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

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

September 9, 1992

Susan Hugo
Division of Environmental Health
80 Swan Lake
Oakland, CA 94612

Dear madam:

Please find enclosed Wahler Associates' Reports on "Hazardous Waste Investigations and Remedial Alternatives" for Shellmound Ventures Property and Barbary Coast Steel Corporation Property for your review.

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

Sincerely,

James W Ross

by:

James W. Ross
District Hazardous Waste Coordinator

HAZARDOUS WASTE INVESTIGATIONS AND REMEDIAL ALTERNATIVES FOR SHELLMOUND VENTURES PROPERTY

Wahler Associates

Wahler Associates

Geotechnical, Environmental and Water Resources Engineering

June 12, 1992
CDT-105L

California Department of Transportation
District 4, Engineering Services
P.O. Box 7310
San Francisco, California 94120

Attention: James W. Ross, P.E.

Subject: Report Transmittal - Shellmound Ventures Property

Union Site

Dear Mr. Ross:

Wahler Associates (Wahler) is pleased to present this report which describes the results of our recent investigations at the subject property, as well as discusses various alternatives available for remediation. At your request, Wahler has provided an opinion of probable cost for site remediation in a separate document.

If you have any comments or questions regarding this report or the project, please contact us.

Very truly yours,

WAHLER ASSOCIATES

Ray N. Kahler
Senior Geologist, R.G.

Fred A. Seirafi, REA #1088
Associate
Manager, East Bay Office

RNK/lml
Enclosures

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HAZARDOUS WASTE INVESTIGATIONS AND REMEDIAL ALTERNATIVES FOR SHELLMOUND VENTURES PROPERTY

Prepared for:

California Department of Transportation
District 4, Engineering Services
P.O. Box 7310
San Francisco, California 94120

File No. 4 - Alameda - 80
Post Mile 2.4/3.8
EA 4-180901
In Oakland from East of West Grand to Powell Street in Emeryville
Contract No. 04D655-PC
Task Order 011

JUNE 1992

WAHLER ASSOCIATES
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CDT-105L

Wahler Associates

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HAZARDOUS WASTE INVESTIGATIONS AND REMEDIAL ALTERNATIVES FOR SHELLMOUND VENTURES PROPERTY

A. INTRODUCTION

California Department of Transportation (Caltrans) is planning to realign and modify Route I-80/580 Interchange. The work involves constructing a westbound high occupancy vehicle (HOV) fly-over, realigning westbound and eastbound I-80, and widening the I-80/I-580 westbound connector. The limits of this project are understood to be from West Grand Avenue (Post Mile 2.4) in the City of Oakland to the Powell Street undercrossing on Route I-80 (Post Mile 3.8) in the City of Emeryville (See Figure I).

Wahler Associates (Wahler) was retained by Caltrans to perform technical services for this project, which consist of conducting a limited hazardous waste and geotechnical investigation at the Shellmound Ventures property (Shellmound or Site), and at the Barbary Coast Steel Corporation property. Collectively, both properties were formally known as the Judson Steel property. This report presents the results of the environmental investigation at the Shellmound Site along with several possible remediation alternatives. The geotechnical investigation report is presented under separate cover. While the scope of the complete project involves both properties, Caltrans has requested that Wahler separate the work conducted at each property into individual reports for the hazardous waste investigations. As a result, only the pertinent data applicable to the Shellmound property has been included with this report.

B. BACKGROUND

1. Location and History

The Shellmound property is located at 4300 Eastshore Highway on the west side of Shellmound Street just east of I-80 in Emeryville. The property consists of three parcels APN #49-1516-4 (Shellmound III), APN #49-1516-6 (Shellmound II), and APN #49-1516-7 (Shellmound I). A water course, Temescal Creek, runs between parcels 49-1516-4 and 49-1516-6 flowing east to west and discharging into San Francisco Bay. As previously mentioned, the Shellmound property was formally a part of Judson Steel. Judson Steel Corporation, founded in 1882, processed reinforcing bars from scrap iron at the Site. Materials used for this process were stored on-site. Reportedly, portions of the area were located within the floodplain of the San Francisco Bay until the East Shore Highway (I-80) was constructed in 1954. By-products of the process (slag and mill scale) were reportedly used to fill low areas of the Site.

All buildings on the Shellmound property were demolished and removed in 1988, including the removal of a 3,000-gallon diesel tank. Site investigations have been conducted in the past by a number of consultants including Earth Metrics, Inc. (1987, 1990), Alton Geoscience (1988), TENERA Environmental Services (1989), and PES Environmental, Inc. (1990, 1991). PES Environmental has recently completed a Preliminary Endangerment Assessment (PEA) for the Shellmound III property. The PEA summarizes all past work completed for the property as well as initially screens concentrations of potential pollutants for significance. It is apparent from this PEA that extensive investigations have been completed by the developer and/or property owner for the Shellmound III property. These investigations have revealed high levels of lead, pH, PCB's and chromium, and low levels of Petroleum Hydrocarbons. At some point, this data should be completely integrated with current investigations. It is possible that a complete integration of the available information may reduce the need to complete extensive investigations on the other Shellmound parcels.

2. Scope of Work

The scope of work for the project was developed based upon direction and discussions with Caltrans, as well as site visits and Wahler's general understanding of the project needs. It consisted of the following: review of available previously prepared documents; utilization of Underground Service Alert (USA) and a private utility locator service to verify that boring locations were clear of utilities; preparation of a Site Safety Plan (SSP); advancement of five borings and taking soil and groundwater samples; chemical testing of soil and groundwater samples; analysis of gathered data; evaluation of various treatment alternatives and preparation of opinion of probable costs for various remedial alternatives; and preparation of a draft report for Caltrans review, and a final report which addresses concerns/comments of Caltrans staff. Appendix A contains an expanded version of the scope of services agreed to by Wahler and Caltrans.

C. METHODOLOGIES

1. Pollutants of Concern

The pollutants which were anticipated to be of concern at these properties were originally specified by Caltrans in Task Order No. O11. This was based upon previous site investigations conducted by other consultants (Earthmetrics 1987, Earthmetrics 1988, Kaldveer Associates 1988, and PES Environmental Inc. 1991, see references Appendix B). Subsequent discussions between Wahler staff and Caltrans staff led to slight modifications. Listed below are the pollutants of concern along with their appropriate Environmental Protection Agency (EPA) test methods.

Chemical Compound	Test Method
Oil and Grease	EPA 418.1
Total Petroleum Hydrocarbons as Gasoline (TPH-G)	Modified EPA 8015
Total Petroleum Hydrocarbon as Diesel (TPH-D)	Modified EPA 8015
Volatile Organic Compounds (VOCs)	EPA 8240/624
Semi-Volatile Organic Compounds (Semi-Volatiles)	EPA 8270/625
Polychlorinated Biphenyls (PCBs)	EPA 8080/608
Heavy Metals	EPA 6010

Selected soil and grab groundwater samples were analyzed for these compounds. In addition, other soil samples were chosen to have leaching tests performed using the California Waste Extraction Test (WET) and/or the Toxicity Characteristic Leaching Procedure (TCLP).

2. Analytical Laboratory

For this project, Wahler utilized the services of Chromalab, Inc., in San Ramon, California. Chromalab, an environmental laboratory, is certified by the State of California for hazardous waste testing (certification number E694). In order to meet the time restraints of Caltrans, both soil and grab groundwater samples were analyzed on a five day turnaround time.

3. Selection of Sample Locations

For both soil and grab groundwater samples, the selection of a sample location was specified by Caltrans. The goal was to obtain representative pollutant concentrations in the portion of the property which Caltrans anticipates acquiring. The sampling protocol and methodology was based on guidance from the following:

- Test Methods for Evaluating Solid Waste, SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency;

- Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, California Regional Water Quality Control Board, San Francisco Bay Region, August 10, 1990;

- Drilling, Sealing, and Sampling Protocol, Wahler Associates.

On April 6, 1992 Wahler staff, along with staff, from Caltrans and representatives of the property owners, visited the property and marked the location of each proposed boring. Some boring locations were modified at the time of drilling due to drilling conditions and/or a re-evaluation of site conditions. Generalized boring locations are shown on Figure 2, and scaled boring locations are shown on Plate 1.

D. FIELD INVESTIGATIONS

1. Soil Borings

Soil borings HW-2 through HW-5 were completed on April 9, 1992 and soil boring HW-1 was completed on April 10, 1992 (see Figure 2 and/or Plate 1). Prior to drilling activities, all utilities were located using the services of a private locator, California Utilities of Oakland,

California, as well as "Underground Service Alert." Also, prior to drilling activities, an SSP was completed and discussed with all field personnel (see Appendix C).

The soil borings were advanced with a truck mounted drill rig, a mobile B-61 supplied by Gregg Drilling and Testing, Inc. of Concord, California, using 6.5-inch diameter hollow stem augers. During drilling operations, soil samples were collected at intervals of 2, 5, and 10 feet or other appropriate intervals (see boring logs in Appendix D). The samples were obtained with a 2.5 inch I.D. split-barrel, ring-lined sampler. Most of the samples were obtained in stainless steel liners. However, samples from boring HW-1 were obtained in brass liners as the stainless steel liner stock was depleted because of sample splitting at the Barbary Coast property with ENSR Consulting and Engineering. The sampler was advanced into the subsurface at the target depths with a 140 pound pneumatic hammer, dropping 30 inches. The number of blows required to advance the sampler 18 inches was recorded on the boring logs for the three, 6-inch driving intervals. This procedure provides an indication of the relative density or consistency of the subsurface material. Numerous times in the fill material, refusal was encountered and the sampler could not be advanced further. If possible, the boring was advanced with the hollow stem augers a short distance and sampling was again attempted.

Soil cuttings and samples were logged in the field by an experienced geologist under supervision of a registered engineer. Selected soil samples were screened in the field with an organic vapor monitor (OVM) using head space analysis. For the head space analysis, the sample was placed in a zip-lock plastic bag and exposed to sunlight to enhance volatilization of any hydrocarbon pollutants in the soil samples. The head space in the zip-lock bag was then tested for hydrocarbon content using the OVM.

Soil samples (liners) selected for laboratory analysis were sealed and stored in an ice-filled cooler prior to transport under chain-of-custody to Chromalab, Inc. The samples were then analyzed for the pollutants of concern by the previously discussed appropriate EPA test methods. Appendix E contains the laboratory data sheets and the associated chain-of-custody forms.

The augers and other such equipment were steam-cleaned prior to use at each boring. Other sampling equipment was cold-cleaned between borings with inorganic detergent and clean tap water. All borings were tremied to the surface with a cement-grout mixture.

2. Grab Groundwater Samples

Grab groundwater samples were collected from each soil boring which encountered groundwater. To obtain these samples, the borings were advanced to the target depth and the hollow-stem augers were then pulled slightly to allow an adequate flow of groundwater into the boring. A steam-cleaned and/or cold cleaned (inorganic detergent and deionized water) teflon bailer was lowered into the boring to retrieve a water sample. Water was poured directly from the bailer into 40 ml VOAs, and several one-liter amber bottles as well as a plastic bottle. Due to the generally muddy consistency of the groundwater, as encountered in each boring, filtering the samples for metal analysis was not completed at the time of sampling as normal practice dictates. Rather, to obtain the maximum number of data points in the field, the laboratory filtered each sample prior to analysis. This is more thoroughly discussed in the Quality Assurance/Quality Control section of this report. Filled containers were sealed, labelled, and stored in an ice filled cooler for transport under chain-of-custody to Chromalab, Inc. for analysis. The grab groundwater samples were analyzed for the same pollutants as the soil samples. Appendix E contains the laboratory data sheets and the associated chain-of custody forms. It should be noted that chemical results from grab groundwater samples are considered only as gross indicators of groundwater conditions. Individual chemical isopleths are not routinely constructed using such results, unless used in conjunction with results obtained from adjacent monitoring wells sampled at the time the grab groundwater samples were obtained. Nevertheless, chemical results obtained from grab groundwater samples can indicate the existence of potential groundwater pollutants.

E. GEOLOGY AND HYDROGEOLOGY

The engineering geologic map for the area (Area 1 and Engineering Geology of the Oakland West Quadrangle, California, U.S. Geological Survey, Miscellaneous Geologic Investigations Map I-239) indicates that the properties occupy previously tidal flats and/or shoreline areas of the San Francisco Bay (based upon an 1856 U.S. Coast and Geodetic Survey). This map also indicates that in the area, the depth of the present fill ranges from seven to twelve feet and contains sand size to boulder size materials. Recent investigations by other consultants indicated that the fill material is composed of slag and other waste material from the steel making process. Soil borings which Wahler completed verified these findings. Beneath the fill material Bay Mud was generally found. Beneath the Bay Mud the Temescal Formation was encountered in several borings on the Barbary Coast property. Borings HW-1 through HW-5 were generally drilled to a depth of about 10 feet, although, not all of the borings were advanced to this depth as the fill material could not always be penetrated by the augers. Table 1 lists the total depth of each boring completed on the Shellmound property during the hazardous waste investigation as well as the approximate depth of fill material, and Appendix D contains the soil boring logs. Groundwater was encountered in the borings at depths ranging from four to eight feet below ground surface. Because these properties occupy former tidal flats and shoreline areas, it is anticipated that the shallow groundwater is subject to tidal fluctuations. Therefore, the groundwater gradient and velocity is anticipated to vary on a daily basis.

F. CHEMICAL RESULTS

1. Soil Samples

From the five soil borings advanced on this property, a total of twelve soil samples were taken and analyzed for pollutants of concern. Table 2 and Table 3 summarize the results of the organic and inorganic compounds tested for at the property, and Plate 1 identifies the concentrations found at each boring location. Oil and Grease were found in each boring, with

the highest concentration of 200 parts per million (ppm) in sample HW-3-1 at a depth of 2.5 - 3.0 feet. TPH-G was not found at detectable concentrations in any of the borings. TPH-D was found in several borings, with the highest concentration at 19 ppm in sample HW-3-1 at a depth of 2.5 to 3.0 feet. Trichloroethene (TCE) and Tetrachloroethane (PCE) were the only VOCs that were above the detection limits in any of the borings. These compounds were found in sample HW-5-3 at a depth of 11 to 11.5 feet and at a concentration of 6.4 and 13 parts per billion (ppb) respectively. The only sample which contained PCBs was in boring HW-1. The highest concentration was in sample HW-1-2 at a depth of 5.5 to 6 feet, and at a concentration of 0.29 ppm. Elevated metal concentrations were generally found in each boring. The highest concentrations of Cadmium, Chromium, Lead, Zinc, Nickel, and Arsenic were found in samples HW-1-2, HW-5-1, HW-3-1, HW-4-3, HW-1-1, and HW-3-1 respectively. Cadmium was found at a depth of 5.5 to 6.0 feet in sample HW-1-2 and at a concentration of 11 ppm. Chromium was found at a depth of 2.5 to 3.0 feet in sample HW-5-1 and at a concentration of 229 ppm. In sample HW-3-1, lead was found at a concentration of 300 ppm at a depth of 2.5 to 3.0 feet. Zinc was found at a concentration of 634 ppm in sample HW-4-3 at a depth of 11.0 to 11.5 feet. Nickel was found in sample HW-1-1 at a concentration of 98 ppm and at a depth of 3.0 to 3.5 feet. Arsenic was found at a concentration of 6.2 ppm in sample HW-3-1 at a depth of 2.5 to 3.0 feet.

For each boring, the sample which contained the highest concentration of polutants was generally selected for the WET and/or TCLP. Sample HW-5-3 was selected for the TCLP for VOCs. The results indicate TCE and PCE at concentrations of 0.50 and 0.70 ppb respectively. For the WET samples HW-1-2, HW-2-2, HW-3-1, HW-4-3, and HW-5-1 were selected. The highest concentrations of Cadmium, Chromium, Lead, Zinc, Nickel, and Arsenic were found to be 1.5 ppm, 14 ppm, 81 ppm, 160 ppm, 6.6 ppm, and 0.5 ppm, respectively. Sample HW-3-1 contained the highest concentrations of Cadmium, Lead, Zinc, Nickel, and Arsenic, while sample HW-2-2 contained the highest concentration of Chromium. Table 4 is a summary of the WET and TCLP results.

2. Grab Groundwater Samples

Only borings HW-2, HW-4, and HW-5 were sampled for groundwater as the other borings were not able to penetrate the water table due to adverse drilling conditions. Groundwater from all of the borings sampled contained elevated concentrations of Oil and Grease and TPH-D, the highest being 29 ppb and 3,400 ppb, respectively. These results were obtained from boring HW-2. Only groundwater from boring HW-5 contained detectable concentrations of VOCs. The VOCs detected were Chloroform, Benzene, TCE, and PCE at concentrations of 5.1 ppb, 6.0 ppb, 6.8 ppb, and 9.0 ppb respectively. TPH-G, PCBs, and Semi-Volatiles, were all found at non-detectable concentrations in groundwater samples from these borings. For metals, only Chromium and Zinc were found in the groundwater at detectable concentrations. Chromium was found in all three borings, with the highest concentration in HW-4 at 0.06 ppm. Zinc was only found in boring HW-4 and at a concentration of 0.02 ppm. Table 5 summarizes grab groundwater samples obtained from these borings.

G. QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) REVIEW

QA/QC procedures for the collection and chemical analysis of soil and groundwater samples have been promulgated by the EPA in document SW-846. These procedures are designed to confirm the reliability of the test results. This section offers a review of the QA/QC procedures that were followed in the field, and the QA/QC data supplied by the testing laboratory, Chromalab, Inc.

1. Field Sampling

The soil and groundwater samples were collected in accordance with Wahler's internal sampling protocol. To prevent contamination between discrete sampling points, the hollow stem augers used to drill the soil borings were steam cleaned prior to use. Between each sampling episode, the California modified split-spoon samplers were cold-cleaned with non-hazardous inorganic

detergent. The integrity of the soil samples was maintained by properly sealing, labelling, and storing the samples until receipt by the testing laboratory.

Grab groundwater samples were collected from each soil boring location using clean teflon bailers, and the water samples were carefully poured into approved containers, sealed, labelled and stored on ice pending receipt by Chromalab. On each day of sampling, equipment blanks were collected in the field. The equipment blank is a QA/QC measure that is used to check the cleanliness of the sampling equipment. To prepare an equipment blank, de-ionized water supplied by Chromalab was poured into the teflon bailer. The water was then poured into 40 ml VOA containers, labelled, and submitted blind to the laboratory. A trip blank (travel blank) was carried with the sample containers throughout the field day. The trip blank was prepared by Chromalab using de-ionized water. The trip blank is a QA/QC measure that is used to evaluate whether contamination of samples has occurred in the container (cooler) that is used to transport the samples, or in the laboratory prior to analysis of the samples. The equipment blanks and the trip blank were analyzed in the laboratory for the presence of volatile organic compounds (VOC's) by EPA Method 8240.

The chain-of-custody of both the soil samples and the grab groundwater samples were duly recorded. The chain-of-custody (COD) forms are attached with the laboratory data sheets in Appendix E. The chemical analyses requested for each sample were indicated on the chain-of-custody forms. Additional tests such as TCLP and STLC (WET) were requested by verbal communication as these tests were dependent on the outcome of the initial tests as listed on the COD forms.

2. Laboratory Analysis

To evaluate the validity of the test results, the following QA/QC parameters were reviewed:

- sample holding times
- equipment blank and trip blank analytical data
- surrogated spike recovery data
- matrix spike/matrix spike duplicate (MS/MSD) recovery data

The laboratory reports indicate that for all the samples, the analytical procedures including extraction and analysis were performed within the sample holding times specified by the EPA for the various analyses.

Surrogate spike recovery data was supplied by Chromalab for the EPA 8240 and EPA 8270 analysis of the soil and water samples. The SW-846 manual requires that each sample be spiked with a known quantity of surrogate compounds. These compounds are similar to, but distinct from the compounds being tested for in the sample. the percentage of the surrogate recovered by the analysis is a measure of the accuracy of the concentration of contaminants reported by the lab for a particular sample. For volatile organic analysis (EPA 8240/624) the surrogate compounds specified are D4-1, 2-Dichloroethane, D8-Toluene, and Bromofluorobenzene. The recovery percentages for compound D4-1, 2-Dichloroethane exceeded the specified upper limit of 114% for water samples HW-4 and HW-5. In our discussions, Chromalab indicated that the cause of the high recoveries may be due to matrix effects in the samples; recoveries for all samples in that batch were consistently high with some samples exceeding the upper limit. The effect of the excessive recoveries may be that the reported concentrations would be slightly higher than actual concentrations. It should be noted that the reported sample concentrations are not adjusted based on the surrogate recoveries, but are reported as raw data.

For semi-volatile organic analysis (EPA 8270/625), the surrogate compounds that are specified by SW-846 manual are Nitrobenzene D5, 2-Fluorobiphenyl, Terphenyl D14, Phenol D5, 2-Fluorophenol, and 2,4,6-Tribromophenol. Water samples HW-5 and HW-2 were analyzed for semi-volatile organic compounds. The surrogate recoveries for all surrogate compounds in both water samples fell within the specified limits, and are considered acceptable.

A trip blank and an equipment blank were collected on the first day of sampling at the Shellmound property. Both blanks, along with grab groundwater samples from borings HW-2, HW-4, and HW-5 were analyzed for the presence of volatile organic compounds by EPA method 8240. Chloroform was detected in the trip blank at 4.3 ppb. Chloroform was also detected in water sample HW-5 at 5.1 ppb. However, Chloroform was not detected in the equipment blank BS-1. This unusual situation was discussed with Chromalab. The lab indicated that it does not use the chemical Chloroform in any of its analytical procedures. However, the de-ionized water that is used by the lab for analytical procedures comes from the same source as the de-ionized water that was used to prepare both the trip blank and the equipment blank. The lab indicates that the trip blank was run twice to confirm the existance of chloroform and that the water samples were run in the same period of time. At present, there is insufficient evidence to assume laboratory error. It should be noted that other contaminants were detected in water sample HW-5. Thus, the presence of chloroform may not necessarily be a false positive result, and Wahler recommends that the boring location HW-5 be resampled for confirmation.

Matrix spike/matrix spike duplicate (MS/MSD) data was supplied by Chromalab for all the chemical analyses requested. The SW-846 manual specifies that MS/MSD analyses be performed on a subset of the samples being analyzed. In the MS/MSD procedure, the selected sample is spiked with a compound that is identical to the compound being analyzed for. The selected sample is then split, to create a duplicate, and both parts are analyzed. The recovery percentages of both spikes should fall within limits specified either by SW-846 or the laboratory, as allowed by SW-846. The relative percent difference (RPD) of the recoveries of the spike and duplicate are calculated and are used to assess the precision of the analytical procedure. The

MS/MSD data was reported as percentage recovery of spike and duplicate. The RPD's were calculated in each case and were compared with the RPD limits set by SW-846 or the limits set by the lab for spike recoveries from water and soil matrices. The RPD's for Metals analysis, PCB's, EPA 8240/625, EPA 8270/625, TPH-G, TPH-D, and Oil and Grease were reviewed for all soil and water samples from borings HW-1, through HW-5. All RPD's fell within the allowable limits, and are considered acceptable.

In addition to a review of the above QA/QC procedures, Wahler did confirm with Chromalab that all water samples were filtered in the lab prior to digestion for heavy metal analysis. The samples were reportedly filtered through 0.45 micron filter paper.

Based on the results of the QA/QC review, the soil and water sample results appear to be acceptable for the purposes of this investigation.

H. BENEFICIAL USES/CLEANUP GOALS FOR SITE RESOURCES

1. Soil/Groundwater

Cleanup of soil and groundwater at the Site is driven by the (current or potential) beneficial use of the resource. The goal is to return usable groundwaters to beneficial uses within a reasonable time-frame. The Regional Water Quality Control Board (RWQCB), as required by the California Porter-Cologne Water Quality Control Act, has defined the beneficial uses of various water bodies in the greater San Francisco Bay Area. The beneficial uses of the water bodies are presented in the Water Quality Control Plan for the San Francisco Basin (Basin Plan). The Basin Plan was adopted on December 16, 1986 by the RWQCB, and was approved on May 21, 1987 by the State Water Resources Control Board (SWRCB). The Basin Plan classifies the groundwater in the area of the Site as "part of the Santa Clara Valley Groundwater Basin," and states that "present and potential uses applicable to the main groundwater basins in the Region are municipal supply, industrial process water supply, industrial service supply, and agricultural

supply." In addition, the Basin Plan states that the "use of waters in the vicinity represent the best information on beneficial uses." The Site is located near the San Francisco Bay in an area which has been filled with industrial wastes derived from the steel manufacturing process. The area which was filled was formerly tidal lands. Previous studies completed for the Shellmound property (PES Environmental, Inc. 1991) have indicated that groundwater production wells (tapping lower aquifers) have not been found within one mile of the property. In addition, the PES Environmental, Inc. report suggests that the only wells in the area are for monitoring the shallow groundwater.

In addition to the Basin Plan, the SWRCB has established the "Sources of Drinking Water" policy to provide guidance for municipal and domestic designation for State Waters. According to the SWRCB Policy, all groundwaters are considered suitable or potentially suitable for municipal or domestic supply with two exceptions. The first exception states that if total dissolved solids (TDS) in the groundwater exceed 3000 mg/l then the groundwater will not be considered for municipal or domestic use. The second exception states that if a single well does not provide sufficient water to produce a sustained average yield of 200 gallons per day, then the groundwater will not be considered for municipal or domestic use. Given the location of the Site, Wahler anticipates that either of these two exceptions may apply for the shallow groundwater. Wahler, upon considering the goals of the Basin Plan, the "Sources of Drinking Water Policy," and past investigations by other consultants, as well as interaction with RWQCB staff, anticipates that State drinking water standards will not be enforced unless at some future date it is found that the Site is impacting aquifers used for domestic or municipal purposes. As such, it may be prudent to conduct an independent well survey to verify and document that water supply wells have not been utilized at the property, or if they were utilized, that they were properly destroyed. This is a prudent action for a site which has been in use for so long.

Another source of regulatory oversight for the Site is found in the California Code of Regulations, Title 22, Article 2 through 5. According to Title 22, Cal EPA Department of Health Services (DHS)sets forth criteria for identifying hazardous waste defined as Resource

Conservation and Recovery Act (RCRA) hazardous waste. Title 22 classifies a material as a RCRA waste if it has been discarded at an unauthorized facility and is either toxic (based on the Total Threshold Limit Concentration, and/or the Toxicity Characteristic Leaching Procedure, or the Solubility Threshold Limit Concentration) ignitable, reactive, or corrosive. These classifications are pertinent to the wastes found on-site, and Wahler anticipates that they may not be strictly enforced. Rather, they may be enforced on a site specific and/or waste specific basis.

2. Cleanup Goals

a. Site Remediation

Chemicals found in the soil and groundwater at the Site are considered subject to Federal and State of California standards. For soils containing elevated levels of TPH, current RWQCB guidance generally allows soils with TPH to remain in place if concentrations are below 100 ppm and the potential for groundwater impact is shown to be minimal. Soils with TPH concentrations above 100 ppm and below 1000 ppm are classified as designated waste. Soils with TPH concentrations above 1000 ppm are classified as hazardous waste. Soils classified as designated or hazardous waste usually require disposal at a Class I or Class II landfill or treatment to reduce concentrations to less than 100 ppm and then disposed at a Class II or Class III landfill. In some cases, and on a site specific basis, the RWQCB has allowed soils treated to below 100 ppm to be left and/or contained on-site.

For soils containing elevated levels of metals, the concern of DHS is the potential for leaching of the heavy metal pollutants, e.g. lead, zinc, mercury, and cadmium, into the groundwater. Where heavy metal concentrations are below their respective STLC, the soil containing the pollutants is classified as non-hazardous. Soils containing metals that exceed their TTLC are classified as hazardous waste. In addition, cleanup can be required if the STLC values exceed EPA drinking water standards.

The highest concentrations of chemical compounds found in the soils and groundwater at the Site are presented in Table 6 and Table 7. For comparative purposes, Federal and State cleanup standards for drinking water are also listed. It is apparent that while most of the chemical compounds found at the Site during Wahler's investigation exceed the state standards for drinking water, the metals Cadmium, Chromium, and Lead were found to exceed Title 22 standards at the Site. As stated earlier, Wahler does not believe that these standards will be strictly enforced, rather, cleanup standards will need to be developed based on the risk appraisal process. An initial PEA has already been completed for the Shellmound III property by the developer and/or owner. It should be noted, however, that a PEA assessment, according to guidance (see references), is a "preliminary appraisal method." This method utilizes a series of screening values to determine if concentrations of a pollutant "...are significant. They [screening values] are not limits of health concern...screening values are <u>not</u> to be used as a target for removal or remedial actions <u>nor</u> as a standard of performance after a removal or remedial action has taken place." In addition, an Environmental Risk Assessment (Earth Matrics, 1987, 1988) has been completed for the Site. However, Wahler did not see any documentation indicating that the Risk Assessment has been accepted by the regulatory agencies. As a consequence and because the risk appraisal process may have changed since the subject risk assessment has been completed, an updated risk assessment may be required for the Site. However, in lieu of this and for the purposes of this investigation, Wahler has applied prevailing and normally accepted cleanup goals for similar situations.

b. <u>Construction Activities</u>

Materials which are removed from the Site due to construction may be subject to more stringent cleanup standards than if those same materials were left in place at the Site. This is due in part to the strict requirements regulating the transportation and disposal of hazardous materials. In addition, construction workers at the Site may be at increased risk for short periods of time during excavation of soils and other material. Worker exposure during construction activities would be addressed during the risk assessment anticipated for the property.

In addition, if dewatering is implemented for construction activities, then the water obtained from that process may need to be property disposed by treatment prior to discharge via an NPDES permit or to the sanitary sewer. Obtaining an NPDES permit and/or a permit to discharge to the local sewer may take as long as six months.

I. IDENTIFICATION OF REMEDIAL TECHNOLOGIES

1. Introduction

Various remedial options are available to remediate soil and groundwater. A number of relevant remediation technologies are considered below, each with its own benefits and limitations. On a general basis, these technologies can be broadly categorized as destructive, separation and physical/chemical containment.

Destructive remediation processes generally are most effective when used to destroy a broad range of organic compounds including TPH-D and Oil and Grease pollutants. Destructive technologies include incineration, bioremediation, and a wide variety of chemical destruct technologies. Destructive technologies are generally not applicable to inorganic (heavy metal) pollutants.

Separation technologies are available for both hydrocarbon and metal pollutants, and a wide variety of separation and treatment technologies are currently employed in the industry. Commonly used separation and treatment technologies include soil washing, air and steam stripping, soil venting, steam injection, liquid and vapor phase granular activated carbon, and many varieties of pump-and-treat technologies. Most separation technologies are only effective with organic wastes; however, leaching, flushing, and washing techniques tend to be effective for both organic and inorganic wastes.

Physical or chemical containment of hazardous waste can be achieved through several methods. Stabilization/Solidification, provide a highly cost efficient method of bringing organic, inorganic, and mixed wastes into compliance. While applicable over a wide range of waste combinations, the effectiveness of this process can be limited where there is a predominance of organics in the waste. Other containment techniques currently employed include: container storage, vitrification, entombment, slurry walls, grout curtains, and other barrier techniques.

2. Options for Soil and Groundwater Remediation

Based on the results of limited subsurface investigations performed by Wahler and existing site information, the following remedial options are currently available for treatment of hydrocarbon and metal pollutants at this Site:

a. **Excavation** (treatment and removal)

- Removal to a disposal facility

  Off-site disposal of excavated soil to a Class I landfill will require the services of a hazardous waste hauler to transport the impacted soils. As this method of disposal usually just transfers the pollutant problem to another location, current regulatory policy does not usually favor this type of action unless the soil can first be treated to reduce the TPH concentrations to below 100 ppm. "Land-ban" regulations also require that soil containing heavy metal pollutants be first treated to minimize the leaching potential of the pollutants prior to disposal at a Class I landfill. Thus, pre-treatment regulations have increased the cost of disposal at Class I landfills.

- Incineration

Incineration achieves destruction of pollutants through thermal destruction. Several different incineration methods are currently available. Specific application requirements may prescribe the use of catalytic or thermal oxidizers, rotary kiln, fluidized bed, or infrared technologies. While incineration is effective for use with organic waste, it is not suitable for use with metals. Incineration of waste containing even a low level of metal contaminants may require further processing and may further create toxic emissions problems. The use of incineration is generally limited to low volume waste applications, based on production rates and comparative processing costs.

- Bioremediation

Bioremediation is another process designed for use with predominantly organic wastes. Two methods are typically used: biodegradation and enhanced biodegradation. The process of biodegradation encourages bacteria, indigenous to the soil, to metabolize pollutants while the process of enhanced biodegradation involves the destruction of pollutants by the introduction of specific microbes and nutrients to enhance natural bacterial metabolism. While bioremediation tends to be a relatively inexpensive process, it can also be an extremely slow process, thus reducing its appeal where the time-reuse factor is dominant. Since bioremediation tends to be contaminant specific, it has a limited application with mixed wastes.

b. **In-situ Treatments** (treatment and replacement)

- Stabilization

The stabilization process involves combining specially formulated reagents with the waste so that the pollutants are chemically maintained in their most immobile, or least toxic form. The goal in the stabilization state is to reduce the solubility or chemical reactivity of a waste. This change is brought about by altering the chemical state of the waste through the addition of a specific reagent mix.

In the stabilization process, a choice of reagents is available for a broad range of wastes, both organic and inorganic. Different reagents may include oxidation/reduction agents, complexing agents or various chemical adsorbents such as ion exchange resins, activated carbon and organophillic clays.

- Solidification

Solidification is a physical process designed to convert the waste into an easily handled solid, significantly reducing the potential for leaching. The beneficial results of this treatment are obtained primarily through the production of a solid, impermeable matrix with relatively high structural integrity.

Various techniques are used when solidifying the waste product. The first of these, chemical sorption, results in the elimination of all free liquid by adding a reagent such as Quicklime (CaO) to hydrate the liquid present in the waste. The second solidification process uses lime and flyash to form a low-strength cement. The finely divided, non-crystalline silica in the flyash combines with the calcium in the lime to produce a concrete matrix which effectively entraps the waste. The third technique combines Portland cement, flyash or other pozzolan materials to produce a stronger waste/concrete

composite. In this process, containment is realized by microencapsulation of the waste within the concrete matrix. For specific application requirements, soluble silicates may be added to accelerate hardening and containment of metals.

- Soil washing

This process involves the use of detergents or surfactants to wash pollutants from the soil. The detergent or surfactant formulas are usually pollutant specific. In addition, the soil will usually require preparation prior to washing. The wash solution must either be disposed of or further treated.

c. **Barrier Walls**

- Slurry Walls

A slurry wall is one of several types of subsurface cut-off walls that prevent leachate penetration by redirecting upgradient groundwater away from a contaminated area, and/or controlling horizontal leachate movement away from the site. A slurry wall is constructed by filling a trench with a slurry such as bentonite or bentonite-soil-cement during excavation. The backfilled trench has a much lower coefficient of permeability than the surrounding soil and thus creates a barrier to flow of groundwater.

- Sheet Piling

Sheet piling can be used to form a continuous groundwater barrier. Although sheet piles can also be made of wood or precast concrete, steel is generally the most effective in terms of cutting off groundwater and ease of installation. The construction of a steel sheet piling cut-off wall involves driving interlocking piles into the ground using a

pneumatic or steam-driven hammer. In some cases, the piles are pushed into pre-dug trenches. Piles are commonly 4 to 40 feet long and 15 to 20 inches wide.

- Grout Curtains

Generally, grouting is the injection under pressure of one of a variety of special fluids into a rock or soil body. Once this fluid sets in the rock or soil voids, it greatly reduces the permeability, and increases the mechanical strength of the grouted mass. When carried out in the proper pattern and sequence, this process can result in a curtain or wall that can be a very effective groundwater barrier. The injection process itself involves drilling holes to the desired depth and injecting the grout with the use of special equipment. A line of holes is drilled in single, double, or sometimes triple staggered rows (depending on the site characteristics) and fluid is injected in either descending stages with increasing pressure, or ascending stages with decreasing pressure. The spacing of the injection holes is site-specific and is determined by the penetration radius of the grout out from the holes. Ideally, the grout injected in adjacent holes should fuse between them. This process ultimately results in a continuous, impervious barrier or curtain.

d. Infiltration Barriers

Infiltration barriers involve surface sealing (capping) a site with any of a variety of materials, including clay and low permeability soils, asphalt, concrete, or geomembranes to prevent water infiltration and to mitigate the effects of hazardous waste. Since Caltrans plans to develop the site by construction of a roadway, the asphaltic concrete pavement of the roadway can be designed to act as an effective barrier to infiltration of surface water. The pavement capping would also tend to mitigate the effects of the soil pollutants by inhibiting direct contact with the potential users of the site.

e. Extraction Wells/Interceptor Trenches

- Extraction Well Systems

Extraction wells are usually well points, which are driven into the ground, or they are occasionally deep wells, which are drilled and cased. Groundwater is collected in the extraction wells and pumped by submersible pumps or above ground air-lift pumps directly out of the wells, into the treatment system.

- Extraction Well/Interceptor Trench Systems

Typically an underground, gravel-filled trench with perforated pipe or tile laid at the bottom, acts as a subsurface drain to intercept leachate, infiltrating water or groundwater. The water or leachate is subsequently pumped out through extraction well points, into the treatment system.

- Interceptor Trench Systems

The interceptor trench is used to transport leachate or infiltrating water away from the waste site, typically to a collection sump or tank. The sides and bottom of the trench may be lined with plastic or clay before the trench is backfilled with gravel.

J. CONCLUSIONS/RECOMMENDATIONS

It is apparent that from past investigations a significant amount of work has been completed on the Shellmound III property. This information should be used in conjunction with current investigations to determine statistically, the concentrations of soil pollutants on all three Shellmound parcels. This information would be used, if needed, in the development of the next phase of field investigations. Wahler anticipates that the next phase of field investigations will

consist of verifying soil pollutant concentrations on the remaining two Shellmound parcels if needed, as well as evaluating the horizontal and vertical extent of groundwater pollutants. During drilling by the Wahler geotechnical team, hydrocarbon odors were reported in other locations on the site. It is possible that hydrocarbon plumes have migrated beneath the existing roadway and beyond, in a direction towards the San Francisco Bay. Wahler has been informed by Caltrans geotechnical personnel that during the construction of the existing roadway, fill/native material was removed and replaced with dredged sand to a depth of 15 feet and across the width of the existing highway, approximately 150 feet. Sand is a permeable material and would act as a preferential pathway for off-site migration of any hydrocarbon groundwater plumes that originate on the properties that are adjacent to the highway. It may also be prudent to conduct a well survey to identify if past water sources for the property included on-site water-producing wells for domestic or industrial us.

K. LIMITATIONS

The data, information, interpretations, and recommendations contained in this technical report are presented solely as preliminary bases and guides to the existing environmental conditions of the Shellmound Ventures Property. The conclusions and professional opinions presented herein were developed by Wahler in accordance with generally accepted engineering principles and practices. As with all geotechnical and environmental reports, the opinions expressed here are subject to revisions in light of new information, new governmental regulations or new interpretations of existing regulations, which may be developed in the future, and no warranties are expressed or implied.

This report has not been prepared for use by parties other than Caltrans. It may not contain sufficient information for the purposes of other parties or other uses. If any changes are made in the project as described in this report, the conclusions and recommendations contained herein should not be considered valid, unless the changes are reviewed by Wahler, and the conclusions and recommendations are modified or approved in writing.

Soil deposits may vary in type, strength, permeability, and many other important properties between points of observation and exploration. Additionally, changes can occur in groundwater and soil moisture conditions due to seasonal variations, or for other reasons. Furthermore, the distribution of chemical concentrations in the soil and groundwater can vary spatially and over time. The chemical analysis results presented herein are illustrative of only the sampling locations at the time of sampling. Therefore, it must be recognized that Wahler does not and cannot have complete knowledge of the subsurface conditions underlying the subject site. The opinions presented are based upon the findings at the points of exploration and upon interpretative data, including interpolation and extrapolation of information obtained at points of observation.

L. ACKNOWLEDGEMENTS

This report was prepared under general supervision of F. Nick Homayounfar, PhD, P.E., Manager of Wahler's Environmental Services. The project was directed by Fred A. Seirafi, Manger, East Bay Office. Ray N. Kahler, Senior Geologist, acted as Project Manager. Field work was conducted by Ray Kahler and Todd Murray. Bruce Gaviglio, G.E. provided geotechnical review of the field data. Data analyses and remediation studies were performed by Robert C. Serafin, Environmental Scientist, Lynford Edwards, Civil/Environmental Engineer, and Xinggang Tong, Environmental Engineer. Support services were provided by Lisa Larsen and Maria Tarczy. John J. Heneghan, Senior Vice President and Jose Landazuri, Manager, Geotechnical Services provided overall review and quality assurance/quality control.

TABLE 1

BORING/FILL DEPTHS - HAZARDOUS WASTE INVESTIGATION

SHELLMOUND VENTURES PROPERTY

BORING NUMBER	TOTAL DEPTH (FEET)	APPROXIMATE DEPTH OF FILL (FEET)
HW-1	9.0	*
HW-2	11.5	~8
HW-3	3.5	*
HW-4	11.5	*
HW-5	11.5	*

NOTES:

* Fill at least as deep as total depth of boring. Fill/native contact not encountered.

TABLE 2

SOIL SAMPLES

CHEMICAL SUMMARY SHEET - ORGANIC COMPOUND

SHELLMOUND VENTURES PROPERTY

				Analyte/Compound Concentrations				
Boring Number	**Date Sampled**	**Sample Number**	**Depth (feet)**	**Oil & Grease EPA 418.1 mg/kg**	**TPH-G EPA 8015 mg/kg**	**TPH-D EPA 8015 mg/kg**	**VOCs EPA 8240 ug/kg**	**PCBs EPA 8080 mg/kg**
HW-1	4/10/92	HW-1-1	3.0- 3.5	110	N.D.	N.D.	N.D.	0.055
		HW-1-2	5.5- 6.0	100	N.D.	N.D.	N.D.	0.29
HW-2	4/09/92	HW-2-1	4.5- 5.0	29	N.D.	1.8	N.D.	N.D.
		HW-2-2	6.0- 6.5	N.D.	N.D.	N.D.	N.D.	N.D.
		HW-2-3	11.0-11.5	N.D.	N.D.	N.D.	N.D.	N.D.
HW-3	4/09/92	HW-3-1	2.5- 3.0	200	N.D.	19	N.D.	N.D.
HW-4	4/09/92	HW-4-1	4.5- 5.0	N.D.	N.D	N.D.	N.D.	N.D.
		HW-4-2	6.0- 6.5	150	N.D.	7.3	N.D.	N.D.
		HW-4-3	11.0-11.5	92	N.D.	3.3	N.D.	N.D.
HW-5	4/09/92	HW-5-1	2.5- 3.0	16	N.D.	N.D.	N.D.	N.D
		HW-5-2	8.0- 8.5	23	N.D.	N.D.	N.D.	N.D
		HW-5-3	11.0-11.5	87	N.D.	8.4	6.4 TCE* 13 PCE	N.D
			MDL	10	1.0	1.0	5	0.5

NOTES:

N.D. Not Detected at Method Detection Limits
MDL Method Detection Limit
TPH-G Total Petroleum Hydrocarbons as Gasoline
TPH-D Total Petroleum Hydrocarbons as Diesel
VOCs Volatile Organic Compounds
PCBS Polychlorinated Biphenyls
mg/l Milligram per liter
ug/l Microgram per liter; 1 mg/l = 1,000 ug/l
* Sample selected for Toxicity Characteristic Leaching Procedure

TABLE 3

SOIL SAMPLES

CHEMICAL SUMMARY SHEET - INORGANIC COMPOUNDS

SHELLMOUND VENTURES PROPERTY

Boring Number	Date Sampled	Sample Number	Depth (feet)	Cadmium mg/kg	Chromium mg/kg	Lead mg/kg	Zinc mg/kg	Nickel mg/kg	Arsenic mg/kg
HW-1	04/10/92	HW-1-1	3.0 - 3.5	5.9	68	9.1	32	98	N.T.
		HW-1-2	5.5 - 6.0	11	21	210	360	20	N.T.
HW-2	04/09/92	HW-2-1	4.5 - 5.0	2.0	140	21	55	3.4	N.T.
		HW-2-2*	6.0 - 6.5	2.0	160	10	20	3.8	N.D.
		HW-2-3	11.0 -11.5	1.2	17	5.5	19	17	N.T.
HW-3	04/09/92	HW-3-1*	2.5 - 3.0	5.9	57	300	600	58	6.2
HW-4	04/09/92	HW-4-1	4.5 - 5.0	9.3	160	4.3	59	21	N.T.
		HW-4-2	6.0 - 6.5	5.4	61	43	290	57	N.T.
		HW-4-3*	11.0 -11.5	3.9	180	240	634	11	1.2
HW-5	04/09/92	HW-5-1*	2.5 - 3.0	3.2	229	77	58	5.7	N.D.
		HW-5-2	8.0 - 8.5	2.5	73	N.D.	5	47	N.T.
		HW-5-3	11.0 -11.5	5.9	96	80	95	24	N.T.
			MDL	0.05	0.5	0.5	0.5	0.5	0.25

NOTES:

N.D. Not Detected at Method Detection Limits
N.T. Not Tested
MDL Method Detected Limits
mg/kg Milligrams per Kilogram
* Sample Selected for Waste Extraction Test

TABLE 4

SOIL SAMPLES

CHEMICAL SUMMARY SHEET - TCLP/STLC

SHELLMOUND VENTURES PROPERTY

ORGANIC COMPOUNDS

Boring Number	Date Sampled	Sample Number	Analyte/Compound Concentrations (TCLP)	
			TCE ug/l	PCE ug/l
HW-5	4/09/92	HW-5-3	0.5	0.7

INORGANIC COMPOUNDS

Boring Number	Date Sampled	Sample Number	Analyte/Compound Concentrations (STLC)					
			Cadmium mg/l	Chromium mg/l	Lead mg/l	Zinc mg/l	Nickel mg/l	Arsenic mg/l
HW-1	4/10/92	HW-1-2	0.53	0.8	91	89	0.6	N.D.
HW-2	4/09/92	HW-2-2	0.24	14	0.18	2.9	0.38	N.D.
HW-3	4/09/92	HW-3-1	1.5	3.9	81	160	6.6	0.5
HW-4	4/09/92	HW-4-3	0.03	1.4	0.4	5.1	0.27	N.D.
HW-5	4/09/92	HW-5-1	N.D.	1.2	0.89	N.D.	0.13	N.D.

NOTES:

ug/l Micrograms per liter
mg/l Milligrams per liter - ppm
TCE Trichloroethene
PCE Tetrachloroethene
N.D. Not Detected at Method Detection Limits

TABLE 5

GRAB GROUNDWATER SAMPLES

CHEMICAL SUMMARY SHEET - ORGANIC AND INORGANIC COMPOUNDS

SHELLMOUND VENTURES PROPERTY

EPA Analysis	Analyte/Compound	MDL	HW-1	HW-2	HW-3	HW-4	HW-5
418.1	Oil and Grease	0.5 mg/l	N.S.	29	N.S.	1.2	3.1
8015	TPH-G	50.0 ug/l	N.S.	N.D.	N.S.	N.D.	N.D.
8015	TPH-D	50.0 ug/l	N.S.	3,400	N.S.	430	1,700
8080	PCBs	10.0 ug/l	N.S.	N.D.	N.S.	N.D.	N.D.
8240/624	Benzene Trichloroethene Tetrachloroethane	2.0 ug/l 2.0 ug/l 2.0 ug/l	N.S. N.S. N.S.	N.D. N.D. N.D.	N.S. N.S. N.S.	N.D. N.D. N.D.	6.0 6.8 9.0
8270/625	Semivolatile	0.002 - 0.010 mg/l	N.S.	N.D.	N.S.	N.S.	N.D.
6010	Cadmium Chromium Lead Zinc Nickel	0.001 mg/l 0.01 mg/l 0.01 mg/l 0.005 mg/l 0.01 mg/l	N.S. N.S. N.S. N.S. N.S.	N.D. 0.04 N.D. N.D. N.D.	N.S. N.S. N.S. N.S. N.S.	N.D. 0.06 N.D. 0.02 N.D.	N.D. 0.03 N.D. N.D. N.D.
Date Sampled			--	4/09/92	--	4/09/92	4/09/92

NOTES:

N.D. Not Detected at Method Detection Limits
N.S. Not Sampled
MDL Method Detection Limit
TPH-G Total Petroleum Hydrocarbons as Gasoline
TPH-D Total Petroleum Hydrocarbons as Diesel
PCBs Polychlorinated Biphenyls
mg/l Milligrams per liter (ppm)
ug/l Micrograms per liter (ppb)

TABLE 6

CHEMICALS FOUND IN SOIL SAMPLES

COMPARED WITH VARIOUS CLEANUP STANDARDS

SHELLMOUND VENTURES PROPERTY

CHEMICAL	CONCENTRATION		SAMPLE NUMBER	STANDARD	BASIS
	Total	TCLP/STLC			
ORGANIC COMPOUNDS					
Trichloroethene*	6.4 ug/kg	0.5 ug/kg	HW-5-3	5 ug/l, 0.5 mg/l, 204 mg/l	1, 2, 3
Tetrachloroethene*	13 ug/kg	0.7 ug/l		5 ug/l, 0.7 mg/l	1, 2
PCBs*	0.29 mg/kg		HW-1-2	5 mg/l	3
TOTAL PETROLEUM HYDROCARBONS					
Oil and Grease	200 mg/kg		HW-3-1	10 mg/l, -100 mg/l	6
Diesel	19 mg/kg		HW-3-1	10 mg/l, -100 mg/l	6
METALS					
Cadmium	11 mg/kg	N.A.	HW-1-2	10 ug/l, 1.0 mg/l, 1.0 mg/l, 100 mg/kg	1, 2, 4, 5
	5.9 mg/kg	1.5 mg/l	HW-3-1		
Chromium	229 mg/kg	1.2 mg/l	HW-5-1	50 ug/l, 5.0 mg/l, 5.0 mg/l, 1,000 mg/kg	1, 2, 4, 5
	160 mg/kg	14 mg/l	HW-2-2		
Lead	300 mg/kg	81 mg/l	HW-3-1	50 ug/l, 5.0 mg/l, 5.0 mg/l, 1,000 mg/kg	1, 2, 4, 5,
Zinc	634 mg/kg	5.1	HW-4-3	5,000 ug/l, 250 mg/l, 5,000 mg/kg	1, 4, 5
	600 mg/kg	160	HW-3-1		
Nickel	98 mg/kg	N.A.	HW-1-1	100 ug/l, 20 mg/l, 2,000 mg/kg	1, 4, 5
	58 mg/kg	6.6	HW-3-1		1, 2, 4, 5
Arsenic		0.5	HW-3-1	50 ug/l, 5 mg/l, 5 mg/l 500 mg/kg	1, 2, 4, 5

NOTES:

*	Known or possible carcinogen
ug/l	Micrograms per liter
mg/l	Milligrams per liter
mg/kg	Millgrams per kilogram
N.A.	Not Analyzed
TCLP	Toxicity Characteristic Leaching Procedure
STLC	Soluble Threshold Limit Concentrations
1	California State Primary and/or Secondary Maximum Contamination Level for Drinking Water (proposed or adopted).
2	TCLP, Article 3 - Characteristics of Hazardous Waste Title 22.
3	STLC - Organic Substances, Article 3 - Characteristics of Hazardous Waste, Title 22.
4	STLC - Inorganic Substances, Article 3 - Characteristics of hazardous Waste, Title 22.
5	TTLC - Inorganic Substances, Article 3 - Characteristics of Hazardous Waste, Title 22.
6	Current Acceptable Practice, RWQCB - Tri Regional Recommendations

TABLE 7

CHEMICALS FOUND IN GRAB GROUNDWATER SAMPLES

COMPARED WITH VAIOUS CLEANUP STANDARDS

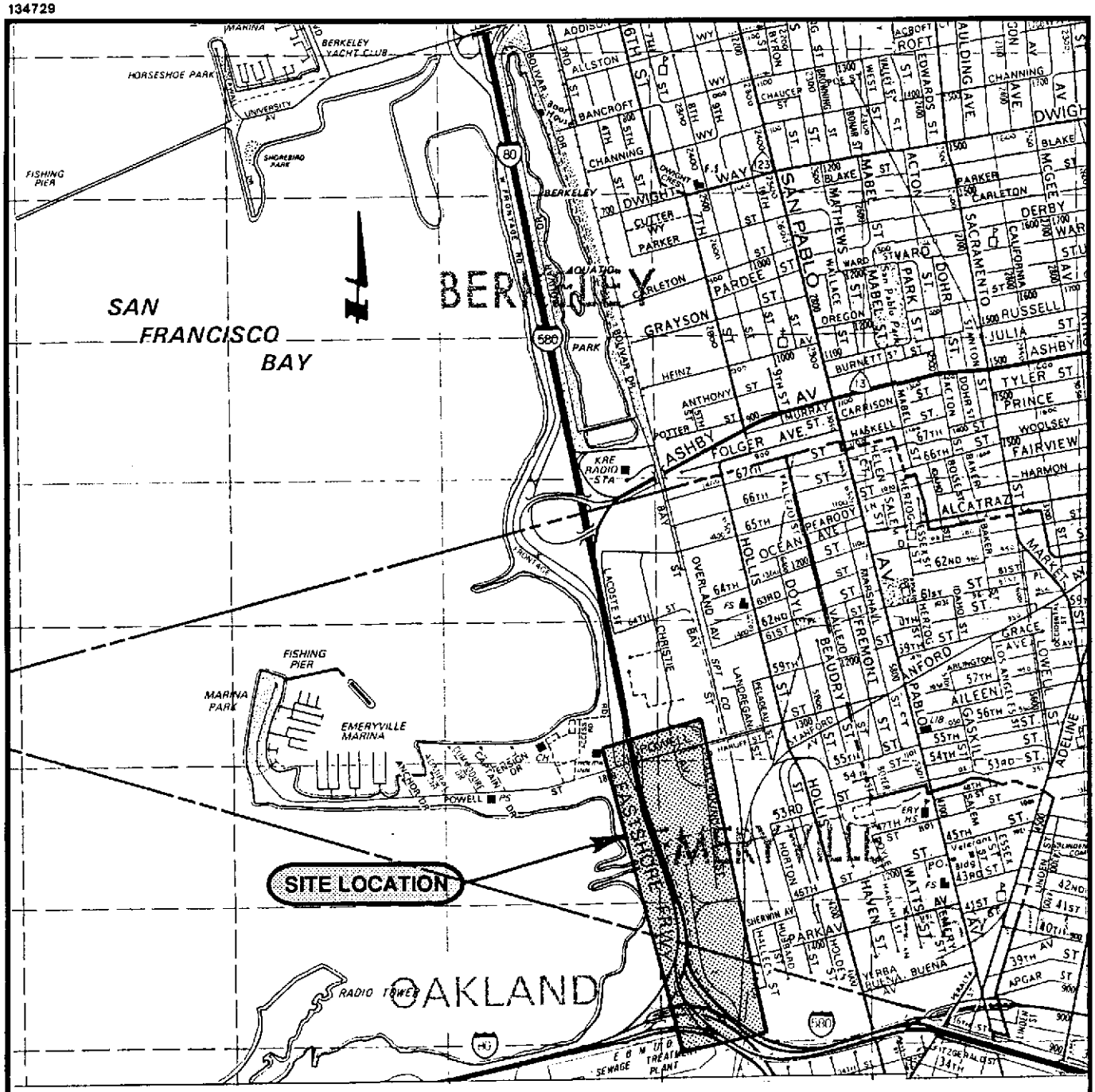
SHELLMOUND VENTURES PROPERTY

CHEMICAL	CONCENTRATION	LOCATION	STANDARD	BASIS
VOLATILE ORGANIC COMPOUNDS				
Benzene*	6.0 ug/l	HW-5	1 ug/l	1
Trichloroethene*	6.8 ug/l	HW-5	5 ug/l	1
Tetrachlorethane*	9.0 ug/l	HW-5	5 ug/l	1
TOTAL PETROLEUM HYDROCARBONS				
Oil and Grease	29 mg/l	HW-2	50 ug/l	2
Diesel	3400 ug/l	HW-2	50 ug/l	2
METALS				
Chromium	0.06 ug/l	HW-4	50 ug/l	1
Zinc	0.02 mg/l	HW-4	5,000 ug/l	1

NOTES:

* Known or possible carcinogen
ug/l Micrograms per liter
mg/l Milligrams per liter
1 California State Primary or Secondary Maximum Contamination Level for Drinking Water (proposed or adopted).
2 Representative NPDES Permits

134729



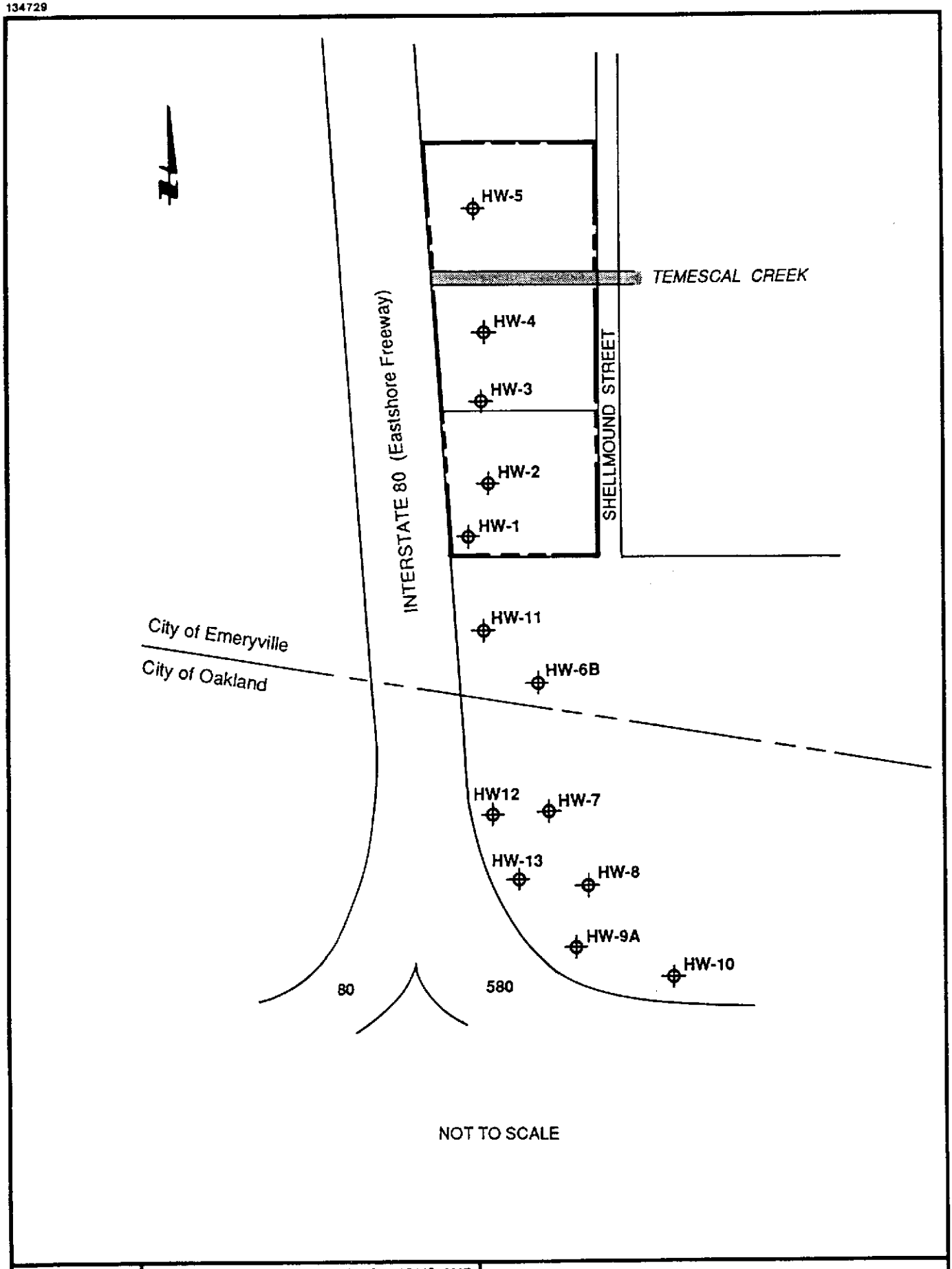
BASE FROM THOMAS BROS MAP

SCALE

0 1/2 1 MILE

Wahler Associates	FREEWAY I-80 WIDENING AND REALIGNMENT HAZARDOUS WASTE INVESTIGATIONS AND REMEDIAL ALTERNATIVES EMERYVILLE, CALIFORNIA	LOCATION MAP		
		PROJECT NO.	DATE	FIGURE NO.
PALO ALTO • CALIFORNIA		CDT-105L	JUNE 1992	1

134729



Wahler Associates	HAZARDOUS WASTE INVESTIGATIONS AND REMEDIAL ALTERNATIVES SHELLMOUND VENTURES PROPERTY EMERYVILLE, CALIFORNIA	SITE SKETCH		
	PALO ALTO • CALIFORNIA	PROJECT NO.	DATE	FIGURE NO.
		CDT-105L	JUNE 1992	2

SCOPE OF WORK

The proposed scope of work was developed based upon a letter from Mr. E. R. Sowko dated March 15, 1992, our discussion with Messrs. E. R. Sowko, Hooshmand Nikoui, and Ms. Zenaida Villamor on March 17, 1992, our discussion with Mr. Nikoui on March 19, 1992, and our understanding of the project. Our proposed scopes of work for both deliverables are presented in the following paragraphs:

1. Deliverable 1 - Hazardous Waste Investigation and Report

Task 110 - Project preparation include the review of previously prepared reports, data and maps in the vicinity of the project site, and interactions with regulatory agencies. Wahler will interact with the Regional Water Quality Control board as needed to confirm that their interests will be addressed.

Task 120 - We will visit the site to assess the current conditions and to coordinate the investigation in order to minimize disturbance to traffic. The location of underground utilities will be coordinated with Underground Services Alert (USA), Caltrans, and a private utility locator prior to drilling. The private utility locator will verify that the boring locations are clear of utilities prior to drillings.

Task 130 - Wahler will prepare a Site Safety Plan (SSP) in accordance with Section 29 of the Code of Federal Regulations (CFR) 190.20. The SSP will be made available to all parties involved in the drilling of exploratory borings and will be available on-site during the drilling operations. Immediately prior to the start of work, a safety meeting will be held at the Site.

Task 140 - Eight exploratory borings will be drilled to approximately 10-foot depths, and five borings will be drilled to approximately 20-foot depths using a truck-mounted drill rig with hollow-stem augers. The borings will be drilled by Gregg Drilling Company of Concord. Bulk groundwater samples will be collected from each boring. Four of the borings are anticipated to be drilled in conjunction with the deeper borings for the geotechnical investigation. Soil

samples will be collected from each boring at 2, 5, and 10 feet below the ground surface, or at a groundwater level, whichever comes first. In addition, soil samples will be collected at the 15 and 20-foot depths.

Cuttings will be logged by an experienced geologist or engineer under the supervision of a registered engineer or geologist. Soil samples and cuttings will be screened in the field using a Photoionization Detector (PID) or other appropriate screening equipment. Wahler's standard Drilling, Well Construction, and Sampling and Sealing Protocol, which is based on accepted practice, will be adhered to during all drilling operations as appropriate. Once the borings have been completed, locations will be surveyed, and the information used during data analysis.

Task 150 - As requested, all soil samples will be analyzed by the following methods: EPA Method 418.1 for Oil and Grease; EPA Method 8015 modified for gasoline and diesel; EPA Method 6010 for heavy metals; EPA Method 8240 for volatile organic compounds; and EPA Method 8080 for polychlorinated biphenyls (PCBs). In addition, and as appropriate, one sample from each boring (containing the highest pollutant concentrations) will have leaching tests performed using the California Waste Extraction Test (WET) and the Toxicity Characteristic Leaching Procedure (TCLP).

For groundwater samples, the analyses will be the same as for soil samples, with the exception of the WET test and the TCLP test, which will not be conducted, because these procedures are for leaching contaminants from a soil sample.

In addition, based upon conversations with Ms. Villamor, five groundwater samples and five soil samples will be analyzed by EPA Method 8270 for semi-volatile compounds.

The Quality Assurance/Quality Control (QA/QC) program will consist of collection and analyses of the following: preparation and preservation of a travel blank for each container of samples transported to the laboratory; an instrument blank and a duplicate groundwater sample for the groundwater samples (for each day or every 10 samples); Wahler will perform a Quality Control

(QC) review of the chemical analyses results to assess the accuracy and precision of analytical data, using data provided by the analytical laboratories.

Task 160 - Data will be tabulated and soil survey sheets completed. The data obtained from the investigation will be evaluated in light of current state and federal regulations governing pollutants, and conditions at and in the vicinity of the Site.

Task 170 - Wahler will evaluate the various treatment alternatives available to remediate any contaminants which are found during the investigation. The results of this evaluation will be used to prepare an opinion of probable cost for remediation of properties subject to acquisition by Caltrans. The selection of the remedial treatment technology will be based upon the concentrations of pollutants at the Site and regulatory clean-up standards for these compounds, as well as a cost vs. benefit analysis.

Task 180 - Weekly status reports for the project will be completed as needed and discussed with, or submitted to Caltrans for review. These reports will be brief and will outline the progress of the work during the previous week and the proposed activities scheduled for the following week.

After completion of the tasks described above, Wahler will prepare a draft report which will detail the investigative efforts and discuss the rationale for selecting the treatment alternative. As appropriate, other recommendations may be included. Comments by Caltrans' staff concerning the draft report will be addressed in a final report for the project. Two copies of the draft report and five copies of the final report are included in our cost estimate.

Task 190 - Wahler staff will be available to meet with Caltrans staff and discuss the progress of the project or the present the findings of the investigation. Three meetings are included in our estimate.

REFERENCES

A Compilation of Water Quality Goals, Staff Report of the California Regional Water Quality Control Board, Central Valley Region, prepared by Jon Marshack, September 1991.

California Code of Regulations, Title 22, Division 4, Environmental Health, Register 91, No. 22, Division 4, Environmental Health, Register 91, No. 22, 5/31/91, published by Barclays Law Publishers.

Earth Metrics, Incorporated; (1987-1988), "Environmental Risk Assessment for the Judson Steel Site, Parcels 1 and 2," prepared for the Martin Company, September 1987 - updated January 1988.

Earth Metrics, Incorporated; (1987), "Final Environmental Risk Assessment for the Judson Steel Site, prepared for the Birmingham Steel Corporation, March 1987.

Interim Guidance for Preparation of a Preliminary Endangerment Assessment Report; California Department of Health Services, June 1990.

Kaldveer Associates: (1988), "Foundation Investigation for Chiron Research Park," July 1988.

PES Environmental, Incorporated; (1991), "Preliminary Endangerment Assessment, Shellmound III Site, prepared for the Martin Group, September 1992.

Radbruch, Dorothy H., 1957, Area and Engineering Geology of the Oakland West Quadrangle, California: U.S. Geological Survey - Miscellaneous Geologic Investigations Map I-239, Scale 1:24,000.

Test Methods for Evaluating Solid Waste, SW-846, Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency.

Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites, California Regional Water Quality Control Board, San Francisco Bay Region, August 10, 1990.

SITE SAFETY EVALUATION FORM

A. SITE DESCRIPTION

Project Name and No. CDT-105 Date April 8, 1992

Location 4300 Eastshore Hwy Emeryville CA Project Manager

(attached site map)

Site Condition Former site of Judson Steel, some building and vacant land

Scope of Work Drill soil borings and take samples - soil and grab H_2O

B. PERSONNEL AND PERSONAL PROTECTIVE EQUIPMENT

Name	Firm	Job. Descr.	Level of Protection	Monitoring Equip.	PPE
Ray Kahler	Wahler	Geologist	D	HNU-PID	
Todd Murray	Wahler	Eng. Assis	D		
Chris St. Pierre	Gregg	Driller	D		
Andy Doig	Gregg	Driller	D		

Level D Safety

Decont. Procedures Steam clean, wash with D.I. & detergent

C. EMERGENCY CONTACTS

All sites working with hazardous waste require a portable telephone.

Nearest public telephone (within 2-5 min. of site) @ Powell & Christie

Mileage from site to nearest public telephone ~ 1/4 mile.

If over 5 miles, name of person working on-site trained in CPR/First Aid:

Agency	Contact	City	Telephone No.
Site Contact	Bob Curlette Leanne Mark (EJSR)	Barbary Coast	(415) 397-6000
Fire Department			911
Police Department			911
Poison Cntl. Ctr.			911
Wahler's Health & Safety Officer	Nick Homayoun far	Palo Alto	(415) 968-6250
Hospital Name and Address	Merritt	350 Hawthorne Oakland	655-4000
Route to Hospital	see attached	map	

Route Map Attached yes

Caltrans Zenaida Villamor (415) 904-9759

FormB/ENVIR

HAZARDS IDENTIFICATION

Chemical Name	PEL/TLV	IDLH	UNIT	LEL(%)	HIGHEST CONCENTRATION (PPM) AIR	WATER	SOIL	SYMPTOMS OF ACUTE EXPOSURE	INSTRUMENT RESPONSE FACTORS PID	FID	OTHER
Benzene	0.1-8hr	Ca	ppm	1.3	?	0.1	<0.05	Irrit eyes, nau, ftg			
Toluene	100-10hr	2000	ppm	1.3		0.0031	0.028	Ftg, Dizz, dil pup			
Ethylebenzene	100	2000	ppm	1.0		0.0004	<0.10	Irrit eyes, mac memb			
Xylene	100 10hr	1000	ppm	1.1		0.0087	0.084	Dizz, drow			
- Lead	<0.1-10hr	N/A	mg/m³	N/A		0.039	20,000	Insom, pal			
- Zinc	5-10hr	N/A	mg/m³	N/A		0.06	12,300	nau, vomit, sweet metal taste			
Arsenic	2	Ca	ug/m³	N/A		0.064	38	ulceration of nas sep			
- Chromium	1-8hr	250	mg/m³	N/A		0.16	1500				
- Nickle	15-10hr	Ca	ug/m³	N/A		0.04	210	sens derm			
Copper	1	N/A	mg/m³	N/A		0.03	910	Irrit mac memb			
Barium	0.5	250	mg/m³	N/A	↓	5.2	950	upper resp irrit			

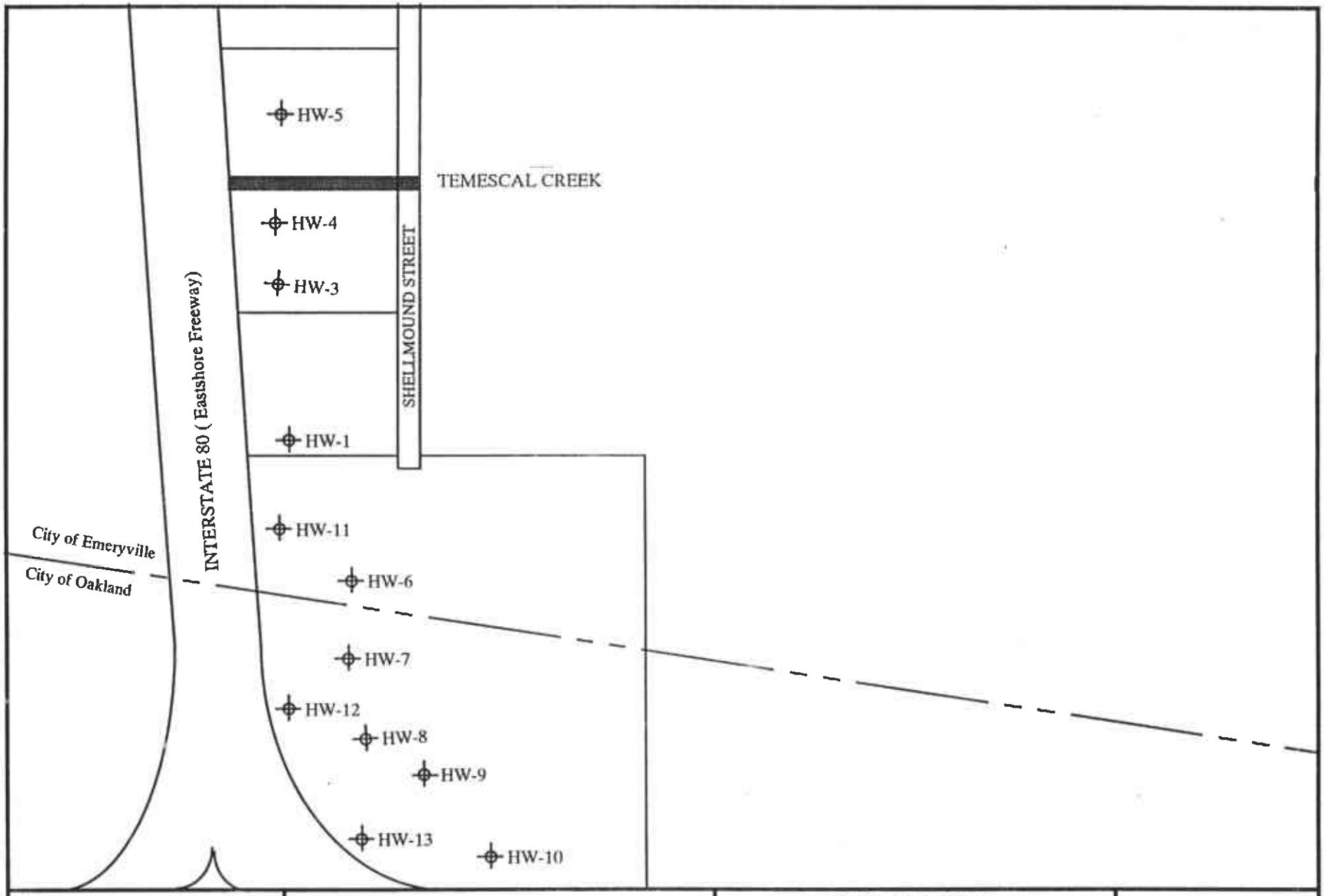
OTHER POTENTIAL HAZARDS

Radioactive Materials ___ Oxygen Deficiency ___ Underground Utilities X

Pathogens ___ Poisonous Animals ___ Aboveground Utilities X

Cold ___ Heat ___ Other X Heavy equipment @ Barbary Coast

Form II-ENVIR



Wahler Associates

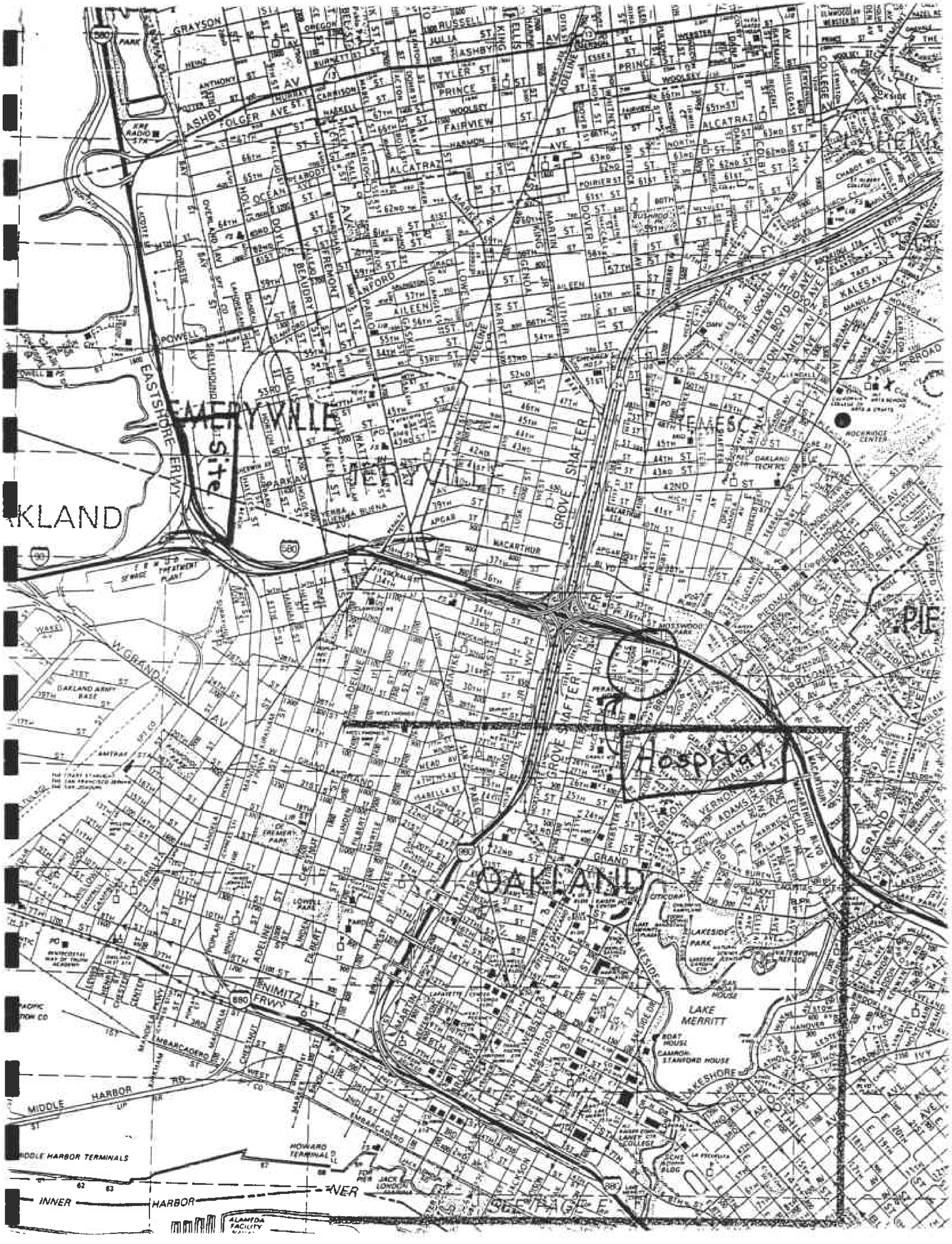
SITE SKETCH

Date: APRIL 1992

Drawing not to scale

Figure No.

1


EMERYVILLE
Site
Hospital
OAKLAND
KLAND
EASTSHORE FRWY
NIMITZ FRWY
LAKE MERRITT
LAKESIDE PARK
MIDDLE HARBOR TERMINALS
INNER HARBOR
OAKLAND ARMY BASE
SEWAGE TREATMENT PLANT
GRAYSON
ASHBY
ALCATRAZ
POWELL
MACARTHUR
GRAND
WEST GRAND
EMBARCADERO
MIDDLE HARBOR RD
GROVE
SHAFTER
ADELINE
SAN PABLO
BROADWAY
TELEGRAPH
LAKESHORE
COLLEGE AV
ROCKRIDGE CENTER
BOAT HOUSE
CAMRON-STANFORD HOUSE
JACK LONDON

BORING LOCATION: Shellmound Ventures Property		APPROVED BY: BG	GROUND EL: 10.18'
DEPTH/ELEV.WATER : ~6'	DRILL CONTRACTOR: Gregg Drilling		TOTAL DEPTH: 9.0'
DRILL RIG: Mobile B-61	BORING DIA.: 6.5"	DATE DRILLED: 4-10-92	LOGGED BY: RNK

SOIL CLASS	DESCRIPTION	DEPTH	SAMPLE NO.	PR / RQD	REC.	MODE	REMARKS
	FILL 0'-9': GRAVELLY SAND, slag and refactory material; grey to brown to white; moist; poorly compacted.	0				HA	Advanced boring with 8" O.D. hollow stem augers (HA). Samples obtained by driving (DR) a 2" I.D. California split-spoon sampler (CS).
		2	HW-1-1	8	0.5	DR CS	
SW	hard drilling	4					
				9	0.7	DR	
		6	HW-1-2	18 50	1.5	CS	
	~6.5': Color change to dark brown to dark grey.						
	~8.5': 0.7' x 0.5' slag chunk retrieved from boring.	8				HA	
	9': Auger will not advance refusal						
	TOTAL DEPTH 9'	10					Terminated Boring at 9'
							No water samples obtained-muddy and will not flow into bailer.
		12					
		14					
		16					
		18					
		20					

DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL- DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

THIS LOG INDICATES CONDITIONS IN THIS HOLE ONLY ON THE DATE INDICATED AND MAY NOT REPRESENT CONDITIONS AT OTHER LOCATIONS AND ON OTHER DATES. ANY WATER LEVELS SHOWN ARE SUBJECT TO VARIATION.

THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONTRACTORS.

THE STRATIFICATION LINES OR DEPTH INTERVALS REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES, AND THE TRANSITIONS MAY BE GRADUAL.

SOIL CLASSIFICATIONS SHOWN ON LOGS ARE FIELD CLASSIFICATIONS BASED ON THE UNIFIED SOILS CLASSIFICATION SYSTEM.

Wahler Associates	FREEWAY I-80 WIDENING AND REALIGMENT EMERYVILLE, CALIFORNIA	EXPLORATION BORING LOG	BORING NO.
		PROJECT NO. CDT-105L	SHEET: 1 of 1	HW-1

BORING LOCATION: Shellmound Ventures Property		APPROVED BY: BG	GROUND EL: 7.79'
DEPTH/ELEV.WATER : ~5'	DRILL CONTRACTOR: Gregg Drilling		TOTAL DEPTH: 11.5'
DRILL RIG: Mobile B-61	BORING DIA.: 6.5"	DATE DRILLED: 4-9-92	LOGGED BY: RNK

SOIL CLASS	DESCRIPTION	DEPTH	SAMPLE NO.	PR / RQD	REC.	MODE	REMARKS
SW	**FILL** 0'-8.': GRAVELLY SAND, slag and refactory material; grey to brown to white; moist; poorly compacted.	0 2 4				HA	Advanced boring with 8" O.D. hollow stem augers (HA). Samples obtained by driving (DR) a 2" I.D. California split-spoon sampler (CS).
			HW-2-1	35 50	0.8 1.0	DR CS	
		6	HW-2	29 26	0.4 1.5	DR CS	
			HW-2-2	31			
CL	**BAY MUD** 8'-11.5': LEAN CLAY: Dark grey; wet; very soft; organic odor.	8 10				HA	
			HW-2-3	1 1 2	1.5 1.5	DR CS	
	TOTAL DEPTH 11.5'	12 14 16 18 20					Boring Terminated at 11.5' Grab water samples obtained HW-2

DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL- DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

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THIS HOLE WAS LOGGED IN SUCH A WAY AS TO PROVIDE DATA PRIMARILY FOR DESIGN PURPOSES AND NOT NECESSARILY FOR THE PURPOSES OF SPECIFIC CONTRACTORS.

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SOIL CLASSIFICATIONS SHOWN ON LOGS ARE FIELD CLASSIFICATIONS BASED ON THE UNIFIED SOILS CLASSIFICATION SYSTEM.

Wahler Associates	FREEWAY I-80 WIDENING AND REALIGMENT EMERYVILLE, CALIFORNIA	EXPLORATION BORING LOG		BORING NO.
		PROJECT NO.	SHEET: 1 of 1	HW-2
		CDT-105L		

BORING LOCATION: Shellmound Ventures Property		APPROVED BY: BG		GROUND EL: 10.30'
DEPTH/ELEV.WATER :		DRILL CONTRACTOR: Gregg Drilling		TOTAL DEPTH: 3.5'
DRILL RIG: Mobile B-61	BORING DIA.: 6.5"	DATE DRILLED: 4-9-92		LOGGED BY: RNK

SOIL CLASS	DESCRIPTION	DEPTH	SAMPLE NO.	PR / RQD	REC.	MODE	REMARKS
SW	FILL 0'-3.5': GRAVELLY SAND, slag and refactory material; grey to brown to white; moist; poorly compacted. 1/4" x 3" iron rod pop bottle cap	0 2				HA	Advanced boring with 8" O.D. hollow stem augers (HA). Samples obtained by driving (DR) a 2" I.D. California split-spoon sampler (CS).
				11	0.5	DR	
			HW-3-1	50	1.5	CS	
	REFUSAL					HA	
	TOTAL DEPTH 3.5'	4					Boring Terminated at 3.5'

DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL- DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

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SOIL CLASSIFICATIONS SHOWN ON LOGS ARE FIELD CLASSIFICATIONS BASED ON THE UNIFIED SOILS CLASSIFICATION SYSTEM.

6 8 10 12 14 16 18 20

Wahler Associates

FREEWAY I-80 WIDENING AND REALIGMENT EMERYVILLE, CALIFORNIA

EXPLORATION BORING LOG

PROJECT NO. CDT-105L

SHEET: 1 of 1

BORING NO. HW-3

BORING LOCATION: Shellmound Ventures Property		APPROVED BY: BG		GROUND EL: 10.35'
DEPTH/ELEV.WATER : ~8'		DRILL CONTRACTOR: Gregg Drilling		TOTAL DEPTH:
DRILL RIG: Mobile B-61	BORING DIA.: 6.5"	DATE DRILLED: 4-9-92		LOGGED BY: RNK

SOIL CLASS	DESCRIPTION	DEPTH	SAMPLE NO.	PR / RQD	REC.	MODE	REMARKS
SW	FILL 0'-0.5': ASPHALT 0.5'-11.5': GRAVELLY SAND, slag and refactory material; grey to brown to white; moist; poorly compacted. ~5': Increase in refactory material. Color change to reddish brown. ~6..5': Increase in refractory material. Color change to yellow. ~11.5: Increase in fines, could be near interface of fill/native contact.	0 2 4 6 8 10	HW-4-1 HW-4-2 HW-4 HW-4-3	41 14 / 25 / 12 7 / 43 / 41 9 / 27 / 18	0.0 / 0.5 0.7 / 1.5 1.0 / 1.5 0.5 / 1.5	HA DR CS HA DR DR CS HA DR CS	Advanced boring with 8" O.D. hollow stem augers (HA). Samples obtained by driving (DR) a 2" I.D. California split-spoon sampler (CS).
	TOTAL DEPTH 11.5'	12 14 16 18 20					Boring Terminated at 11.5' Grab water samples obtained HW-4.

DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL- DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

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Wahler Associates

FREEWAY I-80 WIDENING AND REALIGMENT EMERYVILLE, CALIFORNIA

EXPLORATION BORING LOG

PROJECT NO. CDT-105L

SHEET: 1 of 1

BORING NO. HW-4

BORING LOCATION: Shellmound Ventures Property	APPROVED BY: BG	GROUND EL: 10.36'
DEPTH/ELEV.WATER : ~8'	DRILL CONTRACTOR: Gregg Drilling	TOTAL DEPTH: 11.5'
DRILL RIG: Mobile B-61	BORING DIA.: 6.5"	DATE DRILLED: 4-9-92	LOGGED BY: RNK

SOIL CLASS	DESCRIPTION	DEPTH	SAMPLE NO.	PR / RQD	REC.	MODE	REMARKS
GW	FILL 0'-11.5': SANDY GRAVEL, slag and refactory material; grey to brown to white; moist; poorly compacted.	0				HA	Advanced boring with 8" O.D. hollow stem augers (HA). Samples obtained by driving (DR) a 2" I.D. California split-spoon sampler (CS).
		2	HW-5-1	48 50	0.6 1.5	DR CS	
		4				HA	
	~6.5': Increase in refractory material	6		19 25 36	0.2 1.5	DR CS	
						HA	
	~8.5': Increase in refractory material.	8	HW-5 HW-5-2	31 50	0.8 1.5	DR CS	
	~10': No gravel size fragments	10				HA	
			HW-5-3	17 32 25	0.8 1.5	DR CS	
	TOTAL DEPTH 11.5'	12					Boring Terminated at 11.5'
		14					Grab water samples obtained - hydrocarbon sheen HW-5.
		16					
		18					
		20					

DATA ON THIS LOG ARE AN APPROXIMATION OF THE GEOLOGIC AND SUBSURFACE CONDITIONS BECAUSE THE INFORMATION WAS OBTAINED FROM INDIRECT, DISCONTINUOUS, AND POSSIBLY DISTURBED SAMPLING NECESSITATED BY USE OF SMALL- DIAMETER HOLES. ROTARY AND WASH BORING HOLES HAVE FURTHER COMPLICATIONS IN THIS REGARD BECAUSE OF THE NEED TO USE DRILLING FLUID AND/OR CASING IN ADVANCING HOLES.

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Wahler Associates

FREEWAY I-80 WIDENING AND REALIGMENT EMERYVILLE, CALIFORNIA

EXPLORATION BORING LOG

PROJECT NO. CDT-105L

SHEET: 1 of 1

BORING NO. HW-5

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 23, 1992 ChromaLab File No.: 0492122

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: One soil sample for Arsenic and STLC (WET) Cadmium, Chromium, Lead, Zinc, Nickel and Arsenic analyses

Project Name: CAL TRANS
Project Number: CDT-105
Date Sampled: Apr. 10, 1992 Date Submitted: Apr. 13, 1992
Date Extracted: Apr. 21, 1992 Date Analyzed: Apr. 22, 1992

RESULTS:

Sample I.D.	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Zinc (mg/L)	Nickel (mg/L)	Arsenic (mg/L)
HW-1-2	0.53	0.8	91	89	1.6	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE REC.	60%	65%	*	*	102%	60%
DUP SPIKE REC	60%	68%	*	*	93%	60%
DET. LIMIT	0.01	0.1	0.1	0.1	0.1	0.05
METHOD OF ANALYSIS	3010/ 6010					

Sample I.D.	Arsenic (mg/Kg)
HW-1-2	0.50
SPIKE RECOVERY	75%
DUP SPIKE RECOVERY	76%
DETECTION LIMIT	0.250
METHOD OF ANALYSIS	3050/6010

*Lead and Zinc concentration in sample more than 4 times spiked amount.

ChromaLab, Inc.

Refaat A. Mankarious
Inorganics Supervisor

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 20, 1992 ChromaLab File No.: 0492122

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: Three soil samples for Cadmium, Chromium, Lead, Nickel and Zinc analyses

Project Name: CAL TRANS
Project Number: CDT-105
Date Sampled: April 10, 1992 Date Submitted: April 13, 1992
Date Extracted: April 17, 1992 Date Analyzed: April 20, 1992

RESULTS:

Sample	Cadmium (mg/Kg)	Chromium (mg/Kg)	Lead (mg/Kg)	Zinc (mg/Kg)	Nickel (mg/Kg)
HW-1-1	5.9	68	9.1	32	98
HW-1-2	11	21	210	360	20
SS-1	1.6	31	57	500	9.6
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	70%	87%	70%	78%	80%
DUP SPIKE RECOVERY	70%	83%	70%	78%	73%
DETECTION LIMIT	0.05	0.5	0.5	0.25	0.5
METHOD OF ANALYSIS	3050/ 6010	3050/ 6010	3050/ 6010	3050/ 6010	3050/ 6010

ChromaLab, Inc.

Refaat A. Mankarious
Inorganics Supervisor

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992 ChromaLab File No.: 0492096

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: Sixteen soil and four water samples for Cadmium, Chromium, Lead, Zinc and Nickel analysis

Project Name: CAL TRANS
Project Number: CDT-105
Date Sampled: Apr. 9, 1992 Date Submitted: Apr. 9, 1992
Date Extracted: Apr. 14, 1992 Date Analyzed: Apr. 15, 1992

RESULTS:

Sample I.D.	Cadmium (mg/Kg)	Chromium (mg/Kg)	Lead (mg/Kg)	Zinc (mg/Kg)	Nickel (mg/Kg)
HW-5-1	3.2	229	77	58	5.7
HW-5-2	2.5	73	N.D.	5	47
HW-5-3	5.9	96	80	95	24
HW-4-1	9.3	160	4.3	59	21
HW-4-2	5.4	61	43	290	57
HW-4-3	3.9	180	240	634	11
HW-3-1	5.9	57	300	600	58
HW-2-1	2.0	140	21	55	3.4
HW-2-2	2.0	160	10	20	3.8
HW-2-3	1.2	17	5.5	19	17

(Continued on next page)

ChromaLab, Inc.

Refaat A. Mankarious
Inorganics Supervisor

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992

ChromaLab File No.: 0492096

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: Sixteen soil and four water samples for Cadmium, Chromium, Lead, Zinc and Nickel analysis

Project Name: CAL TRANS
Project Number: CDT-105
Date Sampled: Apr. 9, 1992 Date Submitted: Apr. 9, 1992
Date Extracted: Apr. 14, 1992 Date Analyzed: Apr. 15, 1992

RESULTS:

Sample I.D.	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Zinc (mg/L)	Nickel (mg/L)
HW-5	N.D.	0.03	N.D.	N.D.	N.D.
HW-4	N.D.	0.06	N.D.	0.02	N.D.
HW-2	N.D.	0.04	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.	N.D.	N.D.
SPIKE RECOVERY	70%	100%	70%	80%	70%
DUPLICATE SPIKE REC.	70%	90%	70%	80%	70%
DETECTION LIMIT	0.001	0.01	0.01	0.005	0.01
METHOD OF ANALYSIS	6010	6010	6010	6010	6010

ChromaLab, Inc.

Refaat A. Mankarious
Inorganics Supervisor

Eric Tam
Laboratory Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 23, 1992 ChromaLab File No.: 0492096

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: Six soil samples for STLC (WET) Cadmium, Chromium, Lead, Zinc, Nickel and Arsenic analyses

Project Name: CAL TRANS
Project Number: CDT-105
Date Sampled: Apr. 9, 1992 Date Submitted: Apr. 9, 1992
Date Extracted: Apr. 20, 1992 Date Analyzed: Apr. 23, 1992

RESULTS:

Sample I.D.	Cadmium (mg/L)	Chromium (mg/L)	Lead (mg/L)	Zinc (mg/L)	Nickel (mg/L)	Arsenic (mg/L)
HW-5-1	N.D.	1.2	0.89	N.D.	0.13	N.D.
HW-4-3	0.03	1.4	0.4	5.1	0.27	N.D.
HW-3-1	1.5	3.9	81	160	6.6	0.5
HW-2-2	0.24	14	0.18	2.9	0.38	N.D.
SPIKE REC.	60%	65%	*	*	102%	60%
DUP SPIKE REC	60%	68%	*	*	93%	60%
DET. LIMIT	0.010	0.10	0.10	0.05	0.1	0.05
METHOD OF ANALYSIS	3010/ 6010					

*Lead and Zinc concentration in sample more than 4 times spiked amount.

ChromaLab, Inc.

Refaat A. Mankarious
Inorganics Supervisor

Eric Tam
Laboratory Director

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 24, 1992 ChromaLab File No.: 0492096

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: Six soil samples for Arsenic analyses

Project Name: CAL-TRANS
Project Number: CDT-105
Date Sampled: Apr. 9, 1992 Date Submitted: Apr. 9, 1992
Date Extracted: Apr. 14, 1992 Date Analyzed: Apr. 23, 1992

RESULTS:

Sample I.D.	Arsenic (mg/Kg)
HW-5-1	N.D.
HW-4-3	1.2
HW-3-1	6.2
HW-2-2	N.D.

BLANK	N.D.
SPIKE RECOVERY	75%
DUPLICATE SPIKE RECOVERY	76%
DETECTION LIMIT	0.25
METHOD OF ANALYSIS	3050/6010

ChromaLab, Inc.

Refaat A. Mankarious
Inorganics Supervisor

Eric Tam
Laboratory Director

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 17, 1992 ChromaLab File No.: 0492096

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: Sixteen soil samples for Gasoline, Diesel and Oil & Grease analyses

Project Name: CAL TRANS
Project Number: CDT-105
Date Sampled: April 9, 1992 Date Submitted: April 9, 1992
Date Extracted: Apr. 13-14, 1992 Date Analyzed: Apr.13-14, 1992

RESULTS:

Sample I.D.	Gasoline (mg/Kg)	Diesel (mg/Kg)	Oil & Grease (mg/Kg)
HW-5-1	N.D.	N.D.	16
HW-5-2	N.D.	N.D.	23
HW-5-3	N.D.	8.4	87
HW-4-1	N.D.	N.D.	N.D.
HW-4-2	N.D.	7.3	150
HW-4-3	N.D.	3.3	92
HW-3-1	N.D.	19	200
HW-2-1	N.D.	1.8	29
HW-2-2	N.D.	N.D.	N.D.
HW-2-3	N.D.	N.D.	N.D.
BLANK	N.D.	N.D.	N.D.
SPIKED RECOVERY	100%	111%	92%
DUPLICATE SPIKED RECOVERY	104%	105%	90%
DETECTION LIMIT	1.0	1.0	10
METHOD OF ANALYSIS	5030/8015	3550/8015	5520 E/F

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Laboratory Director

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 20, 1992 ChromaLab File No.: 0492122

WAHLER ASSOCIATES Attn: Ray Kahler

RE: Three soil samples for Gasoline, Diesel, and Oil & Grease analyses

Project Name: Cal Trans Project Number: CDT-105
Date Sampled: April 10, 1992 Date Submitted: April 13, 1992
Date Extracted: April 17, 1992 Date Analyzed: April 17-20,1992

RESULTS:

Sample I.D.	Gasoline (mg/Kg)	Diesel (mg/Kg)	Oil & Grease (mg/Kg)
HW-1-1	N.D.	N.D.	110
HW-1-2	N.D.	N.D.	100
SS-1	N.D.	N.D.	23
BLANK	N.D.	N.D.	N.D.
SPIKE RECOVERY	99%	88%	102%
DUP SPIKE RECOVERY	109%	84%	95%
DETECTION LIMIT	1.0	1.0	10
METHOD OF ANALYSIS	5030/8015	3550/8015	5520 E/F

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Laboratory Director

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 17, 1992 ChromaLab File No.: 0492096

WAHLER ASSOCIATES

Attn: Ray Kahler

RE: Five water samples for Gasoline, Diesel and Oil & Grease analyses

Project Name: CAL TRANS
Project Number: CDT-105
Date Sampled: April 9, 1992 Date Submitted: April 9, 1992
Date Extracted: Apr. 13-14, 1992 Date Analyzed: Apr.13-14, 1992

RESULTS:

Sample I.D.	Gasoline (µg/L)	Diesel (µg/L)	Oil & Grease (mg/L)
HW-5	N.D.	1700	3.1
HW-4	N.D.	430	1.2
HW-2	N.D.	3400	29
BLANK	N.D.	N.D.	N.D.
SPIKED RECOVERY	94%	92%	93%
DUPLICATE SPIKED RECOVERY	99%	104%	90%
DETECTION LIMIT	50	50	0.5
METHOD OF ANALYSIS	5030/8015	3510/8015	5520 B/F

*Due to insufficient water, sludge in container was analyzed. 170 mg/Kg of Diesel was found.

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 20, 1992 ChromaLab File No.: 0492122

Wahler Associates

Attn: Ray Kahler

RE: Three soil samples for PCB analysis

Project Name: Cal Trans Project Number: CDT-105
Date Sampled: Apr. 10, 1992
Date Submitted: Apr. 13, 1992
Date Analyzed: Apr. 17, 1992

RESULTS:

SAMPLE I.D.	PCB (mg/kg)
SS-1-1	0.098
HW 1-1	0.055
HW 1-2	0.29
BLANK	N.D.
SPIKE RECOVERY	101%
DUPLICATE SPIKE RECOVERY	86%
DETECTION LIMIT	0.05
METHOD OF ANALYSIS	8080

ChromaLab, Inc.

Mary Cappelli
Analytical Chemist

Eric Tam
Laboratory Director

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 ChromaLab File No.: 0492096A

Wahler Associates

Attn: Ray Kahler

RE: Sixteen soil samples for PCB analysis

Project Name: Cal Trans Project Number: CDT-105
Date Sampled: Apr. 09, 1992
Date Submitted: Apr. 09, 1992
Date Analyzed: Apr. 15, 1992

RESULTS:

SAMPLE I.D.	PCB (mg/kg)
HW 5-1	N.D.
HW 5-2	N.D.
HW 5-3	N.D.
HW 4-1	N.D.
HW 4-2	N.D.
HW 4-3	N.D.
HW 3-1	N.D.
HW 2-1	N.D.
HW 2-2	N.D.
HW 2-3	N.D.

BLANK	N.D.
SPIKE RECOVERY	91%
DUPLICATE SPIKE RECOVERY	89%
DETECTION LIMIT	0.5
METHOD OF ANALYSIS	8080

ChromaLab, Inc.

Mary Cappelli
Analytical Chemist

Eric Tam
Laboratory Director

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CHROMALAB, INC.

Environmental Laboratory (1094)

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By

5 DAYS TURNAROUND

April 28, 1992

ChromaLab File # 0492096
0492117
0492122
0492134

Wahler Associates/Walnut Creek

Attn: Ray Kahler

Re: Surrogate standard recoveries for 8240 and 8270 analyses

Project Name: Cal Trans Project Number: CDT-105

I) 8240 Surrogate Standards

Sample I.D.	D4-1,2-Dichloro-ethane (%)	D8-Toluene (%)	Bromofluoro-benzene(%)
HW-5-1	115.0%	115.0%	98.6%
HW-5-2	116.0%	100.0%	86.4%
HW-5-3	116.0%	98.4%	93.6%
HW-5	116.2%	100.0%	96.0%
HW-4-1	112.0%	99.2%	96.2%
HW-4-2	112.2%	99.0%	98.6%
HW-4-3	119.6%	99.6%	96.2%
HW-4	121.4%	101.0%	97.2%
HW-3-1	115.4%	100.0%	93.0%
HW-2-1	111.2%	114.6%	100.6%
HW-2-2	113.0%	99.6%	93.8%
HW-2-3	115.6%	98.6%	99.4%
HW-2	113.6%	98.2%	95.2%
BS-2	105.6%	103.4%	96.8%
BS-3	112.6%	101.5%	94.2%

(Continued on next page)

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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 28, 1992 ChromaLab File # 0492096
0492117
0492122
0492134

Wahler Associates/Walnut Creek

Attn: Ray Kahler

Re: Surrogate standard recoveries for 8240 and 8270 analyses

Project Name: Cal Trans Project Number: CDT-105

I) 8240 Surrogate Standards (from page 1.)

Sample I.D.	D4-1,2-Dichloro-ethane (%)	D8-Toluene (%)	Bromofluoro-benzene(%)
HW-1-1	104.4%	104.2%	93.1%
HW-1-2	106.5%	95.3%	91.7%
HW-2 SPIKE	103.2%	103.3%	93.2%
HW-2 DUP. SPIKE	105.1%	102.5%	98.6%

(continued on next page)

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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 28, 1992

ChromaLab File # 0492096
0492117
0492122
0492134

Wahler Associates/Walnut Creek

Attn: Ray Kahler

Re: Surrogate standard recoveries for 8240 and 8270 analyses

Project Name: Cal Trans Project Number: CDT-105

II) 8270 Surrogate Standards

Sample I.D.	Nitro-Benzene D5	2-Fluoro Biphenyl	Terphenyl D14	Phenol D5	2-Fluoro-Phenol	246-Tri-bromophenol
HW-5	81.3%	82.5%	83.1%	79.6%	81.2%	80.6%
HW-2	85.2%	84.0%	81.5%	82.7%	85.0%	82.1%

Yiu Tam
Analytical Chemist

Eric Tam
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CHROMALAB, INC.

5 DAYS TURNAROUND

Analytical Laboratory (E694)

April 20, 1992 ChromaLab File # 0492122 A

Wahler Associates Attn: Ray Kahler
Date Sampled: Apr. 10, 1992 Date Submitted: Apr. 13, 1992
Date of Analysis: Apr. 20, 1992

Project Name: CAL TRANS Job No.: CDT-105
Sample I.D.: HW-1-1
Method of Analysis: EPA 8240 Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	92.2% 97.7%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	105% 107%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	111% 97.2%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	100% 106%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 20, 1992 — ChromaLab File # 0492122 B

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 10, 1992 — Date Submitted: Apr. 13, 1992
Date of Analysis: Apr. 20, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-1-2
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	92.2% 97.7%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	105% 107%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	111% 97.2%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	100% 106%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 O

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-2
Method of Analysis: EPA 624 — Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	91.5% 94.2%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	98.7% 95.0%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	102% 96.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 96.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 H

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-4
Method of Analysis: EPA 624 — Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	91.5% 94.2%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	98.7% 95.0%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	102% 96.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 96.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Lab Director

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 D

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-5
Method of Analysis: EPA 624 — Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	91.5% 94.2%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	5.1	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	6.0	---
TRICHLOROETHENE	6.8	98.7% 95.0%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	9.0	102% 96.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 96.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Lab Director

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Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 23, 1992

ChromaLab File # 0492096 C

Wahler Associates
Attn: Ray Kahler
Date Sampled: Apr. 09, 1992
Date Submitted: Apr. 09, 1992
Date Extracted: Apr. 17-18, 1992
Date Analyzed: Apr. 21, 1992

Project Name: CAL TRANS
Job No.: CDT-105
Sample I.D.: HW-5-3
Method of Analysis: TCLP- 624
Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	94.8% 103%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	0.50	98.4% 102%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	0.70	119% 112%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	106% 100%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Charles Woolley
Analytical Chemist

Eric Tam
Lab Director

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 J

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-2-1
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Lab Director

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 M

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-2-2
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

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Yiu Tam
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Eric Tam
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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 N

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-2-3
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

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Eric Tam
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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 I

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-3-1
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 E

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-4-1
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 F

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-4-2
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 G

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-4-3
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

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Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 A

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-5-1
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Lab Director

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Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992

ChromaLab File # 0492096 B

Wahler Associates

Attn: Ray Kahler

Date Sampled: Apr. 09, 1992

Date Submitted: Apr. 09, 1992

Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS

Job No.: CDT-105

Sample I.D.: HW-5-2

Method of Analysis: EPA 8240

Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
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Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 C

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: HW-5-3
Method of Analysis: EPA 8240 — Detection Limit: 5.0 µg/kg

COMPOUND NAME	µg/kg	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	116% 98.4%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	6.4	95.0% 89.9%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	13	107% 102%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 97.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
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Federal ID #68-0140157

CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492096 O

Wahler Associates
Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 09, 1992
Date Extracted: Apr. 15, 1992 — Date Analyzed: Apr. 15, 1992
Project Number: CDT-105 — Project Name: CAl TRANS
Sample I.D.: HW-2
Method of Analysis: 625 — Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.002	-----
BIS(2-CHLOROETHYL) ETHER	N.D.	0.002	98% 101%
2-CHLOROPHENOL	N.D.	0.002	-----
1,3-DICHLOROBENZENE	N.D.	0.002	-----
1,4-DICHLOROBENZENE	N.D.	0.002	-----
BENZYL ALCOHOL	N.D.	0.004	-----
1,2-DICHLOROBENZENE	N.D.	0.002	-----
2-METHYLPHENOL	N.D.	0.002	88% 91%
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.002	-----
4-METHYLPHENOL	N.D.	0.002	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.002	-----
HEXACHLOROETHANE	N.D.	0.002	-----
NITROBENZENE	N.D.	0.002	-----
ISOPHORONE	N.D.	0.002	-----
2-NITROPHENOL	N.D.	0.002	-----
2,4-DIMETHYLPHENOL	N.D.	0.002	-----
BENZOIC ACID	N.D.	0.010	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.002	99% 86%
2,4-DICHLOROPHENOL	N.D.	0.002	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.002	-----
NAPHTHALENE	N.D.	0.002	-----
4-CHLOROANILINE	N.D.	0.004	-----
HEXACHLOROBUTADIENE	N.D.	0.002	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.004	-----
2-METHYLNAPHTHALENE	N.D.	0.002	100% 89%
HEXACHLOROCYCLOPENTADIENE	N.D.	0.002	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.002	- - - - - -
2,4,5-TRICHLOROPHENOL	N.D.	0.002	-----
2-CHLORONAPHTHALENE	N.D.	0.002	-----
2-NITROANILINE	N.D.	0.010	-----
DIMETHYL PHTHALATE	N.D.	0.002	-----
ACENAPHTHYLENE	N.D.	0.002	-----
3-NITROANILINE	N.D.	0.010	-----
ACENAPHTHENE	N.D.	0.002	92% 106%
2,4-DINITROPHENOL	N.D.	0.010	-----
4-NITROPHENOL	N.D.	0.010	-----
DIBENZOFURAN	N.D.	0.002	-----

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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

ChromaLab File # 0492096 O

Project Number: CDT-105 Project Name: CAL TRANS
Sample I.D.: HW-2
Method of Analysis: 625 Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.002	-----
2,6-DINITROTOLUENE	N.D.	0.002	83% 92%
DIETHYL PHTHALATE	N.D.	0.002	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.002	-----
FLUORENE	N.D.	0.002	-----
4-NITROANILINE	N.D.	0.010	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.010	-----
N-NITROSODIPHENYLAMINE	N.D.	0.002	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.002	-----
HEXACHLOROBENZENE	N.D.	0.002	-----
PENTACHLOROPHENOL	N.D.	0.010	89% 98%
PHENANTHRENE	N.D.	0.002	-----
ANTHRACENE	N.D.	0.002	-----
DI-N-BUTYL PHTHALATE	N.D.	0.002	-----
FLUORANTHENE	N.D.	0.002	-----
PYRENE	N.D.	0.002	-----
BUTYLBENZYLPHTHALATE	N.D.	0.002	-----
3,3'-DICHLOROBENZIDINE	N.D.	0.004	-----
BENZO(A)ANTHRACENE	N.D.	0.002	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.002	-----
CHRYSENE	N.D.	0.002	95% 94%
DI-N-OCTYLPHTHALATE	N.D.	0.002	-----
BENZO(B)FLUORANTHENE	N.D.	0.002	-----
BENZO(K)FLUORANTHENE	N.D.	0.002	-----
BENZO(A)PYRENE	N.D.	0.002	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.002	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.002	-----
BENZO(G,H,I)PERYLENE	N.D.	0.002	-----

ChromaLab, Inc.

Yiu Tam
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Eric Tam
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CHROMALAB, INC.

Analytical Laboratory (E694)

5 DAYS TURNAROUND

April 16, 1992

ChromaLab File # 0492096 D

Wahler Associates
Attn: Ray Kahler
Date Sampled: Apr. 09, 1992
Date Extracted: Apr. 15, 1992
Project Number: CDT-105
Sample I.D.: HW-5
Method of Analysis: 625

Date Submitted: Apr. 09, 1992
Date Analyzed: Apr. 15, 1992
Project Name: CAl TRANS

Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
PHENOL	N.D.	0.002	-----
BIS(2-CHLOROETHYL) ETHER	N.D.	0.002	98% 101%
2-CHLOROPHENOL	N.D.	0.002	-----
1,3-DICHLOROBENZENE	N.D.	0.002	-----
1,4-DICHLOROBENZENE	N.D.	0.002	-----
BENZYL ALCOHOL	N.D.	0.004	-----
1,2-DICHLOROBENZENE	N.D.	0.002	-----
2-METHYLPHENOL	N.D.	0.002	88% 91%
BIS(2-CHLOROISOPROPYL)ETHER	N.D.	0.002	-----
4-METHYLPHENOL	N.D.	0.002	-----
N-NITROSO-DI-N-PROPYLAMINE	N.D.	0.002	-----
HEXACHLOROETHANE	N.D.	0.002	-----
NITROBENZENE	N.D.	0.002	-----
ISOPHORONE	N.D.	0.002	-----
2-NITROPHENOL	N.D.	0.002	-----
2,4-DIMETHYLPHENOL	N.D.	0.002	-----
BENZOIC ACID	N.D.	0.010	-----
BIS(2-CHLOROETHOXY)METHANE	N.D.	0.002	99% 86%
2,4-DICHLOROPHENOL	N.D.	0.002	-----
1,2,4-TRICHLOROBENZENE	N.D.	0.002	-----
NAPHTHALENE	N.D.	0.002	-----
4-CHLOROANILINE	N.D.	0.004	-----
HEXACHLOROBUTADIENE	N.D.	0.002	-----
4-CHLORO-3-METHYLPHENOL	N.D.	0.004	-----
2-METHYLNAPHTHALENE	N.D.	0.002	100% 89%
HEXACHLOROCYCLOPENTADIENE	N.D.	0.002	-----
2,4,6-TRICHLOROPHENOL	N.D.	0.002	- - - - -
2,4,5-TRICHLOROPHENOL	N.D.	0.002	-----
2-CHLORONAPHTHALENE	N.D.	0.002	-----
2-NITROANILINE	N.D.	0.010	-----
DIMETHYL PHTHALATE	N.D.	0.002	-----
ACENAPHTHYLENE	N.D.	0.002	-----
3-NITROANILINE	N.D.	0.010	-----
ACENAPHTHENE	N.D.	0.002	92% 106%
2,4-DINITROPHENOL	N.D.	0.010	-----
4-NITROPHENOL	N.D.	0.010	-----
DIBENZOFURAN	N.D.	0.002	-----

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CHROMALAB, INC.

Analytical Laboratory (E694)

ChromaLab File # 0492096 D

Project Number: CDT-105 Project Name: CAL TRANS
Sample I.D.: HW-5
Method of Analysis: 625 Matrix: water

COMPOUND NAME	Sample mg/L	MDL mg/L	Spike Recovery
2,4-DINITROTOLUENE	N.D.	0.002	-----
2,6-DINITROTOLUENE	N.D.	0.002	83% 92%
DIETHYL PHTHALATE	N.D.	0.002	-----
4-CHLORO-PHENYL PHENYL ETHER	N.D.	0.002	-----
FLUORENE	N.D.	0.002	-----
4-NITROANILINE	N.D.	0.010	-----
4,6-DINITRO-2-METHYL PHENOL	N.D.	0.010	-----
N-NITROSODIPHENYLAMINE	N.D.	0.002	-----
4-BROMOPHENYL PHENYL ETHER	N.D.	0.002	-----
HEXACHLOROBENZENE	N.D.	0.002	-----
PENTACHLOROPHENOL	N.D.	0.010	89% 98%
PHENANTHRENE	N.D.	0.002	-----
ANTHRACENE	N.D.	0.002	-----
DI-N-BUTYL PHTHALATE	N.D.	0.002	-----
FLUORANTHENE	N.D.	0.002	-----
PYRENE	N.D.	0.002	-----
BUTYLBENZYLPHTHALATE	N.D.	0.002	-----
3,3'-DICHLOROBENZIDINE	N.D.	0.004	-----
BENZO(A)ANTHRACENE	N.D.	0.002	-----
BIS(2-ETHYLHEXYL)PHTHALATE	N.D.	0.002	-----
CHRYSENE	N.D.	0.002	95% 94%
DI-N-OCTYLPHTHALATE	N.D.	0.002	-----
BENZO(B)FLUORANTHENE	N.D.	0.002	-----
BENZO(K)FLUORANTHENE	N.D.	0.002	-----
BENZO(A)PYRENE	N.D.	0.002	-----
INDENO(1,2,3 C,D)PYRENE	N.D.	0.002	-----
DIBENZO(A,H)ANTHRACENE	N.D.	0.002	-----
BENZO(G,H,I)PERYLENE	N.D.	0.002	-----

ChromaLab, Inc.

Yiu Tam
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Eric Tam
Lab Director

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992

ChromaLab File # 0492096 L

Wahler Associates
Date Sampled: Apr. 09, 1992
Date of Analysis: Apr. 14, 1992

Attn: Ray Kahler
Date Submitted: Apr. 09, 1992

Project Name: CAL TRANS
Sample I.D.: TRIP BLANK
Method of Analysis: EPA 624

Job No.: CDT-105

Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	91.5% 94.2%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	4.3	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	98.7% 95.0%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	102% 96.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 96.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
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CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992

ChromaLab File # 0492096 K

Wahler Associates

Attn: Ray Kahler

Date Sampled: Apr. 09, 1992

Date Submitted: Apr. 09, 1992

Date of Analysis: Apr. 14, 1992

Project Name: CAL TRANS

Job No.: CDT-105

Sample I.D.: BS-1

Method of Analysis: EPA 624

Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	91.5% 94.2%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	98.7% 95.0%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	102% 96.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	105% 96.8%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Lab Director

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Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492117 B

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 09, 1992 — Date Submitted: Apr. 10, 1992
Date of Analysis: Apr. 15, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: BS-2
Method of Analysis: EPA 624 — Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	89.3% 92.6%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	92.6% 98.6%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	91.4% 89.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	93.6% 88.1%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Lab Director

2239 Omega Road, #1 • San Ramon, California 94583
510/831-1788 • Facsimile 510/831-8798
Federal ID #68-0140157

CHROMALAB, INC.

Environmental Laboratory (1094)

5 DAYS TURNAROUND

April 16, 1992 — ChromaLab File # 0492117 F

Wahler Associates — Attn: Ray Kahler
Date Sampled: Apr. 10, 1992 — Date Submitted: Apr. 10, 1992
Date of Analysis: Apr. 15, 1992

Project Name: CAL TRANS — Job No.: CDT-105
Sample I.D.: BS-3
Method of Analysis: EPA 624 — Detection Limit: 2.0 µg/l

COMPOUND NAME	µg/l	Spike Recovery
CHLOROMETHANE	N.D.	---
VINYL CHLORIDE	N.D.	---
BROMOMETHANE	N.D.	---
CHLOROETHANE	N.D.	---
TRICHLOROFLUOROMETHANE	N.D.	---
1,1-DICHLOROETHENE	N.D.	89.3% 92.6%
METHYLENE CHLORIDE	N.D.	---
1,2-DICHLOROETHENE (TOTAL)	N.D.	---
1,1-DICHLOROETHANE	N.D.	---
CHLOROFORM	N.D.	---
1,1,1-TRICHLOROETHANE	N.D.	---
CARBON TETRACHLORIDE	N.D.	---
1,2-DICHLOROETHANE	N.D.	---
BENZENE	N.D.	---
TRICHLOROETHENE	N.D.	92.6% 98.6%
1,2-DICHLOROPROPANE	N.D.	---
BROMODICHLOROMETHANE	N.D.	---
2-CHLOROETHYLVINYLETHER	N.D.	---
TRANS-1,3-DICHLOROPROPENE	N.D.	---
TOLUENE	N.D.	---
CIS-1,3-DICHLOROPROPENE	N.D.	---
1,1,2-TRICHLOROETHANE	N.D.	---
TETRACHLOROETHENE	N.D.	91.4% 89.7%
DIBROMOCHLOROMETHANE	N.D.	---
CHLOROBENZENE	N.D.	---
ETHYL BENZENE	N.D.	---
BROMOFORM	N.D.	---
1,1,2,2-TETRACHLOROETHANE	N.D.	93.6% 88.1%
1,3-DICHLOROBENZENE	N.D.	---
1,4-DICHLOROBENZENE	N.D.	---
1,2-DICHLOROBENZENE	N.D.	---
TOTAL XYLENES	N.D.	---
ACETONE	N.D.	---
METHYL ETHYL KETONE	N.D.	---
METHYL ISOBUTYL KETONE	N.D.	---

ChromaLab, Inc.

Yiu Tam
Analytical Chemist

Eric Tam
Lab Director

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Federal ID #68-0140157

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P.O. Box 10028
Palo Alto, CA 94303
FAX: (415) 968-5365
(415) 968-6250

Walnut Creek Office

CHAIN OF CUSTODY FORM

Laboratory: Chromalab
Turnaround Time: Normal - 10 days
Results To: Ray Kahler

Serial Number:
WA Authorization:
Sheet 1 of 2
Samplers: Todd Muraoka
Recorder: Todd Muraoka (signature required)

Project: Cal Trans
Job Number: CDT-105
Project Manager: Ray Kahler
Date: 4/7/1992

CHROMALAB FILE # 492096
ORDER # 6048

ITEM NO.	SAMPLE NUMBER	DATE AND TIME SAMPLED: Date	Time	MATRIX	# CONTAINERS & PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	HCl	ANALYSIS REQUESTED: Cd	Pb	Zn	Ni	TPH-G	8240	8270	COMMENTS
1	HW-5-1	4/6/92	8:15	Soil	1				X	X	X	X	X	X		
2	HW-5-2		8:30	Soil	1				X	X	X	X	X	X		
3	HW-5-3		8:35	Soil	1				X	X	X	X	X	X		
4	HW-5		9:00	H_2O	3	1		5	X	X	X	X	X	X	X	Sheen on water
5	HW-4-1		9:40	Soil	1				X	X	X	X	X	X		
6	HW-4-2		9:45	Soil	1				X	X	X	X	X	X		
7	HW-4-3		9:50	Soil	1				X	X	X	X	X	X		
8	HW-4		10:00	Water	3	1		5	X	X	X	X	X	X		Sheen on water
9	HW-3-1		10:50	Soil	1				X	X	X	X	X	X		
10	HW-2-1		11:55	Soil	1				X	X	X	X	X	X		
11	BG-1		8:40	H_2O				2								
12	Trip Blank		- -	H_2O				1								

MISCELLANEOUS

Number of Coolers	Type of Coolant
2	ICE

COMMENTS:

LABORATORY COPY WHITE PROJECT COPY YELLOW FIELD or OFFICE COPY PINK

CHAIN OF CUSTODY RECORD

Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation) 4/7/92 4:40	Received by: (signature & affiliation)	Date/Time
Dispatched by: (signature & affiliation) Date/Time	Received for lab by: 4/9/92 1140	Date/Time

Wahler Associates
1023 Corporation Way
P.O. Box 10023
Palo Alto, CA 94303
FAX: (415) 968-5365
(415) 968-6250
Walnut Creek office

CHAIN OF CUSTODY FORM

Laboratory: Chemtech
Turnaround Time: Normal 5 day
Results To: Gary Kahler

Serial Number:
WA Authorization:
Sheet 2 of 2
Samplers: Todd Murray
Recorder: Todd Murray (signature required)

Project: Cal Trans
Job Number: CDT-105
Project Manager: Gary Kahler
Date: 4/9/1992

ITEM NO.	SAMPLE NUMBER	DATE AND TIME SAMPLED: Date	Time	MATRIX	# CONTAINERS & PRESERVATIVES: UNPRESERVED	H2SO4	HNO3	ICE	ANALYSIS REQUESTED / TYPE OF CONTAINER: 8240	8270	COMMENTS
1	HW-2-2	4/9/92	12:00	Soil	1				X		Some head space
2	HW-2-3		12:05	Soil	1				X		
3	HW-2		12:30	H_2O	3	1		1	X	X	Sheen on water
4	HW-11-1		1:50	Soil	1				X		
5	HW-11-2		2:00	Soil	1				X		
6	HW-11		2:30	H_2O	3	1		1	X	X	Sheen on water
7	HW-11 3		2:05	Soil	1				X	X ADD 4-10-92	Head Space
8	HW-12-1		3:00	Soil	1				X		
9	HW-12-2		3:05	Soil	1				X		Head Space
10	HW-12-3		3:20	Soil	1				X		
11	HW-12		4:00	H_2O		1			X		Sheen on water
12											

MISCELLANEOUS

Number of Coolers	Type of Coolant
2	ICE

COMMENTS:

LABORATORY COPY WHITE PROJECT COPY YELLOW FIELD or OFFICE COPY PINK

CHAIN OF CUSTODY RECORD

Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation) 4/9/92 4:40	Received by: (signature & affiliation)	Date/Time
Dispatched by (signature & affiliation) Date/Time	Received for lab by:	Date/Time 4/9/92 4:40

Wahler Associates
1023 Corporation Way
P.O. Box 10023
Palo Alto, CA 94303
FAX: (415) 968 5365
(415) 968 6250

CHAIN OF CUSTODY FORM

Laboratory: Chromalab
Turnaround Time: Normal 5 day
Results To: Ray Kahler

Serial Number:
WA Authorization:
Sheet 1 of 4
Samplers: Todd Murray
Recorder: Todd Murray (signature required)

Project: LAL RAINS
Job Number: CDT-105
Project Manager: Ray Kahler
Date: 4/10/1992

CHROMALAB FILE # 492117
ORDER # 6072

ITEM NO.	SAMPLE NUMBER	DATE SAMPLED	TIME	MATRIX	# CONTAINERS & PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	+DI	ANALYSIS REQUESTED: TPH-G	Heavy Metals	BTEX	TPH-D	COMMENTS
1	HW-13-1	4/9/92	9:50	Soil	1				X	X	X	X	Please split sample
2	BS-2		5:00	H_2O				3					
3	HW-13-2		9:15	Soil	1				X	X	X	X	
4	HW-13		5:30	H_2O					X	X	X	X	
5	HW-10-1	4/10/92	8:10	Soil	1				X	X	X	X	Head space/split
6	BS-3		8:25	H_2O				2					
7	HW-10-2		8:30	Soil	1				X	X	X	X	
8	HW-10-3		8:35	Soil	1				X	X	X	X	
9	HW-10-4		8:40	Soil	1				X	X	X	X	
10	HW-10.5		8:55	Soil	1				X	X	X	X	
11	HW-10		7:15	H_2O	3	1		1	X	X	X	X	
12	HW-9-1		10:00	Soil	1								(Glass jar off flights) (HOLD)

MISCELLANEOUS

Number of Coolers	Type of Coolant
3	ICE

COMMENTS:
Normal 5 day T.A.T.
Metals samples, ase unfiltered, please filter
(X) PER RAY KAHLER 4/13 (H_2O)

LABORATORY COPY WHITE | PROJECT COPY YELLOW | FIELD or OFFICE COPY PINK

CHAIN OF CUSTODY RECORD

Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation) Todd Murray (LAL)	Received by: (signature & affiliation)	Date/Time 4/10/92 6:30 pm
Dispatched by (signature & affiliation) Date/Time	Received for lab by: Terry Cook	Date/Time 4/10/92 6:10 pm

Wahler Associates
1023 Corporation Way
P.O. Box 10023
Palo Alto, CA 94303
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(415) 968-6250

CHAIN OF CUSTODY FORM

Laboratory: Chemtech
Turnaround Time: 5 day
Results To: Ray Kahler

Serial Number:
WA Authorization:
Sheet 2 of 4
Samplers: Todd Murray
Recorder: Todd Murray (signature required)

Project: CAL TRANS
Job Number: CDT-105
Project Manager: Ray Kahler
Date: 4/10/1992

ITEM NO.	SAMPLE NUMBER	DATE SAMPLED		MATRIX	# CONTAINERS & PRESERVATIVES				ANALYSIS REQUESTED / TYPE OF CONTAINER								COMMENTS
		Date	Time		UNPRESERVED	H_2SO_4	HNO_3	ICE					Heavy Metals TPH-G		8270	TPH-D	
1	HW-8-1	4/10/92	10:30	Soil	1				✓	x	x	x	x			x	Please split
2	HW-8-2		10:50	Soil	1				✓	x	x	x	x			x	
3	HW-8-3		11:00	Soil	1				x	x	x	x	x			x	
4	HW-8-4		11:10	Soil	1				x	x	x	x	x			x	
5	HW-8-5		11:15	Soil	1				x	x	x	x	x			x	Head space TPH(D)
6	HW-8		11:30	H2O	3	1		4	x	x	x	x	x			x	
7	HW-9A		12:30	Soil	1				✓	✓	x	x	x			x	
8	HW-9-2		12:35	Soil	1				✓	x	x	x	x			x	
9	HW-9-3		12:45	Soil	1				✓	✓	✓	x	x			x	
10	HW-9-4		12:50	Soil	1				✓	✓	x	x	x			x	
11	HW-9-5		12:55	Soil	1				✓	x	x	x	x			x	
12	HW-9 (7)		1:15	H2O	2	1		4	x	x	x	x	x			x	

MISCELLANEOUS

Number of Coolers	Type of Coolant
3	ICE

COMMENTS:

5 day T.A.T.
Metals Samples (H_2O) are unfiltered, please filter.

LABORATORY COPY WHITE PROJECT COPY YELLOW FIELD or OFFICE COPY PINK

CHAIN OF CUSTODY RECORD

	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation) 4/10/92	Received by: (signature & affiliation)	Date/Time
Dispatched by (signature & affiliation) Date/Time 6:10 pm	Received for lab by: 4/10/92 6:10pm	Date/Time

Wahler Associates
1023 Corporation Way
P.O. Box 10023
Palo Alto, CA 94303
FAX: (415) 968-5365
(415) 968-6250

Chain of Custody Form

Laboratory: Chemtech
Turnaround Time: 5 Day
Results To: Ray Kahler

Serial Number: _____
WA Authorization: _____
Sheet 3 of 4
Samplers: Todd Murray
Recorder: Todd Murray (signature required)

Project: Cal Trans
Job Number: CDT-105
Project Manager: Ray Kahler
Date: 4/10/19 92

ITEM NO.	SAMPLE NUMBER	DATE AND TIME SAMPLED: Date	Time	MATRIX	# CONTAINERS & PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	+Cl	8240	8010	8020	Heavy Metals	TPH-G	8270	TPH-D	COMMENTS
1	HW-7-1	4/10/92	2:15	Soil	1				X	X	X	X	X		X	half full
2	HW-7-2		2:30	Soil	1				X	X	X	X	X	X	X	mason jar/sheen
3	HW-7-3		2:45	Soil	1				X	X	X	X	X		X	
4	HW-7-4		3:50	Soil	1				X	X	X	X	X		X	
5	HW-7-5		3:00	Soil	1				X	X	X	X	X		X	
6	HW-7 (7)		3:15	H_2O	2	1		1	X	X	X	X	X	X	X	sheen on water
7	HW-6-1		4:20	Soil	1											mason jar (Hold)
8	HW-6^A-TM-1		4:40	Soil	1											mason jar (Hold)
9	HW-6^B-TM-1		5:05	Soil	1				X	X	X	X	X		X	Please split
10	HW-6^B-TM-2		5:10	Soil	1				X	X	X	X	X		X	Please split
11	HW-6^B-TM-3		5:15	Soil	1				X	X	X	X	X		X	
12	HW-6B-4		5:20	Soil	1				X	X	X	X	X		X	

MISCELLANEOUS

Number of Coolers	Type of Coolant
3	ICE

COMMENTS:
Normal 5 Day T.A.T
Metals Samples (H_2O) are unfiltered, please filter.

LABORATORY COPY WHITE PROJECT COPY YELLOW FIELD or OFFICE COPY PINK

CHAIN OF CUSTODY RECORD

Relinquished by: (signature & affiliation)	Date/Time	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)		Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)		Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	4/10/92 6:10 pm	Received by: (signature & affiliation)	Date/Time
Dispatched by: (signature & affiliation)	Date/Time	Received for lab by: Gary Cook	4/10/92 6:10 pm

Wahler Associates
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P.O. Box 10023
Palo Alto, CA 94303
FAX: (415) 968-5365
(415) 968-6250

CHAIN OF CUSTODY FORM

Serial Number: ____
WA Authorization: ____
Sheet 4 of 4
Samplers: Todd Murray
Recorder: Todd Murray (signature required)

Laboratory: Chromalab
Turnaround Time: 5 DAY
Results To: Ray Kahler

Project: CAL TRANS
Job Number: SPT-105
Project Manager: Ray Kahler
Date: 4/10/1992

ITEM NO.	SAMPLE NUMBER	DATE AND TIME SAMPLED: Date	DATE AND TIME SAMPLED: Time	MATRIX	# CONTAINERS & PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	HCl	ANALYSIS REQUESTED / TYPE OF CONTAINER: [illegible]	[illegible]	8020	Lead Metals	TPH-G	8270	TPH-D	COMMENTS
1	HW-6B.5	4/10/92	5:30	Soil	1				X	X	X	X	X		X	
2	HW-6B	"	5:45	H_2O	2	1		1	X	X	X	X	X		X	
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																

MISCELLANEOUS

Number of Coolers	Type of Coolant
3	ICE

COMMENTS:
5 DAY T.A.T.
Water sample unfiltered for metals.
Please filter

LABORATORY COPY WHITE · PROJECT COPY YELLOW · FIELD or OFFICE COPY PINK

CHAIN OF CUSTODY RECORD

Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Todd Murray (WA) 4/10/92 6:10 pm		
Dispatched by: (signature & affiliation) Date/Time	Received for lab by: [signature]	4/10/92 6:10 pm

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Palo Alto, CA 94303
FAX (415) 968-5365
(415) 968-6250

Chain of Custody Form

Laboratory: [illegible]
Turnaround Time: [illegible]
Results To: [illegible]

Serial Number:
WA Authorization:
Sheet 1 of 1
Samplers: Todd Murray
Recorder: Todd Murray

Project: Cal Trans
Job Number: CDT-105
Project Manager: Ray Kahler
Date: 4/10/1992

CHROMALAB FILE # 492122
ORDER # 6078

ITEM NO.	SAMPLE NUMBER	DATE AND TIME SAMPLED		MATRIX	# CONTAINERS & PRESERVATIVES			ANALYSIS REQUESTED / TYPE						COMMENTS
		Date	Time		UNPRESERVED	+HCl	+NaOH	[illegible]	[illegible]	[illegible]	[illegible]	Heavy Metals	Oil & Grease	8270	
1	HW-1-1	4/10/92	6:45	Soil	1			✓	✓	✓	✓	X	X		MASON Jar
2	HW-1-2	"	6:55	Soil	1			✓	✓	✓	X	X	X		
3	SS-1	"	7:15	Soil	1				✓	X	X	X	X		Surface sample
4															
5															
6															
7															
8															
9															
10															
11															
12															

MISCELLANEOUS

Number of Coolers	Type of Coolant
1	ICE

COMMENTS:
5 Day T.A.T.

LABORATORY COPY WHITE PROJECT COPY YELLOW FIELD or OFFICE COPY PINK

CHAIN OF CUSTODY RECORD

Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation)	Received by: (signature & affiliation)	Date/Time
Relinquished by: (signature & affiliation) 4/13/92	Received by: (signature & affiliation)	Date/Time
Dispatched by: (signature & affiliation) Date/Time	Received for lab by: [signature]	Date/Time 4/13/92 2:10