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7/28  
JUL 23 1991 65

July 19, 1991

Mr. Anthony Pettiti  
Anthony's Auto Service  
19592 Center Street  
Castro Valley, CA 94546

01  
ANTHONY'S AUTO SERVICE

Subject: Correction to Table 5 of TPE's March 29, 1991 Site Assessment Report for 19592 Center Street, Castro Valley, CA

Dear Mr. Pettiti:

Tank Protect Engineering (TPE) would like to correct an error which was made in Table 5 of TPE's March 29, 1991 Site Assessment Report. In this table, organic lead was mistakenly reported in parts per million. With this letter is included the corrected version of Table 5 which you may use to replace the previous version. An additional two copies of Table 5 have already been sent to:

Mr. Scott O. Seery  
Alameda County Health Care Services Agency  
Department of Environmental Health  
Hazardous Materials Program  
80 Swan Way, Room 200  
Oakland, CA 94612

Mr. Lester Feldman  
California Regional Water Quality  
Control Board - San Francisco Bay Region  
2101 Webster Street, Suite 500  
Oakland, CA 94612

If you have any questions, please call TPE at (415) 429-8088.

Sincerely,

*Michael A. Casso*

Michael A. Casso

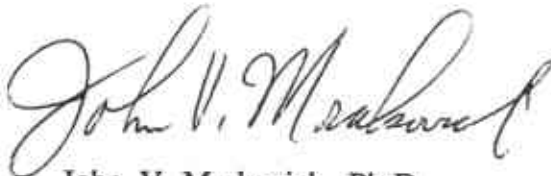
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**SITE ASSESSMENT REPORT**

**ANTHONY'S AUTO SERVICE  
19592 CENTER STREET  
CASTRO VALLEY, CALIFORNIA**

**Submitted By:  
TANK PROTECT ENGINEERING  
Of Northern California  
March 29, 1991**



John V. Mrakovich, Ph.D.  
Registered Geologist



## SITE ASSESSMENT REPORT

Anthony's Auto Service  
19592 Center Street  
Castro Valley, California

March 29, 1991

This site assessment has been prepared by the staff of **Tank Protect Engineering** under the supervision of an Engineer and/or Geologist whose seal(s) and signature(s) appear hereon.

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 expressed or implied.



Jeff J. Farhoomand, M.S.  
Civil Engineer

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- A. ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY, DEPARTMENT OF ENVIRONMENTAL HEALTH, HAZARDOUS MATERIALS DIVISION TANK REMOVAL PERMIT AND LETTER DATED AUGUST 16, 1990, UNIFORM HAZARDOUS WASTE MANIFEST, UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE(LEAK)/CONTAMINATION SITE REPORT, AND ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT WATER RESOURCES MANAGEMENT ZONE 7 PERMITS
- B. CERTIFIED ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY DOCUMENTATION
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## 1.0 INTRODUCTION

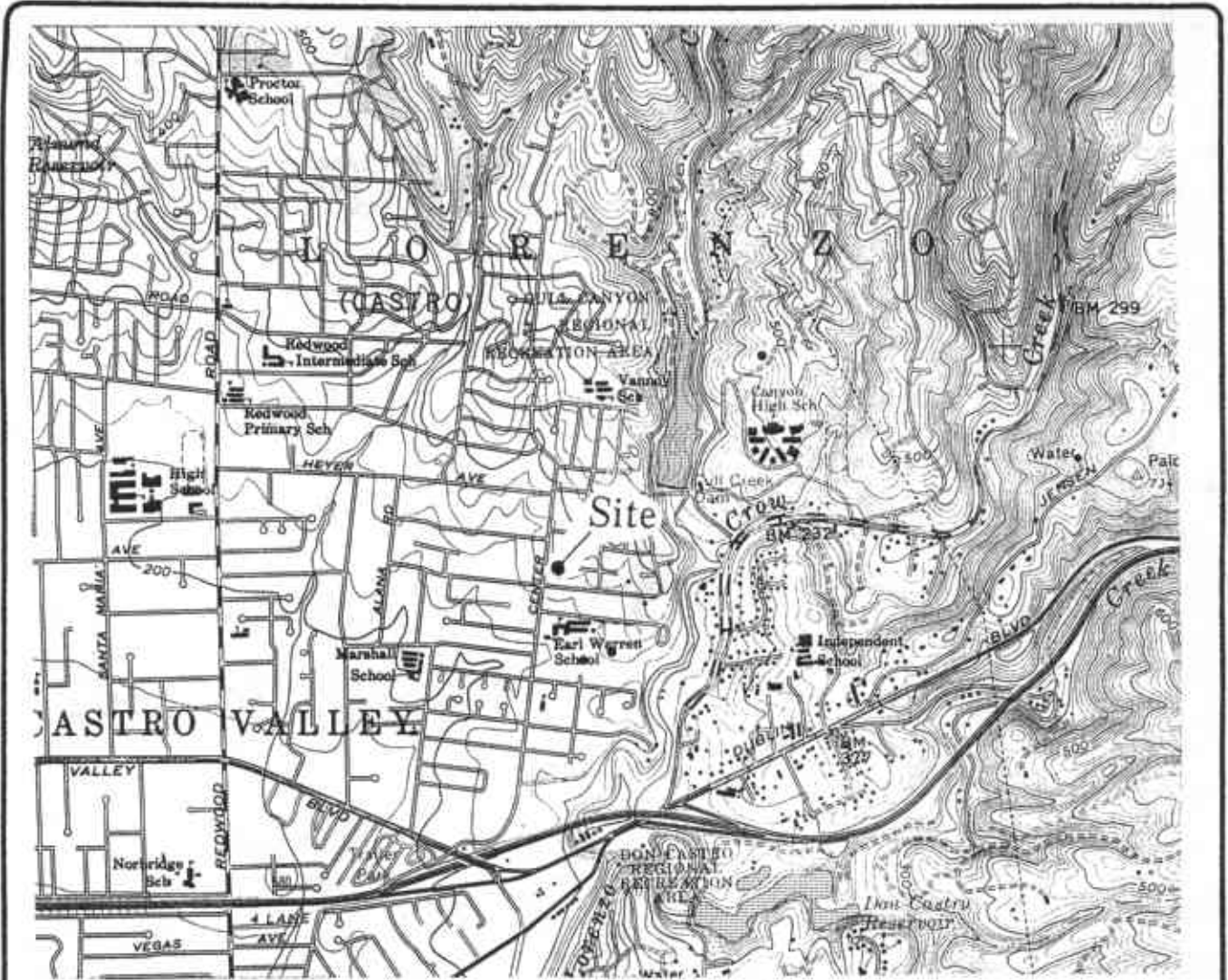
The subject site is located at 19592 Center Street in the City of Castro Valley in Alameda County, California (see Figure 1). Chemical analyses of subsurface soil samples collected during removal of 3 underground fuel storage tanks and 1 underground waste oil tank indicated the subsurface soil had experienced a confirmed release of petroleum hydrocarbons. This Site Assessment Report (SAR) documents tank removal activities, soil sampling and results of chemical analyses, drilling of soil borings, overexcavation, verification soil sampling, remediation of stockpiled soil, installation of groundwater monitoring wells, determination of groundwater gradient, groundwater sampling and results of chemical analyses, and makes a recommendation for additional groundwater monitoring. Information presented in previous reports, quarterly reports, and/or workplans are also presented in this SAR for completeness of activities, findings, and recommendations made by Tank Protect Engineering (TPE).

## 2.0 SITE HISTORY

The site is a former gasoline station currently owned by the Estate of John G. Pettiti (EJGP). John Pettiti purchased the property in 1986 from Wayne DelRio who owned the property and operated a gasoline service station for about 3 to 4 years. Ownership prior to Wayne DelRio is unknown, however, the gasoline service station is believed to have been constructed and in operation from 1956 to 1986.

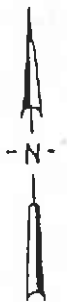
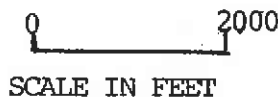
When John Pettiti purchased the property in 1986, he leased the property to his son Anthony who has since operated an automotive repair business at the site known as Anthony's Auto Service.

The former on-site underground fuel tanks are believed to have been in use since 1956. Between 1956 and 1986, the tanks are believed to have been used to dispense Shell and Texaco gasoline products. Since 1986, Anthony's Auto Service and Trick Racing Gasoline (as lessee to Anthony's Auto Service) have used the tanks for storage and dispensing of high octane, leaded, racing gasoline.



L E G E N D

REFERENCE: USGS 7.5 MINUTE  
 SERIES QUADRANGLE MAP,  
 HAYWARD, CALIFORNIA,  
 PHOTO REVISED 1980



SITE VICINITY MAP  
 ANTHONY'S AUTO SERVICE  
 19592 CENTER STREET  
 CASTRO VALLEY, CALIFORNIA

FIGURE  
 1



### 3.0 TANK REMOVAL

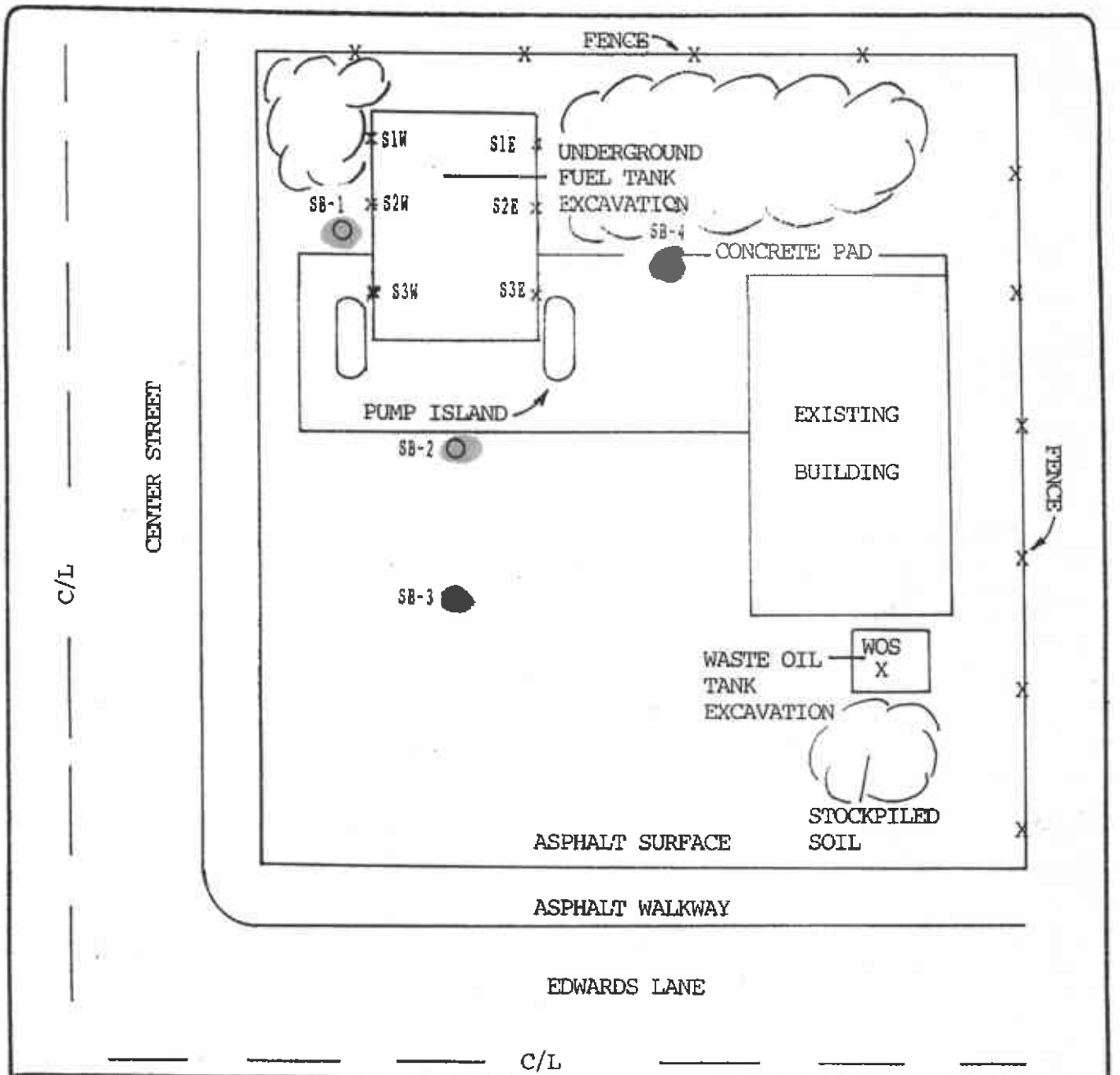
On July 12, 1990, TPE, under contract to EJGP, removed 1-4,000-gallon, steel, underground gasoline tank; 2-3,000-gallon, steel, underground gasoline tanks; and 1-250-gallon, steel, underground waste oil tank. A tank removal permit was obtained from the Alameda County Health Care Services Agency (ACHCSA), Department of Environmental Health, Hazardous Materials Division (see Appendix A).

Prior to tank removal activities by TPE, all tanks were emptied of petroleum products by the client. During tank removal, TPE purged flammable vapors from within the tanks (in-situ) with dry ice. After purging the tanks of flammable vapors, as indicated by a combustible gas indicator, the tanks were removed by TPE and transported off site by Erickson, Inc. as hazardous waste under Uniform Hazardous Waste Manifest, State Manifest Document Number 89890729 (see Appendix A). About 250 cubic yards (cyd) of soil were excavated, covered with plastic, and stockpiled on site as a result of tank removal activities.

Tank removal and subsequent soil sampling were conducted under the supervision of a representative of ACHCSA and in accordance with "Regional Board Staff Recommendations for Initial Evaluation and Investigation of Underground Tanks", 2 June, 1988, revised 9 November, 1989, and underground storage tank removal regulations established by the ACHCSA. During tank removal TPE observed that native soils were visibly discolored and emitted a hydrocarbon odor indicating that leaky tanks, piping, and/or overfilling had contaminated the soil. Because of the contamination an Underground Storage Tank Unauthorized Release(Leak)/Contamination Site Report was prepared for the ACHCSA (see Appendix A).

#### 3.1 Soil Sampling During Tank Removal Activities

Seven soil samples were collected for chemical analysis from beneath the fuel and waste oil tanks from about 1-foot below the native soil interface. One sample was collected from each end of each gasoline tank and 1 sample from below the center of the waste oil tank (see Figure 2). Soil samples were collected by excavating soil with a backhoe and driving a clean brass tube into a newly exposed soil surface in the bucket of the backhoe with a slide hammer corer. After collection of each soil sample, the brass tube ends were quickly



**LEGEND**

SB-1 NAME AND LOCATION OF SOIL BORING

S1W X NAME AND LOCATION OF SOIL SAMPLING



0 20  
SCALE IN FEET



SITE PLAN  
ANTHONY'S AUTO SERVICE  
1952 CENTER STREET  
CASTRO VALLEY, CALIFORNIA

FIGURE  
2

covered with aluminum foil and capped with plastic end-caps which were taped to the brass tubes with duct tape. The tubes were then labeled and placed in an iced cooler for transport to a State-certified laboratory accompanied by chain-of-custody documentation (see Appendix B).

The soil samples were analyzed by Sequoia Analytical located in Redwood City, CA, for total petroleum hydrocarbons as gasoline (TPHG) and for benzene, toluene, ethylbenzene, and xylenes (BTEX) by United States Environmental Protection Agency (EPA) Methods 5030/8015 and 5030/8020, respectively, according to the California Regional Water Quality Control Board - San Francisco Bay Region (CRWQCB) recommended and California Department of Health Services (DHS) approved methods.

Additionally, the soil sample collected below the waste oil tank was analyzed for total petroleum hydrocarbons as diesel (TPHD), total oil and grease (TOG), and halogenated volatile organics by EPA Methods 3550/8015, SM 503 D&E (Gravimetric), and 5030/8010, respectively. The above soil sample was also analyzed for the metals cadmium, chromium, lead, and zinc.

### 3.1.1 Soil Sample Analytical Results

Analytical results showed high concentrations of TPHG [up to 3,200 parts per million (ppm)] and BTEX present in soil samples collected near the ends of the former locations of the 2-3,000-gallon underground gasoline tanks. The soil sample collected below the waste oil tank detected only trace amounts of benzene, toluene, and xylenes, and low levels of chromium, lead, and zinc. Analytical results are summarized in Tables 1 and 2, and documented with certified analytical reports and chain-of-custodies in Appendix B.

## 4.0 SITE ASSESSMENT/SOIL REMEDIATION

Because soil samples collected at the time of tank removal contained up to 3,200 ppm TPHG and soil in the sidewalls and base of the excavation had a hydrocarbon odor and were visibly stained, EJGP contracted with TPE to drill soil borings and install groundwater monitoring wells as a preliminary site assessment to delineate the horizontal and vertical

TABLE 1  
 SUMMARY OF SOIL ANALYTICAL RESULTS  
 FOR SAMPLES COLLECTED DURING TANK REMOVAL\*  
 (ppm)

Sample ID Name	TOG	TPHD	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes
WOS	<30	<1.0	<1.0	.0055	.0094	<.0050	.0086
S1W	NA**	NA	<1.0	.0050	.0140	.0076	.0110
S2W	NA	NA	2,500	1.5000	57.0000	54.0000	310.0000
S3W	NA	NA	990	7.3000	150.0000	1.8000	34.0000
S1E	NA	NA	1.9	.0090	.2000	.0260	.2400
S2E	NA	NA	3,200	2.2000	87.0000	74.0000	470.0000
S3E	NA	NA	720	12.0000	140.0000	3.1000	54.0000

\* No halogenated volatile organics (EPA 8010) were present above their detection limits (see Appendix B)

\*\* Not Analyzed

TABLE 2  
SUMMARY OF SOIL ANALYTICAL RESULTS  
FOR SELECTED METALS  
(ppm)

Sample ID Name	Cadmium	Chromium	Lead	Zinc
WOS	<.50	17	3.8	23

extent of hydrocarbon contamination in the soil and groundwater, if any. Also, TPE was contracted by EJGP to overexcavate and conduct on-site soil remediation of contaminated soil as a remedial alternative, if appropriate. This assessment was also required by the ACHCSA's August 16, 1990 letter to Mr. Anthony Pettiti (see Appendix A).

#### 4.1 Objective and Scope of Work

Tank Protect Engineering's objective in this preliminary investigation was (1) to investigate the vertical and horizontal extent of vadose zone soil contamination, (2) to overexcavate and remediate contaminated soil (if appropriate), (3) to determine the extent of hydrocarbon impact to groundwater beneath the site, and (4) to determine hydraulic gradient and direction of groundwater flow.

To meet these objectives TPE performed the following scope of work:

- . Conducted an on-site subsurface utility survey.
- . Drilled 7 soil borings and converted 3 to groundwater monitoring wells.
- . Collected and analyzed 27 soil samples from 4 soil borings for TPHG and BTEX; 8 of the 27 were also analyzed for total lead.
- . Overexcavated contaminated soil and collected and analyzed 11 verification soil samples for TPHG and BTEX.
- . Remediated about 450 cyd of stockpiled soil on site and collected and analyzed 22 verification soil samples for TPHG and BTEX.
- . Backfilled and closed 2 tank excavations.
- . Developed, purged, and sampled groundwater from 3 monitoring wells and analyzed 3 groundwater samples for TPHG, BTEX, tetraethyllead, and industrial solvents.

- Surveyed top-of-well casings for elevation and determined groundwater flow direction and gradient.
- Prepared this report documenting work performed and analytical results with conclusions and recommendations.

Details of the above work are presented below.

#### 4.2 Prefield Activities

Prior to drilling soil borings at the subject site, TPE contracted with subsurface locators and conducted a USA location request to ensure that drilling activities would not encounter any buried utilities or underground objects. Soil borings and groundwater monitoring wells were permitted by the Alameda County Flood Control and Water Conservation District, Water Resources Management Zone 7 under permit numbers 90489 and 91036, respectively (see Appendix A).

#### 4.3 Drilling and Soil Sampling

On August 16, 1990 TPE drilled 4 soil borings at the locations shown in Figure 3 to assess the vertical and horizontal extent of hydrocarbon contamination in the vadose zone soil.

The exploratory borings were located along the 3 sides of the excavation at locations on site and accessible by a drill rig. The borings nearest the excavation were drilled first. If these borings contained contaminated soil based on field screening of samples with a combustible gas indicator, additional borings were drilled further outward from these borings and the excavation, if possible, in an attempt to find the horizontal limit of soil contamination (i.e. soil borings SB-2 and SB-3). The borings were drilled to a depth of 35-feet which was the shallowest depth that field screening indicated the absence of contamination in all soil borings drilled.

The exploratory borings were drilled using 8-inch diameter, hollow-stem, auger drilling equipment. The augers and sampling equipment were steam-cleaned before drilling each

boring to prevent cross contamination between borings or the introduction of off-site contamination for the initial boring. Representative soil samples were collected at approximately 5-foot depth intervals below the ground surface by advancing a California split-spoon sampler, equipped with brass tubes, into the undisturbed soil beyond the tip of the augers. The sampling equipment was cleaned before each sampling event by washing with a trisodium phosphate solution and rinsing in distilled water. After collection of the soil samples, the brass tube ends were quickly covered with aluminum foil and capped with plastic end-caps which were taped to the brass tubes with duct tape. The tubes were then labeled and placed in an iced cooler for transport to a State-certified laboratory accompanied by chain-of-custody documentation (see Appendix B). See Appendices C, D, and E for TPE's protocol relative to hollow-stem auger drilling and soil sampling procedures, sample handling techniques, and waste handling and decontamination procedures.

Drill cuttings were contained on site in plastic and later remediated with stockpiled soil as discussed below.

A detailed boring log was prepared from auger return material and split-spoon samples (see Appendix F). The soil was logged according to the Unified Soil Classification System by a California registered geologist.

No groundwater was encountered while drilling the soil borings.

All soil samples were analyzed by Sequoia Analytical located in Redwood City, CA according to the CRWQCB recommended and DHS approved methods. Soil samples were analyzed for TPHG and BTEX by EPA Methods 5030/8015 and 5030/8020, respectively.

#### 4.3.1 Soil Sample Analytical Results

All borings (SB-1 through SB-4) were drilled to a depth of 35-feet and sampled for chemical analysis to a depth of 36.5-feet except boring SB-4 which was sampled to a depth of 31.5-feet. The sample at 36.5-feet in boring SB-4 encountered apparent bedrock and only partial penetration and sample recovery made the sample inadequate for chemical analysis.



Soil borings SB-1 and SB-4 detected no TPHG and only trace amounts of some BTEX chemicals to depths of about 16 feet and 21 feet, respectively. Soil boring SB-2 detected 1.2 ppm of TPHG and trace amounts of some BTEX components at a depth of about 26 feet and trace amounts of ethylbenzene and xylenes at about 36 feet at concentrations of .0087 ppm and .0410 ppm, respectively. Soil Boring SB-3 detected TPHG at a concentration of 2.7 ppm and 15.0 ppm at depths of about 11-feet and 26-feet, respectively, with trace amounts of some BTEX chemicals present to total depth. Results of chemical analyses are summarized in Table 3 and documented with certified analytical reports and chain-of-custodies in Appendix B.

Because soil samples SB-2 and SB-3 contained detectable quantities of TPHG, TPE additionally analyzed these samples, and samples at the same depths in borings SB-1 and SB-4, for total lead by AA method. Total lead was detected in all samples ranging in concentration from 3.0 ppm to 18 ppm (see Table 3 and Appendix B).

#### 4.4 Overexcavation

Based on the above soil analytical results from samples collected from the above soil borings, TPE interpreted the results to indicate that vadose zone soil contamination by TPHG and BTEX probably occurred within a limited area near the sidewalls and base of the underground tank excavation. Tank Protect Engineering recommended to the client that contaminated soil be overexcavated, treated on site by chemical oxidation, and with the approval of the ACHCSA be used as backfill for closing the excavation.

Because soil sample WOS, collected beneath the waste oil tank, contained only trace amounts of benzene, toluene, and xylenes (0.0055 ppm, 0.0094 ppm, and 0.0086 ppm, respectively), TPE recommended no further remediation of soil in the area of the waste oil tank.

During the week of November 5, 1990 TPE conducted overexcavation of the 4 sides and base of the underground fuel tank excavation (see Figure 3). During overexcavation, soil in the sidewalls and base were sampled and field-screened for contamination by performing a head-space analysis using a combustible gas indicator. Overexcavation continued until field-screening indicated all contaminated soil had been excavated from all 4 sides and base

TABLE 3  
SUMMARY OF SOIL ANALYTICAL RESULTS  
FOR SITE ASSESSMENT/SOIL...  
(ppm)

Sample ID Name	Depth (in feet)	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes	Total Lead
SB-1	06.0-06.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA*
SB-1	11.0-11.5	<1.0	<.0500	<.1000	<.1000	<.1000	3.0
SB-1	16.0-16.5	<1.0	.0070	.0050	<.1000	<.1000	NA
SB-1	20.5-21.0	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-1	26.0-26.5	<1.0	<.0500	<.1000	<.1000	<.1000	7.0
SB-1	31.0-31.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-1	36.0-36.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-2	06.0-06.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-2	11.0-11.5	<1.0	<.0500	<.1000	<.1000	<.1000	6.5
SB-2	16.0-16.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-2	21.0-21.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-2	26.0-26.5	1.2	<.0500	.0280	.0220	.0460	13.0
SB-2	31.0-31.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-2	36.0-36.5	<1.0	<.0500	<.1000	.0087	.0410	NA
SB-3	06.0-06.5	<1.0	<.0500	.0079	.0068	.0160	NA
SB-3	11.0-11.5	2.7	<.0500	.0067	.0270	.0650	14.0
SB-3	16.0-16.5	<1.0	.0063	.0063	<.1000	<.1000	NA
SB-3	21.0-21.5	<1.0	.0065	.0017	<.1000	<.1000	NA
SB-3	26.0-26.5	15.0	<.0500	<.1000	<.1000	.0270	15.0
SB-3	31.0-31.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
SB-3	36.0-36.5	<1.0	.0051	.0250	.0230	.0570	NA
SB-4	06.0-06.5	<1.0	.0050	.0058	<.1000	.1100	NA
SB-4	11.0-11.5	<1.0	.0069	.0420	.0250	.1000	13.0
SB-4	16.0-16.5	<1.0	<.0500	.0068	<.1000	.0063	NA

borings

TABLE 3  
SUMMARY OF SOIL ANALYTICAL RESULTS  
FOR SITE ASSESSMENT/SOIL...  
(ppm)

Sample ID Name	Depth (in feet)	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes	Total Lead
SB-4	21.0-21.5	<1.0	.0073	.0100	<.1000	.0190	NA
SB-4	26.0-26.5	<1.0	<.0500	<.1000	<.1000	<.1000	18.0
SB-4	31.0-31.5	<1.0	<.0500	<.1000	<.1000	<.1000	NA
VSN-2	15.0-15.5	<1.0	<.0050	<.0050	<.0050	<.0050	NA
VSE-2	16.0-16.5	<1.0	<.0050	<.0050	<.0050	<.0050	NA
VSS-1	16.0-16.5	<1.0	<.0050	<.0050	<.0050	<.0050	NA
VSS-2	16.0-16.5	<1.0	<.0050	<.0050	<.0050	<.0050	NA
VSBP-2	17.5-18.0	<1.0	<.0050	<.0050	<.0050	<.0050	NA
VSE-1	17.0-17.5	<1.0	<.0050	<.0050	<.0050	.0053	NA
VSW-1	15.0-15.5	<1.0	<.0050	<.0050	<.0050	<.0050	NA
VSW-2	16.0-16.5	<1.0	.0092	.0190	<.0050	.0180	NA
VSBP-1	17.5-18.0	<1.0	<.0050	.0070	<.0050	.0071	NA
VSN-1	15.0-15.5	<1.0	<.0050	<.0050	<.0050	<.0050	NA
VSCS-1	03.0-03.5	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-1	--	<1.0	<.0050	<.0050	<.0050	.0700	NA
SP-2	--	<1.0	<.0050	<.0050	<.0050	.4200	NA
SP-3	--	<1.0	<.0050	<.0050	<.0050	.3800	NA
SP-4	--	<1.0	<.0050	<.0050	<.0050	.3800	NA
SP-5	--	<1.0	<.0050	.4600	<.0050	.3400	NA
SP-6	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-7	--	<1.0	<.0050	<.0050	<.0050	.3800	NA
SP-8	--	<1.0	<.0050	<.0050	<.0050	.3000	NA
SP-9	--	<1.0	<.0050	<.0050	<.0050	.1700	NA

borings

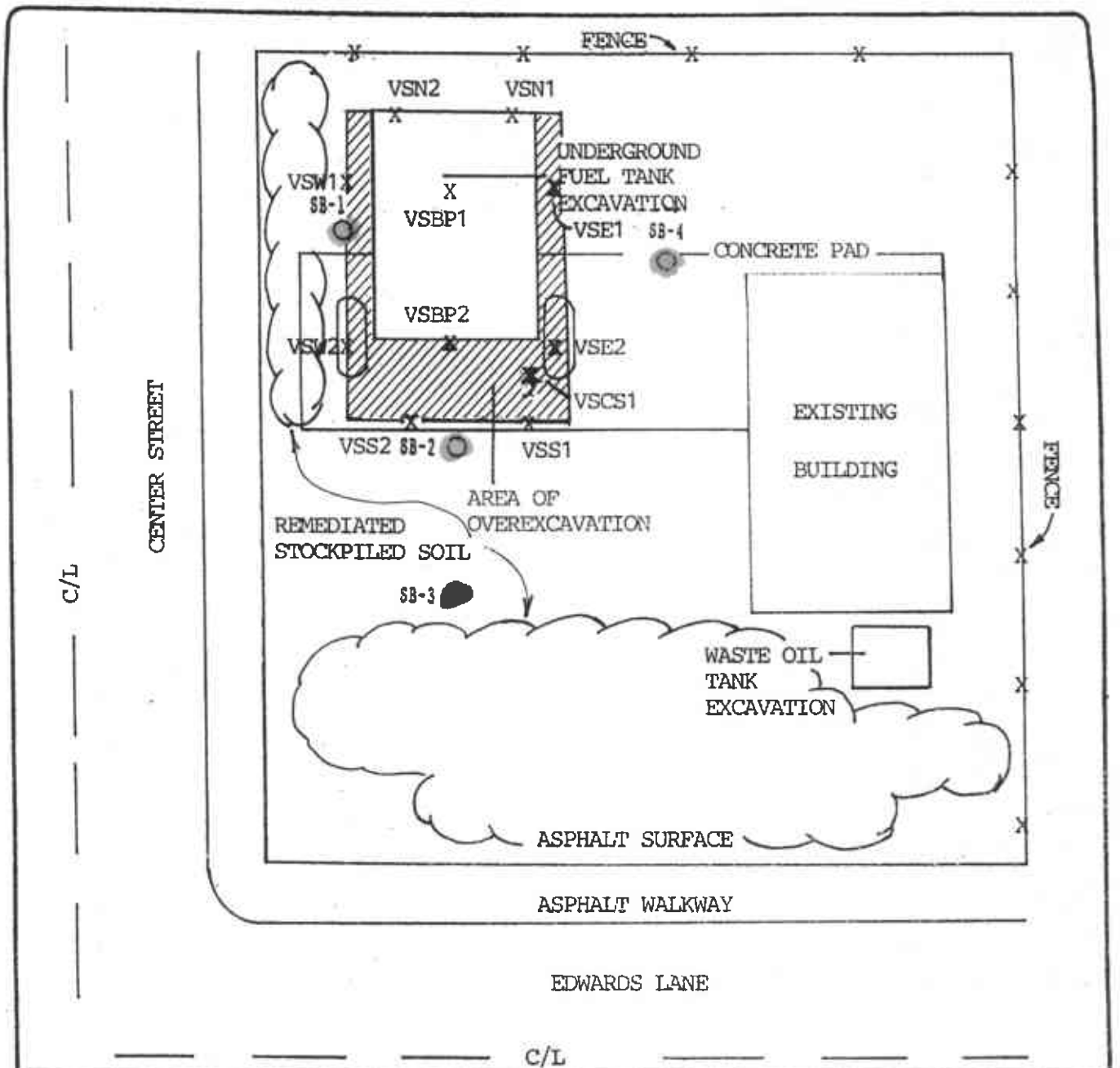
over excavation

stack pile

TABLE 3  
 SUMMARY OF SOIL ANALYTICAL RESULTS  
 FOR SITE ASSESSMENT/SOIL...  
 (ppm)

Sample ID Name	Depth (in feet)	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes	Total Lead
SP-10	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-11	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-12	--	<1.0	<.0050	.7100	.1200	.6100	NA
SP-13	--	<1.0	.1700	<.0050	<.0050	.2500	NA
SP-14	--	<1.0	<.0050	.4100	<.0050	<.0050	NA
SP-15	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-16	--	<1.0	<.0050	<.0050	<.0050	.5200	NA
SP-17	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-18	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-19	--	<1.0	<.0050	.3300	<.0050	.3900	NA
SP-20	--	<1.0	<.0050	<.0050	<.0050	.3800	NA
SP-21	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA
SP-22	--	<1.0	<.0050	<.0050	<.0050	<.0050	NA

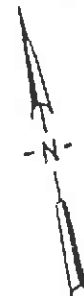
NA\* = NOT ANALYZED



**LEGEND**

SB-1 NAME AND LOCATION OF SOIL BORING  
 ○

VSN1 NAME AND LOCATION OF SOIL SAMPLING  
 X



0 20  
 SCALE IN FEET



OVEREXCAVATION  
 ANTHONY'S AUTO SERVICE  
 19592 CENTER STREET  
 CASTRO VALLEY, CALIFORNIA

FIGURE  
 3

of the excavation. Vertical overexcavation was conducted to a depth of about 17 feet. Including excavation at the time of tank removal, about 450 cubic yards of contaminated soil was excavated and stockpiled on site.

#### 4.4.1 Overexcavation Verification Soil Sampling

Eleven verification soil samples (see Figure 3) were collected for chemical analyses to ensure that all contaminated soil had been removed. Soil samples were collected by excavating soil 1 to 2 feet below the exposed surfaces of the excavation with a backhoe and then, collecting a freshly exposed soil sample from the bucket of the backhoe in a 6-inch brass tube driven by a slide hammer corer. The soil samples were collected, handled, and preserved as described above in Section 4.3 Drilling and Soil Sampling and transported with a chain-of-custody to a California State certified laboratory (Sequoia Analytical in Redwood City, CA) for chemical analysis. Verification soil samples were analyzed for TPHG and BTEX by EPA Methods 5030/8015 and 5030/8020, respectively.

##### 4.4.1.1 Verification Soil Sample Analytical Results

Results of chemical analyses for verification soil samples were below detection limits for all chemicals tested with the exception of soil sample VSW-2 which contained trace levels of benzene, toluene, and xylenes; soil sample VSE-1 which contained trace levels of xylenes; and soil sample VSBP-1 which contained trace levels of toluene and xylenes. Results of chemical analyses are summarized in Table 3 and documented with certified analytical reports and chain-of-custodies in Appendix B.

#### 4.5 Stockpiled Soil Remediation

Tank Protect Engineering remediated hydrocarbons in the stockpiled soil by oxidizing the hydrocarbons with a hydrogen peroxide solution. When applying the solution to hydrocarbon contaminated soil, the chemical reaction between the hydrogen peroxide and hydrocarbons produces non-toxic and non-hazardous carbon dioxide and water as reaction products.

The Bay Area Air Quality Management District was notified by TPE prior to beginning on-site soil remediation.

Treatment began by delineating a treatment area and covering the ground with plastic covered with about 8-inches of clean soil. The plastic and clean soil provided a protective barrier to prevent cross contamination between in-situ soil and the contaminated soil being treated.

At the beginning of the treatment, contaminated soil was moved by backhoe from the contaminated stockpiled soil to the treatment area and spread from 8-inches to 16-inches deep. The soil was then treated by applying a hydrogen peroxide mixture to the exposed surface with a sprayer. The mixture was applied in several doses with the contaminated soil being turned before each dose to expose new surfaces. Additional layers of contaminated soil were spread from about 8-inches to 16-inches deep over the previously treated soil and treated. This process continued until all the contaminated soil had been treated. Remediation was conducted by TPE during November, 1990.

#### 4.5.1 Soil Remediation Verification Soil Sampling

To test the effectiveness of the remedial treatment, TPE, on December 28, 1990, collected 22 discrete soil samples for chemical analysis for TPHG and BTEX by EPA Methods 5030/8015 and 5030/8020, respectively. The soil samples were collected at locations that would represent sampling at the rate of about 1 sample for each 20 cyd of stockpiled soil. The samples were collected by digging to half the depth of the stockpile, about 3.0 feet, and collecting a soil sample by advancing a 6-inch long by 2-inch diameter brass tube ahead of the dug hole with a slide hammer corer. Soil samples were collected, preserved, and handled as described above under Section 4.3 Drilling and Soil Sampling.

##### 4.5.1.1 Verification Soil Sample Analytical Results

Analyses of the verification soil samples detected no TPHG and only .17 ppm benzene in sample SP-13. Toluene was detected in samples SP-5, SP-12, SP-14, and SP-19 at concentrations of .46 ppm, .71 ppm, .41 ppm, and .33 ppm, respectively. Ethylbenzene was

detected only in sample SP-12 at a concentration of .12 ppm and xylenes were detected in 13 samples ranging in concentration from .0700 ppm to .6100 ppm.

#### 4.6 Excavation Closures

Based on the above analytical results and the verbal approval of the ACHCSA, TPE backfilled and sealed the fuel tank and waste oil excavations during the week of January 21, 1991. Backfilling of the fuel tank excavation was begun by placing about 50 cyd of compacted aggregate base into the excavation. The remainder of the excavation was then filled to ground surface with about 440 cyd of compacted, remediated, stockpiled soil excavated during tank removal and overexcavation activities. The surface of the excavation was sealed with asphalt.

The waste oil tank excavation was backfilled with about 10 cyd of compacted, remediated, stockpiled soil and sealed with asphalt.

#### 4.7 Groundwater Monitoring Well Installations

Exploratory borings for the 3 groundwater monitoring wells were drilled to total depths ranging from 39.5 feet to 49.5 feet. Each boring was converted to a monitoring well by installing 2-inch diameter, flush-threaded, schedule 40, polyvinyl chloride casing and 0.020-inch, machine-slotted screen. The exact depth of each boring and screen length was determined by the geologic profile and depth of occurrence of groundwater in the boring at each location. A sand pack of #2/16 filter sand was placed in the annular space to a maximum of 2 feet above the top of the screened interval. Approximately 2 feet of bentonite was placed above the sand pack followed by a portland cement/sand mix surface seal. A traffic rated, locking, vault box was set in cement to protect the well. A locking well cap with lock was also installed on each well casing. The top-of-casing (TOC) was surveyed relative to mean sea level (MSL) by a professional civil engineer. See Appendix F for well completion details, and Appendix G for TPE's groundwater monitoring well construction procedures.



## 4.8 Groundwater Sampling

After the wells were installed, depth to stabilized water was measured and recorded. Depth to water was measured from the TOC to the nearest 0.01 foot using an electronic Solinst water level meter. A minimum of 3 repetitive measurements were made for each level determination to ensure accuracy. Each well was checked for floating product using a clear polyethylene bailer. No floating product was observed.

All wells were developed by bailing (see Appendix H). After groundwater in the wells was allowed to stabilize (a minimum of 24 hours), the wells were purged a minimum of 4 wetted well volumes with a dedicated polyethylene bailer as described in Appendix I. Since dedicated bailers were used for each well sampled, no decontamination was necessary between sampling events. The water samples were collected in sterilized glass vials with teflon-lined screw caps, immediately sealed in the vials, and labeled to include: date, time, sample location, project number, and sampler. The samples were immediately stored on ice for transport to a State-certified laboratory accompanied by chain-of-custody documentation. Water samples were analyzed for TPHG, BTEX, and organic lead by EPA Methods GCFID 5030/8015, 5030/8020, and the California LUFT Manual, 12/87, respectively. See Appendices E and J for waste handling and decontamination procedures, and quality assurance and quality control procedures.

Development and purge water are stored on site in 55-gallon drums. Tank Protect Engineering will provide recommendations to the client and, upon their request, assist them in remediation, or disposal of the fluids, or both in an appropriate manner as an additional work item.

## 4.9 Findings

### 4.9.1 Hydrogeology

The hydrogeology of the subject site has been interpreted from soil boring logs and the stabilized water levels in groundwater monitoring wells MW-1, MW-2, and MW-3. Boring logs and well completion details are presented in Appendix F.

The site is located in Castro Valley, an intermontane valley of the Diablo Range located in the Coast Range Physiographic Province. The Diablo Range is composed mainly of nonwater-bearing, consolidated rock and is separated by the Hayward Fault from the unconsolidated water-bearing rocks of the East Bay Plain. The valley is underlain by Late Pleistocene alluvial deposits of interbedded clay, silt, sand, and gravel that has a maximum thickness of about 80 feet.

Cross section A-A' (see Figure 4) has been constructed to illustrate the stratigraphy beneath the former tank complex at the subject site. The deepest soil borings encountered weathered sandstone bedrock at depths ranging from about 32 feet in the boring of well MW-2 to 39 feet in the boring of well MW-3. The bedrock is overlain by about 20 feet of gravelly, clayey sand or gravelly, clayey, silty sand which, in turn, is overlain by about 2 to 5 feet of clayey silt. Lying above the silt to ground surface is about 15 feet of silty sand.

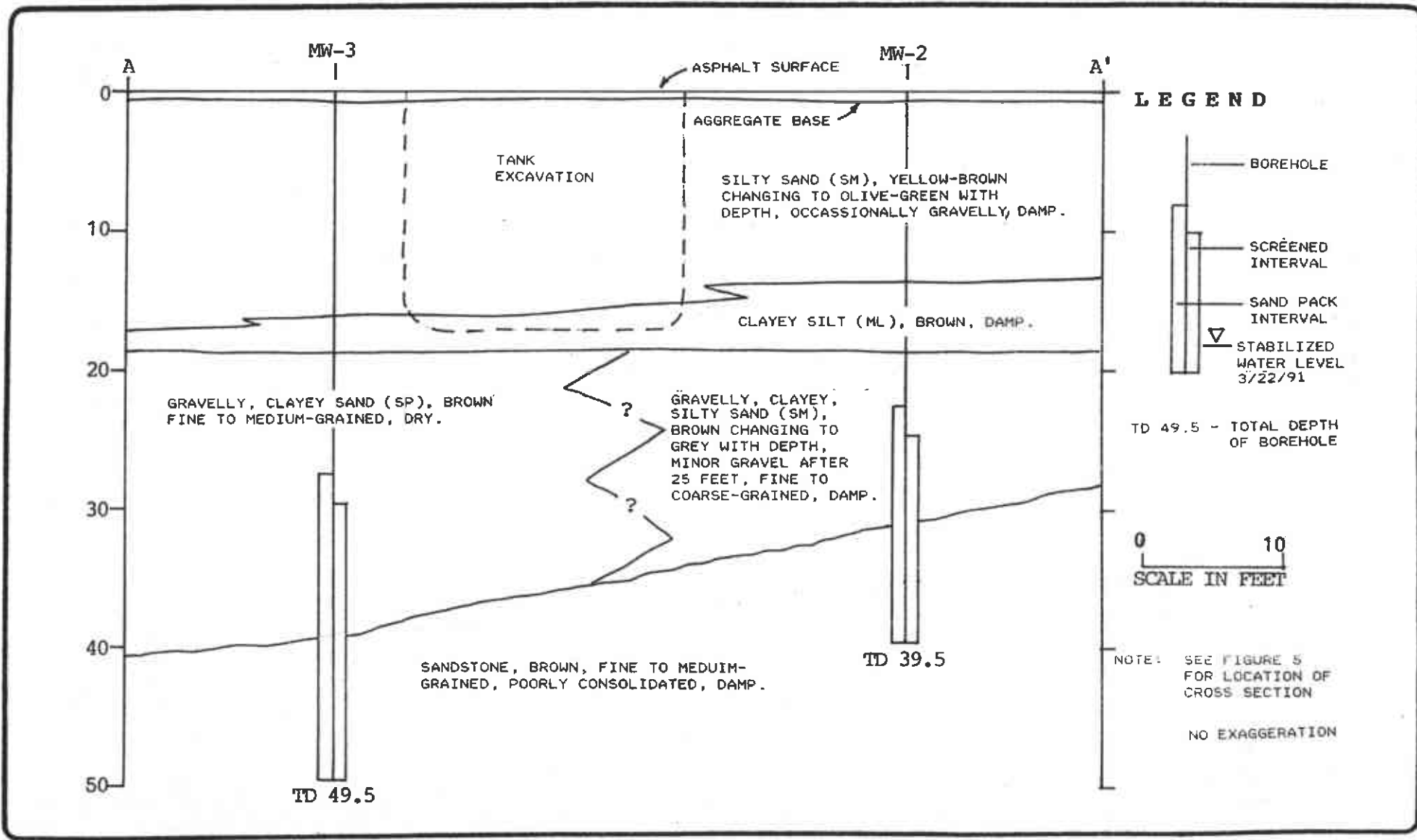
Groundwater was not encountered in any of the borings drilled for the monitoring wells until penetrating the weathered bedrock. Fractured or otherwise porous zones within the bedrock appeared to be the source of groundwater which may be locally confined.

Depth to stabilized groundwater was measured in the 3 groundwater monitoring wells on March 22, 1991 (see Table 4). Figure 5 is a potentiometric map constructed from the above stabilized groundwater levels showing groundwater flow direction to be southwest with a gradient of .109 feet per foot.

#### 4.9.2 Groundwater Analytical Results

Three groundwater samples were analyzed for TPHG, BTEX, and organic lead by Sequoia Analytical located in Concord, California. Certified analytical reports and a chain-of-custody are documented in Appendix B and results of chemical analyses are summarized in Table 5.

Chemical analyses of the 3 groundwater samples detected 160 parts per billion (ppb) and 120 ppb of a chemical not appearing to be gasoline as TPHG in wells MW-1 and MW-3, respectively. No BTEX or organic lead were detected in any samples. As an attempt to identify the chemical or chemicals present in the TPHG scan, an industrial solvents scan by



GEOLOGIC CROSS SECTION  
 ANTHONY'S AUTO SERVICE  
 19592 CENTER STREET  
 CASTRO VALLEY, CALIFORNIA

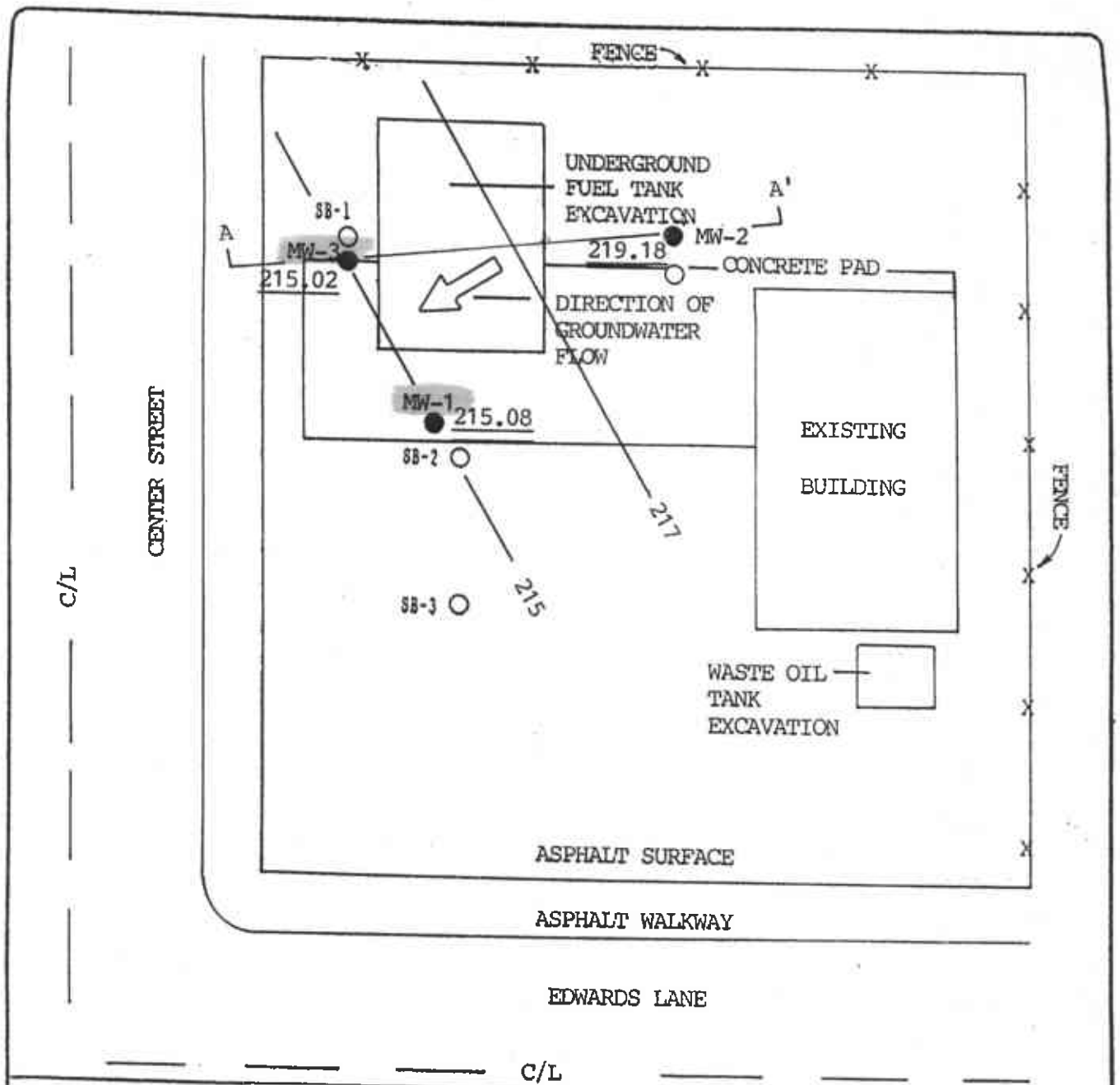
FIGURE  
 4

TABLE 4  
GROUNDWATER ELEVATION

Well Name	Elevation TOC* (feet MSL)	Date	Depth to Water from TOC	Groundwater Elevation (feet MSL)
MW-1	249.72	3/22/91	34.64	215.08
MW-2	250.18	3/22/91	31.00	219.18
MW-3	250.11	3/22/91	35.09	215.02

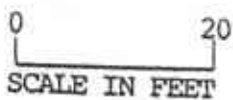
\* TOC = TOP OF CASING

*when installed*

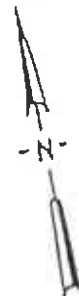


**LEGEND**

- SB-1 NAME AND LOCATION OF SOIL BORING
- 
- MW-1 NAME AND LOCATION OF GROUNDWATER MONITORING WELL
- 



- 215 — POTENTIOMETRIC CONTOUR
- A A' GEOLOGIC CROSS SECTION



GROUNDWATER GRADIENT  
ANTHONY'S AUTO SERVICE  
1952 CENTER STREET  
CASTRO VALLEY, CALIFORNIA

FIGURE  
5

TABLE 5  
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS  
(ppb)

Sample ID Name	Date Sampled	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes	Organic Lead
MW-1	2/18/91	160*	<0.30	<0.30	<0.30	<0.30	<5.0
MW-2	2/18/91	<30	<0.30	<0.30	<0.30	<0.30	<5.0
MW-3	2/18/91	120*	<0.30	<0.30	<0.30	<0.30	<5.0

\* ACCORDING TO SEQUOIA ANALYTICAL THESE SAMPLES DO NOT APPEAR TO CONTAIN GASOLINE. SEE CERTIFIED ANALYTICAL REPORT IN APPENDIX B.

TABLE 5  
SUMMARY OF GROUNDWATER ANALYTICAL RESULTS  
(ppb)

Sample ID Name	Date Sampled	TPHG	Benzene	Toluene	Ethyl-Benzene	Xylenes	Organic Lead
MW-1	2/18/91	160*	<0.30	<0.30	<0.30	<0.30	<0.0050
MW-2	2/18/91	<30	<0.30	<0.30	<0.30	<0.30	<0.0050
MW-3	2/18/91	120*	<0.30	<0.30	<0.30	<0.30	<0.0050

\* ACCORDING TO SEQUOIA ANALYTICAL THESE SAMPLES DO NOT APPEAR TO CONTAIN GASOLINE. SEE CERTIFIED ANALYTICAL REPORT IN APPENDIX B.

*Sampled a month after  
constructed*

150-Octane

EPA Modified Method 3810/8015 was conducted by Sequoia Analytical. This scan of 34 chemicals detected iso-Octane at 150 ppb, consistent with the concentrations detected above for TPHG. It appears that iso-Octane is present in groundwater in wells MW-1 and MW-3 which are downgradient of the location of the former underground fuel tanks. According to Sequoia Analytical, iso-Octane is a hydrocarbon that may be used in motor fuel or as a solvent and thinner.

A telephone call was made by TPE to the DHS in Berkeley, California to determine if iso-Octane appears on any regulatory list of chemicals. Alexis Milea of the DHS advised TPE that iso-Octane did not appear on any list including lists by EPA and States other than California.

#### 5.0 RECOMMENDATIONS

Based on groundwater analytical results discussed above, TPE recommends that quarterly groundwater monitoring be conducted for iso-Octane by EPA Modified Method 3810/8015 at the subject site until 4 consecutive quarters of nondetected analytical results are documented. After 4 consecutive quarters of nondetectable chemicals by the above Method, TPE recommends that EJGP ask the ACHCSA for case closure.

No additional site characterization is recommended by TPE at this time since TPE believes the source of iso-Octane, the former underground fuel tanks, has been removed and the concentration of iso-Octane in the groundwater is expected to show a decreasing trend with time. If the concentration of iso-Octane show an increasing trend with time, TPE would recommend additional investigation and characterization of the groundwater plume.



APPENDIX A

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY, DEPARTMENT OF ENVIRONMENTAL HEALTH, HAZARDOUS MATERIALS DIVISION TANK REMOVAL PERMIT AND LETTER DATED AUGUST 16, 1990, UNIFORM HAZARDOUS WASTE MANIFEST, UNDERGROUND STORAGE TANK UNAUTHORIZED RELEASE(LEAK)/CONTAMINATION SITE REPORT, AND ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT WATER RESOURCES MANAGEMENT ZONE 7 PERMITS

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY  
DEPARTMENT OF ENVIRONMENTAL HEALTH  
HAZARDOUS MATERIALS DIVISION  
80 SWAN WAY, ROOM 200  
OAKLAND, CA 94621  
PHONE NO. 415/271-4320

503.40  
6.29.40

ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY  
DEPARTMENT OF ENVIRONMENTAL HEALTH  
HAZARDOUS MATERIALS DIVISION  
80 SWAN WAY, ROOM 200  
OAKLAND, CA 94621  
PHONE NO. 415/271-4320

UNDERGROUND TANK CLOSURE/MODIFICATION PLANS

1. Business Name Anthony's Auto Service  
Business Owner The Estate of John Pettiti
2. Site Address 19592 Center Street  
city Castro Valley zip 94546 Phone 415-538-1288
3. Mailing Address 19592 Center Street  
city Castro Valley zip 94546 Phone 415-538-1288
4. Land Owner The Estate of John Pettiti  
Address 19592 Center St. city, State Castro Valley CA zip 94546
5. EPA I.D. No. CAC000297233
6. Contractor Tank Protect Engineering  
Address 2821 Whipple Rd.  
city Union City, CA Phone (415) 429-8088  
License Type A ID# 575837
7. Consultant Tank Protect Engineering  
Address 2821 Whipple Rd.  
city Union City Phone (415) 429-8088

ALAMEDA COUNTY  
HEALTH CARE SERVICES

AGENCY  
DAVID J. KEARS, Agency Director



Certified Mailer # P 062 128 225

DEPARTMENT OF ENVIRONMENTAL HEALTH  
Hazardous Materials Program  
80 Swan Way, Rm. 200  
Oakland, CA 94621  
(415)

August 16, 1990

Mr. Anthony Pettiti  
Anthony's Auto Service  
19592 Center Street  
Castro Valley, CA 94546

RE: UNDERGROUND STORAGE TANK CLOSURE REPORT; ESTATE OF JOHN G.  
PETTITI, 19592 CENTER STREET, CASTRO VALLEY: REQUEST FOR  
PRELIMINARY SITE ASSESSMENT (PSA) PROPOSAL

Dear Mr. Pettiti:

This Department has completed review of the report of laboratory analyses, as submitted under Tank Protect Engineering cover dated August 7, 1990. This report documents the analyses performed upon soil samples collected July 12, 1990 during the closure of three (3) fuel underground storage tanks (UST) and one (1) waste oil UST.

The results of laboratory analyses indicate that substantial contamination is present in native soils which underlie the fuel UST cluster. Concentrations of total petroleum hydrocarbons as gasoline (TPH-G) were as high as 3,200 parts per million (ppm) in sample S-2-E. Other samples collected from the fuel UST pit ranged from nondetectable (<1.0 ppm) to 2,500 ppm TPH-G. Observations made during removal of the fuel tanks indicated that native soil below these tanks, particularly toward the southern end of the excavation, was discolored. These soils exhibited the distinct odor of weathered and, below the southern-most UST, fresh gasoline. Native soils uncovered in this excavation are primarily sands and pebbly sands. Such materials are generally highly permeable and exhibit high rates of transmissivity.

Additionally, the waste oil UST had several holes in the welded seam at the low end of the tank. The soil sample collected from below this tank did not show the presence of TPH, total oil and grease (TOG), or halogenated hydrocarbons at or below the respective limits of detection; however, detectable concentrations of the volatile compounds benzene, toluene, ethylbenzene, and xylene (BTEX) were found. Native soil below this tank is similar to that indicated below the fuel tanks.

Mr. Anthony Pettiti  
RE: Pettiti Estate, 19592 Center Street  
August 16, 1990  
Page 2 of 4

As a result of the noted observations made at the time of closure and the results of laboratory analyses, it is evident that an unauthorized release of hazardous materials from the UST systems has occurred at this site. Consequently, you are requested to perform additional investigative work to ensure that there has not been an impact to ground water underlying this site. This preliminary site assessment (PSA) will help to define the vertical and lateral impact upon ground water and soils resulting from any releases from the tanks prior to their removal. The information gathered by this investigation will be used to determine an appropriate course of action to remediate the site. The PSA must be conducted in accordance with the RWQCB Staff Recommendations for the Initial Evaluation and Investigation of Underground Tanks. The major elements of such an investigation are summarized in the attached Appendix A.

In order to proceed with a site investigation, you should obtain professional services of a reputable environmental/geotechnical firm. Your responsibility is to have the consultant submit for review a proposal outlining planned activities pertinent to meeting the criteria broadly outlined in this letter and the attached Appendix A.

This Department will oversee the site assessment and remediation for the Pettiti estate. This oversight will include our review and comment on work proposals and technical guidance on appropriate investigative approaches. The issuance of well drilling permits, however, will be through the Alameda County Flood Control and Water Conservation District, Zone 7. The RWQCB may choose to take over as lead agency if it is determined following the completion of the initial assessment that there has been a substantial impact upon ground water.

This PSA proposal is due within 30 days of the date of this letter, or by **September 17, 1990**. Once this proposal has been reviewed and approved, **work should commence no later than October 17, 1990**. Accompanying this proposal must be a check payable to Alameda County totalling \$933 to offset expenses incurred by this Department during oversight of this project.

A report must be submitted within 30 days after the completion of this phase of work at the site. Subsequent reports must be submitted quarterly until this site qualifies for final RWQCB "sign off". Such quarterly reports are due the first day of the second month of each subsequent quarter (i.e., November 1, February 1, May 1, and August 1).

Mr. Anthony Pettiti  
RE: Pettiti Estate, 19592 Center Street  
August 16, 1990  
Page 3 of 4

The referenced quarterly reports should describe the status of the investigation and must include, among others, the following elements:

- o Details and results of all work performed during the designated period of time: records of field observations and data, boring and well construction logs, water level data, chain-of-custody forms, laboratory results for all samples collected and analyzed, tabulations of free product thicknesses and dissolved fractions, etc.
- o Status of ground water contamination characterization
- o Interpretation of results: water level contour maps showing gradients, free and dissolved product plume definition maps for each target component, geologic cross sections, etc.
- o Recommendations or plans for additional investigative work or remediation

All reports and proposals must be submitted under seal of a California-Registered Geologist, -Certified Engineering Geologist, or -Registered Civil Engineer. Please include a statement of qualifications for each lead professional involved with this project.

Please be advised that this is a formal request for technical reports pursuant to California Water Code Section 13267 (b). Failure to respond or a late response could result in the referral of this case to the RWQCB for enforcement, possibly subjecting the responsible party to civil penalties to a maximum of \$1,000 per day. Any extensions of the stated deadlines, or modifications of the required tasks, must be confirmed in writing by either this agency or the RWQCB.

Should you have any questions about the content of this letter, please call me at 415/271-4320.

Sincerely,

  
Scott O. Seery  
Hazardous Materials Specialist

enclosure

Mr. Anthony Pettiti  
RE: Pettiti Estate, 19592 Center Street  
August 16, 1990  
Page 4 of 4

cc: Rafat A. Shahid, Assistant Agency Director, Alameda County  
Department of Environmental Health  
Edgar Howell, Chief, Hazardous Materials Division  
Gil Jensen, Alameda County District Attorney's Office  
Lester Feldman, RWQCB  
Howard Hatayama, DHS  
Bob Bohman, Castro Valley Fire Department  
Marc Zomorodi, Tank Protect Engineering  
Liz Hasse, Esq.  
files

Please print or type. (Form designed for use on elite (12-pitch typewriter). 72319

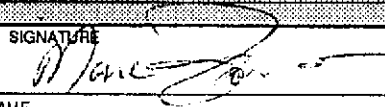
<b>UNIFORM HAZARDOUS WASTE MANIFEST</b>		1. Generator's US EPA ID No. CAC100029723300001	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.	
3. Generator's Name and Mailing Address Anthony's Auto Service 19592 Center Street Castro Valley, Ca. 94546		A. State Manifest Document Number 89890729		B. State Generator's ID		
4. Generator's Phone (415) 538-1288	6. US EPA ID Number C A D 0 0 9 4 6 6 3 9 2		C. State Transporter's ID 106249	D. Transporter's Phone (415) 235-1392		
5. Transporter 1 Company Name Erickson Trucking, Inc.	8. US EPA ID Number		E. State Transporter's ID	F. Transporter's Phone		
7. Transporter 2 Company Name	10. US EPA ID Number		G. State Facility's ID CAD109466392	H. Facility's Phone (415) 235-1393		
9. Designated Facility Name and Site Address Erickson, Inc. 255 Parr Blvd. Richmond, CA 94801						
11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)		12. Containers No. Type	13. Total Quantity	14. Unit Wt/Vol	Waste	
a. Waste empty storage tank Non-RCRA Hazardous Waste Solid		0104 T P	8270	P	State 512 EPA/Other None	
b.					State EPA/Other	
c.					State EPA/Other	
d.					State EPA/Other	
J. Additional Descriptions for Materials Listed Above		K. Handling Codes for Wastes Listed Above				
		a. 01				
		b.				
		c.				
		d.				
15. Special Handling Instructions and Additional Information						
Keep away from sources of ignition. Always wear hardhats when working around U.S.T.'s						
16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national government regulations. If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.						
Printed/Typed Name Anthony Daitt		Signature <i>[Signature]</i>			Month Day Year 07/12/90	
17. Transporter 1 Acknowledgement of Receipt of Materials						
Printed/Typed Name Maurine Shagley		Signature <i>[Signature]</i>			Month Day Year 07/12/90	
18. Transporter 2 Acknowledgement of Receipt of Materials						
Printed/Typed Name		Signature			Month Day Year	
19. Discrepancy Indication Space						
20. Facility Owner or Operator Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.						
Printed/Typed Name HARRISON L. STOKTON		Signature <i>[Signature]</i>			Month Day Year 07/12/90	

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

GENERATOR  
TRANSPORTER  
FACILITY

Do Not Write Below This Line

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

EMERGENCY <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		HAS STATE OFFICE OF EMERGENCY SERVICES REPORT BEEN FILED? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		FOR LOCAL AGENCY USE ONLY I HEREBY CERTIFY THAT I AM A DESIGNATED GOVERNMENT EMPLOYEE AND THAT I HAVE REPORTED THIS INFORMATION TO LOCAL OFFICIALS PURSUANT TO SECTION 25180.7 OF THE HEALTH AND SAFETY CODE		
REPORT DATE 08/08/90		CASE #		SIGNED _____ DATE _____		
REPORTED BY	NAME OF INDIVIDUAL FILING REPORT Marc Zomorodi		PHONE (415) 429-8088		SIGNATURE 	
	REPRESENTING <input checked="" type="checkbox"/> OWNER/OPERATOR <input type="checkbox"/> REGIONAL BOARD <input type="checkbox"/> LOCAL AGENCY <input type="checkbox"/> OTHER		COMPANY OR AGENCY NAME Tank Protect Engineering of Northern California			
	ADDRESS 2821 Whipple Rd STREET city Union City STATE CA 94587					
RESPONSIBLE PARTY	NAME The Estate of John Pettite <input type="checkbox"/> UNKNOWN		CONTACT PERSON		PHONE (415) 538-1288	
	ADDRESS 19592 Center Street STREET city Castro Valley STATE CA 94546					
SITE LOCATION	FACILITY NAME (IF APPLICABLE) The Estate of John Pettite (Anthony's Auto Service)		OPERATOR		PHONE (415) 538-122	
	ADDRESS 19592 Center Street STREET city Castro Valley COUNTY CA 94546					
	CROSS STREET					
IMPLEMENTING AGENCIES	LOCAL AGENCY Alameda County Health Agency		CONTACT PERSON Paul Smith		PHONE (415) 271-4320	
	REGIONAL BOARD S.F. Bay Region				PHONE (415) 464-1255	
SUBSTANCES INVOLVED	(1) NAME Petroleum Hydrocarbons-- see below				QUANTITY LOST (GALLONS) <input checked="" type="checkbox"/> UNKNOWN	
	(2) <input type="checkbox"/> UNKNOWN					
DISCOVERY/ABATEMENT	DATE DISCOVERED 07/17/90		HOW DISCOVERED <input type="checkbox"/> INVENTORY CONTROL <input type="checkbox"/> SUBSURFACE MONITORING <input type="checkbox"/> NUISANCE CONDITIONS <input type="checkbox"/> TANK TEST <input checked="" type="checkbox"/> TANK REMOVAL <input type="checkbox"/> OTHER			
	DATE DISCHARGE BEGAN <input checked="" type="checkbox"/> UNKNOWN		METHOD USED TO STOP DISCHARGE (CHECK ALL THAT APPLY) <input checked="" type="checkbox"/> REMOVE CONTENTS <input type="checkbox"/> REPLACE TANK <input type="checkbox"/> CLOSE TANK <input type="checkbox"/> REPAIR TANK <input type="checkbox"/> REPAIR PIPING <input type="checkbox"/> CHANGE PROCEDURE <input type="checkbox"/> OTHER Remove Tank (s)			
	HAS DISCHARGE BEEN STOPPED? <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, DATE					
SOURCE/CAUSE	SOURCE OF DISCHARGE <input type="checkbox"/> TANK LEAK <input checked="" type="checkbox"/> UNKNOWN <input type="checkbox"/> PIPING LEAK <input type="checkbox"/> OTHER		CAUSE(S) <input type="checkbox"/> OVERFILL <input type="checkbox"/> RUPTURE/FAILURE <input type="checkbox"/> SPILL <input type="checkbox"/> CORROSION <input checked="" type="checkbox"/> UNKNOWN <input type="checkbox"/> OTHER			
	CASE TYPE <input checked="" type="checkbox"/> UNDETERMINED <input type="checkbox"/> SOIL ONLY <input type="checkbox"/> GROUNDWATER <input type="checkbox"/> DRINKING WATER - (CHECK ONLY IF WATER WELLS HAVE ACTUALLY BEEN AFFECTED)					
CURRENT STATUS	CHECK ONE ONLY <input checked="" type="checkbox"/> NO ACTION TAKEN <input type="checkbox"/> PRELIMINARY SITE ASSESSMENT WORKPLAN SUBMITTED <input type="checkbox"/> POLLUTION CHARACTERIZATION <input type="checkbox"/> LEAK BEING CONFIRMED <input type="checkbox"/> PRELIMINARY SITE ASSESSMENT UNDERWAY <input type="checkbox"/> POST CLEANUP MONITORING IN PROGRESS <input type="checkbox"/> REMEDIATION PLAN <input type="checkbox"/> CASE CLOSED (CLEANUP COMPLETED OR UNNECESSARY) <input type="checkbox"/> CLEANUP UNDERWAY					
	CHECK APPROPRIATE ACTION(S) <input type="checkbox"/> CAP SITE (CD) <input checked="" type="checkbox"/> EXCAVATE & TREAT (ET) <input type="checkbox"/> REMOVE FREE PRODUCT (FP) <input type="checkbox"/> ENHANCED BIO DEGRADATION (IT) <input type="checkbox"/> CONTAINMENT BARRIER (CB) <input type="checkbox"/> NO ACTION REQUIRED (NA) <input type="checkbox"/> PUMP & TREAT GROUNDWATER (GT) <input type="checkbox"/> REPLACE SUPPLY (RS) <input type="checkbox"/> VACUUM EXTRACT (VE) <input type="checkbox"/> OTHER (OT) <input type="checkbox"/> TREATMENT AT HOOKUP (HU) <input type="checkbox"/> VENT SOIL (VS)					
COMMENTS	Two (2) 3000 gallon fuel tanks one (1) 4000 fuel tank one (1) 250 gallon waste oil tank have been removed.					
	_____					





ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94566 (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 19592 CENTER STREET CASTRO VALLEY, CA 94546

PERMIT NUMBER 90489

LOCATION NUMBER

CLIENT Name ESTATE OF JOHN PETTITI Address 19592 CENTER ST Phone 415 538 1288 City CASTRO VALLEY, CA Zip 94546

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT Name JOHN MRKOVICH TANK PROTECT ENGINEERING Address 2821 WHIPPLE RD Phone 415 428 8084 City UNION CITY, CA Zip 94587

TYPE OF PROJECT Well Construction Geotechnical Investigation Cathodic Protection General Water Supply Contamination Monitoring Well Destruction

PROPOSED WATER SUPPLY WELL USE Domestic Industrial Other Municipal Irrigation

DILLING METHOD: Mud Rotary Air Rotary Auger Cable Other

DRILLER'S LICENSE NO. 484288

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

GEOTECHNICAL PROJECTS Number of Borings 4-8 Maximum Hole Diameter 8 In. Depth 30 ft.

ESTIMATED STARTING DATE 8/16/90 ESTIMATED COMPLETION DATE 8/16/90

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

APPLICANT'S SIGNATURE John V. Mrkovich Date 8/10/90

A. GENERAL

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

B. WATER WELLS, INCLUDING PIEZOMETERS

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

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

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

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 10 Aug 90



ALAMEDA COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT  
5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94566 (415) 484-2600

GROUNDWATER PROTECTION ORDINANCE PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

FOR OFFICE USE

LOCATION OF PROJECT 19592 CENTER STREET  
CASTRO VALLEY, CA 94546

PERMIT NUMBER 91036  
LOCATION NUMBER \_\_\_\_\_

CLIENT  
Name ESTATE OF JOHN PETTIT  
Address 19592 CENTER ST Phone 415 538-1288  
City CASTRO VALLEY, CA Zip 94546

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT  
Name JOHN M. RAKOVICH  
TANK PROTECT ENGINEERING  
Address 2021 WHIPPLE RD Phone 415 429 8088  
City UNION CITY, CA Zip 94587

TYPE OF PROJECT  
 All Construction  
 Cathodic Protection  
 Water Supply  
 Monitoring  
 Geotechnical Investigation  
 General  
 Contamination  
 Well Destruction

PROPOSED WATER SUPPLY WELL USE  
 Domestic  Industrial  Other   
 Municipal  Irrigation

DRILLING METHOD:  
 Mud Rotary  
 Air Rotary  
 Auger   
 Cable  Other

DRILLER'S LICENSE NO. 484288

WELL PROJECTS  
 Drill Hole Diameter 8 in. Maximum  
 Casing Diameter 2 in. Depth 50 ft.  
 Surface Seal Depth 31 ft. Number 3

GEOTECHNICAL PROJECTS  
 Number of Borings \_\_\_\_\_ Maximum  
 Hole Diameter \_\_\_\_\_ in. Depth \_\_\_\_\_ ft.

ESTIMATED STARTING DATE 1/31/91  
ESTIMATED COMPLETION DATE 1/31/91

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

APPLICANT'S SIGNATURE John V. Mrazek Date 1/18/91

- (A) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
  2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well projects, or drilling logs and location sketch for geotechnical projects.
  3. Permit is void if project not begun within 90 days of approval date.
- (B) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
  2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.
- (C) GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.
- (D) CATHODIC. Fill hole above anode zone with concrete placed by tremie.
- (E) WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 23 Jan 91  
Wyman Hong

**APPENDIX B**

**CERTIFIED ANALYTICAL REPORTS AND  
CHAIN-OF-CUSTODY DOCUMENTATION**



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif. 2821 Whipple Road Union City, CA 94587 Attention: John Marokovich	Client Project ID: #121-071290, 19592 Center St., Castro Valley Matrix Descript: <b>Soil</b> Analysis Method: EPA 5030/8015/8020 First Sample #: 007-2554	Sampled: Jul 12, 1990 Received: Jul 17, 1990 Reported: Aug 6, 1990
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## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
007-2554	W-O-S	N.D.	0.0055	0.0094	N.D.	0.0086
007-2555	S-1-W	N.D.	0.0050	0.014	0.0076	0.011
007-2556	S-2-W	2,500	1.5	57	54	310
007-2557	S-3-W	990	7.3	150	1.8	34
007-2558	S-1-E	1.9	0.0090	0.20	0.026	0.24
007-2559	S-2-E	3,200	2.2	87	74	470
007-2560	S-3-E	720	12	140	3.1	54

<b>Detection Limits:</b>	<b>1.0</b>	<b>0.0050</b>	<b>0.0050</b>	<b>0.0050</b>	<b>0.0050</b>
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.  
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

*Maile A. McBirney*  
Maile A. McBirney  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif. 2821 Whipple Road Union City, CA 94587 Attention: John Marokovich	Client Project ID: #121-071290, 19592 Center St., Castro Valley Matrix Descript: <b>Soil</b> Analysis Method: EPA 3550/8015 First Sample #: 007-2554	Sampled: Jul 12, 1990 Received: Jul 17, 1990 Extracted: Jul 25, 1990 Analyzed: Jul 30, 1990 Reported: Aug 6, 1990
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## TOTAL PETROLEUM FUEL HYDROCARBONS (EPA 8015)

Sample Number	Sample Description	High B.P. Hydrocarbons mg/kg (ppm)
007-2554	W-O-S	N.D.

Detection Limits:

1.0

High Boiling Point Hydrocarbons are quantitated against a diesel fuel standard.  
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Maile A. McBirney  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif.  
2821 Whipple Road  
Union City, CA 94587  
Attention: John Marokovich

Client Project ID: #121-071290, 19592 Center St., Castro Valley  
Matrix Descript: Soil  
Analysis Method: SM 503 D&E (Gravimetric)  
First Sample #: 007-2554

Sampled: Jul 12, 1990  
Received: Jul 17, 1990  
Extracted: Jul 19, 1990  
Analyzed: Jul 20, 1990  
Reported: Aug 6, 1990

## TOTAL RECOVERABLE PETROLEUM OIL

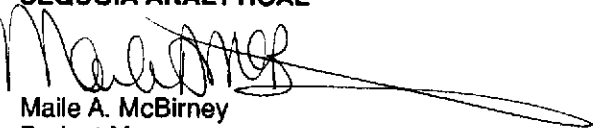
Sample Number	Sample Description	Oil & Grease mg/kg (ppm)
007-2554	W-O-S	N.D.

Detection Limits:

30

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Maile A. McBirney  
Project Manager

72554.TPE <3>



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif. 2821 Whipple Road Union City, CA 94587 Attention: John Marokovich	Client Project ID: #121-071290, 19592 Center St., Castro Valley Sample Descript: <b>Soil, W-O-S</b> Analysis Method: EPA 5030/8010 Lab Number: 007-2554	Sampled: Jul 12, 1990 Received: Jul 17, 1990 Analyzed: Jul 26, 1990 Reported: Aug 6, 1990
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## HALOGENATED VOLATILE ORGANICS (EPA 8010)

Analyte	Detection Limit µg/kg	Sample Results µg/kg
Bromodichloromethane.....	5.0	N.D.
Bromoform.....	5.0	N.D.
Bromomethane.....	5.0	N.D.
Carbon tetrachloride.....	5.0	N.D.
Chlorobenzene.....	5.0	N.D.
Chloroethane.....	25	N.D.
2-Chloroethylvinyl ether.....	5.0	N.D.
Chloroform.....	5.0	N.D.
Chloromethane.....	5.0	N.D.
Dibromochloromethane.....	5.0	N.D.
1,2-Dichlorobenzene.....	10	N.D.
1,3-Dichlorobenzene.....	10	N.D.
1,4-Dichlorobenzene.....	10	N.D.
1,1-Dichloroethane.....	5.0	N.D.
1,2-Dichloroethane.....	5.0	N.D.
1,1-Dichloroethene.....	5.0	N.D.
Total 1,2-Dichloroethene.....	5.0	N.D.
1,2-Dichloropropane.....	5.0	N.D.
cis-1,3-Dichloropropene.....	5.0	N.D.
trans-1,3-Dichloropropene.....	5.0	N.D.
Methylene chloride.....	10	N.D.
1,1,2,2-Tetrachloroethane.....	5.0	N.D.
Tetrachloroethene.....	5.0	N.D.
1,1,1-Trichloroethane.....	5.0	N.D.
1,1,2-Trichloroethane.....	5.0	N.D.
Trichloroethene.....	5.0	N.D.
Trichlorofluoromethane.....	5.0	N.D.
Vinyl chloride.....	10	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Maile A. McBirney  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233


Tank Protect Engineering of N. Calif. 2821 Whipple Road Union City, CA 94587 Attention: John Marokovich	Client Project ID: #121-071290, 19592 Center St., Castro Valley Sample Descript: <b>Soil, W-O-S</b> Lab Number: 007-2554	Sampled: Jul 12, 1990 Received: Jul 17, 1990  Reported: Aug 6, 1990
--	--	--

## LABORATORY ANALYSIS

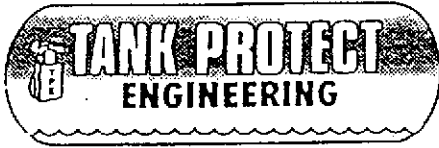
Analyte	Detection Limit mg/kg	Sample Results mg/kg
Cadmium.....	0.50	N.D.
<b>Chromium.....</b>	<b>0.25</b>	<b>17</b>
<b>Lead.....</b>	<b>0.25</b>	<b>3.8</b>
<b>Zinc.....</b>	<b>0.50</b>	<b>23</b>

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Maile A. McBirney  
Project Manager





Of Northern California

TANK PROTECT ENGINEERING OF NORTHERN CALIFORNIA

2821 WHIPPLE ROAD  
 UNION CITY, CA. 94587  
 PHONE #(415) 429-8088  
 (800) 523-8088

FAX: #(415) 429-8089

CHAIN OF CUSTODY

PROJECT NO.		SITE NAME & ADDRESS				(1) TYPE OF CON- TAINER	ANALYTES REQUESTED	TOTAL LIGHT IIC	AROMATIC IIC	TOTAL HEAVY IIC	OIL & GREASE	VOC SCAN (62+5)	OTHER	REMARKS	
121-071290		19592 CENTER STREET CASTRO VALLEY, CA.													
SAMPLERS--NAME, ADDRESS AND TELEPHONE NUMBER															
TANK PROTECT ENGINEERING 2821 WHIPPLE ROAD UNION CITY, CA. 94587 TEL#(415) 429-8088															
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION										
W-0-S	7/17/90	1620	✓		W-0-S	BRASS FIELD				✓			TPH AS GASOLINE, TPH AS DIESEL, BTEX, CLHC, KAPO, AA		
S-1-W	"	1730	✓		S-1-W	"							TPH AS GASOLINE, BTEX		
S-2-W	"	1750	✓		S-2-W	"							" " " "		
S-3-W	"	1800	✓		S-3-W	"							" " " "		
S-1-E	"	1810	✓		S-1-E	"							" " " "		
S-2-E	"	1817	✓		S-2-E	"							" " " "		
S-3-E	"	1821	✓		S-3-E	"							" " " "		
Relinquished by: (Signature)						Date/Time	Received by: (Signature)						Date/Time	Received by: (Signature)	
<i>Justin Alvarado</i>						7/17/90 9:00A	<i>SOPHIE P</i>						7/17/90		
Relinquished by: (Signature)						Date/Time	Received by: (Signature)						Date/Time	Received by: (Signature)	
Relinquished by: (Signature)						Date/Time	Received for Laboratory by: (Signature)				Date/Time	Remarks			

DATE.



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif Client Project ID: #121B-081790	Matrix Descript: <del>Soil</del>	Sampled: Aug 16, 1990
2821 Whipple Road	Analysis Method: EPA 5030/8015/8020	Received: relogged 8/17
Union City, CA 94587	First Sample #: 008-3249	Analyzed: Aug 28-30, 1990
Attention: Marc Zomorodi		Reported: Sep 5, 1990

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
008-3249	SB-1 @ 6.0-6.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3250	SB-1 @ 11.0-11.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3251	SB-1 @ 16.0-16.5'	N.D.	0.0070	0.0050	N.D.	N.D.
008-3252	SB-1 @ 20.5-21.0'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3253	SB-1 @ 26.0-26.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3254	SB-1 @ 31.0-31.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3255	SB-1 @ 36.0-36.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3256	SB-2 @ 6.0-6.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3257	SB-2 @ 11.0-11.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3258	SB-2 @ 16.0-16.5'	N.D.	N.D.	N.D.	N.D.	N.D.

<b>Detection Limits:</b>	<b>1.0</b>	<b>0.05</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard. Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

*Maile A. McBirney*  
 Maile A. McBirney  
 Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif Client Project ID: #121B-081790	Matrix Descript: <b>Soil</b>	Sampled: Aug 16, 1990
2821 Whipple Road	Analysis Method: EPA 5030/8015/8020	Received: relogged 8/17
Union City, CA 94587	First Sample #: 008-3259	Analyzed: Aug 28-30, 1990
Attention: Marc Zomorodi		Reported: Sep 5, 1990


## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons	Benzene	Toluene	Ethyl Benzene	Xylenes
		mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)
008-3259	SB-2 @ 21.0-21.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3260	SB-2 @ 26.0-26.5'	1.2	N.D.	0.028	0.022	0.046
008-3261	SB-2 @ 31.0-31.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3262	SB-2 @ 36.0-36.5'	N.D.	N.D.	N.D.	0.0087	0.041
008-3263	SB-3 @ 6.0-6.5'	N.D.	N.D.	0.0079	0.0068	0.016
008-3264	SB-3 @ 11.0-11.5'	2.7	N.D.	0.0067	0.027	0.065
008-3265	SB-3 @ 16.0-16.5'	N.D.	0.0063	0.0063	N.D.	N.D.
008-3266	SB-3 @ 21.0-21.5'	N.D.	0.0065	0.0017	N.D.	N.D.
008-3267	SB-3 @ 26.0-26.5'	15	N.D.	N.D.	N.D.	0.027
008-3268	SB-3 @ 31.0-31.5'	N.D.	N.D.	N.D.	N.D.	N.D.

<b>Detection Limits:</b>	<b>1.0</b>	<b>0.05</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard. Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Malle A. McBriney  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif Client Project ID: #121B-081790	Matrix Descript: Soil	Sampled: Aug 16, 1990
2821 Whipple Road	Analysis Method: EPA 5030/8015/8020	Received: relogged 8/17
Union City, CA 94587	First Sample #: 008-3269	Analyzed: Aug 28-31, 1990
Attention: Marc Zomorodi		Reported: Sep 5, 1990

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons	Benzene	Toluene	Ethyl Benzene	Xylenes
		mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)
008-3269	SB-3 @ 36.0-36.5'	N.D.	0.0051	0.025	0.023	0.057
008-3270	SB-4 @ 6.0-6.5'	N.D.	0.0050	0.0058	N.D.	0.11
008-3271	SB-4 @ 11.0-11.5'	N.D.	0.0069	0.042	0.025	0.10
008-3272	SB-4 @ 16.0-16.5'	N.D.	N.D.	0.0068	N.D.	0.0063
008-3273	SB-4 @ 21.0-21.5'	N.D.	0.0073	0.010	N.D.	0.019
008-3274	SB-4 @ 26.0-26.5'	N.D.	N.D.	N.D.	N.D.	N.D.
008-3275	SB-4 @ 31.0-31.5'	N.D.	N.D.	N.D.	N.D.	N.D.

<b>Detection Limits:</b>	<b>1.0</b>	<b>0.05</b>	<b>0.1</b>	<b>0.1</b>	<b>0.1</b>
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard. Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. McBirney  
Project Manager



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif Client Project ID: #121B-081790  
2821 Whipple Road Sample Descript: ~~Soil~~  
Union City, CA 94587 Analysis for: Total Lead  
Attention: John Mrakovich First Sample #: 0083250R

Sampled: Aug 17, 1990  
Relogged: Sep 10, 1990  
Extracted: Sep 25, 1990  
Analyzed: Sep 25, 1990  
Reported: Sep 26, 1990

## LABORATORY ANALYSIS FOR: Total Lead

Sample Number	Sample Description	Detection Limit mg/kg	Sample Result mg/kg
0083250R	SB1-11.0-11.5	0.25	3.0
008-3253	SB1-26.0-26.5	0.25	7.0
008-3257	SB2-11.0-11.5	0.25	6.5
008-3260	SB2-26.0-26.5	0.25	13
008-3264	SB3-11.0-11.5	0.25	14
008-3267	SB3-26.0-26.5	0.25	15
008-3271	SB4-11.0-11.5	0.25	13
008-3274	SB4-26.0-26.5	0.25	18

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Maile A. McBirney  
Project Manager

0083250R.TPE <1>



TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415)429-8088  
 (800)523-8088  
 FAX(415)429-8089

CHAIN OF CUSTODY SEQUOIA - NORMAL TURNAROUND 1 OF 4

PROJECT NO. 121B-081790		SITE NAME & ADDRESS 19592 CENTER STREET CASTRO VALLEY, CA					(1) TYPE OF CON- TAINER	ANALYTES REQUESTED TOTAL LIGHT HC AROMATIC HC TOTAL HEAVY HC (BTEX) OIL & GREASE VOC SCAN (624's) OTHER	REMARKS		
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER JOHN MIRAKOVICH TANK PROTECT ENGINEERING											
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION						
SB-1 6.0-6.5	8/16/90	845	✓		SB-1		BRASS TUBE	✓			
SB-1 11.0-11.5		852							X TOTAL LEAD AA		
SB-1 16.0-16.5		900									
SB-1 20.5-21.0		910									
SB-1 26.0-26.5		925							X TOTAL LEAD AA		
SB-1 31.0-31.5		935									
SB-1 36.0-36.5		950									
Relinquished by : (Signature) <i>John V. Mirakovich</i>		Date / Time 8/17/90 930		Received by : (Signature) <i>Christoph Stank</i>		Relinquished by : (Signature)		Date / Time		Received by : (Signature)	
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			

DATE: 8/17/90



TANK PROTECT ENGINEERING

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 UNION CITY, CA 94587  
 (415)429-8088  
 (800)523-8088  
 FAX(415)429-8089

CHAIN OF CUSTODY SEQUOIA-NORMAL TURNAROUNDS 2 OF 4

PROJECT NO. 1218-081790		SITE NAME & ADDRESS 19592 CENTER STREET CASTRO VALLEY, CA				(1) TYPE OF CON- TAINER	ANALYTES REQUESTED							REMARKS
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER JOHN MIRAKOVICH TANK PROTECT ENGINEERING							TOTAL LIGHT HC	AROMATIC HC	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (621's)	OTHER		
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION									
SB-2 6.0-6.5	8/16/96	1030	✓		SO-2	BRASS TUBE	✓	✓						
SB-2 11.0-11.5		1050									X		TOTAL LEAD AA	
SB-2 16.0-16.5		1100												
SB-2 21.0-21.5		1112												
SB-2 26.0-26.5		1125									X		TOTAL LEAD AA	
SB-2 31.0-31.5		1135												
SB-2 36.0-36.5		1145												
Relinquished by : (Signature) <i>John V. Meakow</i>		Date / Time 8/17/96 930		Received by : (Signature) <i>Cheryl...</i>		Relinquished by : (Signature)		Date / Time		Received by : (Signature)				
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						

DATE: 8/17/96



TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415)429-8088  
 (800)523-8088  
 FAX(415)429-8089

CHAIN OF CUSTODY SEQUOIA - NORMAL TURNAROUND 3 OF 4

PROJECT NO.		SITE NAME & ADDRESS				(1) TYPE OF CONTAINER	ANALYTES REQUESTED							REMARKS		
121B-081790		19592 CENTER STREET CASTRO VALLEY, CA					TOTAL LIGHT HC	AROMATIC HC (BTEX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER				
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER																
JOHN MRAKOVICH TANK PROTECT ENGINEERING																
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION											
SB-3 6.0-6.5	8/16/90	1322	✓		SB-3	BRASS TURE	✓	✓								
SB-3 11.0-11.5		1327											X		TOTAL LEAD	AA
SB-3 16.0-16.5		1335														
SB-3 21.0-21.5		1345														
SB-3 26.0-26.5		1445											X		TOTAL LEAD	AD
SB-3 31.0-31.5		1427														
SB-3 36.0-36.5		1450														
Relinquished by : (Signature)		Date / Time		Received by : (Signature)		Relinquished by : (Signature)		Date / Time		Received by : (Signature)						
<i>John V. Meakow</i>		8/17/90 9:30		<i>Chris Lopez Standa</i>												
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								

DATE: 8/17/90





# TANK PROTECT ENGINEERING

2021 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415) 429-8088  
 (800) 523-8088  
 FAX (415) 429-8089

## CHAIN OF CUSTODY *SEQUOIA-NORMAL TURNAROUND 4 OF 4*

PROJECT NO. <i>1218-081790</i>		SITE NAME & ADDRESS <i>19592 CENTER STREET CASTRO VALLEY, CA</i>					(1) TYPE OF CON- TAINER	ANALYTES REQUESTED							REMARKS
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER <i>JOHN MARAKOVICH TANK PROTECT ENGINEERING</i>								TOTAL LIGHT HC	AROMATIC HC	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER		
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION										
<i>SB-4 6.0-6.5</i>	<i>8/16/90</i>	<i>1530</i>	<input checked="" type="checkbox"/>		<i>SB-4</i>	<i>BRASS TUBE</i>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>							
<i>SB-4 11.0-11.5</i>		<i>1540</i>											<i>X</i>	<i>TOTAL LEAD AA</i>	
<i>SB-4 16.0-16.5</i>		<i>1547</i>													
<i>SB-4 21.0-21.5</i>		<i>1557</i>													
<i>SB-4 26.0-26.5</i>		<i>1607</i>											<i>X</i>	<i>TOTAL LEAD AA</i>	
<i>SB-4 31.0-31.5</i>		<i>1615</i>													
Relinquished by : (Signature) <i>John V. Marakovich</i>		Date / Time <i>8/17/90 930</i>		Received by : (Signature) <i>Christy...</i>		Relinquished by : (Signature)		Date / Time		Received by : (Signature)					
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							

DATE: *8/17/90*



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif Client Project ID: 121 A - 111290	Matrix Descript: <b>Soil</b>	Sampled: Nov 9, 1990
2821 Whipple Road	Analysis Method: EPA 5030/8015/8020	Received: Nov 12, 1990
Union City, CA 94587	First Sample #: 011-1495	Analyzed: Nov 23, 1990
Attention: John Mrakovich		Reported: Nov 27, 1990

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P.	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl	Xylenes mg/kg (ppm)
		Hydrocarbons mg/kg (ppm)			Benzene mg/kg (ppm)	
011-1495	VSN-2	N.D.	N.D.	N.D.	N.D.	N.D.
011-1496	VSE-2	N.D.	N.D.	N.D.	N.D.	N.D.
011-1497	VSS-1	N.D.	N.D.	N.D.	N.D.	N.D.
011-1498	VSS-2	N.D.	N.D.	N.D.	N.D.	N.D.
011-1499	VSBP-2	N.D.	N.D.	N.D.	N.D.	N.D.

Detection Limits:	1.0	0.0050	0.0050	0.0050	0.0050
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.  
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. McBirney  
Project Manager



TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415)429-8088  
 (800)523-8088  
 FAX(415)429-8089

P.O. # 129

CHAIN OF CUSTODY SEQUOIA PAGE 10F1

PROJECT NO. 121A-111290		SITE NAME & ADDRESS 17592 CENTER STREET CASTRO VALLEY, CA				(1) TYPE OF CON- TAINER	ANALYTES REQUESTED TOTAL LIGHT HC AROMATIC HC TOTAL HEAVY HC OIL & GREASE POC SCAN (624's) OTHER	REMARKS			
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER LYLE TRAVIS TANK PROTECT ENGINEERING											
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION						
✓ VSN-2	11/9/90	1645	✓		VSN-2 @ 15'	BRASS TUBE	✓				
✓ VSE-2		950			VSE-2 @ 16'						
✓ VSS-1		1130			VSS-1 @ 16'						
✓ VSS-2		1620			VSS-2 @ 16'						
✓ VSBP-2		1630			VSBP-2 @ 17.5'						
Relinquished by : (Signature) <i>Jed Okamoto</i>		Date / Time 10/2/2:35		Received by : (Signature) <i>E. J. Durn</i>		Relinquished by : (Signature)		Date / Time		Received by : (Signature)	
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 NORMAL TURN AROUND			

DATE : \_\_\_\_\_



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering  
2821 Whipple Road  
Union City, CA 94587  
Attention: John Mrakovich

Client Project ID: 121A-11790 / 19592 Center St., Castro Valley  
Matrix Descript: **Soil**  
Analysis Method: EPA 5030/8015/8020  
First Sample #: 011-1037

Sampled: Nov 1, 1990  
Received: Nov 7, 1990  
Reported: Nov 21, 1990

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P. Hydrocarbons				
		mg/kg (ppm)	Benzene mg/kg (ppm)	Toluene mg/kg (ppm)	Ethyl Benzene mg/kg (ppm)	Xylenes mg/kg (ppm)
011-1037	VSE-1 @ 17'	N.D.	N.D.	N.D.	N.D.	0.0053
011-1038	VSW-1 @ 15'	N.D.	N.D.	N.D.	N.D.	N.D.
011-1039	VSW-2 @ 16'	N.D.	0.0092	0.019	N.D.	0.018
011-1040	VSBP-1 @ 17.5'	N.D.	N.D.	0.0070	N.D.	0.0071
011-1041	VSN-1 @ 15'	N.D.	N.D.	N.D.	N.D.	N.D.

<b>Detection Limits:</b>	<b>1.0</b>	<b>0.0050</b>	<b>0.0050</b>	<b>0.0050</b>	<b>0.0050</b>
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.  
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

Maile A. McBirney  
Project Manager



TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415) 429-8088  
 (800) 523-8088  
 FAX (415) 429-8089

P.O.# 128

CHAIN OF CUSTODY

SEQUIA 9 OF 5

PROJECT NO. 121A-11690		SITE NAME & ADDRESS 19592 CENTER STREET CASTRO VALLEY, CA				(1) TYPE OF CONTAINER	ANALYTES REQUESTED						REMARKS
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER LYLE TRAVIS TANK PROTECT ENGINEERING TEL#(415)429-8088							TOTAL LIGHT HC	AROMATIC HC	TOTAL BENZ HC (BTX)	OIL & GREASE	VOC SCAN (24's)	OTHER	
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION								
S7-4	11/6/90	1521	✓		S7-4 @ 10'	GRASS TUBE	✓	✓					comp.
VSE-1	11/5/90	1326			VSE-1 @ 17'								
VSW-1	11/6/90	1100			VSW-1 @ 15'								
VSW-2	11/6/90	1415			VSW-2 @ 16'								
VSBP-1	11/6/90	1420			VSBP-1 @ 17.5'								
Relinquished by : (Signature)		Date / Time		Received by : (Signature)		Relinquished by : (Signature)		Date / Time		Received by : (Signature)			
<i>[Signature]</i>		11/7/90 15:05		<i>[Signature]</i>									
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					
								NORMAL TURN AROUND					

DATE: \_\_\_\_\_



TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415)429-8088  
 (800)523-8088  
 FAX(415)429-8089

P.O. # 128

CHAIN OF CUSTODY SEQUOIA S O F S

PROJECT NO.		SITE NAME & ADDRESS					(1) TYPE OF CONTAINER	ANALYTES REQUESTED	REMARKS
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER		ID NO.	DATE	TIME	SOIL	WATER			
121A-11090		19592 CENTER ST CASTRO VALLEY					BRASS TUBE	<input checked="" type="checkbox"/> TOTAL LIGHT HC <input checked="" type="checkbox"/> AROMATIC HC <input type="checkbox"/> TOTAL HEAVY HC (BTEX) <input type="checkbox"/> OIL & GREASE <input type="checkbox"/> POC SCAN (624's) <input type="checkbox"/> OTHER	
LYLE TRAVIS TANK PROTECT ENGINEERING TEL#(415)429-8088		VSN-1	11/6/90	1050					
Relinquished by : (Signature)		Date / Time		Received by : (Signature)		Relinquished by : (Signature)		Date / Time	Received by : (Signature)
<i>L. Travis</i>		11/7/90 5:05		<i>Michelle G. Jones</i>					
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	
								NORMAL TURN AROUND	

DATE: \_\_\_\_\_



# SEQUOIA ANALYTICAL

680 Chesapeake Drive • Redwood City, CA 94063  
(415) 364-9600 • FAX (415) 364-9233

Tank Protect Engineering of N. Calif Client Project ID: 121 A - 111290	Matrix Descript: <b>Soil</b>	Sampled: Nov 9, 1990
2821 Whipple Road	Analysis Method: EPA 5030/8015/8020	Received: Nov 12, 1990
Union City, CA 94587	First Sample #: 011-1494	Analyzed: Nov 23, 1990
Attention: John Mrakovich		Reported: Nov 26, 1990


## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P.	Benzene	Toluene	Ethyl Benzene	Xylenes
		Hydrocarbons mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)	mg/kg (ppm)
011-1494	VSCS-1	N.D.	N.D.	N.D.	N.D.	N.D.

Detection Limits:	1.0	0.0050	0.0050	0.0050	0.0050
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.  
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Maile A. McBirney  
Project Manager



TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD  
 UNION CITY, CA 94587  
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 FAX(415)429-8089

P.O.#130

CHAIN OF CUSTODY SEQUOIA PAGE 1 OF 1

PROJECT NO.		SITE NAME & ADDRESS				(1) TYPE OF CON- TAINER	ANALYTES REQUESTED						REMARKS	
121A-111290		19512 CENTER STREET CASTRO VALLEY, CA.					BRASS TUBE	✓						
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER														
LYLE TRAVIS TANK PROTECT ENGINEERING														
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	TOTAL LIGHT HC	AROMATIC HC	TOTAL HC (BTK)	OIL & GREASE	VOC SCAN (624's)	OTHER			
VSCS-1	11/19/90	1400	✓		VSCS-1									
Relinquished by : (Signature)		Date / Time		Received by : (Signature)		Relinquished by : (Signature)		Date / Time		Received by : (Signature)				
J.D. Aranda		10/14 2:35		E.I. Burn										
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						
								NORMAL TURN AROUND						

DATE: \_\_\_\_\_





"ENVIRONMENTAL  
TESTING"

CA DOHS Certification #1224

January 14, 1991

**Clients P.O.#** 153

**Clients Job#** 127c-122890

**Client:**  
TPE of N. CA  
2821 Whipple Rad  
Union City, CA 94587

**Project:**  
Anthony's Auto Service  
18592 Center St.

**Sample:** Soil

**Date sampled:** 12/28/90  
**Date submitted:** 01/03/91  
**Date analyzed:** 01/10/91

**Method of Extraction:** Purge and Trap - EPA Method 5030  
**Method of Analysis:** EPA Method 8015 - Total Petroleum  
Hydrocarbons - Gasoline


Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-528-S	SP-1	ND	1
AC-529-S	SP-2	ND	1
AC-530-S	SP-3	ND	1
AC-531-S	SP-4	ND	1
AC-532-S	SP-5	ND	1
AC-533-S	SP-6	ND	1
AC-534-S	SP-7	ND	1
AC-535-S	SP-8	ND	1
AC-536-S	SP-9	ND	1
AC-537-S	SP-10	ND	1
AC-538-S	SP-11	ND	1
AC-539-S	SP-12	ND	1
AC-540-S	SP-13	ND	1

\* 1963 North Main St.  
Orange, CA 92665  
714/921-0888  
800/464-TANK  
FAX: 921-1832



Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-541-S	SP-14	ND	1
AC-542-S	SP-15	ND	1
AC-543-S	SP-16	ND	1
AC-544-S	SP-17	ND	1
AC-545-S	SP-18	ND	1
AC-546-S	SP-19	ND	1
AC-547-S	SP-20	ND	1
AC-548-S	SP-21	ND	1
AC-549-S	SP-22	ND	1

AMERICAN ENVIRONMENTAL LABORATORIES

  
Emdadul H. Khan  
Laboratory Supervisor

EHK:dcr/A91-1222





"ENVIRONMENTAL  
HEALTH"

CA DHS Certification #1224  
January 15, 1991

Client's P.O.# 153

Client's Job# 127C-122890

**Client:**  
Tank Protect Eng.  
of Northern California  
2821 Whipple Road  
Union City, CA 94587

**Project:**  
Anthony's Auto Service  
19592 Center Street  
Castro Valley, CA

**Sample:** Soil

**Date Sampled:** 12/28/90  
**Date Submitted:** 01/03/91  
**Date Analyzed:** 01/10/91

**Method of Extraction:** Purge & Trap - EPA Method 5030  
**Method of Analysis:** EPA Method 8020 BTEX

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-528-S	SP-1		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.07	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-529-S	SP-2		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.42	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-530-S	SP-3		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.38	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-531-S	SP-4		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.38	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-532-S	SP-5		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		.46	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.34	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-533-S	SP-6		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-534-S	SP-7		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.38	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-535-S	SP-8		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.30	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-536-S	SP-9		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.17	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-537-S	SP-10		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-538-S	SP-11		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005



Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-539-S	SP-12		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		0.71	.005
Ethyl Benzene (mg/kg)		0.12	.005
Total Xylenes (mg/kg)		0.61	.005
Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-540-S	SP-13		
Benzene (mg/kg)		0.17	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.25	.005
Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-541-S	SP-14		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		0.41	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005
Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-542-S	SP-15		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-543-S	SP-16		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.52	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-544-S	SP-17		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-545-S	SP-18		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-546-S	SP-19		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		0.33	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.39	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-547-S	SP-20		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		0.38	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-548-S	SP-21		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005

Lab#	Field#	Conc. (mg/kg)	Detection Limit (mg/kg)
AC-549-S	SP-22		
Benzene (mg/kg)		ND	.005
Toluene (mg/kg)		ND	.005
Ethyl Benzene (mg/kg)		ND	.005
Total Xylenes (mg/kg)		ND	.005

**AMERICAN ENVIRONMENTAL LABORATORIES**



Emdadul H. Khan  
Laboratory Supervisor

EHK:dcr/A91-1240







# TANK PROTECT ENGINEERING

2821 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415)429-8088  
 (800)523-8088  
 FAX(415)429-8089

## CHAIN OF CUSTODY

Pg 1 OF 3

PROJECT NO.		SITE NAME & ADDRESS					(1)	ANALYTES REQUESTED							REMARKS
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER		TYPE OF CONTAINER						TOTAL LIGHT HC	AROMATIC HC	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (621's)	OTHER		
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION										
127C-122890 Anthony's	Anthony's AUTO Service 19592 Center St., Castro Valley, Ca.														
Tank Protect Engineering 2821 Whipple Rd. Union City, Ca. 94587															
SP-1	12/28/90		✓										TPHG & BTEX		
SP-2	"		✓										"		
SP-3	"		✓										"		
SP-4	"		✓										"		
SP-5	"		✓										"		
SP-6	"		✓										"		
SP-7	"		✓										"		
SP-8	"		✓										"		
SP-9	"		✓										"		
Relinquished by: (Signature) <i>Jafar Farooqand</i>		Date / Time 1/3/91		Received by: (Signature) <i>[Signature]</i>		Relinquished by: (Signature)		Date / Time 1/3/91		Received by: (Signature)					
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							

DATE: \_\_\_\_\_



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**CHAIN OF CUSTODY**

pg 2 of 3

PROJECT NO.		SITE NAME & ADDRESS				(1) TYPE OF CONTAINER	ANALYTES REQUESTED							REMARKS
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER		SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER					TOTAL LIGHT HC	AROMATIC HC	TOTAL HEAVY HC	OIL & GREASE	PCC SCAN (624's)	OTHER		
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION									
127C-122890	Anthony's AUTO Service 19592 Center St. Castro Valley, Ca.													
Tank Protect Engineering 2821 Whipple Rd. Union City, Ca. 94587														
SP-10	12/28/90		✓										TPHG & BTEX	
SP-11	"		✓										"	
SP-12	"		✓										"	
SP-13	"		✓										"	
SP-14	"		✓										"	
SP-15	"		✓										"	
SP-16	"		✓										"	
SP-17	"		✓										"	
SP-18	"		✓										"	
Relinquished by : (Signature) <i>Jafar Farooq</i>		Date / Time 1/3/91		Received by : (Signature) <i>M...</i>		Relinquished by : (Signature)		Date / Time 1/3/91		Received by : (Signature)				
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						

DATE: \_\_\_\_\_



**TANK PROTECT ENGINEERING**

2021 WHIPPLE ROAD  
 UNION CITY, CA 94587  
 (415)429-8088  
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 FAX(415)429-8089

**CHAIN OF CUSTODY**

Pg 3 of 3

PROJECT NO.		SITE NAME & ADDRESS				(1) TYPE OF CON- TAINER	ANALYTES REQUESTED						REMARKS
127C-122890 Anthony's		Anthony's AUTO SERVICE 19592 Center St. Castro Valley, CA					TOTAL LIGHT HC	AROMATIC HC	TOTAL HEAVY HC	OIL & GREASE	PCC SCAN (624'9)	OTHER	
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION								
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER Tank Protect Engineering 2821 Whipple Rd. Union City, Ca. 94587													
SP-19	12/29/90		✓									TPH6 & BTEX	
SP-20	"		✓									"	
SP-21	"		✓									"	
SP-22	"		✓									"	
Relinquished by: (Signature)		Date / Time		Received by: (Signature)		Relinquished by: (Signature)		Date / Time		Received by: (Signature)			
Jafar Farooqui		1/3/91		Meyers				1/3/91					
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					

DATE: \_\_\_\_\_



# SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520  
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif Client Project ID: #121B-021891	Sampled: Feb 18, 1991
2821 Whipple Road	Received: Feb 19, 1991
Union City, CA 94587	Analyzed: Feb 19, 1991
Attention: John Mrakovich	Reported: Feb 21, 1991
Matrix Descript: <del>Water</del>	
Analysis Method: EPA 5030/8015/8020	
First Sample #: 102-0373 A-B	

## TOTAL PETROLEUM FUEL HYDROCARBONS with BTEX DISTINCTION (EPA 8015/8020)

Sample Number	Sample Description	Low/Medium B.P.	Ethyl			
		Hydrocarbons	Benzene	Toluene	Benzene	Xylenes
		$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)	$\mu\text{g/L}$ (ppb)
102-0373 A-B	MW-1	160	N.D.	N.D.	N.D.	N.D.
102-0374 A-B	MW-2	N.D.	N.D.	N.D.	N.D.	N.D.
102-0375 A-B	MW-3	120	N.D.	N.D.	N.D.	N.D.

### Detection Limits:

30	0.30	0.30	0.30	0.30
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Low to Medium Boiling Point Hydrocarbons are quantitated against a gasoline standard.  
Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Julia R. Malerstein  
Project Manager

### Please Note:

Above samples do not appear to contain gasoline.



# SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520  
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif Client Project ID: #121B-021891  
2821 Whipple Road Sample Descript: ~~102-0373~~  
Union City, CA 94587 Analysis for: Organic Lead  
Attention: John Mrakovich First Sample #: 102-0373 C

Sampled: Feb 18, 1991  
Received: Feb 19, 1991  
Extracted: Feb 20, 1991  
Analyzed: Feb 20, 1991  
Reported: Feb 21, 1991

## LABORATORY ANALYSIS FOR: Organic Lead

Sample Number	Sample Description	Detection Limit mg/L	Sample Result mg/L
102-0373 C	MW-1	0.0050	N.D.
102-0374 C	MW-2	0.0050	N.D.
102-0375 C	MW-3	0.0050	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

  
Julia R. Malerstein  
Project Manager



# SEQUOIA ANALYTICAL

1900 Bates Avenue • Suite LM • Concord, California 94520  
(415) 686-9600 • FAX (415) 686-9689

Tank Protect Engineering of N. Calif Client Project ID: #121B-021891	Sampled: Feb 18, 1991
2821 Whipple Road	Relogged: Feb 26, 1991
Union City, CA 94587	Analyzed: Feb 27, 1991
Attention: John Mrakovich	Reported: Mar 5, 1991
Sample Descript: <del>XXXXXXXXXX</del>	
Analysis Method: EPA 3810/8015 Modified	
Lab Number: #1020373	

## INDUSTRIAL SOLVENTS SCAN

Analyte	Detection Limit mg/L	Sample Results mg/L
Acetone.....	0.40	N.D.
Acetonitrile.....	1.0	N.D.
Benzene.....	0.010	N.D.
iso-Butanol.....	0.20	N.D.
n-Butanol.....	0.50	N.D.
sec-Butanol.....	0.20	N.D.
t-Butanol.....	0.20	N.D.
Carbon tetrachloride.....	0.20	N.D.
Chloroform.....	0.10	N.D.
Cyclohexane.....	0.010	N.D.
1,2-Dichloroethane.....	0.10	N.D.
t-1,2-Dichloroethene.....	0.040	N.D.
Ethanol.....	1.0	N.D.
Ethyl acetate.....	0.10	N.D.
Ethyl benzene.....	0.010	N.D.
Ethyl ether.....	0.020	N.D.
Freon 113 (Trichlorotrifluoroethane).....	0.020	N.D.
Hexane.....	0.010	N.D.
Methanol.....	1.0	N.D.
Methyl ethyl ketone.....	0.20	N.D.
Methyl isobutyl ketone.....	0.050	N.D.
Methylene chloride.....	0.10	N.D.
<b>iso-Octane.....</b>	<b>0.010</b>	<b>0.15</b>
iso-Propanol.....	0.60	N.D.
n-Propanol.....	0.60	N.D.
n-Propyl benzene.....	0.010	N.D.
Tetrachloroethylene.....	0.040	N.D.
Tetrahydrofuran.....	0.10	N.D.
1,1,1,-Trichlorethane.....	0.10	N.D.
Trichloroethylene.....	0.040	N.D.
Toluene.....	0.010	N.D.
m-Xylene.....	0.010	N.D.
o-Xylene.....	0.010	N.D.
p-Xylene.....	0.010	N.D.

Analytes reported as N.D. were not present above the stated limit of detection.

SEQUOIA ANALYTICAL

*Belinda C. Vega*  
Belinda C. Vega  
Laboratory Director



TANK PROTECT ENGINEERING

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P.O. # 166

CHAIN OF CUSTODY

SEQUOIA PAGE 1 OF 1

PROJECT NO. 121B-021891		SITE NAME & ADDRESS ANTHONY'S AUTO SERVICE 19592 CENTER STREET CASTRO VALLEY, CA.				(1) TYPE OF CONTAINER	ANALYTES REQUESTED							REMARKS
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER JOHN V. MRAKOVICH TANK PROTECT ENGINEERING TEL. # (415) 429-8088							TOTAL LIGHT HC	AROMATIC HC	TOTAL HEAVY HC	OIL & GREASE	PCB SCAM (621's)	OTHER (621's)		
ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION									
MW-1	2/18/91	1123 1125		✓	MW-1	2-40 ML 1-LITER	✓	✓		✓		1020373 Δ-C		
MW-2	2/18/91	1153 1153		✓	MW-2	2-40 ML 1-LITER	✓	✓		✓		374 S		
MW-3	2/18/91	1324 1326		✓	MW-3	2-40 ML 1-LITER	✓	✓		✓		375 S		
Relinquished by: (Signature) <i>John Mrakovich</i>						Date / Time	Received by: (Signature) <i>[Signature]</i>	Relinquished by: (Signature)		Date / Time	Received by: (Signature)			
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) <i>[Signature]</i>	Date / Time	Remarks NORMAL TURN AROUND (10)					

DATE: 2/19/91

APPENDIX C

HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING PROCEDURES



## APPENDIX C

### HOLLOW-STEM AUGER DRILLING AND SOIL SAMPLING PROCEDURES

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

Borings shall be drilled with a hollow-stem auger and sampled with a California or modified California-type split-spoon sampler. Soil samples shall be of sufficient volume to perform the analyses which may be required, including replicate analyses.

Soil from all borings shall be described in detail using the Unified Soil Classification System and shall be logged by a geologist, civil engineer, or engineering geologist who is registered or certified by the State of California and is experienced in the use of the Unified Soil Classification System.

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

Soil samples will be collected in decontaminated brass or stainless steel sampling tubes in the split-spoon. Sediment traps will be used when unconsolidated sands and gravels fall from the sampler during retrieval. The brass tubes will be cut apart using a clean knife. The ends of the tubes will be covered with a thin sheet of Teflon tape or aluminum foil beneath plastic end caps and sealed with electrical or duct tape and properly labeled. The samples will be stored on ice at a temperature of 4 degrees Celsius.

Drill cuttings will be stored on site in 55-gallon drums or covered with visquene. Analytical results will be submitted immediately to the site owner for determination of appropriate disposal procedures. The soil borings not completed as wells will be backfilled with a cement grout.

APPENDIX D

SAMPLE HANDLING TECHNIQUES

## APPENDIX D

### SAMPLE HANDLING TECHNIQUES

Soil and groundwater samples will be packaged carefully to avoid breakage or contamination, and will be delivered to the laboratory at proper storage temperatures. The following sample packaging requirements will be followed.

- . Sample bottle/sleeve lids will not be mixed. All sample lids will stay with the original containers and have custody seals affixed to them.
- . Samples will be secured in coolers to maintain custody, control temperature, and prevent breakage during transportation to the laboratory.
- . The original chain-of-custody form and one copy will be placed in a plastic bag and taped to the inside of the cooler lid.
- . Ice or blue ice will be used to keep samples at a constant temperature during transport to the laboratory.
- . 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, and the collector's initials.

All sample containers will be precleaned and will be obtained at I-Chem Research in Hayward, California, or from a State Department of Health Services certified analytical laboratory.

Sample Control/Chain-of-Custody: All field personnel will refer to this work plan to verify the methods to be employed during sample collection. All sample gathering activities will be recorded in the site logbook; all sample transfers will be documented in the site logbook; samples are to be identified with TPE labels and all sample bottles are to be custody-sealed. All information is to be recorded in waterproof ink. All TPE field personnel are personally responsible for sample collection and the care and custody of collected samples until the samples are transferred or properly dispatched.

The custody record will be completed by the field technician who has been designated by the TPE project manager as being responsible for sample shipment to the appropriate laboratory. The custody record will include, among other things, the following information: name of person collecting the samples; date samples were collected; type of sampling conducted (composite/grab); location of sampling station; number and type of containers used; and signature of the TPE person relinquishing samples to a non-TPE person with the date and time of transfer noted. The relinquishing individual will also put all the specific shipping data on the custody record.

Site log books will be maintained by a designated TPE field employee to record, for each sample, sampling locations, station numbers, dates, times, sampler's name, designation of the samples as a grab or composite, notation of the type of sample (e.g. groundwater, soil boring, etc.), preservatives used, on-site measurement data, and other observations or remarks.

APPENDIX E

WASTE HANDLING AND DECONTAMINATION PROCEDURES

## APPENDIX E

### WASTE HANDLING AND DECONTAMINATION PROCEDURES

Decontamination: Any drilling, sampling or field measurement equipment that comes into contact with soils or groundwater will be properly decontaminated prior to its use at the site and after each incident of contact with the soils or groundwater being investigated. Proper decontamination is essential to obtain samples that are representative of environmental conditions and to accurately characterize the extent of soil and groundwater contamination. Hollow-stem auger flights and the drill bit will be steam-cleaned between the sampling of each well.

All sample equipment, including the split-tube sampler and brass tubes, will be cleaned by washing with tri-sodium phosphate detergent, followed by sequential rinsing with tap water, and deionized water.

Waste Handling: Waste materials generated during site characterization activities will be handled and stored as hazardous waste and will be stored on site in appropriately labeled containers. Waste materials anticipated include drill cuttings, development and purge water, water generated during aquifer testing, water generated during decontamination, and used personnel protection equipment such as gloves and Tyvek. The site owner will be responsible for providing the storage containers and will be responsible for the disposal of the waste materials. Drill cuttings from individual borings will be stored separately in drums or covered by visquene and the appropriate disposal procedure will be determined by the site owner or TPE following receipt of the soil sample analytical results.

APPENDIX F

LOGS OF EXPLORATORY BORINGS AND  
WELL COMPLETION DETAILS

# LOG OF EXPLORATORY BORING

PROJECT NUMBER 121

BORING NO. SB-1

PROJECT NAME 19592 Center Street, Castro Valley, CA

BY J. V. Mrakovich

DATE 8/16/90

SURFACE ELEV. 260 FT

RECOVERY (FT/FT)	OVA (PPM)	PENETRA- TION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO- GRAPHIC COLUMN	DESCRIPTION
						ASPHALT	
1.5/1.5	0	69		5	■	AGGREGATE SUBBASE; GRAVELLY SILTY SAND (SM). yellow-brown, 50% gravel, dry, no odor.	
					■	GRAVELLY SILTY SAND (SM), yellow-brown, 10% gravel, damp, possible slight odor.	
					■	As above, brown, no gravel, clayey, fine to medium-grained, clay balls, damp, no odor.	
1.0/1.0	0	50 for 6 in.		10	■	As above, very dense, no odor.	
					■	As above, olive-green, medium-grained, no odor.	
					■	As above, gravelly, slight odor.	
1.3/1.3	0	85 for 10 in.		15	■	As above, very green, damp, no odor.	
					■	CLAYEY SILT (ML), brown, damp, no odor.	
83/.83	0	50 for 4 in.		20	■	GRAVELLY CLAYEY SAND (SP), mottled brown and red-brown, some rock fragments, damp, very dense, no odor.	
1.4/1.4	0	75 for 11 in.		25	■	As above, silty, light green-brown, very fine-grained, damp, no odor.	
					■	As above, brown, fine to medium-grained, dry, no odor.	
1.5/1.5	0	88		30	■	As above, driller reports gravel and cobbles.	
					■	As above, dry, no odor.	
.5/.5		70 for 6 in.		35	■	Boring terminated at 35'; sampled to 36.5'.	

REMARKS: Boring drilled with continuous-flight, hollow-stem,  
8-inch O. D. augers. Samples collected in a 2.5-inch  
O. D. California Sampler. Boring sealed with cement.



# LOG OF EXPLORATORY BORING

PROJECT NUMBER 121

BORING NO. SB-2

PROJECT NAME 19592 Center Street, Castro Valley, CA

BY J. V. Mrakovich

DATE 8/16/90

SURFACE ELEV. 260 FT

RECOVERY (FT/FT)	OVA (PPM)	PENETRA- TION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT	SAMPLES	LITHO- GRAPHIC COLUMN	DESCRIPTION
						ASPHALT	
1.5/1.5	0	75		5	■	CLAY (CL), brown, soft to stiff, damp, no odor.	
					■	SILTY GRAVELLY SAND (SM), orange-brown, fine to medium-grained, 10% gravel, damp, no odor.	
					■	As above, very dense, no odor.	
1.5/1.5	0	80		10	■	As above, light-brown, no gravel, no odor.	
					■	As above, green, gravelly with coarse sand, damp, no odor.	
					■	As above, red-brown, medium to coarse-grained, damp, no odor.	
1.0/1.0	20	50 for 6 in.		15	■	As above, green, possible slight odor.	
					■	As above, mottled green and brown, rock fragments to 1-inch diameter, clayey, damp, no odor.	
.83/.83	73	50 for 4 in.		20	■	As above, no gravel, green, medium to coarse sand, no clay or silt, damp, slight odor.	
1.5/1.5	52	81		25	■	As above, very gravelly, damp, no odor.	
1.5/1.5	0	85		30	■	As above, brown, no gravel, very fine to fine-grained, silt, dry, no odor.	
					■	Boring terminated at 35'; sampled to 36.5'.	
.5/.5	0	75 for 6 in.		35	■		

REMARKS: Boring drilled with continuous-flight, hollow-stem, 8-inch, augers. Samples collected in a 2.5-inch O. D. California Sampler. Boring sealed with cement.

# LOG OF EXPLORATORY BORING

PROJECT NUMBER 121

BORING NO. SB-3

PROJECT NAME 19592 Center Street, Castro Valley, CA

BY J. V. Mrakovich

DATE 8/16/90

SURFACE ELEV. 260 FT

RECOVERY (FT/FT)	OVA (PPM)	PENETRA- TION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO- GRAPHIC COLUMN	DESCRIPTION
1.5/1.5	0	62		5			ASPHALT
							AGGREGATE SUBBASE: GRAVELLY SILTY SAND (SM), red-brown, fine to medium-grained, damp, no odor.
							SILTY CLAY (CL), mottled red and black, soft, damp, no odor.
1.3/1.5	0	87		10			CLAYEY GRAVELLY SAND (SP), light brown, fine to medium-grained, 10% gravel, clay balls, damp, no odor.
							As above, no gravel, red-brown, little clay, very dense, damp, no odor.
							As above, light grey, damp, no odor.
1.5/1.5	0	83		15			As above, red-brown, medium to coarse-grained, gravelly, gravel fragments to 1-inch diameter, damp, no odor.
1.5/1.5	0	71 for 11.5 in.		20			SANDY SILT (ML), olive-brown, very dense, damp, no odor.
5/.5	0	89 for 6 in.		25			GRAVELLY SAND (SP), red-brown, medium to coarse-grained, gravel fragments to 1-inch diameter, 15% gravel, very dense, moist, no odor.
1.0/1.0	0	78		30			SANDSTONE, brown, medium-grained, dry, no odor.
							Boring terminated at 35'; sampled to 36.5'.
42/.5	0	60 for 6 in.		35			

REMARKS: Boring drilled with continuous-flight, hollow-stem, 8-inch O. D. augers. Samples collected in a 2.5-inch O. D. California Sampler. Boring sealed with cement.

# LOG OF EXPLORATORY BORING

PROJECT NUMBER 121

BORING NO. SB-4

PROJECT NAME 19592 Center Street, Castro Valley, CA

BY J. V. Mrakovich

DATE 8/16/90

SURFACE ELEV. 260 FT

RECOVERY (FT/FT)	OVA (PPM)	PENETRA- TION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO- GRAPHIC COLUMN	DESCRIPTION
						CONCRETE	
1.5/1.5	0	70		5	[Sample]	AGGREGATE SUBBASE: GRAVELLY SILTY SAND (SM), brown, fine to medium-grained, damp, no odor.	
					[Sample]	SILTY SAND (SM), brown, 10% gravel, fine to medium-grained, damp, no odor.	
					[Sample]	As above, orange-brown, medium to coarse-grained, very dense, fine-grained gravel, damp, no odor.	
1.0/1.0	0	97		10	[Sample]	As above, very gravelly, gravel fragments to 1-inch diameter, damp, no odor.	
					[Sample]	SANDY SILT (ML), olive-light brown, very dense, pockets of quartz gravel, damp, no odor.	
1.5/1.5	0	86		15	[Sample]	GRAVELLY CLAYEY SILTY SAND (SM), orange-brown, fine to medium-grained, 50% gravel, damp, no odor.	
1.5/1.5	0	82		20	[Sample]	CLAYEY SILTY SAND (SM), olive-grey, no gravel, fine-grained, damp, no odor.	
					[Sample]	As above, mottled yellow-grey, medium to coarse-grained, damp, no odor.	
1.5/1.5	25	63		25	[Sample]	SANDSTONE, brown, fine to medium-grained, poorly consolidated, damp, no odor.	
.83/.83	5	74 for 10 in.		30	[Sample]	Boring terminated at 35'; sampled to 36.5'.	
.33/.33	0	80 for 4 in.		35	[Sample]		

REMARKS: Boring drilled with continuous-flight, hollow-stem 8-inch O. D. augers. Samples collected in a 2.5-inch O. D. California Sampler. Boring sealed with cement.

# LOG OF EXPLORATORY BORING

PROJECT NUMBER 121

BORING NO. MW-1

PROJECT NAME 19592 Center Street, Castro Valley, CA

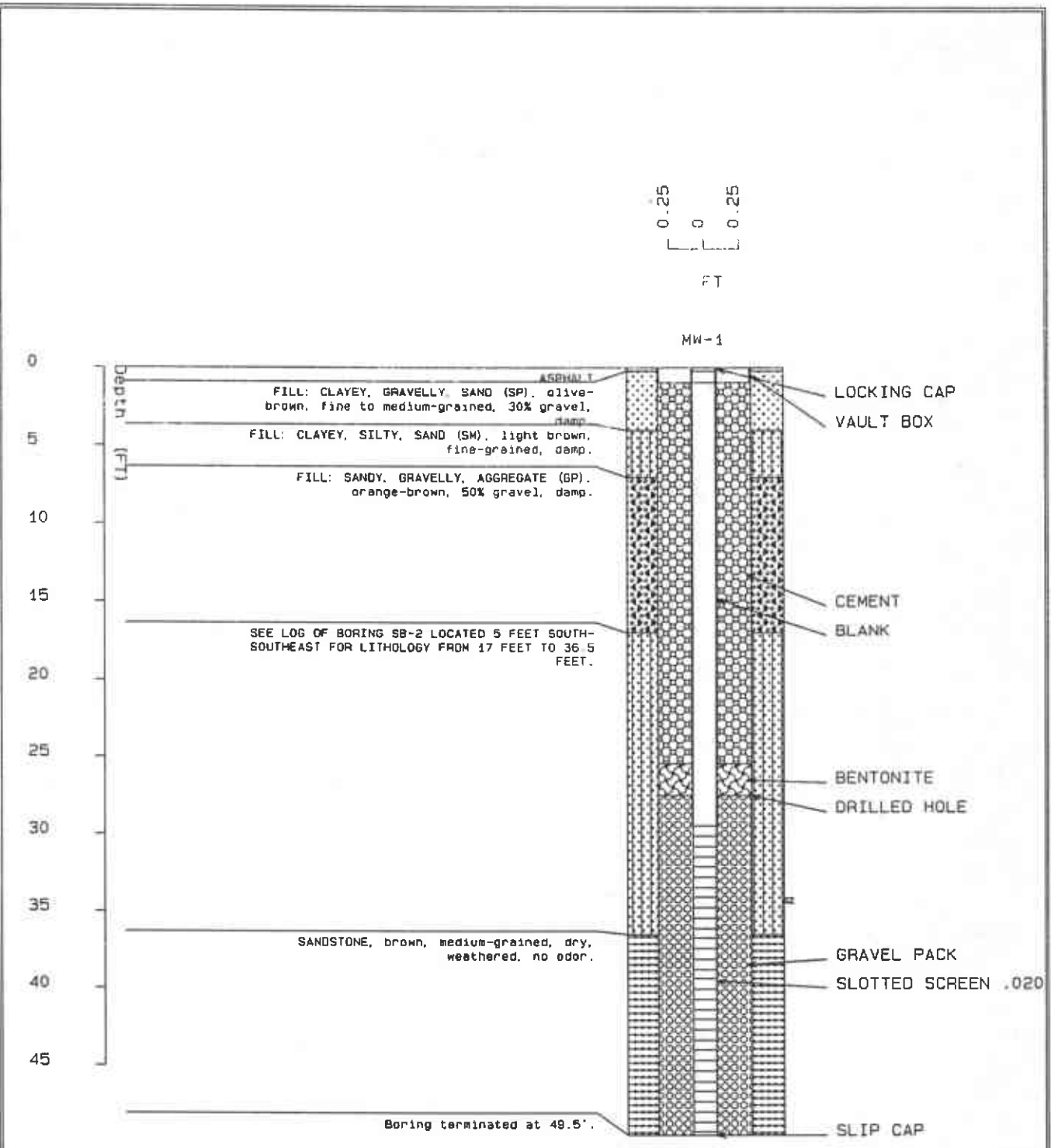
BY J. V. Mrakovich

DATE 1/31/91

SURFACE ELEV. 250 FT

RECOVERY (FT/FT)	DVA (PPM)	PENETRA- TION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO- GRAPHIC COLUMN	DESCRIPTION
				5			ASPHALT
				5			FILL: CLAYEY, GRAVELLY, SAND (SP), olive-brown, fine to medium-grained, 30% gravel, damp
				10			FILL: CLAYEY, SILTY, SAND (SM), light brown, fine-grained, damp.
				10			FILL: SANDY, GRAVELLY, AGGREGATE (GP), orange-brown, 50% gravel, damp.
				15			
				20			SEE LOG OF BORING SB-2 LOCATED 5 FEET SOUTH-SOUTHEAST FOR LITHOLOGY FROM 17 FEET TO 36.5 FEET.
				25			
				30			
				35			
				40			SANDSTONE, brown, medium-grained, dry, weathered, no odor.
0/.06	-	50/.06		40			
				45			Boring terminated at 49.5'.
0/0	-	50/.17		45			

REMARKS: Boring drilled with continuous-flight, hollow-stem, 8-inch, augers. Samples collected in a 2.5-inch O. D. California Sampler.



LEGEND

- GP
- SP
- SM
- SANDSTONE
- ASPHALT

Static Water Level

WELL ID : MW-1

# LOG OF EXPLORATORY BORING

PROJECT NUMBER 121

BORING NO. MW-2

PROJECT NAME 19592 Center Street, Castro Valley, CA

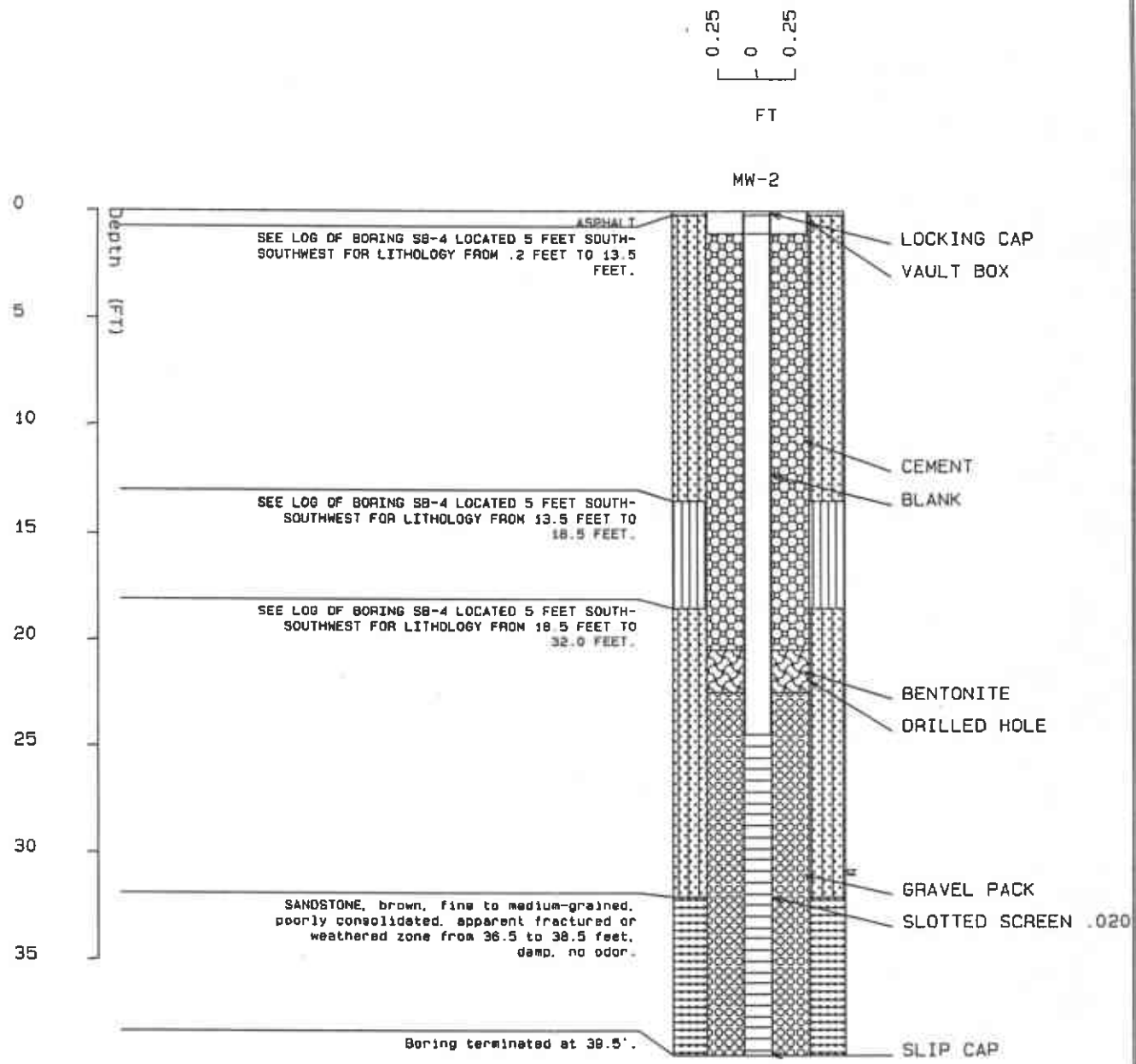
BY J. V. Mrakovich

DATE 1/31/91

SURFACE ELEV. 250 FT

RECOVERY (FT/FT)	OVA (PPM)	PENETRA- TION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO- GRAPHIC COLUMN	DESCRIPTION
				5			ASPHALT
				10			SEE LOG OF BORING SB-4 LOCATED 5 FEET SOUTH-SOUTHWEST FOR LITHOLOGY FROM 2 FEET TO 13.5 FEET.
				15			SEE LOG OF BORING SB-4 LOCATED 5 FEET SOUTH-SOUTHWEST FOR LITHOLOGY FROM 13.5 FEET TO 18.5 FEET.
				20			SEE LOG OF BORING SB-4 LOCATED 5 FEET SOUTH-SOUTHWEST FOR LITHOLOGY FROM 18.5 FEET TO 32.0 FEET.
				25			
				30			SANDSTONE, brown, fine to medium-grained, poorly consolidated, apparent fractured or weathered zone from 36.5 to 38.5 feet, damp, no odor.
				35			Boring terminated at 39.5'.

REMARKS: Boring drilled with continuous-flight, hollow-stem, 8-inch O. D. augers. Samples collected in a 2.5-inch O. D. California Sampler.



LEGEND

Static Water Level

SM

ML

SANDSTONE

ASPHALT

WELL ID : MW-2

TANK PROTECT ENGINEERING

Figure :

# LOG OF EXPLORATORY BORING

PROJECT NUMBER 121

BORING NO. MW-3

PROJECT NAME 19592 Center Street, Castro Valley, CA

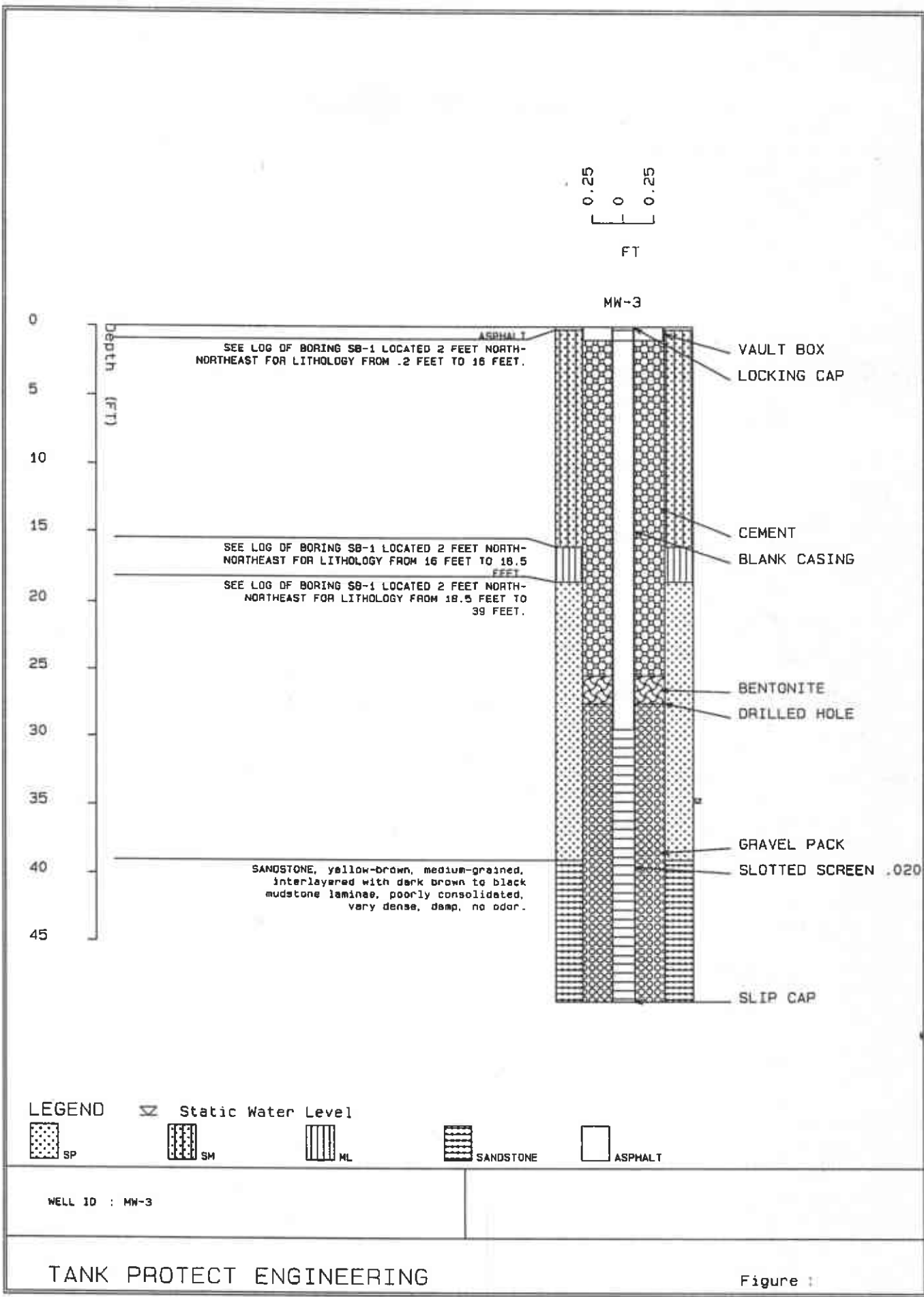
BY J. V. Mrakovich

DATE 1/31/91

SURFACE ELEV. 250 FT

RECOVERY (FT/FT)	OVA (PPM)	PENETRA- TION (BLOWS/FT)	GROUND WATER LEVELS	DEPTH IN FT.	SAMPLES	LITHO- GRAPHIC COLUMN	DESCRIPTION
				5			ASPHALT
				10			SEE LOG OF BORING SB-1 LOCATED 2 FEET NORTH-NORTHEAST FOR LITHOLOGY FROM .2 FEET TO 16 FEET
				15			
				20			SEE LOG OF BORING SB-1 LOCATED 2 FEET NORTH-NORTHEAST FOR LITHOLOGY FROM 16 FEET TO 18.5 FEET
				25			SEE LOG OF BORING SB-1 LOCATED 2 FEET NORTH-NORTHEAST FOR LITHOLOGY FROM 18.5 FEET TO 39 FEET.
				30			
				35			
				40			SANDSTONE, yellow-brown, medium-grained, interlayered with dark brown to black mudstone laminae, poorly consolidated, very dense, damp, no odor.
.33/.33				45			
				50			
				55			
				60			
				65			
				70			
				75			
				80			
				85			
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				870			
				875			
				880			
				885			
				890			
				895			
				900			





APPENDIX G

GROUNDWATER MONITORING WELL CONSTRUCTION PROCEDURES

## APPENDIX G

### GROUNDWATER MONITORING WELL CONSTRUCTION PROCEDURES

#### BOREHOLE DESIGN

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

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 an underlying competent aquitard. The competency of the aquitard may be tested by sampling 5 feet into the underlying aquitard and backfilling the excess hole with either bentonite pellets or neat cement placed by tremie pipe method. An aquitard found to be less than 5 feet thick, is assumed to represent a local lens. The screened interval will begin a minimum of 5 feet above the saturated zone and extend the full thickness of the aquifer or no more than 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.

Deep (Confined Zone) Wells: Any monitoring well to be screened below the upper aquifer shall be installed as a 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 smaller 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 up 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. 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 envelope materials shall be durable, water worn, 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 if Type 1/11 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 five minutes. When a washer is not available, components shall be cleaned with water and detergent or tri-sodium phosphate, rinsed in clean water, than rinsed in distilled water.

Soil and water sampling equipment and material used to construct the wells shall not donate to, capture, mask, nor alter the chemical composition of the soil and groundwater.

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

Casing Installation: The casing will be set under tension to ensure straightness. Centralizers will be used where necessary to prevent 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 installation conditions or local regulations require. Drilling mud, when used, will 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 not be 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 bore hole, 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 well casing. Access to the casing will 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.

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 H

GROUNDWATER MONITORING WELL DEVELOPMENT PROCEDURES



## APPENDIX H

### GROUNDWATER MONITORING WELL DEVELOPMENT PROCEDURES

#### INTRODUCTION

Newly installed groundwater monitoring wells will be developed to restore natural hydraulic conductivity of the formation, remove sediments from well casing and filter pack, stabilize the filter pack and aquifer material, and promote 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 five minutes.

When a washer is not available, components shall be cleaned 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 groundwater.

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

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

Surging: Care will be exercised when using a surge block to avoid damaging the well screen and casing. When surging wells screened in coarse (sand/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 required. 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 on site, pending sampling and laboratory analysis. All hazardous development water will be transported off site by a licensed transporter to a hazardous waste disposal or treatment facility. No hazardous development water will be released to the environment.

APPENDIX I

GROUNDWATER SAMPLING PROCEDURES

## APPENDIX I

### GROUNDWATER SAMPLING PROCEDURES

Groundwater monitoring wells will not be sampled until at least 48 hours after well development. Groundwater samples will be obtained using either a bladder pump or a clear Teflon bailer. Prior to sampling, sampling equipment will be thoroughly decontaminated to prevent introduction of contaminants into the well and to avoid cross-contamination. Monitoring wells will be sampled after three to five wetted casing volumes of groundwater have been evacuated and after the TPE sampling team leader determines that water representative of the formation is being obtained. The well will be purged until conductivity has been stabilized (three consecutive conductivity reading within 15% of one another). 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.

Tank Protect Engineering will also measure the thickness of any floating product in the monitoring wells using a probe or clear Teflon bailer. The floating product will be measured after well development but prior to the collection of groundwater samples. If floating product is present in the well, TPE will recommend to the client that product removal be commenced immediately and reported to the appropriate regulatory agency.

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, Page 69544, Table II) for the type of analysis to be performed.

MEASUREMENTS

Purged Water Parameter: During purging, discharged water will be measured for the following parameters.

<u>Parameter</u>	<u>Units of Measurement</u>
PH	Units
Electrical conductivity	Umhos
Temperature	Degrees F or C
Depth to Water	Feet/Tenths
Volume of Water Discharged	Gallons

Documentation: All parameter measurements shall be documented in writing on TPE development logs.

APPENDIX J

QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

## APPENDIX J

### QUALITY ASSURANCE AND QUALITY CONTROL PROCEDURES

The overall objectives of the field sampling program include generation of reliable data that will support development of a remedial action plan. Sample quality will be checked by the use of proper sampling, handling, and testing methods. Additional sample quality control methods may include the use of background samples, equipment rinsate samples, and trip and field blanks. Chain-of-custody forms, use of a qualified laboratory, acceptable detection limits, and proper sample preservation and holding times also provide assurance of accurate analytical data.

Tank Protect Engineering will follow a QA/QC program in the field to ensure that all samples collected and field measurements taken are representative of actual field and environmental conditions and that data obtained are accurate and reproducible. These activities and laboratory QA/QC procedures are described below.

Field Samples: Additional samples taken in the field are used to evaluate both sampling and analytical methods. Three basic categories of QA/QC samples that may be collected are trip samples, field blanks, and duplicate samples.

Trip blanks are a check for cross-contamination during sample collection, shipment, and in the laboratory. Analytically confirmed organic-free water shall be used for organic parameters and deionized water for metal parameters. Blanks will be prepared by the laboratory supplying the sample containers. The blank shall be numbered, packaged, and sealed in the same manner as the other samples. One trip blank will be used for each sample set of less than 20 samples. At least 5% blanks will be used for sets greater than 20 samples. The trip blank is a water sample that remains with the collected samples during transportation and is analyzed along with the field samples to check for residual contamination. The trip blank is not to be opened by either the sample collectors or the handlers.

The field blank is a water sample that is taken into the field and is opened and exposed at the sampling point to detect contamination from air exposure. The water sample is poured into appropriate containers to simulate actual sampling conditions. Contamination for air exposure can vary considerably from site to site.

The laboratory will not be informed about the presence of field and trip blanks and a false identifying number will be put on the label. Full documentation of these collection and decoy procedure will be made in the site logbook.

Duplicate samples are identical sample pairs (collected in the same place and at the same time), placed in identical containers. For soils, adjacent sample liners will be analyzed. For the purpose of data reporting, one is arbitrarily designated the sample, and the other is designated as a duplicate sample. Both sets of results are reported to give an indication of the precision of sampling and analytical methods.

The laboratory's precision will be assessed without the laboratory's knowledge by labeling one of the duplicates with false identifying information. Data quality will be evaluated on the basis of the duplicate results.

Laboratory QA/QC: Execution of a strict QA/QC program is an essential ingredient in high-quality analytical results. By using accredited laboratory techniques and analytical procedures, estimates of the experimental values can be very close to the actual value of the environmental sample. The experimental value is monitored for its precision and accuracy by performing QC test designed to measure the amount of random and systematic errors and to signal when correction of these errors is needed.

The QA/QC program describes methods for performing QC tests. These methods involve analyzing method blanks, calibration standards, check standards (both independent and EPA-certified standards), duplicates, replicates, and sample spikes. Internal QC also requires adherence to written methods, procedural documentation, and record keeping, and the observance of good laboratory practices.