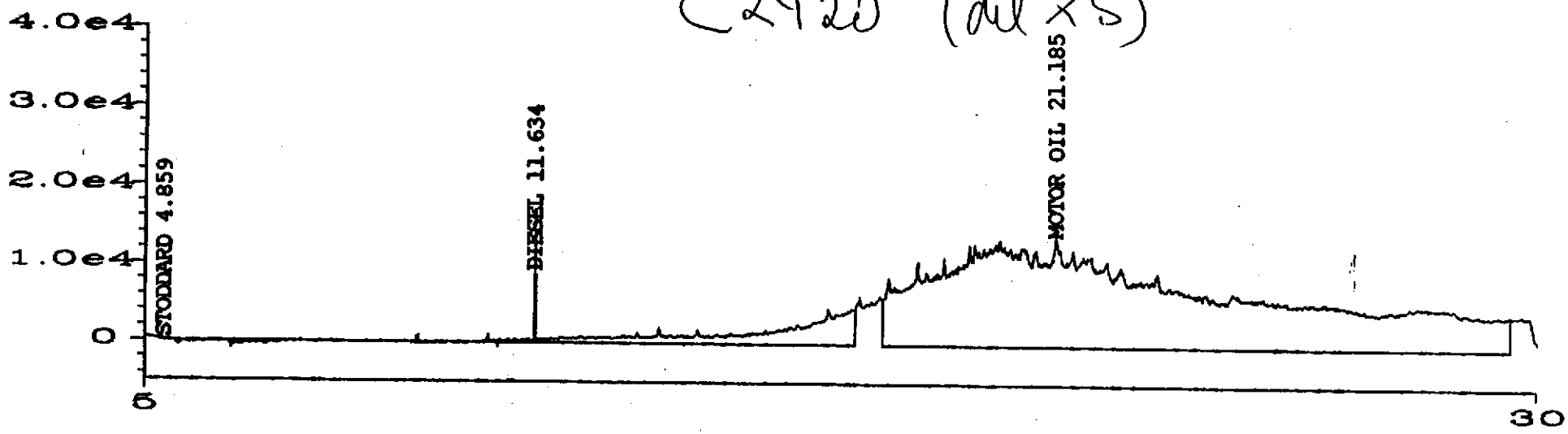
Chromatographic Diff.



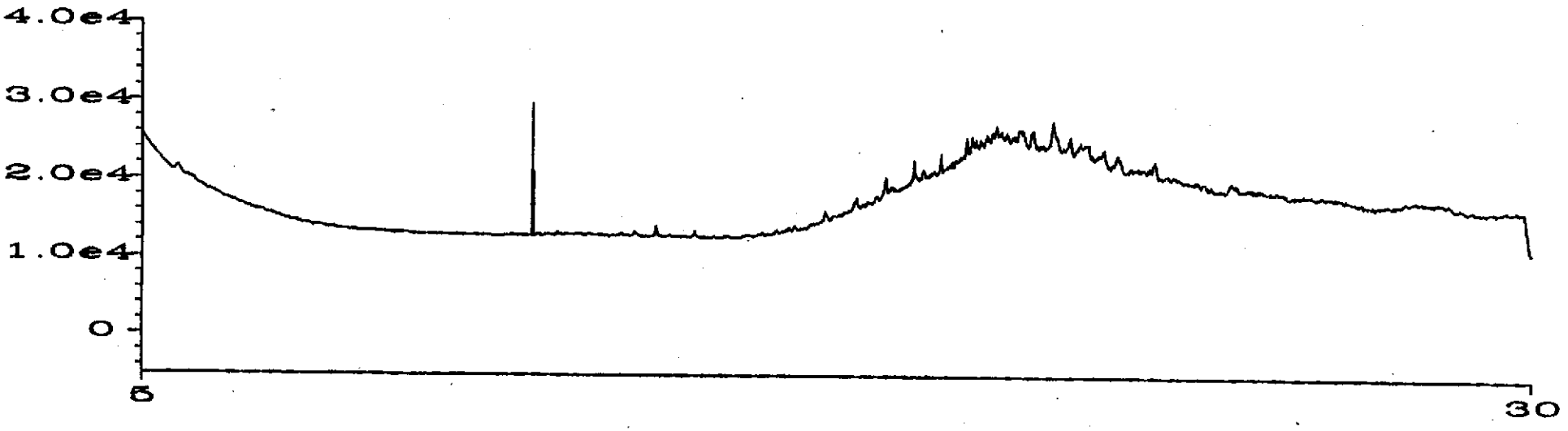
Sig. 1 in C:\HPCHEM\1\DATA\DEA21645.D

TW2-09 (Soil)

C2420 (dil x5)



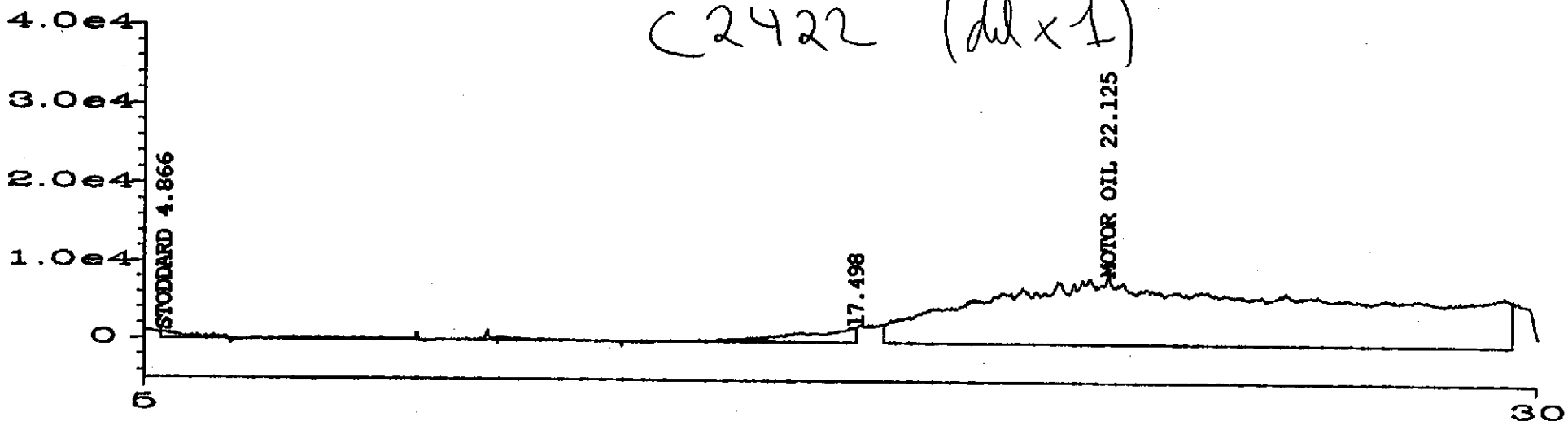
Chromatographic Diff.



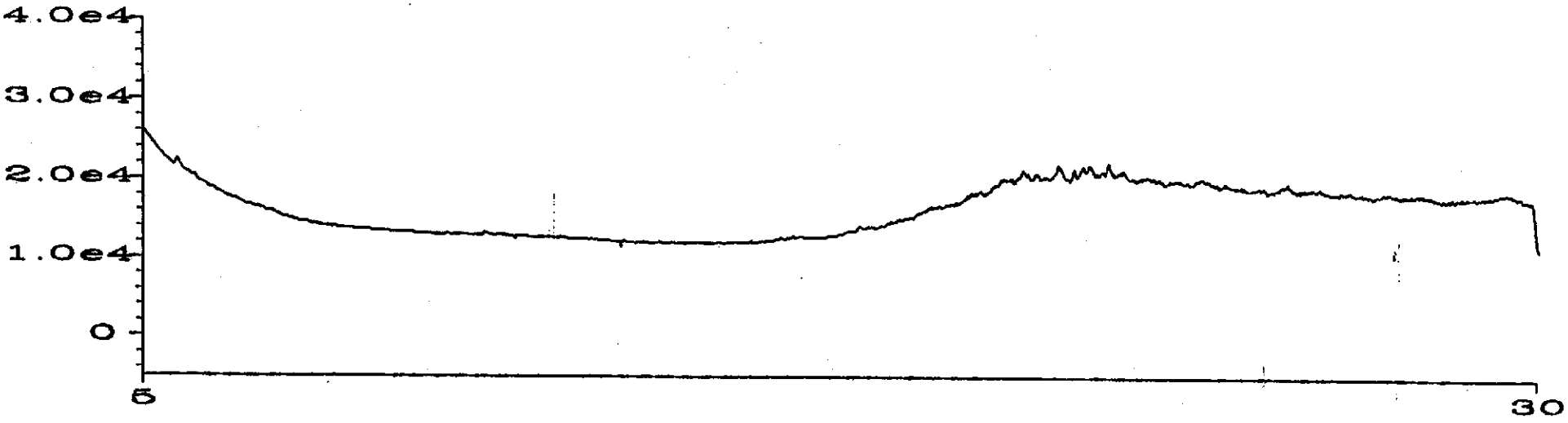
Sig. 1 in C:\HPCHEM\1\DATA\DEA21515.D

TW1-W1 (water)

C2422 (dil x 1)



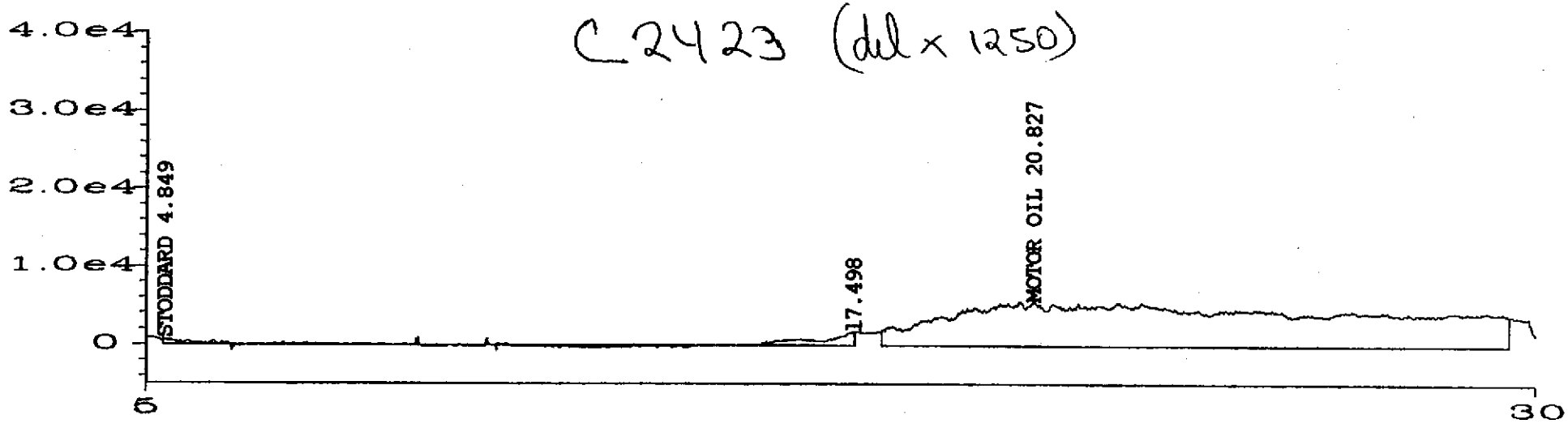
Chromatographic Diff.



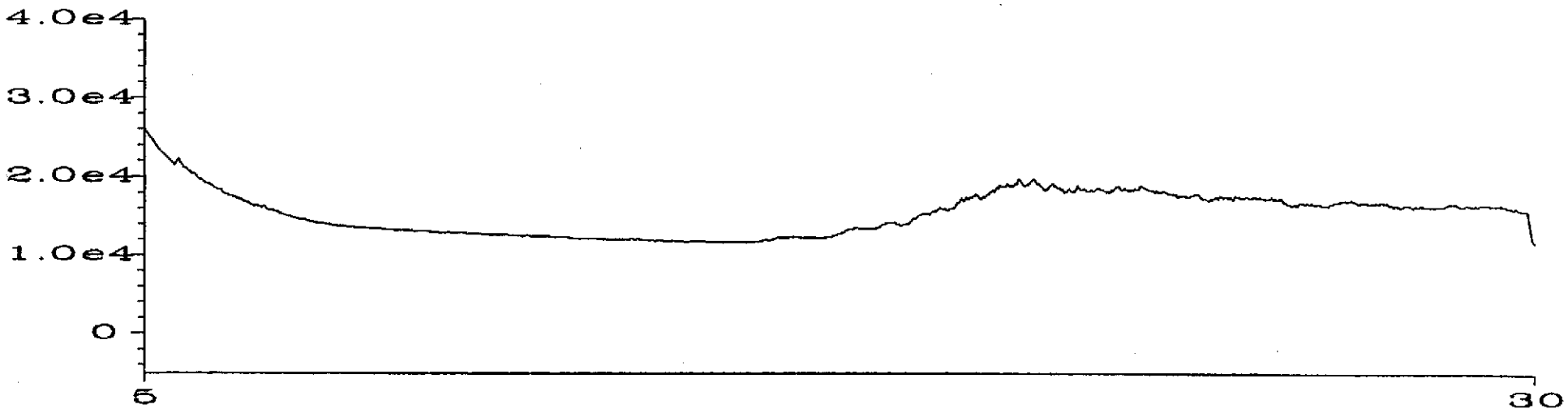
Sig. 1 in C:\HPCHEM\1\DATA\DEA21516.D

TW2-W1

C2423 (dil x 1250)



Chromatographic Diff.



Sig. 1 in C:\HPCHEM\1\DATA\DEA21617.D

Advanced Technology
Laboratories

February 16, 1996

ELAP No.: 1838

Entech Analytical Labs, Inc.
525 Del Rey Avenue Suite E
Sunnyvale, CA 94086

ATTN: Mr. Mike Golden

Client's Project: Tetra Tech
Lab No.: 9785-001

Gentlemen:

Enclosed are the results for sample(s) received by Advanced Technology Laboratories and tested for the parameters indicated in the enclosed chain of custody.

Thank you for the opportunity to service the needs of your company. Please feel free to call me at (310) 989 - 4045 if I can be of further assistance to your company.

Sincerely,

Beverly Jonston for

Edgar P. Caballero
Laboratory Director
EPC/cb

Enclosures

This cover letter is an integral part of this analytical report.

Mailing Address: P.O. Box 9108 Newport Beach, CA 92658
1510 E. 33rd Street Signal Hill, CA 90807 Tel: 310 989-4045 Fax: 310 989-4040

Client: Entech Analytical Labs, Inc.
Attn: Mr. Mike Golden

Client's Project: Tetra Tech

Date Received: 02/10/96
Date Sampled: 02/08/96

Lab No: 9785-001
Sample ID: C2424 SS - NW/SE/SW/NE
Matrix: Soil

Analysis	Date Analyzed	Results	Units	MDL	DLR	Analyst Initials
EPA 9010 (Reactive Cyanide)	02/13/96	ND	mg/kg	0.20	0.20	JD
EPA 9045 (pH)	02/15/96	9.1	pH units	-----	-----	LP
EPA 1010 (Flashpoint)	02/15/96	> 200	deg. F	-----	-----	OL
EPA 9030 (Reactive Sulfide)	02/16/96	ND	mg/kg	0.50	0.50	IG

MDL = Method Detection Limit
ND = Not Detected (Below DLR)
DF = Dilution Factor (DLR/MDL)

Reviewed/Approved By: Cheryl de los Reyes **Date:** 2/16/96
Cheryl de los Reyes
Department Supervisor

Spike Recovery and RPD Summary Report

Method: 9010
Analyst: JD
Data File: 6044-S

Date: 02/13/96
Sample ID: BLANK
Matrix: SOIL

ANALYTE	UNITS	LCS Conc	LCS Res	% Rec	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	DLR
Reac. Cyanide	ug	20	17.0	85	ND	ND	20	20	19	100	93	40-150	8	50	0.5

Approved by: Cheryl DeLos Reyes
Cheryl DeLos Reyes
Inorganics Supervisor

Date: 2/16/96

Advanced Technology Laboratories

Spike Recovery and RPD Summary Report

Method: 9030
Analyst: IG
Data File: 6047-1S

Date: 02/16/96
Sample ID: Blank
Matrix: Soil

ANALYTE	UNITS	LCS Conc	LCS Res	% Rec	METH BLANK	SPL CONC	SPK ADDED	MS RESULT	MSD RESULT	%MS REC	%MSD REC	% REC Limit	RPD	RPD Limit	MDL
Sulfide	mg/kg	1.0	0.97	97	ND	ND	10	8.3	9.7	83	97	80 - 120	16	20	0.50

Approved by: Cheryl de los Reyes
Cheryl De Los Reyes
Inorganics Supervisor

Date: 2/16/96

Advanced Technology Laboratories

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Subcontract Chain of Custody

Subcontract Lab: ATL		Date Sent: 2-9-96	Project Name: TetraTech		Due Date: 2-16-96	
Sample ID and Source	Matrix	Required Analysis	Date Taken	Time Taken	Containers	Pres?
CC424 SS-NW/SE/SW/NE	Soil	RCI *	2-5-96	1140	4-4oz jars *	No

Relinquished By:	Received By:	Date:	Time:
Shellie Hoyt	California Overnight	2-9-96	1710
California Overnight	Katie Kwong	2-10-96	10:00
Relinquished By:	Received By:	Date:	Time:

Notes:

* please composite four subsamples for one analysis

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech

Address: 180 Howard St, Suite 250, San Francisco, CA 94105

Contact: Mike Wopat / Bob Cotton

Telephone #: (415) 974-1221

Date Received:

Turn Around: Standard

Project ID: TC-0637-07

Purchase Order #: "

Sampler/Company: Mike Wopat, T.T.

Telephone #: (415) 974-1221

Special Instructions/Comments: Have a great day! Filter H2O before analyzing for dissolved lead.

LAB USE ONLY

Samples arrived chilled and intact: Yes No

Notes:

Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-g (8015 mod)	BTEX (8020)	TPH-D + motor oil (8015 mod)	Total Lead	Dissolved Lead
C2419	TW1-6.5	Grab	Soil	2/8/96	0850	—	1.5x6" liner	↓	↓	↓	↓	
C2420	TW2-07	↓	↓		0930	–	"				↓	
C2421 →	TRIP Blank							x	x			
C2422	TW1-W1		H2O		1015	VOAs w HCl	3 VOAs, 2 Amb 1 liter, 1 Plastic					
C2423	TW2-W1	↓	H2O	↓	1030	Others, None	"	↓	↓	↓		↓
	SS-NW		Soil		1140		2x6 Sample Sleeve					
C2424-4:1 Composite	-SE											
	-SW											
	-NE	↓	↓	↓	↓		↓					

Composite all four samples. Analyze BTEX (8020) and RCI

Cal metals added 3/11/96 per M. Wopat STD-TAT-[illegible]

Relinq. By:	Received By:	Date	Time
Mike Wopat (Mike Wopat)	Wayne [illegible] WAYNE	2/8/96	
Wayne WAYNE Yeoby	Shellie Hoyt	2-8-96	1655

Entech Analytical Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Attn: Mike Wopat
Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105

Date:	3/15/96
Date Received:	2/8/96
Date Analyzed:	3/15/96
Project Number:	TC-0637-07
P.O.#	TC-0637-07
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*SS-NW, SE, SW, NE*	*Units*	*MDL*	*EPA Method #*
Sample Method	Composite			
Sample Date	2/8/96			
Sample Time	11:40			
Lab #	C2424			
Cadmium	**0.61**	mg/kg	0.5 mg/kg	7130
Chromium	**19**	mg/kg	0.5 mg/kg	7190
Lead	**74**	mg/kg	0.5 mg/kg	7420
Nickel	**26**	mg/kg	0.5 mg/kg	7520
Zinc	**120**	mg/kg	0.5 mg/kg	7950

Analysis performed by Entech Analytical Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

MDL=Method Detection Limit

ND=None Detected at or above MDL

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: 960302
Matrix: Soil/Sand
Units: mg/kg

Date Analyzed: 3/12/96
Extraction Method: TTLC

PARAMETER	Method #	SA mg/kg	SR mg/kg	MS mg/kg	MS %R	MSD mg/kg	MSD %R	QC LIMITS %R
Antimony	7040	na	na	na	na	na	na	50- 150
Barium	7080	na	na	na	na	na	na	50- 150
Beryllium	7090	na	na	na	na	na	na	50- 150
Cadmium	7130	na	na	na	na	na	na	50- 150
Chromium	7190	na	na	na	na	na	na	50- 150
Cobalt	7200	na	na	na	na	na	na	50- 150
Copper	7210	na	na	na	na	na	na	50- 150
Lead	7420	25.0	9.1	30.	85%	30.	86%	50- 150
Molybdenum	7480	na	na	na	na	na	na	50- 150
Nickel	7520	na	na	na	na	na	na	50- 150
Silver	7760	na	na	na	na	na	na	50- 150
Thallium	7840	na	na	na	na	na	na	50- 150
Vanadium	7910	na	na	na	na	na	na	50- 150
Zinc	7950	na	na	na	na	na	na	50- 150
Aluminum	7020	na	na	na	na	na	na	50- 150

Definition of Terms:

- na: Not Analyzed in QC batch
- SA: Spike Added
- SR: Sample Result
- MS: Matrix Spike Result
- MS (%R) Matrix Spike % Recovery
- MSD Matrix Spike Duplicate Result
- MSD (%R) Matrix Spike Duplicate % Recovery

QA/QC OFFICER Nick S. Gaone
N. Gaone

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • Telephone: (408) 735-1550 (800) 287-1799 • Fax: (408) 735-1554

Chain of Custody/Analysis Work Order

Client: Tetra Tech
Address: 180 Howard St, Suite 250
San Francisco, CA 94105
Contact: Mike Wojcik / Bob Catton
Telephone #: (415) 974-1221
Date Received:
Turn Around: Standard

Project ID: TC-0637-07
Purchase Order #: "

Sampler/Company: Mike Wojcik, T.T. Telephone #: (415) 974-1221

Special Instructions/Comments: Have a good day! Filter H_2O before analyzing for dissolved lead.

LAB USE ONLY

Samples arrived chilled and intact: Yes No

Notes:

3/18/96 Transfer for TEPH, WET Pb, NH

Lab #	Sample ID	Grab/ Composite	Matrix	Date Collected	Time Collected	Pres.	Sample Container	TPH-g (5035)	BTEX (8020)	TPH-D + motor oil (8015)	Total Lead	Dissolved Lead
C2419	TW1-6.5	Grab	Soil	2/8/96	0850	—	1.5x6" Liner	↓	↓	↓	↓	
C2420	TW2-09	↓	↓	↓	0930	—	"				↓	
C2421	Trip Blank							x	x			
C2422	TW1-W1		H_2O		1015	VOAs w HCl	3 VOAs, 2 Amber 1 Lt., 1 Plastic	↓	↓	↓		↓
C2423	TW2-W1	↓	H_2O	↓	1030	Others, None	"	↓	↓	↓		↓
C2424 – 4:1 Composite	SS-NW	Grab	Soil	2/8/96	1140		2x6 Sample Sleeve					
	-SE	↓	↓	↓	↓		↓					
	-SW	↓	↓	↓	↓		↓					
	-NE	↓	↓	↓	↓		↓					

Composite all four samples. Analyze for BTEX (8020) and PCB

Late note: added 3/1... per M. Wojcik ... SN/MT

Relinq. By:	Received By:	Date	Time
Mike Wojcik (Mike Wojcik)	Wayne ... WAYNE	2/8/96	
Wayne WAYNE Yeiber	Shellie Hoyt	2-8-96	1655

Entech Analytical Labs, Inc.

CA ELAP# 1369

525 Del Rey Avenue, Suite E • Sunnyvale, CA 94086 • (408) 735-1550 • Fax (408) 735-1554

Attn: Mike Wopat
Tetra Tech, Inc.
180 Howard Street
San Francisco, CA 94105

Date:	4/1/96
Date Received:	2/8/96
Date Analyzed:	4/1/96
Project Number:	TC-0637-07
P.O.#	TC-0637-07
Sampled By:	Client

Certified Analytical Report

Soil Sample Analysis:

Test	*SS-NW, SE, SW, NE*	*Units*	*MDL*	*EPA Method #*
Sample Method	Composite			
Sample Date	2/8/96			
Sample Time	11:40			
Lab #	C2424			
Extraction	STLC			CA WET
Lead	2.7	mg/liter	0.10 mg/l	7420

Analysis performed by Entech Analytical Labs, Inc. (CAELAP #1369)

Michael N. Golden, Lab Director

MDL=Method Detection Limit

ND=None Detected at or above MDL

Environmental Analysis Since 1983

Entech Analytical Labs, Inc.

525 Del Rey Avenue, Suite E
Sunnyvale, CA 94086

QUALITY CONTROL RESULTS SUMMARY

METHOD: Flame Atomic Absorption

QC Batch #: 960303
Matrix: Soil
Units: mg/l

Date Analyzed: 3/22/96
Extraction Method: STLC

PARAMETER	Method #	SA mg/l	SR mg/l	MS mg/l	MS %R	MSD mg/l	MSD %R	QC LIMITS %R
Antimony	7040	na	na	na	na	na	na	70- 130
Barium	7080	na	na	na	na	na	na	70- 130
Beryllium	7090	na	na	na	na	na	na	70- 130
Cadmium	7130	1.00	0.04	1.03	99	1.03	99	70- 130
Chromium	7190	1.00	0.65	1.63	99	1.66	101	70- 130
Cobalt	7200	na	na	na	na	na	na	70- 130
Copper	7210	1.00	2.12	3.13	101	3.12	101	70- 130
Lead	7420	1.00	0.50	1.49	99	1.51	101	70- 130
Molybdenum	7480	na	na	na	na	na	na	70- 130
Nickel	7520	1.00	0.44	1.42	99	1.43	99	70- 130
Silver	7760	1.00	0.07	1.06	99	1.06	99	70- 130
Thallium	7840	na	na	na	na	na	na	70- 130
Vanadium	7910	na	na	na	na	na	na	70- 130
Zinc	7950	1.00	0.75	1.73	98	1.74	99	70- 130

Definition of Terms:

- na: Not analyzed in Q.C. Batch
- SA: Spike Added
- SR: Sample Result
- MS: Matrix Spike Result
- MS (%R) Matrix Spike % Recovery
- MSD Matrix Spike Duplicate Result
- MSD (%R) Matrix Spike Duplicate % Recovery

QA/QC OFFICER: Nick L Gaone
N. Gaone

APPENDIX D

DRILLING PERMIT, FIELD SOIL BORING LOGS

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

Wyman Hong Ext 235

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT Caltrans' Ettie St. Maintenance Facility
3465 Ettie St,
Oakland, Ca. 94608

CLIENT
Name Michael Hillsinski, Caltrans Dept. of Maintenance
Address 111 Grand Avenue Voice (510) 286-4495
City Oakland, CA Zip 94612

APPLICANT
Name Michael Wright
Tetra Tech Fax (415) 979-5914
Address 180 Howard St, Sta 320 Voice (415) 974-1221
City San Francisco, CA Zip 94105

TYPE OF PROJECT

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

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other N/A
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger ___
Cable ___ Other Drive Casing

DRILLER'S LICENSE NO. C-57 #633387

WELL PROJECTS
Drill Hole Diameter ___ in. Maximum
Casing Diameter ___ in. Depth ___ ft.
Surface Seal Depth ___ ft. Number ___

GEOTECHNICAL PROJECTS
Number of Borings 2 Maximum
Hole Diameter 2¾ in. Depth 15 ft.

ESTIMATED STARTING DATE 2/8/96
ESTIMATED COMPLETION DATE 2/8/96

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

APPLICANT'S SIGNATURE Michael Wright Date 2/8/96

FOR OFFICE USE

PERMIT NUMBER 96145
LOCATION NUMBER
At North end of Ettie St, Under elevated portion of I-580

PERMIT CONDITIONS

Circled Permit Requirements Apply

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

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

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

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

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 1 Mar 96
Wyman Hong

91992

TETRA TECH, INC.
FIELD LOG OF BORING

Boring #: TW-1
Sheet 1 of 1

Project Name and Location: Ethne St. Maintenance Station	TC Number: TC-0637-07
Elevation:	Date and Time Started: 2/8/96 0838
Date and Time Completed: 2/8/98 0905	
Completion Depth: 13'	Number of Samples: Drive: (1) ; 1-liter: 2 ; VOA: 3 ; Other: 1 plastic
Boring Diameter & Drilling Method: 2 3/8 drive casing	Water Level: First (date/time): (4.06') @ 0715 2/8/96 ; Second (date/time): (4.01) 2/8/95 1045
Sampler: 1 1/2 cont core	Hammer Wt.: Drop:
Boring Location:	
Drilling Co: Precision Sampling	Driller: Steward King / Jose Andrie
Geologist: M. Wagner	

Depth (ft.)	Sample No.	Sample Interval	Recovery	Blow Count	Description	Graphic Symbol	USCS Symbol	Gr	Sa	Si	Cl	P.I.D. Reading	Comments
0					asphalt over road base	A/C							
2–4					Dk brown-blk clayey, sandy silt, @ Abdt gravel clasts, sltly moist, No HC odor.	(Fill)	ML	20	25	40	15	0	0840
												0	
												0	
6					As above, but saturated.	? ? ?							0850
7	TW1-6.5				May have pushed down to Bay Mud. Black @ 7' top to med green gray @ 10', silty clay, stiff, moist, no HC odor	Bay Mud	CL					0	
												0	
8													0858
10					As above, but more brown-gray @ 12.5'.								
11													0900
13					Terminated 0905 @ 13' due to adequate water.								
15					GW sample TW1-W1 collected @ 1015								

TETRA TECH, INC.
FIELD LOG OF BORING

Boring #: TW-2
Sheet 1 of 1

Project Name and Location: Ethe St. Maintenance Station	TC Number: 0637-03
Elevation:	Date and Time Started: 2/8/96 0915
Date and Time Completed: 2/8/96 0950	
Completion Depth:	Number of Samples: Drive (1) 1-liter: (2) VOA: (3) Other: 1 plastic
Boring Diameter & Drilling Method: 2 3/8 drive casing	Water Level: First (date/time): 2/8/96 1030 ~~Before Sample 5.65~~ Second (date/time): 2/8/96 10:50 3.8' (3.77)
Sampler: 1 1/2" cont. core	Hammer Wt.: Drop:
Boring Location:	
Drilling Co: Precision Sampling	Driller: Stewart King / Jose Abrero
Geologist: M. Wyatt	

Depth (ft.)	Sample No.	Sample Interval	Recovery	Blow Count	Description	Graphic Symbol	USCS Symbol	Gr	Sa	Si	Cl	P.I.D. Reading	Comments
0					asphalt over greenish gray road base.								0920
1													
2													
3			///		Med (not) ~~Gray~~ green to v. dk brn (~~bottom~~) clayey, pebbly, silty fine sand, moist, no HC odor	Fill	SM					0	0922
4												0	
5						- ? - ? -							
6			///		~~[illegible]~~, As Above, but fines downward to clayey sandy silt, ~~[illegible]~~, moist, no HC odor (Mossy)	Bay Mud ?						0 0 0	0925
7													
8			///		v. dk gray ~~[illegible]~~, clay silt, cobbles, grades to black, pebbly silty clay, hi plasticity, wet, no HC odor. GW between 9+11.5'	▽	CH/CL					0 0 0 0	0930
9	TW2-09												
10													
11			No recovery		No recovery - will try a little deeper ; Pushing a piece of wood ; go two more feet to get sample.								0935
12													
13			///		upper part v. dk gray pebbly silty clay, grades to brown pebbly silt at 13.5', ~~[illegible]~~ fines to brown silty clay @ 14.5'.	- - -	CH ML CH						0945
14													
15					Boring Terminated @ 15'								
16													

GW Sample TW2-W2 collected @ 1030

1
2
3
4
5