CONVERSE ENVIRONMENTAL WEST

55 Hawthorne Street, Suite 500
San Francisco, California 94105-3906

Telephone **415 543-4200**
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November 30, 1989
88-44-380-01-282

Mr. Larry Seto
Alameda County Health Care Services Agency
Department of Environmental Hazardous Material
80 Swan Way, Room 200
Oakland, California 94621

Subject: WORK PLAN
2724 Castro Valley Blvd.
Castro Valley, California

Dear Mr. Seto:

Enclosed is a copy of the Work Plan that Shell Oil Company (Shell) and Converse Environmental West (CEW) will use as a guidance document for environmental investigation and remediation of the subject site. This Work Plan is submitted to your office in compliance with your request and will serve as the quarterly reporting requirement for this site (Quarter 4, 1989).

CEW and Shell intend to proceed directly upon your approval with implementation of this Work Plan, and drilling/borings will be scheduled in close cooperation with the site renovation. Please call me at (415) 543-4200, if you have questions about the scope or schedule of proposed activities.

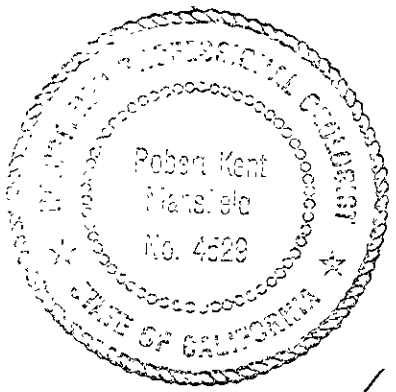
Yours very truly,

CONVERSE ENVIRONMENTAL WEST

R. K. Mansfield

Robert K. Mansfield
Project Manager, California Registered Geologist # 4529
Attachments

2724 Castro Valley\workplan



ROBERT K. MANSFIELD
California Registered Geologist #4529

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2724 Castro Valley Blvd.
Castro Valley, California

November 30, 1989

CEW Project No. 88-44-380-01

This report has been prepared by the staff of **Converse Environmental West** under the professional supervision of the Geologist whose name appears on the signature page.

The findings, recommendations, specifications or professional opinions are presented, within the limits prescribed by the Client, after being prepared in accordance with generally accepted professional engineering and geologic practice. We make no other warranty, either express or implied.

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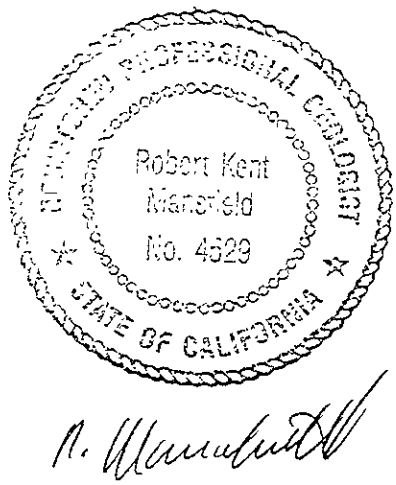

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WORK PLAN

November 30, 1989

SHELL OIL COMPANY FACILITY
2724 Castro VAlley Blvd.
Castro Valley, California

INTRODUCTION

Based on laboratory analyses, the Work Plan presumes that soil contamination exists at the Shell facility at 2724 Castro Valley Blvd, Castro Valley, California. This Work Plan describes tasks Shell will undertake to investigate and remediate soil and/or groundwater contamination at the subject facility.

SITE BACKGROUND

This retail gasoline station is located on the northeast corner of Castro Valley Blvd and Lake Chabot Road in Castro Valley, California. (Refer to Drawing 1). It was an active service station, but is now temporarily closed during the renovation work of tank replacement and major building construction. Commercial businesses exist on all corners of the intersection. Surrounding neighborhood development is commercial along both roads. Single family dwellings are located on side streets nearby.

Topographically, the site is located on the western edge of a gentle valley (Castro Valley) on recent alluvial fill. The terrain rises northward into the San Leandro Hills and the site is approximately 50 feet above the valley floor. An isolated hillside knob with 60 to 100 feet of relief occurs 600 feet south. An intermittent stream is shown 300 feet west on the Hayward, Calif USGS topographic map. This stream enters into the San Lorenzo Creek approximately one mile south. Surface water drainage has been altered by urbanization but is probably south to southwest. Groundwater flow is also assumed to be south.

TABLE 1 - Chronological Summary

The following chronological summary is based on information available to CEW for preparation of this Work Plan. CEW was not provided with certain information related to the construction, operational, and environmental history of the site.

Date	Description of Activity
Nov/21/86 -	Blaine Tech Services removed one 550 gallon waste oil tank and conducted field sampling.
Apr/22/88 -	Woodward-Clyde drilled and sampled three soil borings around the existing underground storage tank (UST) complex. Attachment 2.
Mar/6/89 -	Crosby & Overton, Inc conducted field sampling during removal of 4 underground storage tanks. Contaminated soil was discovered and additional excavation and sampling was performed. Attachment 3.
Mar/31/89 -	Field sampling in the vicinity of the new tank hole was performed. Attachment 4.
May/5/89 -	Converse Environmental West (CEW) was retained by Shell Oil Co to supervise environmental activities at the site.
Jun/12/89 -	Samples SW-1 through SW-7 were collected.
Jul/5/89 -	Samples SW-8 through SW-11 were collected.
Jul/6/89 -	One water sample in the excavation pit was collected.
Jul/11/89 -	CEW sent an "Interim Sampling Report and Recommendations" to the Alameda County Health Agency.
Jul/27/89 -	CEW sent an "Addendum to July 11, 1989 Interim Sampling Report and Recommendations" to the Alameda County Health Agency.
Aug/30/89 -	Samples SS-1 through SS-7 were collected.
Oct/2/89 -	Samples 1 through 3 were collected.
Oct/3/89 -	Samples 4, S-1 through S-5 were collected.
Oct/4/89 -	Samples S-6 & S-7 were collected.
Oct/6/89 -	Samples 5 through 14 were collected.
Oct/11/89 -	Samples 15 through 19 were collected.

Oct/26/89 - Samples 20 through 23, and stockpile 10:26 were collected.

Oct/31/89 - CEW sent a report titled "Soil Sampling Report" to the Alameda County Health Agency.

WORK COMPLETED by CEW

Underground Storage Tank Removal.

CEW did not perform the underground storage tank removal. Work performed by CEW at this site has consisted of post tank removal excavation and environmental soil sampling. Please refer to Attachment 3 for a report on the Crosby & Overton work.

Summary of Soil Borings.

No soil borings have yet been installed by CEW. Please refer to Attachment 2 for a report on the Woodward-Clyde borings.

Summary of Groundwater Monitoring Well Installations.

No groundwater monitoring wells have yet been installed by CEW.

Summary of Excavation work and Soil Sampling.

The existing excavation was widened in 4 stages to reach soils where the residual contamination concentrations (if any) were acceptable to Alameda County (Drawing 3). After each excavation stage, soil samples were collected from the exposed fresh soils. The excavation had been deepened to ground water (approximately 12.5 feet bgl as measured at the southeast corner of the excavation) and this depth was considered as the limiting excavation depth. Please refer to Drawing 3.

Stage 1 was begun on June 12, 1989 after the excavation had been open and exposed for over a month. The excavation faces were scraped away to reveal fresh soils and 8 samples were collected along the sidewalls. Widening was confined to the north by the station building and limited to the east by a shallow telephone trench. The resulting sample analyses revealed higher than allowable concentrations in the northeast corner of the excavation and in the center of the south wall. However, further excavation north and east was essentially impossible.

Stage 2 continued the excavation in a southerly direction towards Castro Valley Blvd. Periodic field screening of soils suggested that contamination was still present and excavation was continued south until limited by the sidewalk. The excavation was squared along the southern wall and samples were collected along the sidewalls of the newest portion. Sample analyses revealed that residual MVF contamination in the soils along the south wall were within County allowable limits. A report of the sample analyses to date titled "Interim Sampling Report and Recommendations" was sent to the Alameda County Health Agency along with a request allowing the excavation to be filled so that additional remedial excavation could be continued westward towards the center of the site.

Stage 3 consisted of excavating soil in the central portion of the site around the former pump islands. Contamination in the gravelly sand (see Geology and Interpretation) was considered possible but remediation by excavation was not considered feasible. Therefore, CEW planned to limit the depth of excavation to into the clay but laterally as far as necessary. Remediation of the gravelly sand was planned to be accomplished by alternate methods.

Surface paving was broken up and buried piping removed. 8 shallow samples (SS-1 through SS-7) were taken from backhoe dug trenches to assess the lateral limits of near surface contamination. They were located at the ends of and between the pump islands. The results from these samples defined the probable lateral limits of near surface contamination and excavation commenced within a digging outline.

Support of the canopy pillars was effected by both pouring a slurry footing around one of the pillars and leaving enough soil around the other pillars to achieve structural stability. Excavation was performed laterally to the digging limits and downward into the clay. Samples S-1 through S-19 were taken as work progressed. As analytical results were received, it became clear that the clay was free of contamination and probably acted as an effective barrier to downward contaminant migration. All samples were within County residual contaminant concentration limits with the exception of S-16 and S-19.

Stage 4 consisted of two tasks. Further excavation laterally in the vicinity of S-19 until clean soil was reached was performed. Samples SW-20 and SW-21 were taken for confirmation. The high concentrations at sample S-16 were suspected to be a result of digging too deep and breaching into the underlying gravelly sand. Samples SW-22 and SW-23 were collected at the same location as S-16 but slightly deeper and examined. They were gravelly sand. The consequent analyses confirmed the suspected contamination.

All soil samples were collected and handled in the field according to standard sample handling protocols. They were transferred to a California State certified analytical laboratory under proper chain of custody and preservation. See Appendix F. In the tables and attachments, some sample numbers are identical, however they can be distinguished by date of collection. Those samples collected in the stockpiles to aid in disposal are noted with an asterisk.

Analytical results are summarized in Table 2. The first suite of samples taken, SW-1 through SW-7, also had analyses run for Oil and Grease, and Diesel Fuel, but the results were not significant and are not summarized here.

All certified laboratory reports are attached as Attachment 1.

TABLE 2. SOIL ANALYSES

NOTE:
All results in mg/Kg(ppm)
* - Indicates sample collected in surface stockpile for disposal analysis

Loc/depth	DATE COLLECTED	TPH-g	B	E	T	X
SW-1 @ 13'	6/12/89	810	2.700	5.000	15.00	31.00
SW-2 @ 13'		160	0.470	1.400	4.600	10.00
SW-3 @ 13'		400	1.300	2.600	6.800	17.00
SW-4 @ 15'		<10	<.025	<.075	<.025	<.075
SW-5 @ 13'		2300	29.00	32.00	160.0	200.0
SW-6 @ 11.5'		14	0.055	0.110	0.090	0.460
SW-6A @ 4'		<10	0.029	<.075	0.120	<.075
SW-7 @ 5.5'		<10	0.061	0.190	0.140	<.075
SW-8 @ 12'	7/5/89	<10	<.025	<.075	<.025	<.075
SW-9 @ 12'		11	<.025	0.060	0.660	1.400
SW-10 @ 12'		18	1.000	0.570	2.900	1.700
SW-11 @ 12'		71	2.600	2.500	7.000	5.400
EX PIT (H2O)	7/6/89	<0.05	<.0005	<.0015	<.0005	<.0015
SS-1 @ 4'	8/30/89	<10	<.025	<.075	<.025	<.075
SS-2 @ 4.5'		130	0.330	2.900	1.300	14.00
SS-3 @ 5'		<10	0.180	<.075	<.025	<.075
SS-3-2 @ 5'		<10	<.025	<.075	<.025	<.075
SS-4 @ 4'		17	0.100	0.240	<.025	1.100
SS-5 @ 5'		630	0.028	0.810	0.240	7.600
SS-6 @ 5'		1300	0.061	3.300	<.025	8.100
SS-7 @ 5.5'		3300	3.600	51.00	4.200	140.0
1 @ 7'	10/2/89	<10	<.025	<.075	<.025	<.075
2 @ 7'		13	<.025	<.075	<.025	<.075
3 @ 8'		12	0.096	0.098	0.180	0.560
4 @ 3'	10/3/89	<10	<.025	<.075	<.025	<.075
S-1 *		28	<.025	0.012	0.038	0.660
S-2 *		14	<.025	<.075	<.025	0.190
S-3 *		11	<.025	<.075	<.025	0.230
S-4 *		81	<.025	0.200	<.025	0.510
S-5 *		<10	<.025	<.075	<.025	<.075
S-6 *	10/4/89	<10	<.025	<.075	<.025	<.075
S-7 *		<10	<.025	<.075	<.025	<.075

5 @ 10.5'	10/4/89	41	0.082	2.100	5.000	12.00
6 @ 7'		<10	0.029	<.075	0.071	0.170
7 @ 3'		<10	<.025	<.075	<.025	<.075
8 @ 3'		<10	<.025	<.075	<.025	<.075
9 @ 6'		<10	<.025	<.075	<.025	<.075
10 @ 3'		<10	<.025	<.075	<.025	<.075
11 @ 7.5'		<10	<.025	<.075	<.025	<.075
12 @ 4'		<10	<.025	<.075	<.025	<.075
13 @ 8'		<10	<.025	0.280	<.025	0.240
14 @ 3'		<10	<.025	<.075	<.025	<.075
15 @ 3'	10/11/89	<10	<.025	<.075	<.025	<.075
16 @ 9'		240	0.150	1.800	1.500	11.00
17 @ 4'		<10	<.025	<.075	<.025	<.075
18 @ 4'		<10	<.025	<.075	<.025	<.075
19 @ 3'		470	<.025	1.000	<.025	10.00
SW-20 @ 6'	10/26/89	1.9	<.0025	<.0025	0.0064	0.0078
SW-21 @ 7'		<1	<.0025	<.0025	<.0025	<.0025
SW-22 @ 12'		200	0.5200	1.5000	1.8000	5.3000
SW-23 @ 12'		350	0.9500	3.1000	4.7000	13.000
SP 10:26 *		1.8	4.500	20.00	40.00	120.00

Well Installations

No groundwater monitoring wells have been installed on the site.

Groundwater Analysis and Results

One groundwater sample was collected (Excavation Pit 7/6/89, all constituents were below detection limits.

GEOLOGY AND INTERPRETATION

SUMMARY - Soil contamination at the site is highest in the eastern portion where the underground storage tanks were previously located. Groundwater contamination has not been determined. Three distinct soil layers affect the distribution of the motor vehicle fuel (MVF) contamination at the site. Motor vehicle fuel contamination (MVF) was discovered only in the soils above and below the dense clay layer.

Drawing 4 shows a geologic column of soils at the site. Contacts are not definite and the depths are only approximate. Topsoil occurs from the surface to approximately 5 feet below ground level (bgl). The upper 2 feet consists of asphalt and sand and brown loam fill. Soil below that is 3 foot thick, dark brown to black, organic, and crumbly. Odor from this zone was only observed during excavation and sampling around the former pump islands. This zone exhibited no odor during the excavation on the eastern side of the site and only one sample (6a) was collected in it.

A dense, light brown clay occurs from 5 to 11 feet bgl. The clay is stiff, plastic, cohesive, and appears to be very impermeable. None of the clay samples exhibited odor during field screening. No contamination has been observed in samples of pure clay.

A gravelly sand occurs from approximately 11 feet to at least the water table. The sand is grayish green in color, loosely consolidated, well graded (poorly sorted), with abundant rounded pebbles of 3/4 inch diameter. This sand appears very porous. Strong odors were observed from this layer during many stages of the excavation. However, at some locations where the odor was the highest, the analytical results were low (eg SW-9 @ 11 ppm and SW-10 @ 18 ppm). This implies a mostly vaporized contaminant phase at those locations.

Drawing 5 shows TPH-g contours in the upper topsoil layer. Localized areas of high concentration with limited lateral spreading are displayed. This contour pattern is typical of shallow contamination sourced from isolated or low volume leaks. Contamination in this topsoil layer above the clay was caused by surface spills or leaks from near surface sources such as dispensers or pipe connections.

Drawing 6 shows TPH-g contours for samples taken in the clay. Only sample 5 and 16 have concentrations substantially above the detection limit. Both these samples were collected near the suspected base of the clay and both were considered likely to be contaminated either by in situ proximity to the gravelly sand or by contact with it during the collection by backhoe bucket.

Drawing 7 shows TPH-g contours for samples taken below the clay in the gravelly sand. The highest concentration is close to the location of the former underground tanks and gradually decreases laterally. Concentrations greater than County allowables may trend offsite to the northeast. No information is available regarding the construction of the former fuel tank excavation, but it is likely that the bottom of the excavation intersected the top of the gravelly sand. In time, leaking MVF could have migrated through the fill into the gravelly sand and undergone lateral migration.

A water level taken during sampling measured static water at 12.5 feet bgl, or approx .5 ft below the top of the gravelly sand. The measurement was obtained after water had seeped into the excavation after having been pumped almost dry the previous day. It was measured from ground surface at the southeast corner of the excavation. The gravelly sand formation is an aquifer for the local water table and the water level is probably seasonally variable. The water sample taken exhibited no contamination.

INTRODUCTION

The purpose of this plan is to establish all the tasks appropriate to the investigation and remediation of soil and groundwater contamination. This Work Plan will present the procedures normally followed from site investigation through remediation or case closure. Some included tasks may not be performed or the sequence of tasks may be altered depending on the site specific situation and previous work history.

The Shell site investigations and remediation could comprise as many as five programs:

- Program I - Soil Investigations (and Remediation if needed) (Tasks 1-6)
- Program II - Tank Replacement and Related Activities (Tasks 7-12)
- Program III - Onsite Groundwater Investigations (Tasks 13-15)
- Program IV - Offsite Groundwater Investigations (if needed) (Tasks 16-20)
- Program V - Groundwater Remediation (if needed) (Tasks 21-24)

Shell will initiate a field program that may consist of as many as 24 tasks. The program will initially assess the quality of soil and groundwater onsite. If needed, additional work may be undertaken later, including (1) offsite investigations, (2) hydrologic studies, (3) remediation planning, and (4) cleanup.

SUMMARY OF PROPOSED SCOPE OF WORK

Work on the following Tasks has already been performed under prior contractors or Work Plans: Tasks 8, 9, 10 and 11.

Six on-site soil borings should be drilled at the locations shown on Drawing 8. These boring will assess the limits of the contamination encountered during previous investigations and help determine if off site borings need to be considered.

Four of these boring will be converted to ground water monitoring wells to assess ground water quality entering and leaving the site.

These borings and wells will be installed during the first quarter of 1990. Additional tasks and their estimated dates of completion will be assigned depending on the results of these borings/wells and will be accomplished according to the procedures in this work plan.

Program I: Soil Investigations and Remediation, (if needed)

Soil investigations will be conducted to assess lateral and vertical extent of soil contamination. Investigations will continue until the lateral extent of petroleum constituents are defined.

Prefield Activities

Prefield activities will include preparation of: (1) site-specific/task-specific Health and Safety Plan(s), (2) this Work Plan, (3) task-specific plans, and (4) budgets. In addition, necessary installation and construction permits will be obtained.

Task 1 - Drill and Sample Soil Borings

Six soil borings will be drilled and sampled at the locations shown on Drawing 8 to further define extent of hydrocarbons in soil at the site. Four soil boring will be completed as monitoring wells. Soil samples from the unsaturated zone will be collected on 5-foot centers downhole following the protocols in Appendix A. Soil samples from the unsaturated zone will be screened for volatile vapors using an organic vapor meter (OVM) or equivalent instrumentation. The results will be noted in the driller's logs. Soil samples and cuttings will be thoroughly described by a qualified geologist using the Unified Soil Classification System (USCS). Unsaturated zone soil samples from all soil borings and well will be properly stored, transported to a State-certified analytical laboratory and analyzed for TPH as gasoline, TPH as diesel, BTEX, and lead.

At the conclusion of sampling, soil borings not converted to monitoring wells will be abandoned using the protocols described in Appendix B. Selected borings will be converted to groundwater monitoring wells by over-drilling and constructed according to the practices described in Appendices A and C.

Task 2 - Drill and Sample Step-Out Borings

Additional soil borings will be drilled and sampled in the event the proposed borings do not quantify the extent of soil contamination. These additional borings will be installed in an iterative, step-out pattern until such contamination is defined. Such additional onsite borings will be drilled, sampled, and abandoned according to the protocols specified in Task 1.

Task 3 - Prepare Soil Remedial Action Plan

The options for cost-effective soil remediation will be identified and relatively evaluated based on the volume of contaminated soil, the hydrologic conditions of contamination, and the concentrations of contaminants involved. Using this information, a Soil Remedial Action Plan will be prepared identifying the options and preferred alternative for soil cleanup at the Shell property.

Task 4 - Remediate Soil

Soil will be remediated according to the protocols, schedule, and cleanup objectives specified in the Soil Remedial Action Plan, as approved by regulatory agencies of the jurisdiction.

Task 5 - Establish Cleanup Levels - Soil

Information supplied in Program I and II will be used to establish the cleanup levels for soil at this site. This information may include: (a) the depth to first groundwater, (b) the depth to highest high water as indicated by chemical reduction of soil, (c) the stratigraphy of soil types, with special emphasis on potential permeability, porosity, and secondary natural and manmade permeability, and (d) the vertical distribution of contaminants in soil, (e) local topography, (f) local and regional groundwater gradient, (g) runoff patterns, (h) identified areas of potential surface water infiltration, (i) potential beneficial uses of groundwater and waters of its discharge, and (j) the results of field testing for hydraulic parameters.

Shell will work with the RWQCB to establish cleanup standards which consider the cost and practicability of meeting cleanup objectives as well as elements of natural and manmade site conditions listed above.

Task 6 - Confirm Remediated Soil

At the completion of Tasks 4 and 5, soil will be established as clean to levels acceptable to regulatory agencies. When combined with clean groundwater from Program V, (if needed) environmental closure of the property will be complete.

Verification soil samples will be collected and analyzed according to procedures described in the Soil Remediation Plan to confirm the effectiveness of soil remediation measures. If verification studies indicate that contamination remains, further remediation and renewed verification will be conducted until soil quality objectives are obtained. Confirmation sample results will be presented in one or more Quarterly Reports submitted to the agencies.

Program II - Tank Replacement and Related Activities

Task 7 - Dewater Planning

This Task was not required.

Task 8 - Drill and sample exploratory soil borings

This Task was performed by another contractor prior to the tank removal. Refer to Attachment 2.

Task 9 - Plan for onsite soil treatment

This Task was completed by using on-site aeration. Stockpiles of soil created from the excavations were analytically profiled for Tph-g and BTEX using one sample for every 50 cubic yards. The data were averaged and the maximum cubic yards of soil calculated that could be aerated at one time. Plastic sheeting was placed over non-aerating portions of the stockpiles. Soil stockpiles were periodically analytically profiled on the same basis as above and disposed of accordingly.

Task 10 - Remove tanks and sample excavation

This Task was performed. Please refer to Attachment 3 for a copy of the report.

Task 11 - Remove product piping lines and sample along runs

This Task was performed in conjunction with task 10.

Task 12 - Sample area of new tank installation

This task was not performed by CEW. Please refer to Attachment 4 for a copy of the report.

Program III: Onsite Groundwater Investigations

Investigation of groundwater conditions onsite (Tasks 13-15) will be performed by the installation of at least four groundwater monitoring wells. Program III investigations will provide data that will define the existence and lateral extent of dissolved product contamination in groundwater within the bounds of the property, and will provide a basis for starting remediation.

Task 13 - Install and Develop Groundwater Monitoring Wells

Four, groundwater monitoring wells will be installed at the locations shown in Drawing 8. These wells will be installed according to descriptions in Task 1 and CEW standard protocols (Appendices A through E) and will be developed, and sampled according to those same protocols. The wells will be constructed with 4-inch diameter, PVC Schedule 40 casing. Screen size will be either .010 or .020 inch.. Boring logs and well construction diagrams will be supplied in the appropriate Quarterly report.

Task 14 - Collect And Analyze Groundwater Samples

The wells will be fully developed by surge-purge methods, following the protocols of Appendix D, with at least eight casing volumes of water removed and contained in tightly covered 55-gallon drums onsite. Following development, groundwater samples will be collected quarterly or as recharge permits for one year. Water from the well will be analyzed for TPH as gasoline, TPH as diesel, BTEX, and lead (Appendices E and F).

The field data, as-built well construction diagrams, boring logs, analytical results, and the results of initial sampling will be compiled and presented in the appropriate Quarter Report of Activities for the site.

If groundwater sampling of the monitor wells indicates that the groundwater is contaminated and that a contaminant plume is incompletely defined, additional groundwater monitoring wells will be installed onsite or offsite in an iterative manner until plume limits are defined.

Task 15 - Conduct Hydrology Tests and Research

Following groundwater well construction, wellheads will be surveyed and a detailed site plan showing wellhead elevations will be prepared. The depth to groundwater will be measured in each well to establish the onsite groundwater gradient. Slug tests may be conducted on each well after development to establish point hydraulic conductivities. In addition, a pumping test may be conducted on wells nearly fully penetrating the upper saturated zone.

Local hydrologic conditions will be researched in public records, including libraries, water districts, and other well record depositories.

The results of this work and water quality data from Task 14 will be compiled onto maps and presented the first quarterly report to regulators after completion of construction and samplings.

Program IV: Offsite Groundwater Investigation (if needed)

If the groundwater contaminant plume extends offsite, investigations may continue upgradient and/or downgradient under Program IV. If site conditions indicate that both floating product contamination (if present) and dissolved product contamination is restricted to the site, Shell may proceed directly with groundwater remediation under Program V.

Task 16 - Perform a Neighborhood Environmental Assessment

If groundwater contamination has been discovered, an environmental assessment of neighborhood businesses, ownerships, and prior operational practices will be conducted to assess discharge history and hydrology of nearby locations. Agency records will be reviewed to identify nearby owners of underground storage tanks and nearby handlers and generators of hazardous materials. In addition, regional hydrologic conditions, present and historical hydrologic gradients, groundwater withdrawal, and subsurface injection patterns will be researched.

Task 17 - Refer to Legal Counsel

If other Principal Responsible Parties (PRPs) are possible or confirmed, Shell may elect to work through its legal counsel to establish fiscal and legal responsibility for environmental cleanup by negotiation with other PRPs involved.

Task 18 - Inform The Regional Water Quality Control Board

If other PRPs are confirmed, Shell may inform the Regional Water Quality Control Board (RWQCB) of its findings so that environmental investigations and cleanup are conducted by other PRPs in proportion to their responsibility.

Task 19 - Prepare Offsite Groundwater Investigation Plan

The Work Plan may be amended to address the investigation and possible remediation of offsite groundwater contamination. Step-out wells may be proposed for key projected offsite upgradient and downgradient extensions of groundwater contamination. Subsequent activities may include obtaining rights-of-entry, acquiring well installation permits, specifying well design criteria and well placement.

Task 20 - Install Offsite Groundwater Wells

Offsite groundwater monitoring wells will be installed and sampled in an iterative process until the extent of offsite contamination from Shell activities is defined.

Program V: Groundwater Remediation (if needed)

If undertaken, Program V will comprise the permitting, planning, design, installation, operation, and monitoring of a groundwater remediation system which will cost-effectively clean up contamination in groundwater at the site.

Task 21 - Groundwater Remedial Action Plan

Once groundwater conditions are characterized and offsite groundwater conditions are known, a Groundwater Remedial Action Plan will be prepared.

This plan will address the means, duration, and cost to remediate contamination at and around the Shell facility. The technical approach recommended will also consider the distribution and composition of contaminants, the beneficial uses of the groundwater, the regulatory limits for extraction, the treatment method, the quality and quantity of effluent, the method of discharge, and the best available technologies. Based on the outcome of neighborhood and offsite investigations and negotiations, Shell may prepare this plan in conjunction with other PRPs.

The Plan will be presented to regulatory agencies of jurisdiction, and implemented upon agency approval to proceed.

If appropriate, NPDES or POTW permits will be prepared for treatment system discharge. Such permits will be submitted to appropriate jurisdictions for prompt review, so that groundwater remediation will not be delayed by the permitting process.

Task 22 - Implement Groundwater Remediation

Upon approval of final remedial system plans by regulatory agencies and acquisition of necessary permits, remediation will proceed in accordance with the parameters specified in the Groundwater Remedial Action Plan.

A formal report of start-up activities and progress reports of remediation (including monitoring data) will be prepared and submitted to regulatory agencies at proper intervals.

Task 23 - Establish Groundwater Cleanup Standards

Shell will work with the RWQCB to establish the parameters defining site-specific water quality objectives. The ultimate cleanup standards will consider the cost and practicability of meeting local and state water quality objectives.

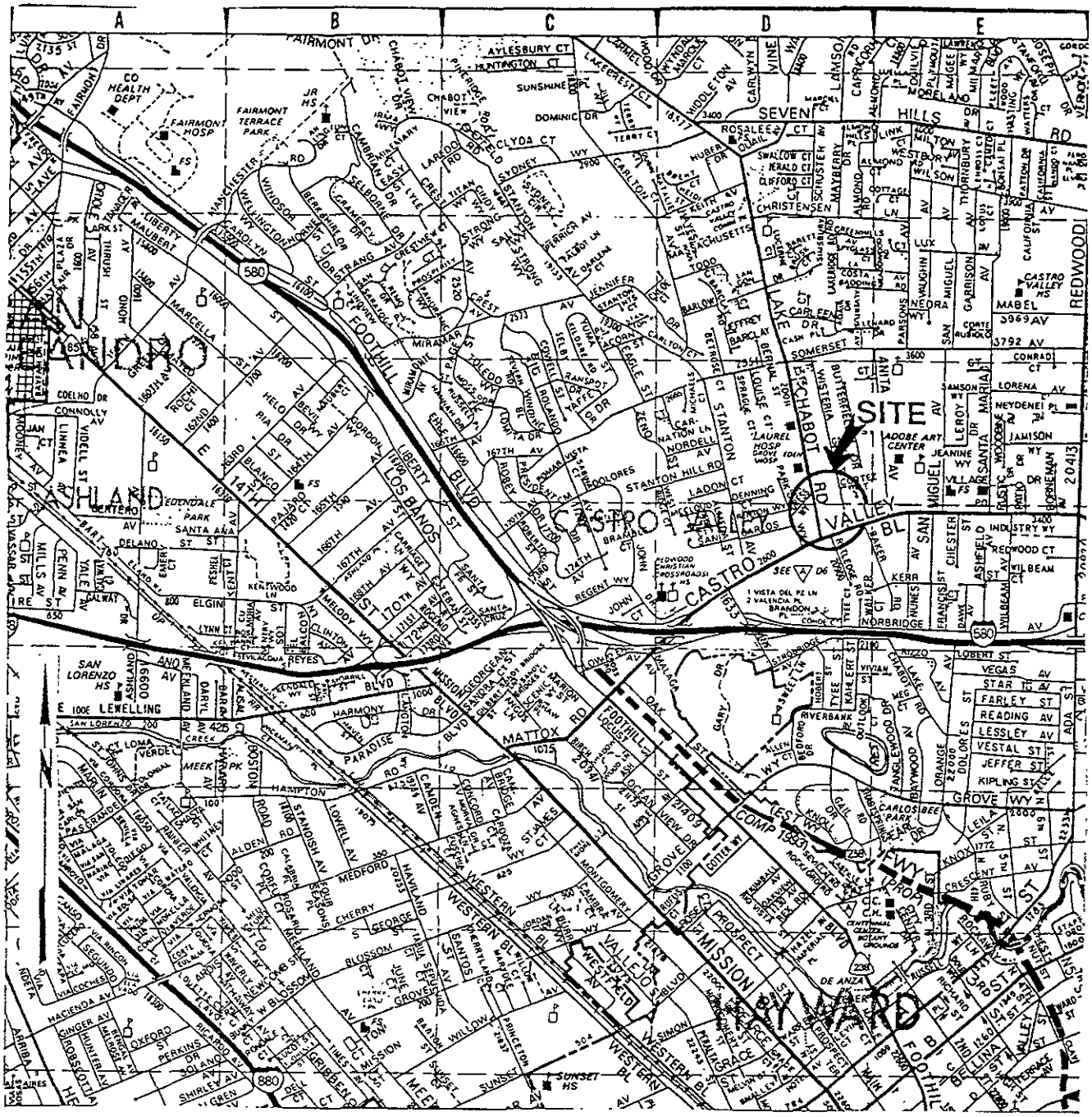
Task 24 - Confirm Remediated Groundwater

At the conclusion of groundwater mitigation, monitoring samples will be collected over a brief period of time to confirm completion of groundwater remediation. Reports will be supplied to regulatory agencies as required, with certifications by registered professionals.

LIST OF APPENDICES

APPENDIX A: Hollow-Stem Auger Drilling and Soil Sampling
APPENDIX B: Standards for Backfilling Borings and Sealing Wells
APPENDIX C: Groundwater Monitoring Well Construction
APPENDIX D: Well Development
APPENDIX E: Groundwater Sampling
APPENDIX F: Chain-of-Custody
APPENDIX G: Drum Handling Procedure

ATTACHMENT 1: ANALYTICAL LABORATORY SHEETS
ATTACHMENT 2: APRIL 22, 1989, WOODWARD-CLYDE REPORT
ATTACHMENT 3: MARCH 6 & MARCH 15, 1989, CROSBY & OVERTON REPORTS
ATTACHMENT 4: MARCH 31, 1989, SHELL OIL REPORT



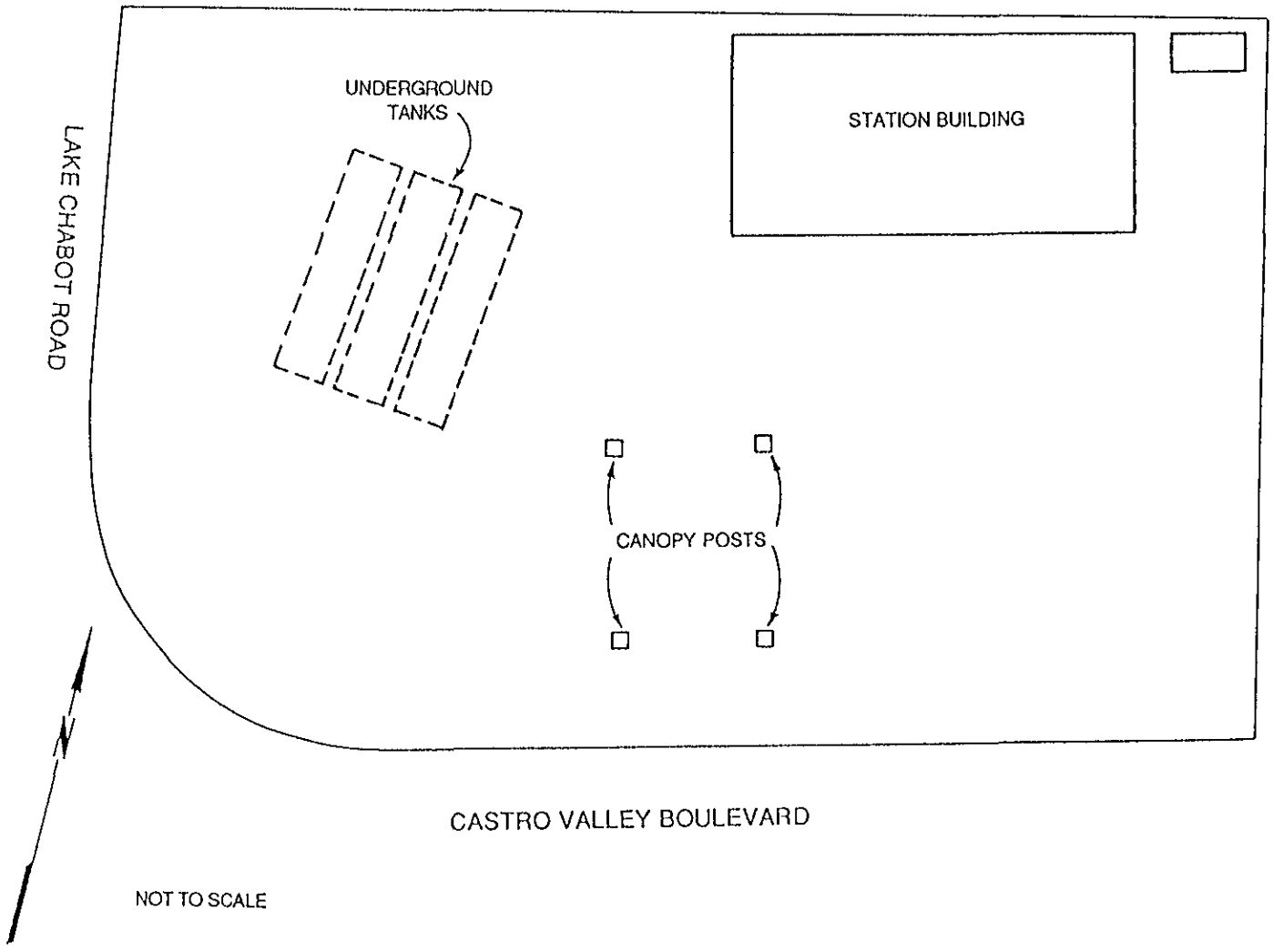
SOURCE: Thomas Brothers Maps, 1989.

SITE LOCATION MAP

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Converse Environmental
Consultants California

Scale: AS SHOWN	Project No.: 88-44-380-01
Prepared by: CRB	Date: 7/20/89
Checked by: RKM	Drawing No.: 1
Approved by: DWC	

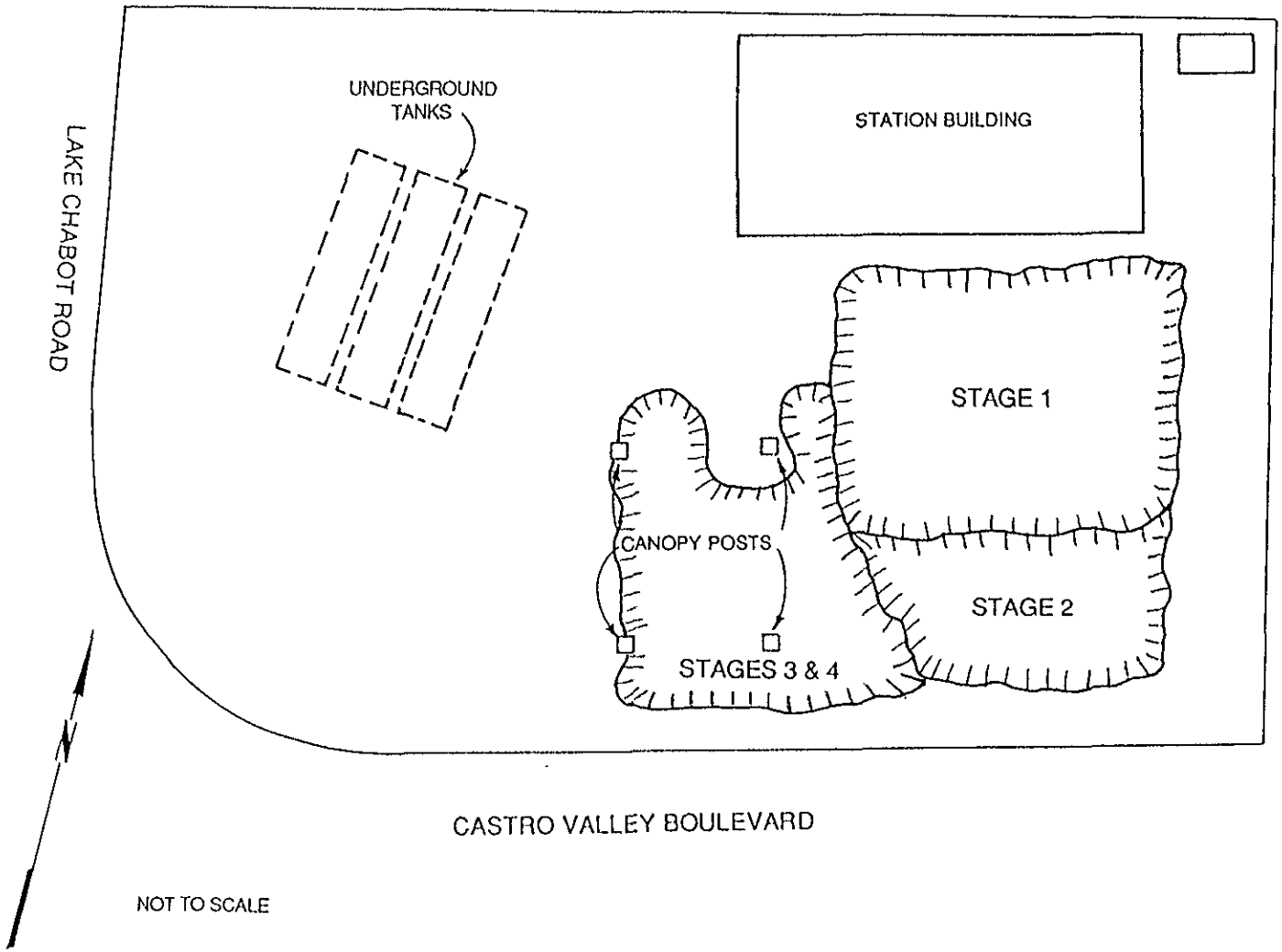


PLOT PLAN

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Converse Environmental Consultants California

Scale	NOT TO SCALE
Date	7/20/89
Prepared By	CRB
Checked By	RKM
Approved By	DWC
Project No	88-44-380-01
Drawing No	2

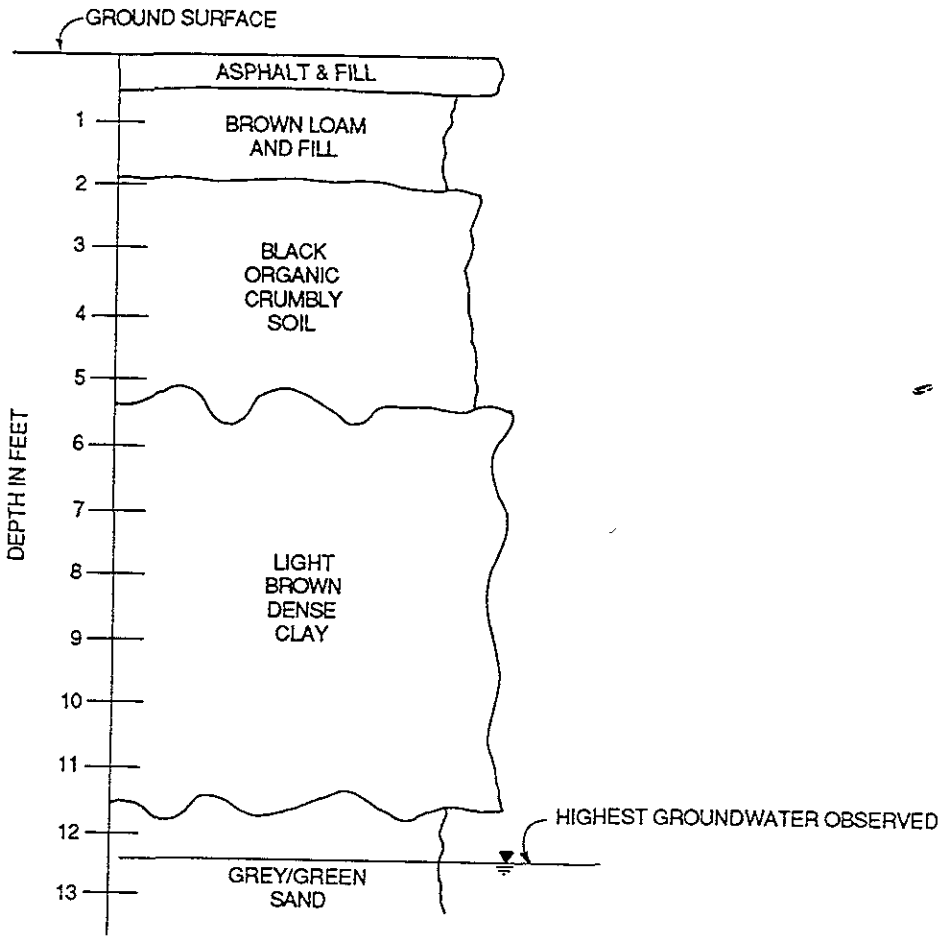


EXCAVATION PLAN

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Converse Environmental Consultants California

Scale	NOT TO SCALE
Date	11/29/89
Prepared By	CRB
Checked By	RKM
Approved By	DWC
Project No	88-44-380-01
Drawing No	3

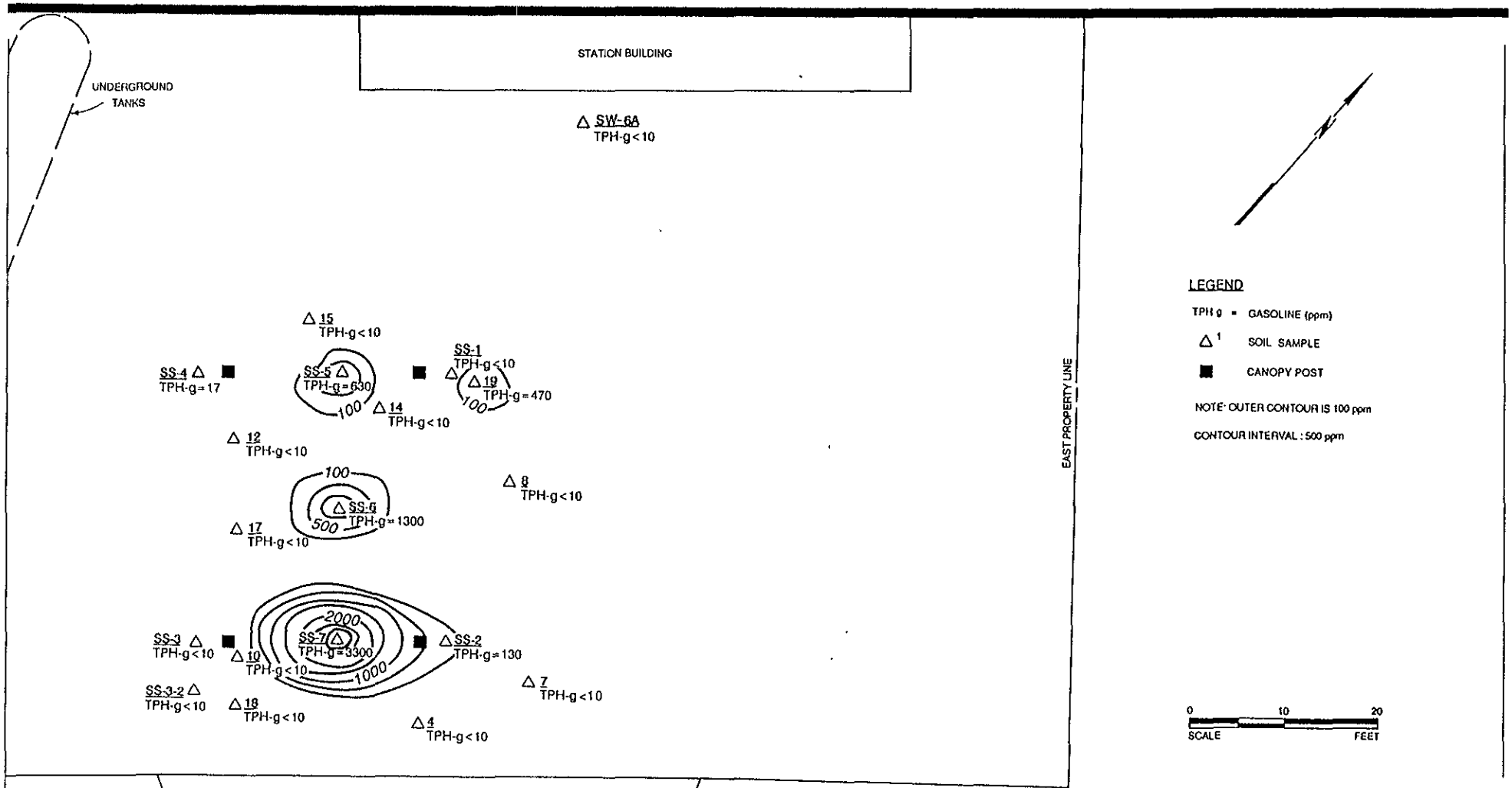


GEOLOGIC COLUMN

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Converse Environmental West

Scale	NOT TO SCALE
Prepared by	CRB
Checked by	RKM
Approved by	
Project No.	88-44-380-01
Date	11/29/89
Drawing No.	4

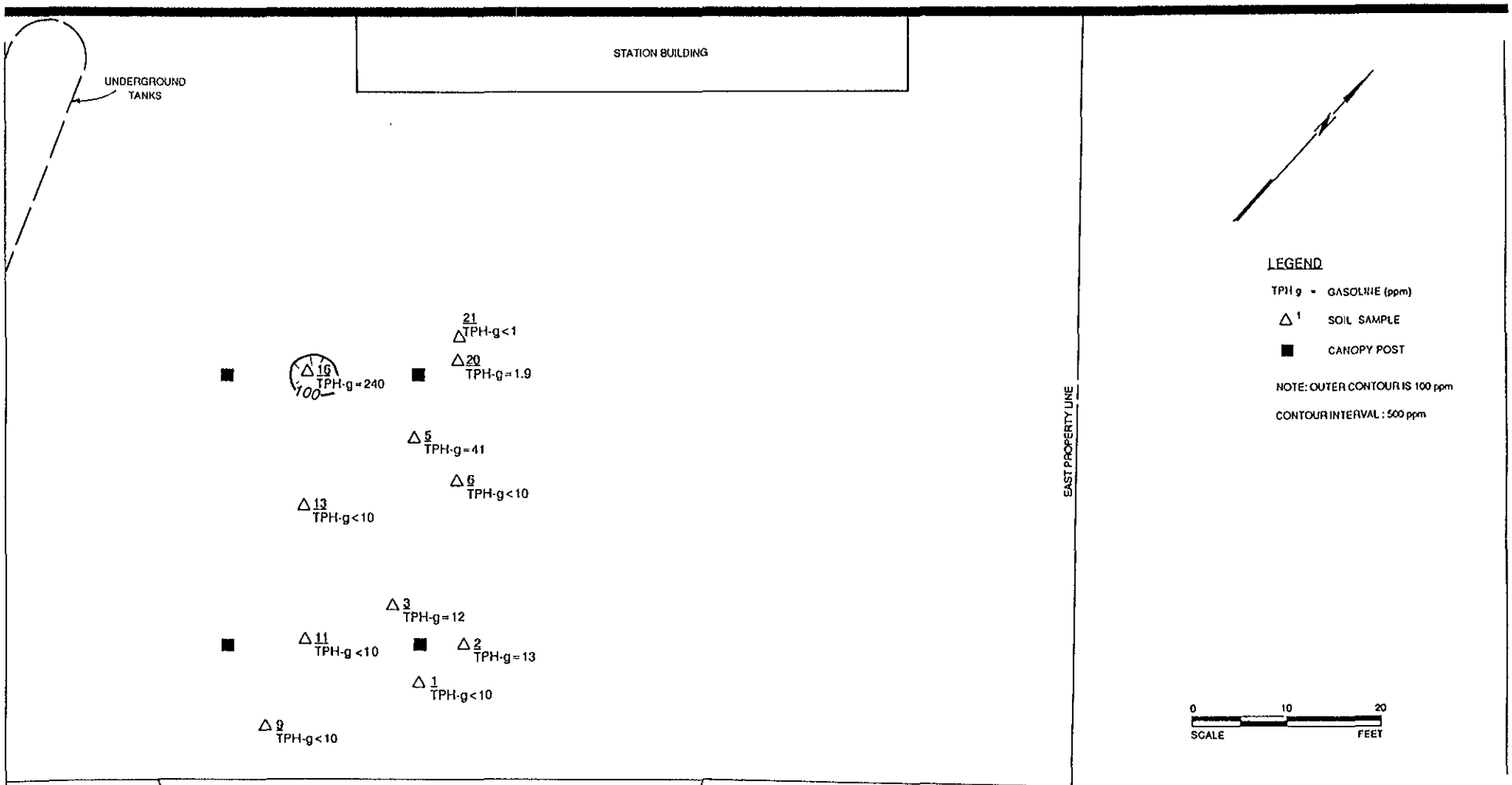


PLAN: SOIL TPH-g AT 0' to 6' BGS

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Scale	AS SHOWN
Date	11/28/89
Prepared By	CRB
Checked By	RKM
Approved By	
Project No	88 44-350 01
Drawing No	5

Converse Environmental Consultants California

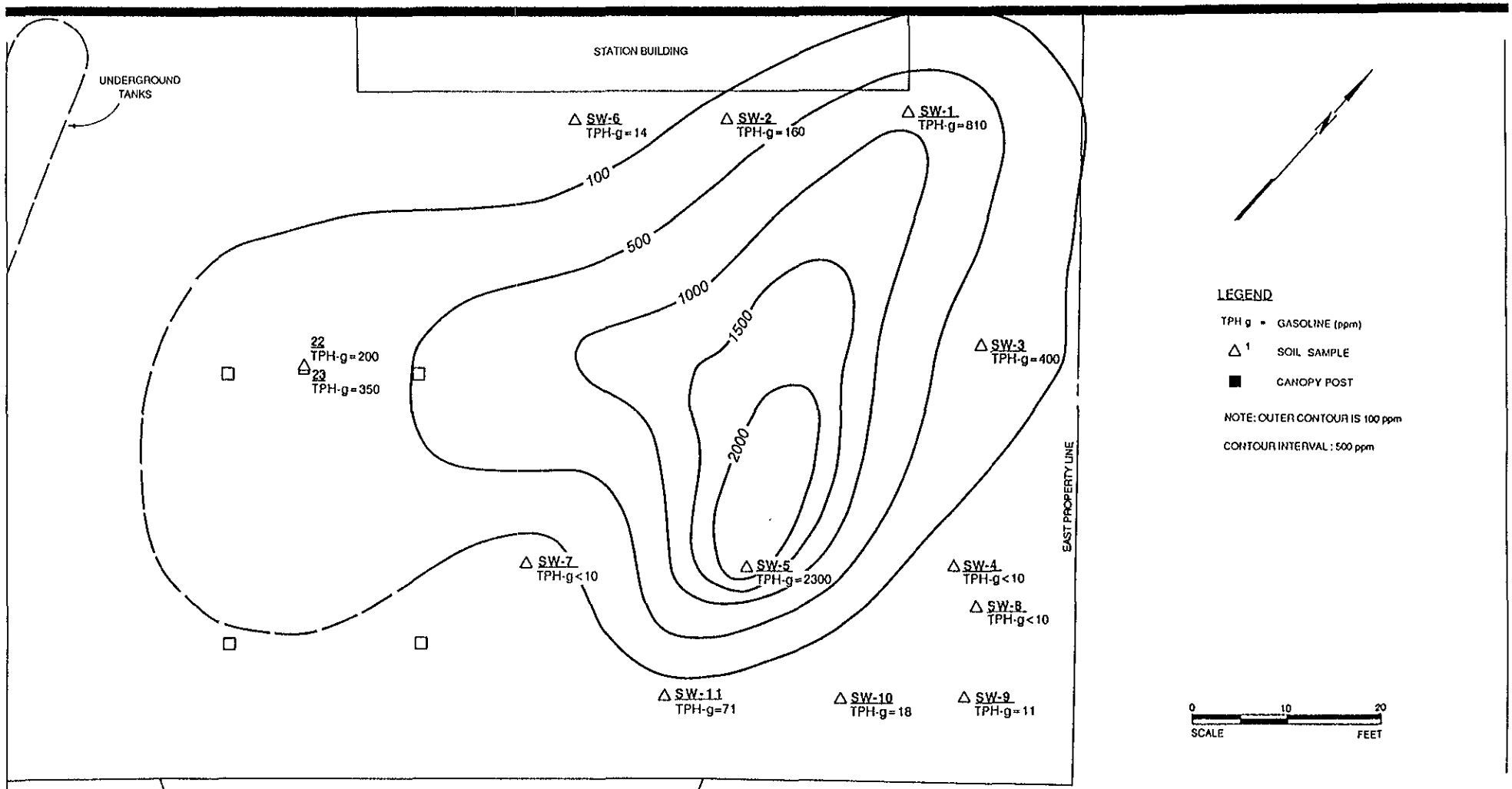


PLAN: SOIL TPH-g AT 6 to 11' BGS

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Converse Environmental Consultants California

Scale	AS SHOWN
Date	11/28/89
Prepared By	CRB
Checked By	RKM
Approved By	
Project No.	86-44-380-01
Drawing No.	6



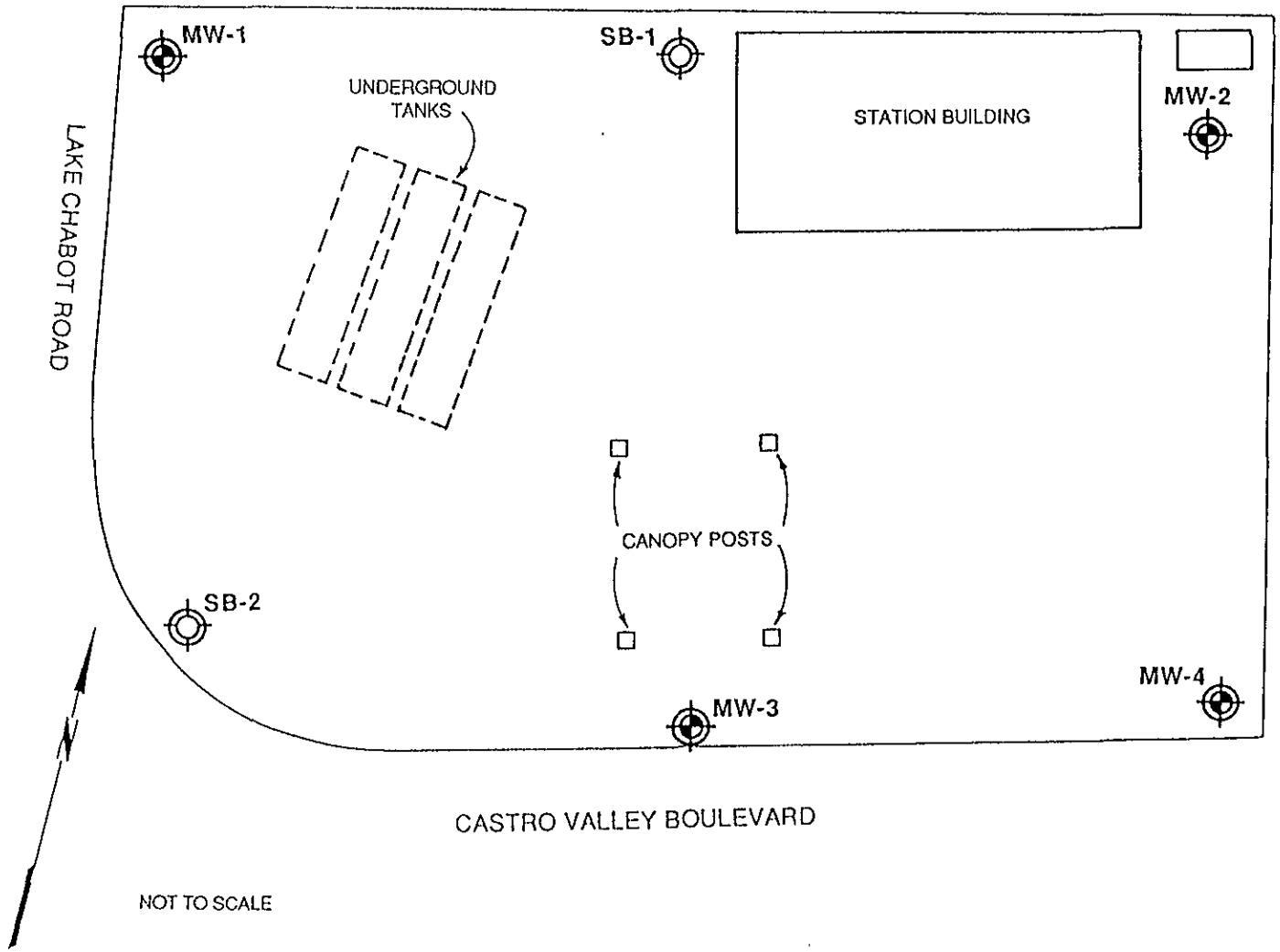
PLAN: SOIL TPH-g AT 11' BGS and below

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Scale	AS SHOWN
Date	11/28/89
Prepared By	CRB
Checked By	RKM
Approved By	

Project No 88 44 380-01
Drawing No 7

Converse Environmental Consultants California



LEGEND

SB-1 PROPOSED SOIL BORING

MW-1 PROPOSED GROUNDWATER MONITORING WELL

PROPOSED WELLS AND BORINGS

SHELL OIL COMPANY
2724 Castro Valley Boulevard
Castro Valley, California

Converse Environmental Consultants California

Scale	NOT TO SCALE
Date	11/29/89
Prepared By	CRB
Checked By	RKM
Approved By	DWC
Project No	88-44-380-01
Drawing No	8

APPENDICES

APPENDIX A

Hollow-Stem Auger Drilling and Soil Sampling

HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING

Borings shall be drilled with a hollow-stem auger and sampled with a modified California-type split-spoon sampler. Soil samples shall be of sufficient volume to perform the analyses which may be required, including replicate analyses. Aside from deionized water or distilled water, no fluids will be used in drilling.

Undisturbed (intact) soil samples shall be recovered from soil borings without introducing liquids into the borings. Soil samples as core or cuttings shall be taken continuously from ground surface to termination depth (TD), or through the aquifer zone of interest for lithologic logging.

Soils from all borings shall be described in detail using the Unified Soil Classification System and shall be logged by a professional geologist, civil engineer, or engineering geologist who is registered or certified by the State of California and who is experienced in the use of the Unified Soil Classification System. A technician trained and experienced in the use of the Unified Soil Classification System who is working under the direct supervision of one of the aforementioned professionals shall be qualified to log borings, provided the aforementioned professional reviews the logs and assumes responsibility for the accuracy and completeness of the logs.

All wet zones above the free water zone shall be noted and accurately logged.

If evidence of contamination is detected by sight, smell, or other field analytical methods, drilling shall be halted until the responsible professional determines if drilling deeper is advisable.

All drilling tools shall be thoroughly decontaminated with trisodium phosphate (TSP) or steam cleaner immediately before starting each boring.

Soil samples shall be taken in decontaminated brass sampling tubes in the split-spoon. The brass sleeves will be cut apart using a clean knife. The ends of the tubes will be covered tightly with teflon wrap, capped with tight-fitting plastic caps, wrapped with plastic electricians' tape, and properly labeled.

APPENDIX B

Standards for Backfilling Borings and Sealing Wells

STANDARDS FOR BACKFILLING BORINGS AND SEALING WELLS

INTRODUCTION

As standard practice, all borings and observation and monitoring wells shall be backfilled or sealed with "relatively impervious" grout to prevent surface contamination or cross-contamination between aquifers. Borings will be sealed from termination depth to the surface and observation and monitoring wells shall be backfilled and sealed above the water table. This practice will reduce liability if it is determined and proven that groundwater contamination occurred along a "vertical pathway" in an improperly sealed or filled boring or well.

In hazardous and potentially hazardous waste sites where deep borings or wells are installed, appropriate geologic information will be reviewed to determine if multiple aquifer system(s) exist(s). If such system(s) exist(s), drilling and sealing techniques will be used to prevent contamination of a lower aquifer by upper, potentially contaminated aquifer(s). Grout seals will be installed according to the following techniques through all thicknesses of impermeable zones which separate aquifer.

Borehole grouting shall consist of backfilling with bentonite pellets, cement/bentonite grout, or a thick bentonite slurry, depending upon the depth of the boring, depth to ground water, and type of drilling equipment used. Details of currently acceptable sealing methods are outlined below.

GENERAL SPECIFICATIONS

- All grouting and well construction and sealing and abandonment of borings shall be consistent with local ordinances.

- Cement/bentonite grout used to seal wells will be of a hard consistency that can resist traffic loads, but not installed to create a "concrete pile" that will obstruct further earthwork. Bentonite slurry, which does not support surface loads, will not be used for sealing wells.

GROUTING/SEALING TECHNIQUES

Dry Holes and Borings Containing Less Than 5 Feet of Water

Option 1: Backfill boring with bentonite pellets or granules in about 2-foot lifts. Add a gallon of water to hole after each lift.

Option 2: Pour in a mixture of cement/bentonite group (9 parts cement, 1 part bentonite powder plus water as needed to make mixture consistency of pancake batter).

Option 3: Pour in a thick mixture of bentonite and water. Soil cuttings can be used to bulk this mixture is soil is not contaminated and chunks are small and well-mixed in slurry.

Borings Containing More Than 5 Feet of Water

Option 1: Pump out water and use criteria for "dry hole."

Option 2: Pump cement/bentonite grout to bottom of hole or use tremie. Do not pour grout through water.

Option 3: Pump or tremie bentonite slurry. This alternative is particularly efficient if you are using rotary wash equipment since all you have to do is thicken the drilling mud and pump it through the drill rod.

Monitoring/Observation Well Sealing (Single Aquifer)

A. Place sand pack around well casing to about 2 feet above slotted interval. Anticipate fluctuation of water level so screened interval covers maximum water elevation.

B. Place 2-foot thick bentonite pellet seal above sand pack. Add a bucket of clean water to swell pellets.

C. Pour cement/bentonite grout or bentonite slurry above pellet seal to ground surface.

APPENDIX C

Groundwater Monitoring Well Construction

GROUNDWATER MONITORING WELL CONSTRUCTON

BOREHOLE DESIGN

Casing Diameter: The minimum diameter of well casings shall be 2 inches (nominal). Four-inch diameter well casings shall be preferred.

Borehole Diameter: The diameter of the borehole shall be a minimum of 4 inches and a maximum of 12 inches greater than the diameter of the well casing.

Shallow (Unconfined) Zone Wells: When groundwater is encountered or known to be within 45 feet of the ground surface, the borehole will be advanced through the aquifer to a competent aquitard. A competent aquitard is defined as being greater than 5 feet thick. To test the competency of the aquitard, the borehole will be drilled five feet into it. Once confirmed, the excess borehole shall be sealed with bentonite, concrete, or cement. The screened interval will begin 5 feet above the saturated zone and extend the full thickness of the aquifer or 20 feet into the saturated zone, whichever is reached first. The well screen will not extend into the aquitard, nor shall the screened interval exceed 25 feet in length.

If an aquitard is found to be less than 5 feet thick, it is assumed to represent a local lens. If the aquifer is greater than 20 feet thick and no competent aquitard is present, the well screen will be placed in the interval of 5 feet above and not more than 20 feet below the top of the saturated zone.

Deep (Confined) Zone Wells: Any monitoring well to be screened below the upper aquifer shall be installed as double-cased well. A steel conductor casing shall be placed through the upper water-bearing zone to prevent aquifer cross-contamination.

The conductor casing shall be installed in the following manner: a large diameter borehole (typically 18 inches) shall be drilled until it is determined that the first competent aquitard has been reached. A low carbon steel conductor casing shall be placed in the borehole to the depth drilled. Centralizers shall be used to center the casing in the borehole. The annular space between the conductor casing and the formation shall be cement-grouted from bottom to top by tremie pipe method. The grout shall be allowed to set for a minimum of 72 hours.

Drilling may continue inside the conductor casing, with a drill bit of smaller diameter than the conductor casing. If additional known aquifers are to be fully penetrated, the procedure can be repeated with successively small diameter conductor casings.

The bottom of the well screen in a confined aquifer shall be determined by presence or lack of a competent (5 foot) aquitard as described above. The screened interval in a confined zone shall extend across the entire saturated zone of the aquifer or to a length of 20 feet, which ever is less. The screened zone and filter pack shall not cross connect to another aquifer.

CONSTRUCTION MATERIALS

Casing Materials: Well casing shall be constructed of materials that have the least potential for affecting the quality of the sample, have sufficient strength, and resist rapid deterioration from corrosion. The most suitable material for a particular installation will depend upon the parameters to be monitored. Acceptable materials include PVC, stainless steel, or low carbon steel.

Casing Joints: Joints shall be connected by flush threaded couplers. Organic bonding compounds and solvents will not be used on joints.

Well Screen Slots: Well screen shall be factory slotted. The size of the slots shall be selected to allow sufficient groundwater flow to the well for sampling, minimize the passage of formation materials into the well, and ensure sufficient structural integrity to prevent the collapse of the intake structure.

Casing Bottom Plug: The bottom of the well casing will be permanently plugged, either by flush threaded screw-on or friction cap. Friction caps shall be secured with stainless steel set screws. No organic solvents or cements will be applied.

Filter Pack Material: Filter pack envelope materials shall be durable, waterworn, and washed clean of silt, dirt, and foreign matter. Sand size particles shall be screened silica sand. Particles shall be well rounded and graded to an appropriate size for retention of aquifer materials.

Bentonite Seal Material: Bentonite shall be pure and free of additives that may effect groundwater quality. Bentonite shall be hydrated with clean water.

Grout Seal Material: Cement grout shall consist of a proper mixture of Type I/II Portland cement, hydrated with clean water. Up to 3% bentonite may be added to the mixture to control shrinkage.

CONSTRUCTION PROCEDURES

Decontamination: All downhole tools, well casings, casing fittings, screens, and all other components that are installed in the well shall be thoroughly cleaned immediately before starting each well installation. When available, each component shall be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components shall be cleaned with clean water and detergent or tri-sodium phosphate, rinsed in clean water, then rinsed in distilled water.

Soil and water sampling equipment and materials used to construct the wells shall not donate to, capture, mask, nor alter the chemical composition of the soils and ground water.

Drilling Methods: Acceptable drilling methods include solid and hollow stem auger, percussion, direct circulation (mud) rotary, and air circulation direct, and reverse rotary. The best alternative is that which minimizes the introduction of foreign materials or fluids.

If drilling mud is employed, drilling fluid additives shall be limited to inorganic and non-hazardous compounds. Compressed air introduced to the borehole shall be adequately filtered to remove oil and particulates.

Soil Sampling Methods: Soil sampling shall be recovered according to protocols described in CEW Standard Operating Procedure: Soil Sampling of Boreholes.

Casing Installation: The casing will be set under tension to ensure straightness. Centralizers should be used where necessary to avoid unnecessary curvature or stress to the casing.

Sand Pack Installation: The sand pack will be installed so as to avoid bridging and the creation of void spaces. The tremie pipe method will be used where installatoin conditions or local regulations require. Drilling mud, when used, must be thinned prior to pack placement. The sand pack shall cover the entire screened interval and rise a minimum of two feet above the highest perforation.

Bentonite Seal Placement: The bentonite seal will be placed by a method that prevents bridging. Bentonite pellets can be placed by free fall if proper sinking through annular water can be assured. Bentonite slurry will be placed by the tremie pipe method from the bottom upward. The bentonite seal should be not less than 1 foot in thickness above the sand pack.

Grout Seal Placement: The cement grout mixture shall be hydrated with clean water and thoroughly mixed prior to placement. If substantial groundwater exists in the borehole, the grout shall be placed by tremie pipe method from the bottom upward. In a dry borehole, the grout may be surface poured. Grout will be placed in one continuous lift and will extend to the surface or to the well vault if the wellhead is completed below grade. A minimum of 5 feet of grout seal will be installed, unless impractical due to the shallow nature of the well.

Surface Completion: The wellhead will be protected from fluid entry, accidental damage, unauthorized access, and vandalism. A watertight cap shall be installed on the top of the well casing. Access to the casing should be controlled by a keyed lock.

Wellheads completed below grade will be completed in a concrete and/or steel vault, installed to drain surface runoff away from the vault opening.

Well Identification: Each well will be identified by well number, owner, and type of installation. Construction data, including depth, hole and casing diameter and screened interval will be noted.

APPENDIX D

Well Development

WELL DEVELOPMENT

INTRODUCTION

Newly installed groundwater monitoring wells will be developed to restore natural hydraulic conductivity of the formation, remove sediments from the well casing and filter pack, stabilize the filter pack and aquifer material, and ensure turbidity-free groundwater samples.

Wells may be developed by bailing, mechanical pumping, air lift, pumping, surging, swabbing, or an effective combination of methods. Wells will be developed until the well is free of sand, silt, and turbidity.

In some cases where low permeability formations are involved or the drilling mud used fails to respond to cleanup, initial development pumping may immediately dewater the well casing and thereby inhibit development. When this occurs, clean, potable grade water may be introduced into the well, followed by surging of the introduced waters with a surge block. This operation will be followed by pumping. The procedure may be repeated as required to establish full development.

METHODOLOGY

Seal Stabilization: Cement and bentonite annular seals shall set and cure not less than 24 hours prior to well development.

Decontamination: All well development tools and equipment shall be thoroughly cleaned immediately before starting each well installation. When available, each component shall be cleaned with a high temperature, high pressure washer for a minimum of 5 minutes. When a washer is not available, components shall be cleaned with clean water and detergent or tri-sodium phosphate, rinsed with clean water, then rinsed with distilled water.

Development equipment shall not donate to, capture, mask, nor alter the chemical composition of the soils and ground water.

Introduction of Water: Initial development of wells in low permeability formations may de-water the casing and filter pack. When this occurs, clean, potable water can be introduced in to the well to enhance development.

Bailing: Development will begin by bailing to remove heavy sediments from the well casing. Care shall be taken to not damage the well bottom cap during lowering of the bailer.

Surging: Care shall be exercised when using surge block to avoid damaging the well screen and casing. When surging wells screened in coarse (sandy/gravelly) aquifers, the rate of surge block lifting shall be slow and constant. When surging wells screened in fine

(silty) aquifers, more vigorous lifting may be require. Between surging episodes, wells will be bailed to remove accumulated sediments.

Pumping: Development pumping rates shall be less than the recharge rate of the well in order to avoid de-watering.

Discharged Water Containment and Disposal: All water and sediment generated by well development shall be collected in 55-gallon steel drums. Development water will be temporarily contained onsite, pending sampling and laboratory analysis. All development water will be transported offsite by a licensed transporter to a licensed hazardous waste disposal or treatment facility. No development water shall be released to the environment.

MEASUREMENTS

Discharged Water Parameters: During development, discharged water shall be measured for the following parameters:

Parameter	Units of Measurement
pH	Units
Electrical Conductivity	umhos
Temperature	Degrees F or C
Turbidity	Nephelometric Turbidity Units (NTU's)
Sediment Production	_____
Depth to Water in Casing	Feet/Tenths
Volume of Water Discharged	Gallons

Sediment Production: Sediment production from the well shall be measured using Imhoff Cone.

Turbidity: The development water turbidity shall be measured using a nephelometer. Turbidity at the conclusion of development should be less than 5 NTU's.

Measurement Frequency: Parameters shall be measured not less than every 3 pre-development casing volumes of water discharged.

Documentation: All parameter measurements shall be documented in writing on CEW Development Logs (example attached). Additional documentation shall include the well owners name, the well designation, the date of development, pre- and post-development depths to water, methods of development, general development and notes and comments.

APPENDIX E

Groundwater Sampling

GROUNDWATER SAMPLING

Groundwater samples shall be collected for laboratory analysis by the following procedures:

1. Before sampling or purging begins, all bailers, pumps, cables and lines will be steam-cleaned. An established and designated cleaning area will be kept clean by lining with visqueen or using a cleaning rack.

2. A pre-purge sample shall first be obtained with a bailer from as deep in the well as possible. Standard "Water Sampling Field Survey Forms" will be filled out for this and all future samples, to include the following information:

   - Depth to water and total depth of water column, measured and recorded before purging begins;

   - Conductivity, checked and recorded for every 5 gallons of purged water (for small volumes); and

   - Purged volume (as appropriate), with stabilized readings for pH, conductivity and temperature.

The well shall then be bailed or pumped to remove four to ten well volumes prior to sampling. The well will be purged until conductivity has been stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another. A casing volume will be based on actual measurements made on the day of sampling, i.e., the total depth minus depth to water on day of sampling, time the cross-sectioned area of the casing.

If the well is emptied before four to ten well volumes are removed, the sample shall be taken when the water level in the well recovers to 80% of its initial water level or better.

Whenever possible, samples will be collected within 24 hours after purging; ideally, samples will be collected immediately after purging.

Following the required volume of evacuation from the well, the sample shall be obtained with a teflon or stainless steel bailer on a 60-pound monofilament or polypropylene (washed) line. Care will be taken to properly clean cables with braided stainless steel cable or plastic coverings, if used. Air lift sampling and bladder pumps shall not be used.

Unless specifically waived or changed by the local, prevailing regulatory agency, water samples shall be handled and preserved according to the latest EPA methods as described in the Federal Register (Volume 44, No. 233, Monday, December 3, 1979, Page 69544, Table II) for the type of analysis to be performed.

Purge water will be properly disposed of or temporarily contained in steel barrels pending chemical analysis to designate proper disposal procedure.

APPENDIX F

Chain-of-Custody

CHAIN-OF-CUSTODY

SAMPLE COLLECTION, HANDLING AND IDENTIFICATION

Sample collection, handling, and identification will follow the guidelines set by the California Department of Health Services. Field records will be completed when the sample is collected and will be signed or initialed, including the date and time, by the sample collector(s). Field records will contain the following information:

1. Unique sample or log number;
2. Date and time;
3. Source of sample (including name, location and sample type);
4. Preservative used;
5. Analyses required;
6. Name of collector(s);
7. Pertinent field data (pH, DO, C1, residual, etc.); and
8. Serial number on seals and transportation cases.

Each sample will be identified by affixing a pressure sensitive, gummed label, or standardized tag on the container(s). This label will contain the sample identification number, date and time of sample collection, source of sample preservative used, and the collector(s) initial(s). Analysis required will be identified. Where a label is not available, the same information will be affixed to the sample contained with an indelible, waterproof, marking pen.

The sample container will be placed in a transportation case along with the chain-of-custody record form, pertinent field records, and analyses request form. The transportation case will then be sealed and labeled. Records will be filled out legibly in pen.

TRANSFER OF CUSTODY AND SHIPMENT

When transferring the possession of the samples, the transferee will sign and record the date and time on the chain-of-custody record. Custody transfer, if made to a sample custodian in the field, will account for each individual sample, although samples may be transferred as a group.

The field custodian or field inspector will be responsible for properly packaging and dispatching samples to the appropriate laboratory for analysis. This responsibility includes filling out, dating, and signing the appropriate portion of the chain-of-custody record.

All packages sent to the laboratory will be accompanied by the chain-of-custody record and other pertinent forms. A copy of these forms will be retained by the originating office.

Mailed packages can be registered with return receipt requested. If packages are sent by common carrier, receipts should be retained as part of the permanent chain-of-custody documentation.

Samples to be shipped will be sealed locked so evidence of tampering may be readily detected.

LABORATORY CUSTODY PROCEDURES

Chain-of-custody procedures will be followed in the laboratory from the time of sample receipt to the time the sample is discarded.

The sample control officer (SCO) will be the designated custodian, and an alternate is designated to act as custodian in the custodian's absence. All incoming samples are received by the SCO, who shall indicate receipt by signing the accompanying custody forms and who shall retain the signed forms as permanent records.

The SCO will maintain a permanent log book to record, for each sample, the person delivering the sample, the person receiving the sample, date and time received, source of sample, sample identification or log number, how transmitted to the laboratory, and condition received (sealed, unsealed, broken container, or other pertinent remarks). A standardized format will be established for log book entries.

A clean, dry, isolated room, building, and/or refrigerated space that can be securely locked from the outside, will be designated as a "sample storage security area."

The SCO will ensure that heat-sensitive, light-sensitive samples, radioactive, or other sample materials having unusual physical characteristics, or requiring special handling, are properly stored and maintained prior to analysis.

Only the custodian will distribute samples to the section leaders who are responsible for the laboratory performing the analysis.

The laboratory area will be maintained as a secured area, restricted to authorized personnel only.

Laboratory personnel will be responsible for the care and custody of the sample once it is received by them. These personnel shall be prepared to testify that the sample was in their possession and view, or secured in the laboratory at all times, from the moment it was received from the SCO, until the time that the analyses are completed.

Once the sample analyses are completed, the unused portion of the sample, together with all identifying labels, will be returned to the SCO. The returned tagged sample will be retained in the custody room until permission to destroy the sample is received by the SCO.

Samples will be destroyed only upon the order of the Laboratory Director, in consultation with previously-designated Project Manager, and/or client, or when it is certain that the information is no longer required or the samples have deteriorated. The same procedure will apply to tags and laboratory records.

APPENDIX G

Drum Handling Procedures

8. Manifests may be signed by the onsite contractor or consultant, station dealer, or other authorized Shell Oil representatives. The transporter CAN NOT sign the manifest.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR/CONSULTANT TO ARRANGE FOR A PERSON TO SIGN THE MANIFEST ON THE DAY OF PICK-UP.

9. Reporting

   All reports must be received by the Shell Hazardous Waste Coordinator within 7 working days of disposal. Reports shall include the following:

   - Completed drummed soil and water worksheets.
   - Attach a copy of the analytical results.
   - State how and where material was disposed.
   - If drums are emptied and material was disposed in bulk, state how empty drums were handled.
   - The signed blue and yellow copies of the hazardous waste manifest.

SOIL:

1. Test Requirements and Methods: Per Shell's site-specific test requirements

   - TPH: EPA Method 8015
   - BTEX: EPA Method 8020
   - Lead:

     -One composite sample from each boring
     -See attached decision tree
     -Total Lead - EPA Method 7421
     -Inorganic (soluble) Lead - DOS Title 22, Waste Extraction Test, §22-66700

   - Ignitable:

     -One composite sample from each boring
     -Bunsen Burner Test Flame Test

2. Classification:

   - Clean: TPH, BTEX, and Lead non-detectable
   - Non-Hazardous if any are true:

     -TPH less than 1000 ppm

-Lead -Inorganic (soluble) Lead less than 5 ppm (STLC)
or less than 100 ppm (TTLC)
-Organic Lead less than 13 ppm (TTLC)

-Ignitable - If TPH < 1000 ppm do not conduct test

- Hazardous if any are true:

-TPH greater than 1000 ppm

-Lead -Inorganic (soluble) Lead greater than 5 ppm (STLC)
or greater than 1000 ppm (TTLC)
-Organic Lead greater than 13 PPM (TTLC)

-Ignitable -If TPH >1000 ppm, then conduct Bunsen Burner Test
-If soil burns vigorously and persistently, soils are RCRA D001

3. Responsibility for Disposal:

- Clean: Consultant/Contractor
- Non-Hazardous: Consultant/Contractor or Shell Hazardous Waste Coordinator
- Hazardous: Shell Hazardous Waste Coordinator

4. Types of Drums: DOT-17H for a solid, solidified, or sludge material.

5. Disposal Facility:

- Clean: Any local landfill
- Non-Hazardous: Class III landfill. If a Class III landfill will not accept, contact Shell Hazardous Waste Coordinator for assistance
- Hazardous: Class I landfill arranged by Shell Hazardous Waste Coordinator

WATER:

1. Test Requirements and Methods: Per Shell's site-specific test requirements.

- TPH: EPA Method 8015
- BTEX: EPA Method 602

2. Classification:

- Clean Water: TPH and BTEX non-detectable

- Non-Hazardous:

  -Water with dissolved product and detectable TPH and BTEX
  -Water with free product
  -Free product only

3. Responsibility for Disposal:

   - Clean: Consultant/Contractor

   - Non-Hazardous: Consultant/Contractor or Shell Hazardous Waste Coordinator

4. Types of Drums: DOT-17C or DOT-17E for liquid or slurry

5. Disposal Facility:

   - Clean Water: Into dealer's sanitary sewer or with proper approval from Water Board to storm sewer

   - Non-Hazardous:

     Water with TPH and BTEX only -

     -Into dealer's sanitary sewer with approval from the POTW
     -Contact Shell Hazardous Waste Coordinator to arrange disposal

     Water with free product -

     -Contact Shell Hazardous Waste Coordinator to arrange disposal

   - Hazardous:

     Free product only -

     -Contact Shell Hazardous Waste Coordinator to arrange disposal

ATTACHMENT 1

NATIONAL
ENVIRONMENTAL
TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

Robin Breuer/Fadwa Samara
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

06-22-89
NET Pacific Log No: 6758
Series No: 212
Client Ref: Proj 88-44-380-01

Subject: Analytical Results for 2724 Castro Valley Received 06-13-89.

Dear Robin Breuer/Fadwa Samara

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Susan Joy Griffin
Group Leader
Gas Chromatography

Approved by:

Brian Fies
Group Leader
Atomic Spectroscopy

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample, unless noted otherwise.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V$ mean$]$x100.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

THE COVER LETTER AND KEY TO ABBREVIATIONS ARE AN INTEGRAL PART OF THIS REPORT

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) SW-1 06-12-89 (-29102)	SW-2 06-12-89 (-29103)	SW-3 06-12-89 (-29104)	SW-4 06-12-89 (-29105)	SW-5 06-12-89 (-29106)
Oil & Grease, total	50	ND	ND	ND	ND	ND
Oil & Grease, (non-polar)	100	ND	ND	ND	ND	ND
PETROLEUM HYDROCARBONS						
Volatile, as Gasoline	10	810	160	400	ND	2300
DATE ANALYZED		06-14-89	06-14-89	06-14-89	06-14-89	06-14-89
Extractable,						
as Motor Oil	10	ND	ND	ND	ND	ND
as Diesel Fuel	10	ND	35[a]	110[a]	ND	38[a]
DATE ANALYZED		06-14-89	06-14-89	06-14-89	06-14-89	06-14-89
DATE EXTRACTED		06-13-89	06-13-89	06-13-89	06-13-89	06-13-89

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) SW-1 06-12-89 (-29102)[b]	SW-2 06-12-89 (-29103)[c]	SW-3 06-12-89 (-29104)[c]	SW-4 06-12-89 (-29105)	SW-5 06-12-89 (-29106)[b]
PURGEABLE AROMATICS						
Benzene	0.025	2.7	0.47	1.3	ND	29
Ethylbenzene	0.075	5.0	1.4	2.6	ND	32
Toluene	0.025	15	4.60	6.8	ND	160
Xylenes, total	0.075	31	10	17	ND	200

[a] Sample appears to contain lower boiling hydrocarbons not characteristic of diesel.
[b] The reporting limits for this sample are 50 times the listed reporting limits.
[c] The reporting limits for this sample are 10 times the listed reporting limits.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) SW-6 06-12-89 (-29107)	SW-6A 06-12-89 (-29108)	SW-7 06-12-89 (-29109)
Oil & Grease, total	50	ND	ND	ND
Oil & Grease (non-polar)	100	ND	ND	ND
PETROLEUM HYDROCARBONS				
Volatile, as Gasoline	10	14	ND	ND
DATE ANALYZED		06-14-89	06-14-89	06-14-89
Extractable,				
as Motor Oil soil	10	ND	ND	ND
as Diesel Fuel	10	ND	ND	ND
DATE ANALYZED		06-14-89	06-14-89	06-14-89
DATE EXTRACTED		06-13-89	06-13-89	06-13-89

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) SW-6 06-12-89 (-29107)	SW-6A 06-12-89 (-29108)	SW-7 06-12-89 (-29109)
PURGEABLE AROMATICS				
Benzene	0.025	0.055	0.029	0.061
Ethylbenzene	0.075	0.11	ND	0.19
Toluene	0.025	0.090	0.12	0.14
Xylenes, total	0.075	0.46	ND	ND

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name
88-44-380-01	2724 Castro Valley

Samplers: (signature) N. Manchilet

#6758

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-g/BTEX – 24hr	TPH-d – 5 day	TOG (503) – 5 day				Remarks
1	6-12			✓	SW-1	1	X	X	X				
				✓	SW-2	1	X	X	X				
				✓	SW-3	1	X	X	X				
				✓	SW-4	1	X	X	X				
				✓	SW-5	1	X	X	X				
				✓	SW-6	1	X	X	X				
				✓	SW-6A	1	X	X	X				Black soil Horizon
				✓	SW-7	1	X	X	X				

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
N. Manchilet	6-12 | 1442	Nicola Blanc	Nicola Blanc	6/12 | 2:45	Fred Elrod
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)

Method of Shipment	Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time
(via NCS)			[illegible signature]	6/13/89 | 0710

88.44.380.01

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

2724 Castro Valley Blvd

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JUL 5 1989

CONVERSE ENVIRONMENTAL

Robin Breuer/Fadwa Samara
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

06-30-89
NET Pacific Log No: 6792
Series No: 212
Client Ref:

Subject: Analytical Results for One Soil Sample Received 06-15-89.

Dear Robin Breuer/Fadwa Samara:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Sue J. Long

Sue J. Long
Group Leader
Classical Chemistry

Approved by:

Brian Fies
Group Leader
Atomic Spectroscopy

/sm

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample, unless noted otherwise.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

SAMPLE DESCRIPTION: SW-5 06-12-89
LAB NO.: (-29305)

Parameter	Reporting Limit	Results	Units
Bunson Burner Flame Test		NEGATIVE	

NATIONAL ENVIRONMENTAL TESTING, INC.

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Robin Breuer/Fadwa Samara
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

07-11-89
NET Pacific Log No: 6999
Series No: 212
Client Ref:

Subject: Analytical Results for Shell - 2724 Castro Valley Blvd Received 07-06-89.

Dear Robin Breuer/Fadwa Samara:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Brian Fies
Group Leader
Atomic Spectroscopy

Approved by:

Susan Joy Griffin
Group Leader
Gas Chromatography

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
mg/L	:	Concentration in units of milligrams of analyte per liter of sample, unless noted otherwise.
mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V \text{ mean}]x100$.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results (ppm) SW 8 @ 12' 07-05-89 (-30339)	SW 9 @ 12' 07-05-89 (-30340)	SW 10 @ 12' 07-05-89 (-30341)	SW 11 @ 12' 07-05-89 (-30342)
PETROLEUM HYDROCARBONS					
Volatile, as Gasoline	10	ND	11	18	71
DATE ANALYZED		07-06-89	07-06-89	07-06-89	07-06-89
PURGEABLE AROMATICS					
Benzene	0.025	ND	ND	1.0	2.6
Ethylbenzene	0.075	ND	0.60	0.57	2.5
Toluene	0.025	ND	0.66	2.9	7.0
Xylenes, total	0.075	ND	1.4	1.7	5.4

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name: 2724 Castro Valley Blvd
Samplers: (signature)	N. Hamblett

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-g BTEX						Remarks
													6999
1	7.5	–		✓	SW-8 @ 12'	1	X						
"	"	–		✓	SW-9 @ 12'	1	X						
"	"	–		✓	SW-10 @ 12'	1	X						
"	"	–		✓	SW-11 @ 12'	1	X						

NOTE: NEED RESULTS ASAP (24 HR TURN)

SAVE SAMPLES IN CASE Pb NEEDS TO BE RUN

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
N. Hamblett	7.5 | 1530	Nicola Black	Nicola Black	7-5 | 1535	Jon Hodge
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
	|			|	
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
	|			|	
Method of Shipment: via NCS		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature) declare dow	Date/Time 7/6/89 | 0630

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

Robert Mansfield
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

07-19-89
NET Pacific Log No: 7047
Series No: 212
Client Ref: Project# 88-44-380-01

Subject: Analytical Results for Shell 2424 Castro Valley Blvd Received 07-11-89.

Dear Mr. Mansfield:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Brian Fies
Group Leader
Atomic Spectroscopy

Approved by:

Susan Griffin
Group Leader
Gas Chromatography

/ma
Encl: Sample Custody Document

KEY TO ABBREVIATIONS

mean	:	Average; the sum of the measurements divided by the total number of measurements.
mg/Kg (ppm)	:	Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).
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mL/L/hr	:	Milliliters per liter per hour.
MPN/100 mL	:	Most probable number of bacteria per one hundred milliliters of sample.
N/A	:	Not applicable.
ND	:	Not detected; the analyte concentration is less than the listed reporting limit.
NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RL	:	Reporting limit.
RPD	:	Relative percent difference, $[V^1-V^2/V$ mean$]$x100.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
ug/filter	:	Concentration in units of micrograms of analyte per filter.
umhos/cm	:	Micromhos per centimeter.
*	:	See cover letter for details.

THE COVER LETTER AND KEY TO ABBREVIATIONS ARE AN INTEGRAL PART OF THIS REPORT

SAMPLE DESCRIPTION: Excav. Pit 07-06-89 1100 grab H_2O sample
LAB NO.: (-30626)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS			
Volatile, as Gasoline	0.05	ND	ppm
DATE ANALYZED		07-14-89	
METHOD 8015/5030			
PURGEABLE AROMATICS			
Benzene	0.0005	ND	ppm
Ethylbenzene	0.0015	ND	ppm
Toluene	0.0005	ND	ppm
Xylenes, total	0.0015	ND	ppm
METHOD 602			

Converse Consultants

7049

CHAIN OF CUSTODY RECORD

Project No.	Project Name
88-44-380-01	SHELL - 2724 CASTRO VALLEY BLVD

Samplers: (signature)

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-GAS	BTEX					Remarks
						4 VOAS							SHELL
EXCAVATION PIT	7-6-89	11:00	✓		2724 CASTRO VALLEY BLVD	4	✓	✓					~~STAT.~~ STANDARD - T.A.T.

Relinquished by: (signature)	Date/Time 7/10/89 15:50 7-6-89 9:50pm	Received by: (signature)	Relinquished by: (signature) 7/14/89	Date/Time 7-18 0315	Received by: (signature)
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature) CUIH NCS1	Received for Laboratory: (signature)	Date/Time 7/11/89 0410

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

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SEP 11 1989

CONVERSE ENVIRONMENTAL

Bob Mansfield
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

09-07-89
NET Pacific Log No: 7599
Series No: 212
Client Ref: Project #88-44-380-01

Subject: Analytical Results for "Shell - 2724 Castro Valley BL" Received 09-01-89.

Dear Mr. Mansfield:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Sue J. Long
Group Leader
Classical Chemistry

Approved by:

Jules Skamarack
Laboratory Manager

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS and METHOD REFERENCES

Abbreviations

mean : Average; sum of measurements divided by number of measurements.

mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).

mg/L : Concentration in units of milligrams of analyte per liter of sample.

mL/L/hr : Milliliters per liter per hour.

MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.

N/A : Not applicable.

NA : Not analyzed.

ND : Not detected; the analyte concentration is less than applicable listed reporting limit.

NR : Not requested.

NTU : Nephelometric turbidity units.

RPD : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).

ug/L : Concentration in units of micrograms of analyte per liter of sample.

umhos/cm : Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the acutal reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results SS-1 08-31-89 (-34019)	SS-2 08-31-89 (-34020)	SS-3 08-31-89 (-34021)	SS-4 08-31-89 (-34022)	SS-5 08-31-89 (-34023)
PETROLEUM HYDROCARBONS VOLATILE (SOIL)						
DILUTION FACTOR *		1	10	1	1	10
DATE ANALYZED		09-01-89	09-01-89	09-01-89	09-01-89	09-01-89
METHOD GC FID/5030						
as Gasoline	10	ND	130	ND	17	630
METHOD 8020						
Benzene	0.025	ND	0.33	0.18	0.10	0.028
Ethylbenzene	0.075	ND	2.9	ND	0.24	0.81
Toluene	0.025	ND	1.3	ND	ND	0.24
Xylenes, total	0.075	ND	14	ND	1.1	7.6

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results SS-6 08-31-89 (-34024)	SS-7 08-31-89 (-34025)	SS-3 II 08-31-89 (-34026)
PETROLEUM HYDROCARBONS VOLATILE (SOIL)				
DILUTION FACTOR *		20	25	1
DATE ANALYZED		09-01-89	09-01-89	09-01-89
METHOD GC FID/5030 as Gasoline	10	1,300	3,300	ND
METHOD 8020				
Benzene	0.025	0.061	3.6	ND
Ethylbenzene	0.075	3.3	51	ND
Toluene	0.025	ND	4.2	ND
Xylenes, total	0.075	8.1	140	ND

Converse Consultants

CHAIN OF CUSTODY RECORD

P.M. Bob Mansfield

Project No.	Project Name
88-441-380-01	Shell-2724 Castro Valley BL

Samplers: (signature) Thomas Smith

Shell

T599

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	8 Brass Sleeves	TPH-Gas	BTEX				Remarks
SS-1	8/31/89			V	2724 Castro Valley BL	1	V	V					24 Hour turn around
SS-2	8/31/89			V	" "	1	V	V					
SS-3	8/31/89			V	" "	1	V	V					
SS-4	8/31/89			V	" "	1	V	V					
SS-5	8/31/89			V	" "	1	V	V					
SS-6	8/31/89			V	" "	1	V	V					
SS-7	8/31/89			V	" "	1	V	V					
SS-3 D	8/31/89			V	" "	1	V	V					

Relinquished by: (signature) Thomas Smith	Date/Time 8/30/89 20:05	Received by: (signature)	Relinquished by: (signature)	Date/Time 9-1-89 0300	Received by: (signature)
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature) CVIA NCSJ	Received for Laboratory: (signature)	Date/Time 9/1/89 0730

NATIONAL ENVIRONMENTAL TESTING, INC.

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Formerly: ANATEC Labs, Inc.

Bob Mansfield
Converse Consultants
55 Hawthorne St, Ste 500
San Francisco, CA 94105

09-14-89
NET Pacific Log No: 7643
Series No: 212
Client Ref: Project #88-44-380-01

Subject: Analytical Results for "Shell-2724 Castro Valley Blvd" Received 09-06-89.

Dear Mr. Mansfield:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Sue J. Long
Group Leader
Classical Chemistry

Approved by:

Susan Joy Griffin
Group Leader
Gas Chromatography

/ma

KEY TO ABBREVIATIONS and METHOD REFERENCES

Abbreviations

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NR	:	Not requested.
NTU	:	Nephelometric turbidity units.
RPD	:	Relative percent difference, 100 [Value 1 - Value 2]/mean value.
SNA	:	Standard not available.
ug/Kg (ppb)	:	Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).
ug/L	:	Concentration in units of micrograms of analyte per liter of sample.
umhos/cm	:	Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results SS-6 08-31-89 (-34384)	SS-7 08-31-89 (-34385)
Bunsen Burner Flame Test	--	NEGATIVE	NEGATIVE

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

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OCT 11 1989

CONVERSE ENVIRONMENTAL

Michael Carey
Converse Consultants
55 Hawthorne St
Suite 500
San Francisco, CA 94105

10-06-89
NET Pacific Log No: 7994
Series No: 103.1
Client Ref: proj#88-44-380-01

Subject: Analytical Results for "Shell - 2724 Castro Valley Blvd." Received 10-03-89.

Dear Mr. Carey:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Jules Skamarack
Laboratory Manager

Approved by:

Brian Fies
Group Leader
Atomic Spectroscopy

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS and METHOD REFERENCES

Abbreviations

mean : Average; sum of measurements divided by number of measurements.

ppm (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).

mg/L : Concentration in units of milligrams of analyte per liter of sample.

mL/L/hr : Milliliters per liter per hour.

MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.

N/A : Not applicable.

NA : Not analyzed.

ND : Not detected; the analyte concentration is less than applicable listed reporting limit.

NR : Not requested.

NTU : Nephelometric turbidity units.

RPD : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ppm (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).

ug/L : Concentration in units of micrograms of analyte per liter of sample.

umhos/cm : Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

SAMPLE DESCRIPTION: 1 at 7 ft 10-02-89
LAB NO.: (-36205)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL)			
DILUTION FACTOR *		1	
DATE ANALYZED		10-04-89	
METHOD GC FID/5030			
as Gasoline	10	ND	ppm
METHOD 8020			
Benzene	0.025	ND	ppm
Ethylbenzene	0.075	ND	ppm
Toluene	0.025	ND	ppm
Xylenes, total	0.075	ND	ppm

SAMPLE DESCRIPTION: 2 at 7 ft 10-02-89
LAB NO.: (-36206)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL)			
DILUTION FACTOR *		1	
DATE ANALYZED		10-04-89	
METHOD GC FID/5030			
as Gasoline	10	13	ppm
METHOD 8020			
Benzene	0.025	ND	ppm
Ethylbenzene	0.075	ND	ppm
Toluene	0.025	ND	ppm
Xylenes, total	0.075	ND	ppm

SAMPLE DESCRIPTION: 3 at 8 ft 10-02-89
LAB NO.: (-36207)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL)			
DILUTION FACTOR *		1	
DATE ANALYZED		10-04-89	
METHOD GC FID/5030			
as Gasoline	10	12	ppm
METHOD 8020			
Benzene	0.025	0.096	ppm
Ethylbenzene	0.075	0.098	ppm
Toluene	0.025	0.18	ppm
Xylenes, total	0.075	0.56	ppm

Converse Consultants

7444

CHAIN OF CUSTODY RECORD

P.M. Michael Carey

SHELL

Project No.	Project Name
88-44-380.01	2724 Castro Valley Blvd

Samplers: (signature) Michael Carey

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-g	BTEX	Remarks
	10-2				Samp 1 @ -7		/	/	1 Week Turn-Around.
	10-2				Samp 2 @ -7		/	/	WIC: 204-1381-0407
	10-2				Samp 3 @ -8		/	/	AFE: 986675
									Code: 5442

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Michael Carey	10-2-88	B. Cline	B. Cline	10/2/88	
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment: VIA NCS		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature)	Date/Time: 10/3 | 0700

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

Michael Carey
Converse Consultants
55 Hawthorne St.
Suite 500
San Francisco, CA 94105

10-10-89
NET Pacific Log No: 8001
Series No: 103.1
Client Ref: Proj #88-44-380-01

Subject: Analytical Results for "Shell - 2724 Castro Valley Blvd." Received 10-04-89.

Dear Mr. Carey:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Gregg P. Oakes
Group Leader
Mass Spectroscopy

Approved by:

Brian Fies
Group Leader
Atomic Spectroscopy

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS and METHOD REFERENCES

Abbreviations

mean : Average; sum of measurements divided by number of measurements.

mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).

mg/L : Concentration in units of milligrams of analyte per liter of sample.

mL/L/hr : Milliliters per liter per hour.

MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.

N/A : Not applicable.

NA : Not analyzed.

ND : Not detected; the analyte concentration is less than applicable listed reporting limit.

NR : Not requested.

NTU : Nephelometric turbidity units.

RPD : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).

ug/L : Concentration in units of micrograms of analyte per liter of sample.

umhos/cm : Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results: Samp 4 @ 3 Sidewall 10-03-89 (-36242)	Samp S-1 East Stock 10-03-89 (-36243)	Samp S-2 East Stock 10-03-89 (-36244)
PETROLEUM HYDROCARBONS VOLATILE (SOIL)				
DILUTION FACTOR *		1	1	1
DATE ANALYZED		10-06-89	10-06-89	10-06-89
METHOD GC FID/5030				
as Gasoline	10	ND	28	14
METHOD 8020				
Benzene	0.025	ND	ND	ND
Ethylbenzene	0.075	ND	0.12	ND
Toluene	0.025	ND	0.038	ND
Xylenes, total	0.075	ND	0.66	0.19

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results: Samp S-3 East Stock 10-03-89 (-36245)	Samp S-4 East Stock 10-03-89 (-36246)	Samp S-5 West Stock 10-03-89 (-36247)
PETROLEUM HYDROCARBONS VOLATILE (SOIL)				
DILUTION FACTOR *		1	1	1
DATE ANALYZED		10-06-89	10-06-89	10-06-89
METHOD GC FID/5030				
as Gasoline	10	11	81	ND
METHOD 8020				
Benzene	0.025	ND	ND	ND
Ethylbenzene	0.075	ND	0.20	ND
Toluene	0.025	ND	ND	ND
Xylenes, total	0.075	0.23	0.51	ND

Converse Consultants

Log #8001

CHAIN OF CUSTODY RECORD

Project No. 88-44-380-01 | Project Name 2724 Castro Valley Blvd

Samplers: (signature) Michael Cavey

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-g	BTEX	Remarks
	10-3				Samp 4 @ -3 sidewall	1	1		48 hour TAT - Rand
	10-3				Samp S-1 East Stock	1	1		
	10-3				Samp S-2 E. Stockpile	1	1		
	10-3				Samp S-3 E. Stockpile	1	1		
	10-3				Samp S4 E Stockpile	1	1		
	10-3				Samp S-5 W Stockpile	1	1		

Relinquished by: (signature) Michael Cavey	Date/Time 10-3-89	Received by: (signature) B. Clem	Relinquished by: (signature) B. Clem	Date/Time 10/3/89 7:15p	Received by: (signature) UPS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature) Judy Kelley	Date/Time 10/4 0700

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
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Fax: (707) 526-9623

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OCT 16 1989

CONVERSE ENVIRONMENTAL

Michael Carey
Converse Consultants
55 Hawthorne St
Suite 500
San Francisco, CA 94105

10-10-89
NET Pacific Log No: 8036
Series No: 103.1
Client Ref: Proj #88-44-380-01

Subject: Analytical Results for "Shell - 2724 Castro Valley Blvd." Received 10-05-89.

Dear Mr. Carey:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Gregg P. Oakes
Group Leader
Mass Spectroscopy

Approved by:

Jules Skamarack
Laboratory Manager

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS and METHOD REFERENCES

Abbreviations

mean : Average; sum of measurements divided by number of measurements.

mg/Kg (ppm) : Concentration in units of milligrams of analyte per kilogram of sample, wet-weight basis (parts per million).

mg/L : Concentration in units of milligrams of analyte per liter of sample.

mL/L/hr : Milliliters per liter per hour.

MPN/100 mL : Most probable number of bacteria per one hundred milliliters of sample.

N/A : Not applicable.

NA : Not analyzed.

ND : Not detected; the analyte concentration is less than applicable listed reporting limit.

NR : Not requested.

NTU : Nephelometric turbidity units.

RPD : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).

ug/L : Concentration in units of micrograms of analyte per liter of sample.

umhos/cm : Micromhos per centimeter.

Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

SAMPLE DESCRIPTION: S-6 stock 10-04-89
LAB NO.: (-36500)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL)			
DILUTION FACTOR *		1	
DATE ANALYZED		10-09-89	
METHOD GC FID/5030			
as Gasoline	10	ND	ppm
METHOD 8020			
Benzene	0.025	ND	ppm
Ethylbenzene	0.075	ND	ppm
Toluene	0.025	ND	ppm
Xylenes, total	0.075	ND	ppm

SAMPLE DESCRIPTION: S-7 stock 10-04-89
LAB NO.: (-36501)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS VOLATILE (SOIL)			
DILUTION FACTOR *		1	
DATE ANALYZED		10-09-89	
METHOD GC FID/5030			
as Gasoline	10	ND	ppm
METHOD 8020			
Benzene	0.025	ND	ppm
Ethylbenzene	0.075	ND	ppm
Toluene	0.025	ND	ppm
Xylenes, total	0.075	ND	ppm

Converse Consultants

CHAIN OF CUSTODY RECORD

Project No.	Project Name	
88-44-380-01	~~2500~~ 2724	Castro Valley Blvd.

Samplers: (signature) Castro Valley

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-g	BTEX	Remarks
	10-4	89		✓	S-6 Stockpile		X	X	48 Hour Turn-Around Log # 8036
	10-4	89		✓	S-7 Stockpile		X	X	
	~~10-4~~	~~89~~							
	10-4	89		✓	5 In Place Soil (See MAP)		X	X	Log # 8037
	10-4	89		✓	6		X	X	
	10-4	89		✓	7		X	X	5 days per Michael to pk 10/4 4:30
				✓	8		X	X	
				✓	9		X	X	
				✓	10		X	X	
				✓	11		X	X	
				✓	12		X	X	
				✓	13		X	X	
				✓	14		X	X	~~AFB~~ # 9886675 WIC # 204-1381-0407

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Michael Carey	10-4-89	Jeff Wickham 16:10	Jeff Wickham	VIA	NCS
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature)	Received for Laboratory: (signature) Judy Kelley	Date/Time 10/5/1070

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

Formerly: ANATEC Labs, Inc.

Michael Carey
Converse Consultants
55 Hawthorne St., Ste.500
San Francisco, CA 94105

10-19-89
NET Pacific Log No: 8153
Series No: 103.1
Client Ref: Proj# 88-44-380-01

Subject: Analytical Results for "Shell - Castro Valley Blvd." Received 10-12-89.

Dear Mr. Carey:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Jules Skamarack
Laboratory Manager

Approved by:

Brian Fies
Group Leader
Atomic Spectroscopy

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS and METHOD REFERENCES

Abbreviations

mean : Average; sum of measurements divided by number of measurements.

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NA : Not analyzed.

ND : Not detected; the analyte concentration is less than applicable listed reporting limit.

NR : Not requested.

NTU : Nephelometric turbidity units.

RPD : Relative percent difference, 100 [Value 1 - Value 2]/mean value.

SNA : Standard not available.

ug/Kg (ppb) : Concentration in units of micrograms of analyte per kilogram of sample, wet-weight basis (parts per billion).

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Method References

Methods 601 through 625: see "Guidelines Establishing Test Procedures for the Analysis of Pollutants" U.S. EPA, 40 CFR, Part 136, rev. 1988.

Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

Parameter	Reporting Limit (ppm)	Descriptor, Lab No. and Results #15 10-11-89 (-37070)	#16 10-11-89 (-37071)	#17 10-11-89 (-37072)	#18 10-11-89 (-37073)	#19 10-11-89 (-37074)
PETROLEUM HYDROCARBONS VOLATILE (SOIL)		—	—	—	—	—
DILUTION FACTOR *		1	5	1	1	10
DATE ANALYZED		10-14-89	10-14-89	10-14-89	10-14-89	10-14-89
METHOD GC FID/5030		—	—	—	—	—
as Gasoline	10	ND	240	ND	ND	470
METHOD 8020		—	—	—	—	—
Benzene	0.025	ND	0.15	ND	ND	ND
Ethylbenzene	0.075	ND	1.8	ND	ND	1.0
Toluene	0.025	ND	1.5	ND	ND	ND
Xylenes, total	0.075	ND	11	ND	ND	10

NATIONAL ENVIRONMENTAL TESTING, INC. NET Laboratory Group

435 Tesconi Circle, Santa Rosa, CA 95401

CONVERSE CONSULT

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME
SE-44-300-01	CASTRO Valley Blvd

SAMPLERS (Signature)
Michael Carey (Proj. Mgr)

STA. NO	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CONTAINERS	TPH-g	BTEX	REMARKS
	10-11				15	1	/	/	48 Hr Turn - Around
	"				16	1	/	/	
	"				17	1	/	/	
	"				18	1	/	/	
	"				19	1	/	/	
	"								"

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Michael Carey	10-11-89 3:20	Diane Krueger	Diane Krueger		
Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Relinquished by: (Signature)	Date / Time	Received for Laboratory by: (Signature)	Date / Time	Remarks	
(VIA NCS)		K Temple	10/12/89 0700	B153	

NATIONAL ENVIRONMENTAL TESTING, INC.

NET Pacific, Inc.
435 Tesconi Circle
Santa Rosa, CA 95401
Tel: (707) 526-7200
Fax: (707) 526-9623

RECEIVED

1989

Formerly: ANATEC Labs, Inc.

CONVERSE ENVIRONMENTAL

Robert Mansfield
Converse Consultants
55 Hawthorne St., Ste 500
San Francisco, CA 94105

11-02-89
NET Pacific Log No: 8348
Series No: 103.1
Client Ref: Robert Mansfield

Subject: Analytical Results for "Shell - 2724 Castro Valley" Received 10-27-89.

Dear Mr. Mansfield:

Sample analysis in support of the project referenced above has been completed and results are presented on following pages. Should you have questions regarding procedures or results, please feel welcome to contact Client Services.

Submitted by:

Gregg P. Oakes
Group Leader
Mass Spectroscopy

Approved by:

Sue J. Long
Group Leader
Classical Chemistry

/sm
Enc: Sample Custody Document

KEY TO ABBREVIATIONS and METHOD REFERENCES

Abbreviations

mean : Average; sum of measurements divided by number of measurements.

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Methods 1000 through 9999: see "Test Methods for Evaluating Solid Waste", U.S. EPA SW-846, 3rd edition, 1986.

* Reporting Limits are a function of the dilution factor for any given sample. To obtain the actual reporting limits for this sample, multiply the stated reporting limits by the dilution factor.

SAMPLE DESCRIPTION: SW-20 10-26-89
LAB NO.: (-38378)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (SOIL)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-31-89	
METHOD GC FID/5030		--	
as Gasoline	1	1.9	ppm
METHOD 8020		--	
Benzene	0.0025	ND	ppm
Ethylbenzene	0.0025	ND	ppm
Toluene	0.0025	0.0064	ppm
Xylenes, total	0.0025	0.0078	ppm

SAMPLE DESCRIPTION: SW-21 10-26-89
LAB NO.: (-38379)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (SOIL)		--	
DILUTION FACTOR *		1	
DATE ANALYZED		10-31-89	
METHOD GC FID/5030		--	
as Gasoline	1	ND	ppm
METHOD 8020		--	
Benzene	0.0025	ND	ppm
Ethylbenzene	0.0025	ND	ppm
Toluene	0.0025	ND	ppm
Xylenes, total	0.0025	ND	ppm

SAMPLE DESCRIPTION: SW-22 10-26-89
LAB NO.: (-38380)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (SOIL)		--	
DILUTION FACTOR *		200	
DATE ANALYZED		10-31-89	
METHOD GC FID/5030		--	
as Gasoline	1	200	ppm
METHOD 8020		--	
Benzene	0.0025	0.52	ppm
Ethylbenzene	0.0025	1.5	ppm
Toluene	0.0025	1.8	ppm
Xylenes, total	0.0025	5.3	ppm

SAMPLE DESCRIPTION: SW-23 10-26-89
LAB NO.: (-38381)

Parameter	Reporting Limit	Results	Units
PETROLEUM HYDROCARBONS		--	
VOLATILE (SOIL)		--	
DILUTION FACTOR *		200	
DATE ANALYZED		10-31-89	
METHOD GC FID/5030		--	
as Gasoline	1	350	ppm
METHOD 8020		--	
Benzene	0.0025	0.95	ppm
Ethylbenzene	0.0025	3.1	ppm
Toluene	0.0025	4.7	ppm
Xylenes, total	0.0025	13	ppm

Converse Consultants

SHELL

CHAIN OF CUSTODY RECORD

Project No.	Project Name	PM = Bob Mansfield
	2724 Castro Valley	
Samplers: (signature)	M. Mansfield	

Station No.	Date	Time	Comp.	Grab	Station Location	Number of Containers	TPH-g/BTEX	PCB						Remarks
	10.26			X	SW-20	1	X							24 Hr turn around time ← Log 8348
	"			X	SW-21	1	X							
	"			X	SW-22	1	X							
	"			X	SW-23	1	X							
	"		X		Stockpile 10:26	1	X	X						← 5 day turn around time Log 8349
														NOTE: Please recomposite Stockpile 10:26

Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
M. Mansfield	10.26 1522	Jeff Wickham	Jeff Wickham		
Relinquished by: (signature)	Date/Time	Received by: (signature)	Relinquished by: (signature)	Date/Time	Received by: (signature)
Relinquished by Courier: (signature)	Date/Time	Received by Mobile Lab: (signature)	Relinquished by Mobile Lab: (signature)	Date/Time	Received by Courier: (signature)
Method of Shipment		Shipped by: (signature)	Courier from Airport: (signature) CUVA NCS	Received for Laboratory: (signature)	Date/Time
				K Tompkins	10/27/88 0750

ATTACHMENT 2

500 12th Street
Suite 100
Oakland, CA 94607-4014
(415) 893-3600

Woodward-Clyde Consultants

April 22, 1988
8820011A

Gettler-Ryan Inc.
1992 National Avenue
Hayward, California 94545

Attention: Mr. Jeff Ryan

Subject: Shell Service Station
2724 Castro Valley Blvd.
Castro Valley, California

This memorandum documents a preliminary soil investigation at the Shell Service Station at 2724 Castro Valley Blvd. in Castro Valley, California. A total of three soil borings (S-A, S-B and S-C) were drilled in March and April of 1988. Two borings were drilled within the tank complex backfill and one boring was drilled in the proposed location of a new tank complex, outside of the tank backfill area. All boring locations were specified by Shell Oil Company and are shown on Figure 1.

The borings were advanced using hollow-stem augers. A modified California Sampler, fitted with brass liners, was used to collect soil samples. In borings S-A and S-B, three samples were collected at the following depth intervals: 3.5 to 5, 6.5 to 8, 10.5 to 12, and 14.5 to 16 feet below grade. In boring S-C, three samples were collected at the depth intervals: 4 to 5.5, 8 to 9.5, and 12 to 13.5 feet below grade. A Woodward-Clyde Consultants (WCC) geologist observed the drilling, described the samples using the Unified Soils Classification System, and prepared a log for each boring. Copies of the boring logs are attached to this memorandum.

A portion of each soil sample collected was used to perform a head-space test in the field for volatile organic compounds. The test procedure involved emptying the contents of a brass liner used to collect soil samples (approximately 30 grams) into a clean glass jar, and covering the jar with aluminum foil secured under a ring-type threaded lid. After approximately 20 minutes, the foil was pierced and the head-space within the jar was tested for total organic vapor, measured in parts per million (HNu units) with an HNu photoionization detector. The head-space test results are presented on the attached boring logs.

A portion of the soil sample collected from the 14.5- to 16-foot depth interval in borings S-A and S-B, and from the 13 to 13.5-foot depth interval in boring S-C was retained for chemical analysis. These

samples were collected in clean brass liners which were retained for analysis by covering both ends of the liner with Teflon sheeting and sealing with plastic end caps and electrical tape. The sample was then labeled, and later transported on ice to I.T. Corporation's California State Department of Health Services-certified environmental laboratory in Santa Clara, California using WCC chain-of-custody documentation.

The soil samples were analyzed for benzene, toluene, ethyl benzene, xylenes (BTEX), and low boiling point hydrocarbons (calculated as gasoline). The laboratory results are presented on the attached certified analytical report.

We appreciate the opportunity to provide consulting services on this project. Please call if we can be of additional assistance.

Sincerely,

WOODWARD-CLYDE CONSULTANTS

Helen M. Nuckolls

Helen M. Nuckolls
Assistant Project Geologist

Michael S. Bonkowski

Michael S. Bonkowski
Senior Project Geologist
CEG 1329

HMN:bd
8820011Lf/CON

SAMPLE CLASSIFICATION CHART

MOISTURE CONTENT

DRY	- LITTLE/NO PERCEPTIBLE MOISTURE
DAMP	- SOME PERCEPTIBLE MOISTURE, NOT COMPACTABLE
MOIST	- COMPACTABLE
WET	- ABOVE COMPACTABLE RANGE
SATURATED	- PORES, VOIDS FILLED WITH WATER
▼	- WATER TABLE (AT TIME OF DRILLING)

SORTING ($So = P_{75}/P_{25}$)

	So
EXTREMELY WELL	1.0-1.1
VERY WELL	1.1-1.2
WELL	1.2-1.4
MODERATELY	1.4-2.0
POORLY	2.0-2.7
VERY POORLY	2.7-5.0

SOIL CONSISTANCY

SAND OR GRAVEL	BLOWS/FT	SILT OR CLAY	BLOWS/FT	THUMB PENETRATION
Very loose	< 5	Very Soft	<3	Very easily - inches
Loose	5 - 15	Soft	3 - 5	Easily - inches
Medium Dense	16 - 40	Medium (firm)	6 - 10	Moderate effort - inches
Dense	41 - 65	Stiff	11 - 20	Indented easily
Very Dense	> 65	Very Stiff	21 - 40	Indented by nail
		Hard	> 40	Difficult by nail

SOIL BORING AND WELL CONSTRUCTION LEGEND

MODIFIED CALIFORNIA SAMPLE RECOVERY

WATER LEVEL OBSERVED IN BORING

STATIC WATER LEVEL MEASURED IN WELL

NOTE: BLOW COUNT (BLOWS/FT) REPRESENTS THE NUMBER OF BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES PER BLOW REQUIRED TO DRIVE A SAMPLER THROUGH THE LAST 12 INCHES OF AN 18-INCH PENETRATION

NOTE: THE LINE SEPARATING STRATA ON THE LOGS REPRESENTS APPROXIMATE BOUNDARIES ONLY. THE ACTUAL TRANSITION MAY BE GRADUAL. NO WARRANTY IS PROVIDED AS TO THE CONTINUITY OF SOIL STRATA BETWEEN BORINGS. LOGS REPRESENT THE SOIL SECTION OBSERVED AT THE BORING LOCATION ON THE DATE OF DRILLING ONLY.

BLANK CASING

SCREENED CASING

CEMENT GROUT

BENTONITE

SAND PACK

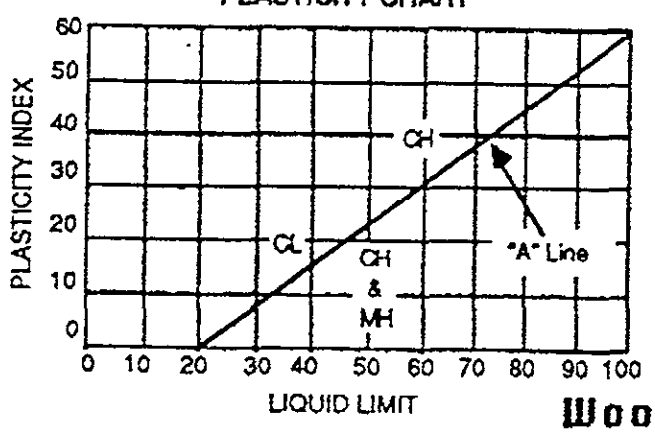
Woodward-Clyde Consultants

SAMPLE CLASSIFICATION CHART

UNIFIED SOIL CLASSIFICATION SHCEME				
MAJOR DIVISIONS		SYMBOLS	GRAPHIC COLUMN	TYPICAL NAMES
COARSE GRAINED SOILS (More than 1/2 of soil > no. 200 sieve size)	GRAVELS (More than 1/2 of coarse fraction > no. 4 sieve size)	GW		Well-graded gravels and gravel-sand mixtures, little or no fines
		GP		Poorly-graded gravels or gravel-sand mixtures, little or no fines
		GM		Silty gravels, gravel-sand-silt mixtures
		GC		Clayey gravels, gravel-sand-clay mixtures
	SANDS (More than 1/2 of coarse fraction < no. 4 sieve size)	SW		Well-graded sands or gravelly sands, little or no fines
		SP		Poorly-graded sands or gravelly sands, little or no fines
		SM		Silty sands, sand-silt mixtures
		SC		Clayey sands, sand-clay mixtures
FINE GRAINED SOILS (More than 1/2 of soil < no. 200 sieve size)	SILTS & CLAYS LL < 50	ML		Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity
		CL		Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
		OL		Organic silts and organic silty clays of low plasticity
	SILTS & CLAYS LL > 50	MH		Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
		CH		Inorganic clays of high plasticity, fat clays
		OH		Organic clays of medium to high plasticity, organic silty clays, organic silts
HIGHLY ORGANIC SOILS		Pt		Peat and other highly organic soils

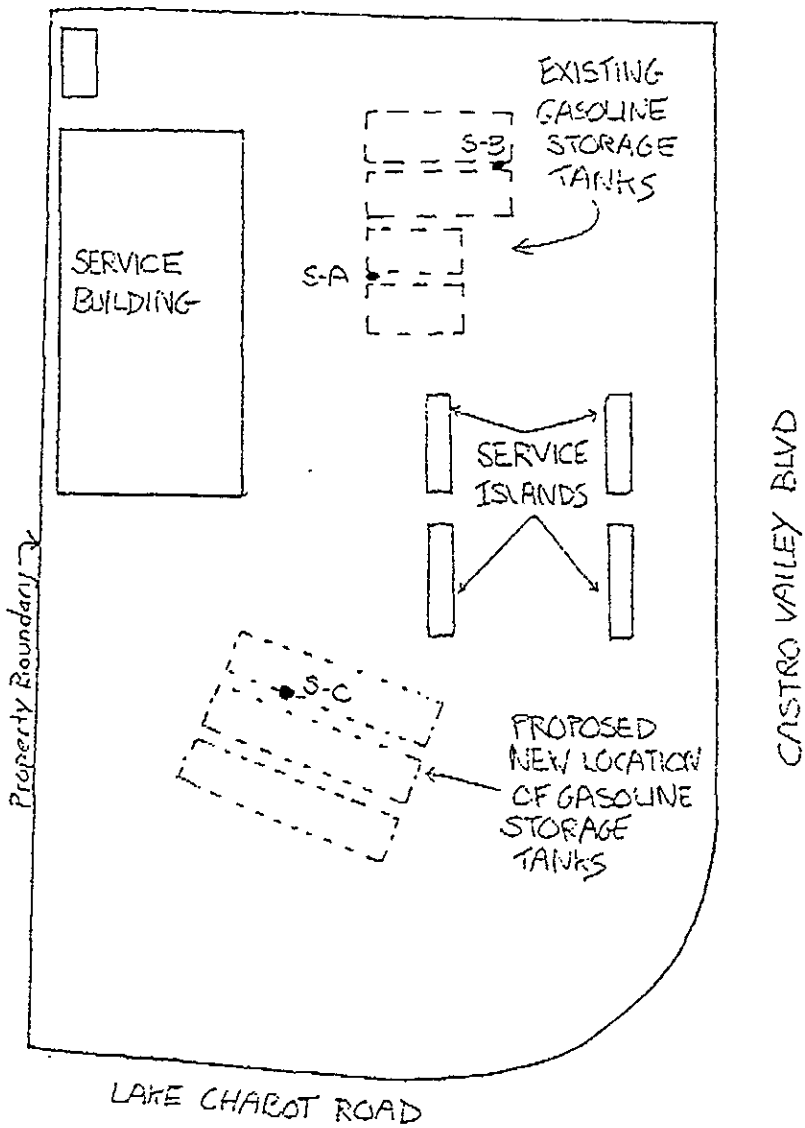
CLASSIFICATION MODIFIERS	
TRACE	0 - 10%
LITTLE	10 - 20%
SOME	20 - 35%
AND	35 - 50%
± MODIFIERS	

PLASTICITY CHART



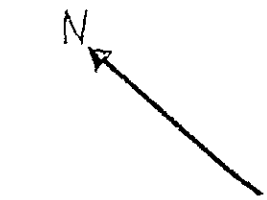
GRAIN SIZE CLASSIFICATION		
CLASSIFICATION	RANGE OF GRAIN SIZES	
	U.S Standard Sieve Size	Grain Size in Millimeters
BOULDERS	Above 12"	Above 305
COBBLES	12" to 3"	305 to 76.2
GRAVEL	3" to No. 4	76.2 to 4.76
coarse (c)	3" to 3/4"	76.2 to 19.1
fine (f)	3/4" to No. 4	19.1 to 4.76
SAND	No. 4 to No. 200	4.76 to 0.074
coarse (c)	No. 4 to No. 10	4.76 to 2.00
medium (m)	No. 10 to No. 40	2.00 to 0.420
fine (f)	No. 40 to No 200	0.420 to 0.074
SILT & CLAY	Below No. 200	Below 0.074

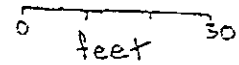
Woodward-Clyde Consultants



LEGEND

S-A • Soil Boring Location and Designation





Project No. 8820011A	Gettler-Ryan	SHELL OIL COMPANY SERVICE STATION — SOIL INVESTIGATION 2724 CASTRO VALLEY BLVD, CASTRO VALLEY, CA.	Figure 1
Woodward-Clyde Consultants			

Woodward-Clyde Consultants

PROJECT NAME Gettler-Ryan NO. 8820011A

BORING LOCATION 2724 Castro Valley Blvd., Castro Valley		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling Co	DRILLER Kurt	DATE STARTED	DATE FINISHED
DRILLING EQUIPMENT CME-75		COMPLETION DEPTH 16'	SAMPLER California modified Sampler
DRILLING METHOD 8" Hollowstem Auger	DRILL BIT	NO. OF SAMPLES DIST.	UNDIST.
LOGGED BY: H. Nuckolls		WATER LEVEL FIRST not encountered	COMPL. 24 HRS.
CHECKED BY: Mike Bonkowski			

Depth (feet)	Samples	Blow Count	MATERIAL DESCRIPTION		USCS	Moisture Content	Dry Density pcf
5		pushed 8 38	SAND olive grey-green fine to medium grained, little to some coarse grained to gravel (to 1/2" diameter), sub angular to subrounded. dry	Slight HCO HNu = 50ppm	SW		
		1 3 7	→ trace to little clay, very soft	HCO HNu = 50p			
10		1 3 3	CLAY brown, some gravel, subangular to subrounded, high plasticity, moist, very soft to soft	HCO HNu = 130ppm	CH		
15		5 8 11	trace to little gravel subangular to 1/2" diam., low plasticity, dry, medium (firm)	no HCO HNu = 20ppm	CL		
			Bottom of Hole = 16'				
20			HCO = hydrocarbon odor				
25							
30							
35							

FIELD LOG OF BORING NO. S-A SHEET 1 OF 1

Woodward-Clyde Consultants

PROJECT NAME Getter-Ryan NO. 8R2001IA

BORING LOCATION 22nd Castro Valley Blvd., Castro Valley, CA		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling Co	DRILLER Kurt	DATE STARTED / DATE FINISHED	
DRILLING EQUIPMENT CME-75		COMPLETION DEPTH 16'	SAMPLER California Modified Sampler
DRILLING METHOD 8" Hollowstem Auger	DRILL BIT	NO. OF SAMPLES / DIST.	BNDIST.
LOGGED BY: H. Nuckolls		WATER LEVEL FIRST none encountered	COMPL. / 24 HRS.
CHECKED BY: Mike Bonkowski			

Depth (feet)	Samples	Blow Count	MATERIAL DESCRIPTION	USCS	Moisture Content	Dry Density pcf
5		8 2 50 passed	SAND olive grey-green, fine to medium-grained, little to some coarse grained to gravel (to 1/2"), subangular to subrounded dry Slight HCO HNu = 50ppm	SW		
		1 2 1	trace to little clay HCO HNu = 50ppm			
10		1 2 1	SANDY CLAY mottled yellow brown to grey, fine to medium grained, trace coarse grained to gravel, moist slight HCO HNu = 80ppm	CL		
15		10 15 50/5"	Strong HCO CLAY medium brown, dry, 1/2" thick calcite vein No HCO HNu = 0ppm			
20			Bottom of Hole: 16'			
25			HCO = hydrocarbon odor			
30						
35						

FIELD LOG OF BORING NO. S-13 SHEET 1 OF 1

P.8/11

MAY. 09 '89 07:47

Woodward-Clyde Consultants

PROJECT NAME Gettler-Ryan NO. 8820011A

BORING LOCATION 2724 Castro Valley Blvd., Castro Valley		ELEVATION AND DATUM	
DRILLING AGENCY Bay Land Drilling Company	DRILLER Joe	DATE STARTED 4/4/88 DATE FINISHED 4/4/88	
DRILLING EQUIPMENT CME-55		COMPLETION DEPTH 13.5'	SAMPLER Modified California Sampler
DRILLING METHOD 8" Hollowstem Augers	DRILL BIT	NO. OF SAMPLES DIST.	UNDIST.
LOGGED BY: M. Fulford		WATER LEVEL FIRST 11'	COMPL. 24 HRS.
CHECKED BY: M. Bontowski			

Depth (feet)	Samples	Blows	MATERIAL DESCRIPTION	USCS	Moisture Content	Dry Density pcf
5	1	5 10 13	CLAYEY SILT dark brown with orange mottling, trace gravel to 2mm, little fine to medium grained sand, moist, firm, moderate to high plasticity, little organics and wood	ML		
			HNu = 0 ppm No HCO			
10	2	6 12 14	GRAVELLY CLAY orange brown and gray mottled, some silt and fine to medium grained sand, gravel to 4 mm, moist, loose, moderate plasticity, roots along gray (clay) mottling	CL	ATD	
			HNu = 0 No HCO			
		5 50/4"	SANDY GRAVEL tan, little silt, sand fine to coarse grained, gravel to 4 mm, subrounded, wet, very loose to dense	GP		
15			HNu = 0.5 ppm No HCO			
20			BOTTOM OF HOLE: 13.5'			
25			Note: ATD = Water level at time of drilling HCO = hydrocarbon odor Bottom of hole sealed with bentonite pellets to approximately 10 feet			
30						
35						

FIELD LOG OF BORING NO. S-C SHEET 1 OF 1

INTERNATIONAL TECHNOLOGY CORPORATION

RECEIVED
APR 01 1988
SETTLER-RYAN INC.
GENERAL CONTRACTORS

March 31, 1988

Gettler-Ryan
1992 National Avenue
Hayward, CA 94545

ATTN: Christa Lopez

Following are the results of analyses on the samples described below.

Project:	G-R #9749/WCC #8820011A, Shell, Castro Valley Blvd., Castro Valley
Lab Numbers:	S8-03-232-01 and S8-03-232-02
Number of Samples:	2
Sample Type:	Soil
Date Received:	3/25/88
Analyses Requested:	Low Boiling Hydrocarbons

The method of analysis for low boiling hydrocarbons is taken from EPA Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector as well as a photoionization detector.

The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethyl benzene and xylenes.

ND = None Detected

Summary of Results
Parts per Million - dry soil basis

Lab Number	Sample Identification	Low Boiling Hydrocarbons (Gasoline)	Benzene	Toluene	Ethyl benzene and xylenes
S8-03-232-01	*S-F/GR 9749 14.5-16A	ND	ND	ND	ND
S8-03-232-02	*S-G/GR 9749 14.5-16A	ND	0.10	ND	ND
Detection Limit		5.	0.05	0.1	0.4

*Sample S-F corresponds to Boring S-A
*Sample S-G corresponds to Boring S-B

Fred Rouse

FR/gg

Regional Office
397 Mathew Street • Santa Clara, California 95050 • 408-727-4277

INTERNATIONAL TECHNOLOGY CORPORATION

April 13, 1988

Gettler-Ryan
1992 National Avenue
Hayward, CA 94545

ATTN: Christa Lopez

Following is the result of analysis on the sample described below.

Project :	G-R #9749/WCC #8820011A, Shell, Castro Valley Blvd., and Lake Chabot Rd., Castro Valley
Lab Number:	S8-04-045-01
Sample Type:	soil
Date Received:	4/6/88
Analysis Requested:	Low Boiling Hydrocarbons

The method of analysis for low boiling hydrocarbons is taken from E.P.A. Methods 8015, 8020 and 5030. The sample is examined using the purge and trap technique. Final detection is by gas chromatography using a flame ionization detector as well as a photo-ionization detector.

The result for total low boiling hydrocarbons is calculated as gasoline and includes benzene, toluene, ethyl benzene and xylenes.

Summary of Results

nd = none detected

Parts per Million - (Dry Soil Basis)

Lab Number	Sample Identification	Low Boiling Hydrocarbons (Gasoline)	Benzene	Toluene	Ethyl benzene and xylenes
S8-04-045-01	S-C 13-13.5A	nd	nd	nd	nd
Detection Limit		5.	0.05	0.1	0.4

Fred Rouse

FR/ksr

ATTACHMENT 3

CROSBY & OVERTON, INC.

Environmental Management

8430 Amelia Street
Oakland, California 94621
FAX (415) 633-0759
(415) 633-0336 ▪ (800) 821-0424

March 6, 1989

Mr. Ray Newsome
Shell Oil Company
P.O. Box 4023
Concord, CA 94524

Dear Mr. Newsome:

Crosby & Overton, Inc. is pleased to submit this report regarding soil sampling at 2724 Castro Valley Blvd. in Castro Valley, California.

On February 16, 1989 two 5,000 gallon and two 8,000 gallon underground gasoline fuel tanks were excavated and removed by Parideso Construction (see figure for tank, island, pipeline and stockpile locations). Upon removal from the excavation the tanks were visually inspected for shell integrity. Tanks #2 and #3 were rusted and pitted, but no obvious holes were observed. A hydrocarbon odor emanated from the excavation.

METHODOLOGY

Under the direction of Larry Seto of the Alameda County Health Agency, Crosby & Overton collected eight samples (one directly below each tank end, approximately 12.5' below ground surface).

A backhoe was utilized for sample procurement. Immediately after the backhoe bucket was brought to the surface, the first several inches of soil on top were scraped away by a clean trowel. A clean four inch long by two inches diameter brass tube was then inserted into the soil in the center of the bucket and extracted. The tube ends were sealed by aluminum foil, plastic cap plugs and wrapped with duct tape. Samples were then placed on ice for transportation to Anametrix, Inc. (a California State certified hazardous materials laboratory) in San Jose, California.

The site was revisited on February 21, 1989, in order to sample the soil beneath two pipelines adjacent to the two islands.

Under the direction of Mary Jo Meyers-Barnes, of the Alameda County Health Agency, Crosby & Overton collected five samples from beneath the pipelines. Clean brass tubes were pounded into the soil by a rubber mallet at locations specified by Ms. Meyers-Barnes. Samples were sealed and transported by the same methodology detailed above.

CONCLUSIONS AND RECOMMENDATIONS

Samples taken from beneath the four tanks yielded total petroleum hydrocarbons as gasoline (TPH-G) values between non-detectable (<100 ppb) to 620 ppm. Benezene levels ranged from non-detectable (<100 ppb) to 1.4 ppm. Toluene, ethylbenzene and xylene values were all well below Department of Health

Services and the Regional Water Quality Control Board action levels.

According to the RWQCB's "Guidelines for Addressing Fuel Leaks", soil contaminated as a result of product loss from an underground storage tank equal to or in excess of 100 ppm TPH constitutes a "confirmed release", and at least one groundwater monitoring well must be installed. Therefore, it is recommended that at least one groundwater monitoring well be placed in the verified downgradient direction, and within ten feet of the excavation.

Following the installation, development and initial sampling of the well, a periodic sampling schedule will likely be mandated by concerned regulatory agencies. Typically, such a schedule would consist of quarterly sampling for a minimum of one year in order to acquire data throughout a full hydrologic cycle.

Although three excavation samples yielded benzene values above regulatory recommended soil cleanup levels, additional pit excavation will not be necessary (per phone conversation between myself and Mary Jo Meyers-Barnes on March 1, 1989) as risk assessment and attenuation factors deem unlikely that known conditions at the site will be viewed as presenting a significant threat to the public health and/or the environment. ACHD

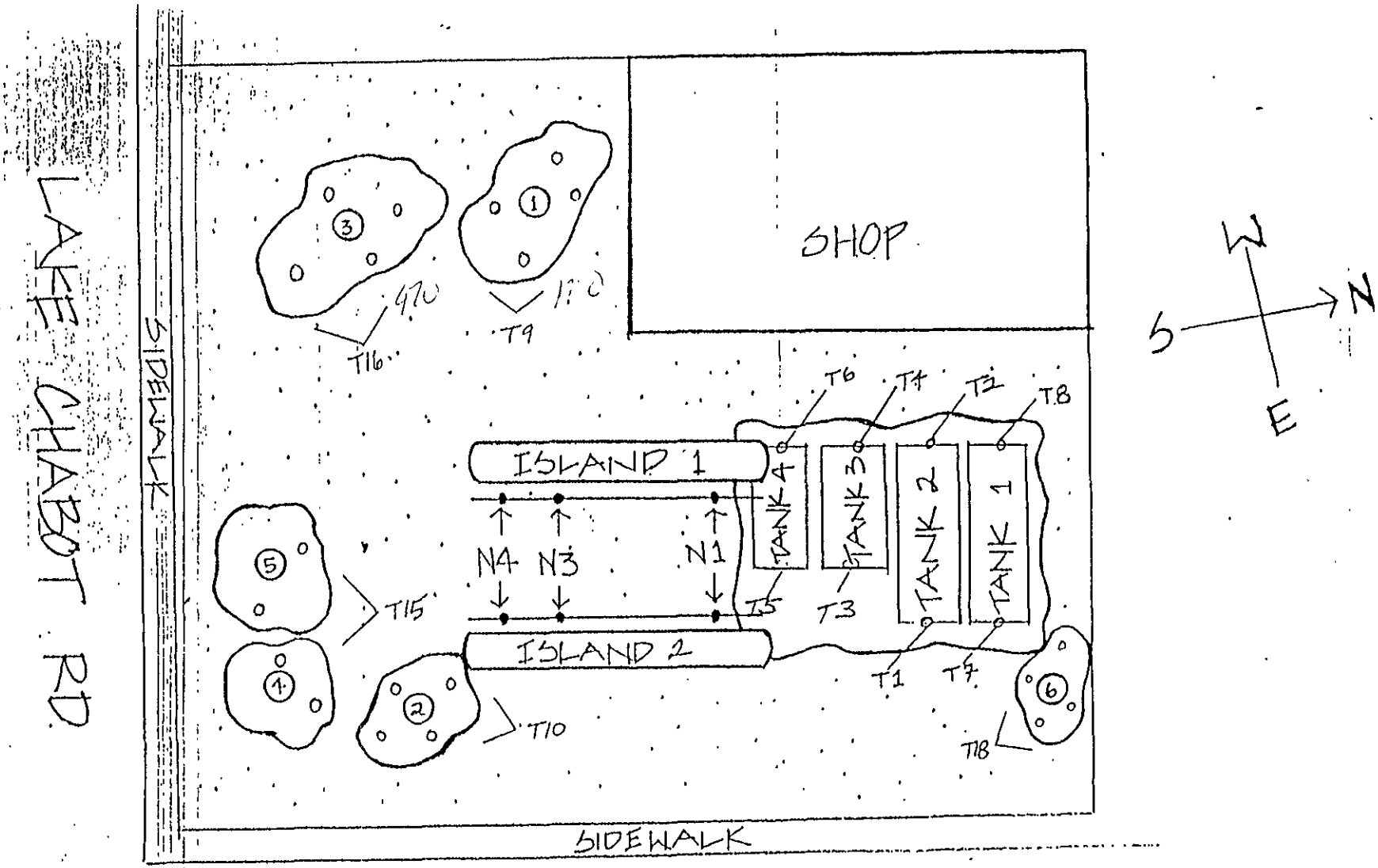
If you have any questions regarding this report, please contact me at your convenience.

Respectfully submitted,

Dave Sadoff
Environmental Geologist

cc: Mary Jo Meyers-Barnes
Lisa McCann

DS/ms



SHELL STATION

2724 Castro Valley Blvd

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client : Crosby & Overton Environmental
Address : 8430 Amelia Street
City : Oakland, CA 94621
Attn. : Ron Cadiz

Anametrix W.O.#: 8902121
Date Received : 02/16/89
Purchase Order#: 6632
Project No. : 4125-T
Date Released : 02/21/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8902121-01	4125-T T-1	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-02	4125-T T-2	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-03	4125-T T-3	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-04	4125-T T-4	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-05	4125-T T-5	SOIL	02/16/89	TPH		02/17/89	N/A
8902121-06	4125-T T-6	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-07	4125-T T-7	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-08	4125-T T-8	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-09	4125-T T-9	SOIL	02/16/89	TPH		02/16/89	N/A
8902121-10	4125-T T-10	SOIL	02/16/89	TPH		02/16/89	N/A

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 4125-T T-1	Anametrix I.D.	: 8902121-01
Matrix	: SOIL	Analyst	: [illegible]
Date sampled	: 02/16/89	Supervisor	: [illegible]
Date anl.TPHg	: 02/16/89	Date released	: 02/21/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	1100
108-88-3	Toluene	100	300
100-41-4	Ethylbenzene	100	500
1330-20-7	Total Xylenes	100	1200
	TPH as Gasoline	1000	11000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-2
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/16/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-02
Analyst : [signature]
Supervisor : [signature]
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	400
108-88-3	Toluene	100	ND
100-41-4	Ethylbenzene	100	200
1330-20-7	Total Xylenes	100	400
	TPH as Gasoline	1000	5000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-3
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/16/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-03
Analyst : a
Supervisor : [illegible]
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	ND
108-88-3	Toluene	100	300
100-41-4	Ethylbenzene	100	ND
1330-20-7	Total Xylenes	100	500
	TPH as Gasoline	1000	3000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-4
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/16/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-04
Analyst :
Supervisor :
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	1400
108-88-3	Toluene	100	300
100-41-4	Ethylbenzene	100	600
1330-20-7	Total Xylenes	100	600
	TPH as Gasoline	1000	8000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-5
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/17/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-05
Analyst : av
Supervisor : SJ
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	2000	ND
108-88-3	Toluene	2000	7000
100-41-4	Ethylbenzene	2000	2000
1330-20-7	Total Xylenes	2000	13000
	TPH as Gasoline	20000	620000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-6
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/16/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-06
Analyst : [illegible]
Supervisor : [illegible]
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	ND
108-88-3	Toluene	100	ND
100-41-4	Ethylbenzene	100	ND
1330-20-7	Total Xylenes	100	ND
	TPH as Gasoline	1000	ND

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D.	: 4125-T T-7	Anametrix I.D.	: 8902121-07
Matrix	: SOIL	Analyst	: aw
Date sampled	: 02/16/89	Supervisor	: BS
Date anl.TPHg	: 02/16/89	Date released	: 02/21/89
Date ext.TPHd	: N/A	Date ext. TOG	: N/A
Date anl.TPHd	: N/A	Date anl. TOG	: N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	ND
108-88-3	Toluene	100	ND
100-41-4	Ethylbenzene	100	ND
1330-20-7	Total Xylenes	100	ND
	TPH as Gasoline	1000	ND

ND - Not detected at or above the practical quantitation limit for the method.

TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.

BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-8
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/16/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-08
Analyst : [illegible]
Supervisor : [illegible]
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	1000
108-88-3	Toluene	100	ND
100-41-4	Ethylbenzene	100	ND
1330-20-7	Total Xylenes	100	ND
	TPH as Gasoline	1000	2000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-9
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/16/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-09
Analyst : a
Supervisor : [illegible]
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	2000	ND
108-88-3	Toluene	2000	26000
100-41-4	Ethylbenzene	2000	19000
1330-20-7	Total Xylenes	2000	130000
	TPH as Gasoline	20000	1700000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

ANALYSIS DATA SHEET - PETROLEUM HYDROCARBON COMPOUNDS
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-10
Matrix : SOIL
Date sampled : 02/16/89
Date anl.TPHg: 02/16/89
Date ext.TPHd: N/A
Date anl.TPHd: N/A

Anametrix I.D. : 8902121-10
Analyst : au
Supervisor : SJS
Date released : 02/21/89
Date ext. TOG : N/A
Date anl. TOG : N/A

CAS #	Compound Name	Detection Limit (ug/kg)	Amount Found (ug/kg)
71-43-2	Benzene	100	ND
108-88-3	Toluene	100	200
100-41-4	Ethylbenzene	100	100
1330-20-7	Total Xylenes	100	900
	TPH as Gasoline	1000	43000

ND - Not detected at or above the practical quantitation limit for the method.
TPHg - Total Petroleum Hydrocarbons as gasoline is determined by GCFID using EPA Method 5030.
BTEX - Benzene, Toluene, Ethylbenzene, and Total Xylenes are determined by modified EPA 8020.

All testing procedures follow California Department of Health Services (Cal-DHS) approved methods.

REPORT SUMMARY
ANAMETRIX, INC. (408) 432-8192

Client : Crosby & Overton Environmental
Address : 8430 Amelia Street
City : Oakland, CA 94621
Attn. : Ron Cadiz

Anametrix W.O.#: 0902121
Date Received : 02/16/89
Purchase Order#: 6632
Project No. : 4125-T
Date Released : 02/21/89

Anametrix I.D.	Sample I.D.	Matrix	Date Sampled	Method	Date Extract	Date Analyzed	Inst I.D.
RESULTS							
8902121-01	4125-T T-1	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-02	4125-T T-2	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-03	4125-T T-3	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-04	4125-T T-4	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-05	4125-T T-5	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-06	4125-T T-6	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-07	4125-T T-7	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-08	4125-T T-8	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-09	4125-T T-9	SOIL	02/16/89	TTLPB		02/17/89	AA1
8902121-10	4125-T T-10	SOIL	02/16/89	TTLPB		02/17/89	AA1
QUALITY ASSURANCE (QA)							
MB213	METHOD BLANK	SOIL	N/A	TTLPB		02/17/89	AA1

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-1
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-01
Analyst : MN
Supervisor : RS
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	9.48

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-2
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-02
Analyst : MN
Supervisor : [illegible]
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	6.95

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-3
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-03
Analyst : MN
Supervisor : MS
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	10.1

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-4
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-04
Analyst : MN
Supervisor : RS
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	10.9

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-5
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-05
Analyst : MN
Supervisor : BS
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	7.91

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-6
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-06
Analyst : MN
Supervisor : SJ
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	9.16

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-7
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-07
Analyst : MN
Supervisor : BS
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	7.68

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-8
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-08
Analyst : MN
Supervisor : RT
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	7.06

ND : Not detected at or above the practical quantitation limit for the limit.

ANALYSIS DATA SHEET - INORGANIC LEAD
ANAMETRIX, INC. (408) 432-8192

Sample I.D. : 4125-T T-9
Matrix : SOIL
Date Sampled : 02/16/89
Date Prepared: 02/16/89
Date Analyzed: 02/17/89

Anametrix ID : 8902121-09
Analyst : MN
Supervisor : [illegible]
Date released: 02/21/89
Instrument ID: AA1

METHOD NO.	COMPOUNDS	Detection Limit (mg/kg)	Amount Found (mg/kg)
7421	Total Lead (Pb)	0.1	3.5

ND : Not detected at or above the practical quantitation limit for the limit.