WORKPLAN
FOR
STOCKPILED SOIL REMEDIATION

CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

1-24-95

5119 # 2116

Prepared For:
MESSRS. AARON AND STANLEY WONG
2200 E. 12TH STREET
OAKLAND, CA 94606

Submitted By:
TANK PROTECT ENGINEERING
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January 24, 1995

Project Number 267

TANK PROTECT ENGINEERING
Of Northern California, Inc.

TRANSMITTAL FORM

DATE: 1/24/95 PROJECT NO.: 267

R0527

TO: Mr. Barney Chan
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Room 250
Alameda, CA 94502-6577

FROM: John V. Mrakovich
Tank Protect Engineering
2821 Whipple Road
Union City, CA 94587-1233

WE ARE SENDING YOU ☒ ATTACHED ☐ UNDER SEPARATE COVER
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COPIES	DATED	DESCRIPTION
1	1/24/95	Workplan For Stockpiled Soil Remediation For Credit World
		Auto Sales at 2345 E. 14th Street, Oakalnd, CA 94601

HAZMAT
FILE

REMARKS:

CC: File
Messrs. Aaron & Stanley Wong
Credit World Auto Sales

SIGNATURE: Captain Travis

John V. Mrakovich, Ph.D.
Sr. Registered Geologist

Expiration Date 4/30/96

Jeff J. Farhoomand, M.S.
Principal Engineer

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This workplan has been prepared by the staff of **Tank Protect Engineering of Northern California, Inc.** under direction of an Engineer and/or Geologist whose seal(s) and/or 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.

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FIGURE

APPENDICES

1.0 INTRODUCTION

The subject site is located at 2345 E. 14th Street in the City of Oakland in Alameda County, California and is owned by Messrs. Aaron and Stanley Wong [(Wong), telephone number (510) 532-1672]. The site is currently vacant but was most recently occupied by a used car dealership known as Credit World Auto Sales. The only onsite structure is a building which includes an office and automotive service bay. Previous work by others and Tank Protect Engineering of Northern California, Inc. (TPE) has documented soil and groundwater contamination apparently due to leaks or spills associated with a former underground gasoline tank complex.

This Workplan for Stockpiled Soil Remediation (WP) summarizes TPE's understanding of site history and documents work conducted by others and TPE. The WP presents a scope of work for remediating stockpiled soil.

2.0 SITE HISTORY

Work conducted by others is summarized from documents provided to TPE by Wong.

2.1 Tank Removal

On August 5, 1988, one 8,000-gallon, underground, gasoline storage tank; two 6,000-gallon, underground, gasoline storage tanks; one 1,000-gallon, underground, waste oil storage tank; 2 dispenser islands; and associated piping were removed from the site by West Coast Tank Company of Campbell, California. Subsequent soil sampling was conducted by SCS Engineers (SCS) of Dublin, California.

2.1.1 Tank Removal Soil Sampling

On August 25, 1988, two soil samples were collected from beneath each gasoline tank and analyzed for total petroleum hydrocarbons as gasoline (TPHG) by the United States Environmental Protection Agency (EPA) Method 8015; for benzene, toluene,

ethylbenzene, and xylenes (BTEX) by EPA Method 8020; and for lead by EPA Method 7420. Samples collected from beneath the waste oil storage tank were analyzed for total petroleum hydrocarbons as diesel (TPHD) by EPA Method 8015, for total oil & grease (TOG) by Standard Method 503E, and for volatile organics by EPA Method 624.

2.1.1.1 Results of Chemical Analyses

All samples analyzed for TPHG, BTEX, and lead contained concentrations of all constituents. TPHG ranged in concentration from 130 parts per million (ppm) to 1,500 ppm. BTEX chemicals ranged in concentration from a low of .17 ppm for benzene to a high of 160 ppm for xylenes. Lead ranged in concentration from 4.6 ppm to 316 ppm.

TOG and TPHD were detected in both soil samples collected beneath the waste oil tank. TOG was detected at concentrations of 570 ppm and 780 ppm. TPHD was detected at concentrations of 65 ppm and 110 ppm.

EPA Method 624 detected only ethylbenzene and total xylenes in soil beneath the waste oil tank.

The reader is referred to SCS's September 19, 1988 letter report to Mr. Dino Gonis for documentation of the above work and analytical results.

2.2 Excavation Closure

Earth Systems Environmental, Inc. (ESE) documented that the excavations were backfilled "with the stockpiled spoils and imported fill, compacted, graded to surface contours and capped with concrete" (see ESE's December 23, 1991 Phase I Soil and Ground Water Assessment report).

2.3 Soil Boring and Groundwater Investigation - October 3, 1988

On October 3, 1988, California Environmental Consultants (CEC) drilled 3 soil borings, B-1 through B-3 (see Figure 1), to characterize the soil in the vicinity of the tanks. Borings B-1 and B-2 were drilled in the area of the former underground gasoline tanks and boring B-3 was drilled in the area of the former waste oil tank. One soil sample and 1 "grab" groundwater sample were collected from each boring. Soil samples were collected at depths of about 15 feet.

CEC also reported collecting samples SP-1, SP-2, and SP-3 from 3 aerated stockpiles, 2 associated with the fuel tanks excavation and 1 associated with the waste oil tank excavation. The stockpiles were aerated for use as excavation backfill material.

2.3.1 Results of Chemical Analyses

2.3.1.1 Soil Samples

Soil samples from SP-1, SP-2, and borings B-1 and B-2 were analyzed for TPHG and BTEX by EPA Method 5030 or 3810/8015/8020. TPHG was detected in samples SP-1 and SP-2 at concentrations of 1.3 ppm and 13 ppm, respectively. TPHG was detected in samples B-1 and B-2 at concentrations of 3.4 ppm and 83 ppm, respectively. All BTEX chemicals were nondetectable in samples SP-1 and SP-2. Low concentrations of some or all BTEX chemicals were detected in samples B-1 and B-2.

The soil samples from SP-3 and boring B-3 were analyzed for BTEX, TOG, and halogenated volatile organics by EPA Methods 5030/8020, 3550, and 5030/8010, respectively. All BTEX chemicals were nondetectable in sample SP-3; however, all BTEX chemicals were detected in sample B-3 ranging in concentration from a low of .360 ppm for benzene to a high of .850 ppm for xylenes. TOG was detected in samples SP-3 and B-3 at concentrations of 1,300 ppm and 88 ppm, respectively. No chemicals were detected by EPA Method 5030/8010 in either sample.

2.3.1.2 "Grab" Groundwater Samples

One "grab" groundwater sample was collected from each boring and analyzed as discussed above under section 2.3.1.1 Soil Samples.

TPHG was detected in water samples from borings B-1 and B-2 at concentrations of 67,000 parts per billion (ppb) and 110,000 ppb, respectively; all BTEX chemicals were detected in both samples with concentrations ranging from a low of 2,400 ppb for toluene to a high of 17,000 ppb for benzene.

The water sample from boring B-3 detected all BTEX chemicals ranging in concentration from a low of 160 ppb for toluene to a high of 1,300 ppb for xylenes. TOG was detected at a concentration of 290,000 ppb and no chemicals were detected by EPA Method 5030/8010.

The reader is referred to CEC's November 21, 1988 letter report to Mr. Dino Gonis for documentation of the above scope of work and analytical results.

2.4 Soil Boring and Groundwater Investigation - August 21 and 22, 1991

On May 22, 1991, ESE, under subcontract to Mobile Labs, Inc., installed 1 groundwater monitoring well, MW-1, and on August 21 and 22, 1991, drilled 5 soil borings, TH-1 through TH-5, and installed 2 groundwater monitoring wells, MW-2 and MW-3, (see Figure 1) as a further characterization of soil and groundwater contamination.

The soil borings were located, generally, along an east-west treading line that runs through the center of the location of the former gasoline tank complex and generally in the direction of the anticipated groundwater gradient. Boring TH-2 is located at the easterly end of the line; boring TH-1 is located in the center of the former complex; boring TH-3 is located at the westerly end of the line near the waste oil tank; and boring TH-4 is located about a third the distance from TH-3 to TH-1. Boring TH-5 was not located in line with the other borings, but was located in the southerly corner of the site (see Figure 1).

Monitoring well MW-1 is located south of the former tank complex; wells MW-2 and MW-3 are located near the northerly and westerly corners of the site, respectively (see Figure 1).

Two soil samples were analyzed from each boring and monitoring well with the exception of boring TH-1 in which only 1 sample was analyzed. All samples were collected at depths of about 10 or 18 feet, with the exception of the deeper sample in boring TH-2 which was collected at a depth of about 30.0 feet.

2.4.1 Results of Soil Sample Chemical Analyses

All soil samples from borings and monitoring wells located in the area of the former gasoline tank complex were analyzed for TPHG by EPA Method 8015 Modified and BTEX by EPA Method 8020. All soil samples from borings and monitoring wells located in the area of the former waste oil tank were analyzed for total recoverable hydrocarbons (TRH) by EPA Method 418.1, TPHG, and BTEX. Soil samples from boring TH-5, located farthest from either former tank area, were analyzed for TPHG and BTEX.

All soil samples in all borings, with the exception of the deeper sample in boring TH-5, detected TPHG with concentrations ranging from 10 ppm to 4,320 ppm. All soil samples analyzed for TRH detected concentrations ranging from 20 ppm to 1,600 ppm. BTEX chemicals were detected almost exclusively in samples collected only in the area of the former gasoline tank complex.

2.4.2 Results of Groundwater Sample Chemical Analyses

Groundwater samples were collected from the monitoring wells on August 23, 1991, one day after their construction and development, and analyzed for TPHG by EPA Method 8015 Modified and BTEX by EPA Method 602. No TPHG or BTEX chemicals were detected in well MW-3. TPHG was detected in wells MW-1 and MW-2 at concentrations of 2,090,000 ppb and 10,000 ppb, respectively. BTEX chemicals

were detected only in well MW-1 and ranged in concentration from 2,145 ppb for ethylbenzene to 23,150 ppb for xylenes.

The reader is referred to ESE's December 23, 1991 Phase I Soil and Ground Water Assessment report for documentation of the above scope of work and analytical results.

2.5 Groundwater Monitoring - April 16, 1992

On April 16, 1992, NKJ Environmental Monitoring (NKJ) measured depth-to-groundwater in each well and found floating product present in all 3 wells. The thickness of product ranged from 0.16 feet to 5.12 feet.

The reader is referred to NKJ's May 1, 1992 letter report to Mobile Labs, Inc. for documentation of the above scope of work.

2.6 Alameda County Health Care Services Agency Letters Dated October 19 and 30, 1992

In an October 19, 1992 letter to Wong, Request for Report of Subsurface Investigation and Workplan Addendum for Former Taxi Taxi, Inc. at 2345 E. 14th St., Oakland, CA 94601, the Alameda County Health Care Services Agency (ACHCSA) requested additional information about the tank closure, disposition of stockpiled soil, and requested an additional workplan to further characterize soil and groundwater contamination.

In an October 30, 1992 letter to Wong, Subsurface Investigation at Former Taxi Taxi at 2345 E. 14th St., Oakland, CA 94601, the ACHCSA approved a recommendation from ESE for installation of 2 additional groundwater monitoring wells and a product removal system.

2.7 Groundwater Gradient - June 11, 1993

On April 26, 1993, Wong contracted with TPE to conduct the above work proposed by ESE and approved by the ACHCSA. Prior to installing 2 additional wells, a representative of TPE visited the site on June 11, 1993 to measure depth-to-groundwater in each well (for evaluation of groundwater gradient and flow direction) and free product thickness, if any. The purpose of determining groundwater flow direction was to assist TPE in optimally locating the 2 new wells. Depth-to-groundwater and top of free product were measured by using a KECK Model KIR-89 interface meter. Gradient was .0357 feet per foot in a northwesterly direction and no significant product thickness was measured.

2.8 Soil Boring and Groundwater Investigation - July 22 and 23, 1993

On June 18, 1993, TPE submitted a Workplan for Construction of Groundwater Monitoring Wells for installation of 2 additional groundwater monitoring wells and up to 2 free product removal systems if free product was present in any of the wells. The workplan was subsequently approved by the ACHCSA in a June 25, 1993 letter to Wong.

On July 22 and 23, 1993, TPE installed groundwater monitoring wells TMW-4 and TMW-5 at the locations shown in Figure 1. The locations of the wells were based on groundwater gradient determined on June 11, 1993. Well TMW-4 was installed as an upgradient well and well TMW-5 was installed as a downgradient well located within 10 feet of the former location of the underground gasoline tank complex. Soil samples were collected for chemical analysis for TPHG and BTEX from each well at depths of about 5.5, 10.5, and 15.5 feet.

TPE measured depth-to-groundwater and sampled all 5 wells on August 17, 1993 for chemical analysis for TPHG and BTEX.

The reader is referred to TPE's November 4, 1993 Preliminary Site Assessment Report (PSAR) for documentation of the above scope of work.

2.8.1 Results of Soil Sample Chemical Analyses

All soil samples were analyzed for TPHG and BTEX by the California Department of Health Services (DHS) Method and Modified EPA Method 8020, respectively.

Chemical analyses of soil samples collected from the boring for well TMW-4 detected only TPHG at a concentration of .940 ppm in the soil sample collected at a depth of about 15.5 to 16.0 feet.

Chemical analyses of soil samples collected from the boring for well TMW-5 detected TPHG and benzene in all samples. TPHG and benzene were detected at depths of about 5.5 to 6.0 feet, 10.5 to 11.0 feet, and 15.5 to 16.0 feet at concentrations of 2.4 ppm, 14 ppm, and 16 ppm; and .026 ppm, .900 ppm, and .840 ppm, respectively. Ethylbenzene was detected in the soil samples collected at depths of about 10.5 to 11.0 feet and 15.5 to 16.0 feet at concentrations of 1.6 ppm and .690 ppm, respectively. Xylenes were detected in the samples collected at depths of about 5.5 to 6.0 feet and 15.5 to 16.0 feet at concentrations of .053 ppm and 1.3 ppm, respectively. Toluene was nondetectable in all the soil samples.

2.8.2 Results of Groundwater Sample Chemical Analyses

All groundwater samples and a trip blank sample were analyzed for TPHG and BTEX by EPA Methods 5030/8015 and 602, respectively.

Chemical analyses detected TPHG and BTEX chemicals in all 5 wells. TPHG was detected in wells MW-1, MW-2, MW-3, TMW-4, and TMW-5 at concentrations of 110,000 ppb, 49,000 ppb, 9,600 ppb, 150 ppb, and 120,000 ppb, respectively. All BTEX chemicals were detected in all wells with the exception of no benzene detected in well TMW-4. No TPHG or BTEX chemicals were detected in the trip blank sample.

Well TMW-4, the farthest upgradient well, detected the lowest concentrations of TPHG and BTEX. Toluene, ethylbenzene, and xylenes were detected at concentrations of .8 ppb, 1.4 ppb, and 3.7 ppb, respectively. Benzene was not detected.

2.9 ACHCSA Letters Dated February 1 and 18, 1994

In a February 1, 1994 letter to Wong, Request for Technical Reports for 2345 E. 14th St., Oakland, CA 94601, Former Taxi Taxi Site, the ACHCSA requested technical information detailing the installation of wells, installation of free product removal systems, and quarterly monitoring data.

In a February 18, 1994 letter to Wong, Comment on November 4, 1993 Preliminary Site Assessment Report for 2345 E. 14th St., Oakland, CA 94601, Credit World Auto Sales, the ACHCSA recommended initiating quarterly groundwater monitoring and a phased approach to further site investigation and remediation. The ACHCSA suggested the initial phase of remediation begin with excavation of contaminated soil at the location of the former underground fuel tank complex.

2.10 Quarterly Groundwater Monitoring

TPE has conducted quarterly groundwater monitoring on March 31, June 27, and September 16, 1994.

The reader is referred to TPE's May 18, 1994 First Quarter Report, 1994, Credit World Auto Sales, 2345 E. 14th Street, Oakland, CA 94601, July 29, 1994 Second Quarter Report, 1994, Credit World Auto Sales, 2345 E. 14th Street, Oakland, CA 94601, and November 2, 1994 Third Quarter Report, 1994, Credit World Auto Sales, 2345 E. 14th Street, Oakland, CA 94601 for documentation of the quarterly groundwater monitoring events.

2.11 August 26, 1994 Workplan

In response to the ACHCSA's August 4, 1994 request for excavation of contaminated soil at the location of the former underground fuel tank complex, Wong contracted with TPE to write a workplan for a scope of work to investigate and remediate vadose zone soil and groundwater contamination. TPE submitted to Wong an August 26, 1994

Workplan for Excavation of Contaminated Soil and Installation of Groundwater Monitoring Wells.

2.12 Excavation of Contaminated Vadose Zone Soil

On December 5, 6, and 15, 1994, TPE excavated about 600 cubic yards (cyds) of contaminated vadose zone soil from the area of the former underground gasoline tank complex and associated piping. On December 6, 1994, TPE collected discrete soil samples VS-1 through VS-5 from the sidewalls of the excavation and VS-6 from beneath the former piping to evaluate remaining concentrations of TPHG and BTEX chemicals in the in-situ soil. All samples were collected under the supervision of an inspector from the ACHCSA.

Twenty-two discrete soil samples were collected from the stockpiled soil for laboratory compositing to characterize the stockpile for TPHG and BTEX contamination. Twenty of the samples were composited into 5 samples and 2 of the samples were composited into 1 sample. total of 6 ples from spoils.

Soil sample locations and depths are shown in Figure 1.

2.12.1 Results of Soil Sample Chemical Analyses

All soil samples were analyzed for TPHG and BTEX by the DHS Method and Modified EPA Method 8020, respectively.

Soil samples collected from the excavation sidewalls detected TPHG at concentrations ranging from 1.3 ppm to 210 ppm. Soil sample VS-6, collected beneath the former piping, detected TPHG at a concentration of 2.7 ppm.

The 6 composite stockpile soil samples detected TPHG at concentrations ranging from 5.3 ppm to 78 ppm.

Some or all BTEX chemicals were detected in all soil samples analyzed.

Results of chemical analyses are documented in a certified analytical report and chain-of-custody in Appendix A.

3.0 PROPOSED WORKPLAN FOR REMEDIATION OF STOCKPILED SOIL

Wong has contracted with TPE to remediate onsite stockpiled soil for reuse to close the excavation. Presently, additional excavation of contaminated vadose zone soil is recommended by TPE; however, due to space limitations, it is necessary to remediate the existing stockpile before generating additional volumes of contaminated soil.

This WP proposes the following scope of work.

3.1 Method of Remediation

TPE proposes to conduct onsite remediation of the stockpiled soil by aeration and by chemical oxidation with a dilute solution of hydrogen peroxide.

Prior to beginning work, TPE will obtain approval of the WP from the ACHCSA and notify the Bay Area Air Quality Management District (BAAQMD). TPE will ensure that the site is secured by a fence and/or access gates so that unexpected entry and potential exposure to the hydrogen peroxide solution are minimized during soil treatment.

Aeration of the soil will be conducted by moving the soil between onsite treatment areas with a front-end loader and dumping the soil from the bucket of the loader while in an elevated position. Chemical oxidation will be accomplished by spraying the soil, while being dumped, with a dilute (about 5%) solution of hydrogen peroxide. The hydrogen peroxide solution will not be applied to the extent of saturating the soil.

Since the treatment areas are covered with concrete or asphalt, no plastic underlayment of the soil is proposed. Upon departing the site between treatment periods, TPE will cover the stockpiled soil with plastic sheeting. Maintenance of the plastic cover

between treatment periods when TPE is not conducting work with the stockpile is the responsibility of Wong.

3.2 Verification Sampling Plan

Because the volume of stockpiled soil to be remediated exceeds 200 cyds, TPE proposes a type of probability soil sampling plan based on EPA publication EPA-SW846. Publication EPA-SW846 addresses the development and implementation of a scientifically credible sampling plan for characterizing the chemical properties of solid waste. The contaminant concentrations resulting from chemical analyses can be statistically treated to test if the true mean of each chemical contaminant of concern is below the regulatory threshold (RT) at a selected level of confidence.

Verification sampling based on a statistical procedure is expected to require fewer soil samples than the 1 sample required for each 20 cyds if a statistical plan is not used. Fewer soil samples translate into a significant cost savings for the client. Probability sampling is acceptable to the California Regional Water Quality Control Board (CRWQCB) as a final characterization when considered in context with preliminary characterization based on discrete and composite sampling, and field screening with vapor meters. If a statistical sampling plan is not used, TPE understands that chemical analyses of 1 discrete soil sample for about each 20 cyds of stockpiled soil is acceptable to the CRWQCB and the ACHCSA for soil characterization and, presently, represents the maximum number of samples a client may be required to analyze for onsite reuse of remediated soil. TPE understands that 1 sample for each 20 cyds is always required by the CRWQCB and ACHCSA for characterizing remediated stockpiles of less than 200 cyds.

This WP proposes a probability sampling plan to collect verification soil samples for documenting cleanup of remediated stockpiled soil to be reused on site as backfill to close the underground tank excavation.

TPE understands that the CRWQCB and ACHCSA will accept cleanup concentrations of 10 ppm and nondetectable for TPHG and BTEX, respectively.

3.2.1 Number of Verification Soil Samples

The appropriate number of discrete verification soil samples to be collected for chemical analyses depends on the population mean (μ) and variance (σ^2) of RT, and the desired confidence level (TPE proposes a two-tailed confidence level of 80%). TPE proposes to define the population to be sampled as the total of all 20 cyds of soil within the stockpile. Each 20 cyds is proposed to be an individual measurement [variate (x_i)] since the CRWQCB and ACHCSA would accept the analysis of 1 discrete sample for each 20 cyds for characterizing stockpiled soil if a statistical approach is not used.

The appropriate number of samples (n) to be collected is given by equation 1a:

$$n = \frac{t_{.20}^2 \sigma^2}{\Delta^2}, \text{ where } \Delta = RT - \mu, \text{ and } \mu = \text{a prior estimate for the population mean.}$$

This equation presumes that an estimate of μ and σ^2 of the population is known from a preliminary study. Since a preliminary study has not been conducted, TPE proposes to collect 1 discrete sample for about each 60 cyds of remediated soil as a preliminary study of the sample mean ($\bar{x}$) and variance (s^2) and calculate the appropriate number of samples, n, by equation 1b:

(1b)
$$n = \frac{t_{.20}^2 s^2}{\Delta^2}, \text{ where } \Delta = RT - \bar{x}, \text{ and } \bar{x} = \frac{\sum_{i=1}^{n} x_i}{n}$$

For example, if the stockpile contains 600 cyds of soil, 10 discrete verification soil samples will be collected for chemical analysis. After results of chemical analyses are received, the appropriate number of samples, n, will be calculated from equation 1b to determine if an appropriate number of samples have been collected. If enough samples have not been collected, additional soil samples will be collected and analyzed and equation 1b will be recalculated until the sa

$n = \frac{t_{20}^2 s^2}{\Delta^2} = \frac{(1.325)^2}{(10-9)^2} = 81$

$\Delta = RT - \bar{x}$ if $\bar{x} = ND$ use d.l. appr

$= 4$ R

$s^2 = \frac{}{10-1}$

3.2.2 Calculation of True Mean Concentration

After an appropriate number of samples have been collected and analyzed, the sample $\bar{x}$ and standard error ($S_{\bar{x}}$) will be calculated for TPHG and used in equation 1c to calculate a confidence interval (CI) for the true population mean (μ) with a two-tailed confidence level of 80% (same as a one-tailed confidence level of 90%).

Equation 1c: $CI = \bar{x} \pm t_{.20} S_{\bar{x}}$

If the upper limit of the CI is less than the RT, it is definitively concluded that TPHG is not present at a hazardous level. If the CI is greater than the RT, additional remediation or appropriate disposal of the stockpiled soil will be required. If additional remediation is conducted for onsite reuse of the stockpiled soil, a new round of verification soil sampling will be performed as described above.

3.2.3 Location and Depth of Verification Soil Samples

The stockpile of remediated soil will be well mixed and spread over a square or rectangular area to a height of about 5 or 6 feet. The stockpile will be subdivided by a grid, such that, each cell of the grid contains about 20 cyds of soil. Each cell is considered a variate of the population. For example, a stockpile containing 600 cyds would be subdivided by a grid containing 30 cells (variates). As proposed above under section 3.2.1 Number of Verification Soil Samples, TPE will conduct a preliminary study of the sample $\bar{x}$ and s^2 by collecting 1 soil sample for about each 60 cyds of stockpiled soil for chemical analysis. One sample for each 60 cyds is chosen because 3 contiguous cells of 20 cyds can be combined into 60 cyds. This combining of cells results in a new grid with fewer but larger cells that assures that sampling is conducted at regular intervals across the stockpile and no large areas remain unsampled. Since there are 30 variates, the combining of variates, 3 at a time, will result in 10 larger cells consisting of 3 variates.

Each 20 cyd cell will be numbered in numerical order, 1 through 30. Cell number 1 will be randomly selected from 1 of the 4 corners of the square or rectangular-shaped stockpile. Cells 1 through 3 will be combined to comprise a larger cell of

about 60 cyds. All 20 cyd cells will be combined in this manner, until all the larger 60 cyd cells are defined. Each larger cell will be numbered in consecutive order, 1 through 10. Each larger cell will be further subdivided into 4 equal quadrants labeled A, B, C, and D. A systematic random sampling plan will be implemented with a discrete sample being collected in numerical and alphabetical order from each larger cell. For example, the first sample will be collected from the approximate center of quadrant A in cell 1; the second sample will be collected from the approximate center of quadrant B in cell 2, and so forth, until all larger cells are sampled. The sample depth will be rotated. For example, the first sample will be collected at a depth of 2 feet; the second sample will be collected at a depth of 3 feet; the third sample will be collected at a depth of 4 feet; the fourth sample will be collected at a depth of 2 feet; and so forth, until all samples are collected.

Samples will be collected by digging holes to the target depths and collecting soil in a 2-inch diameter by 6-inch long brass tube driven by a slide-hammer corer. The ends of each tube will be quickly covered with Teflon sheeting followed by an end-cap. Each tube will be labeled to show site name, project number, date and time sampled, sample name and depth, and sampler name; sealed in individual plastic bags; and preserved in an iced-cooler for delivery to a DHS certified laboratory for analysis for TPHG and BTEX by the DHS Method and Modified EPA Method 8020, respectively (see Appendix B for TPE's protocol relative to sample handling procedures).

4.0 SITE SAFETY PLAN

The above scope of work will be conducted under the Site Safety Plan documented in TPE's August 26, 1994 Workplan for Excavation of Contaminated Soil and Installation of Groundwater Monitoring Wells.

5.0 TIME SCHEDULE

The projected time schedule for implementation of the activities described in this WP is presented below. The schedule reflects a relatively problem-free program. However, delays in the WP review, permitting, or laboratory analyses could lengthen the project

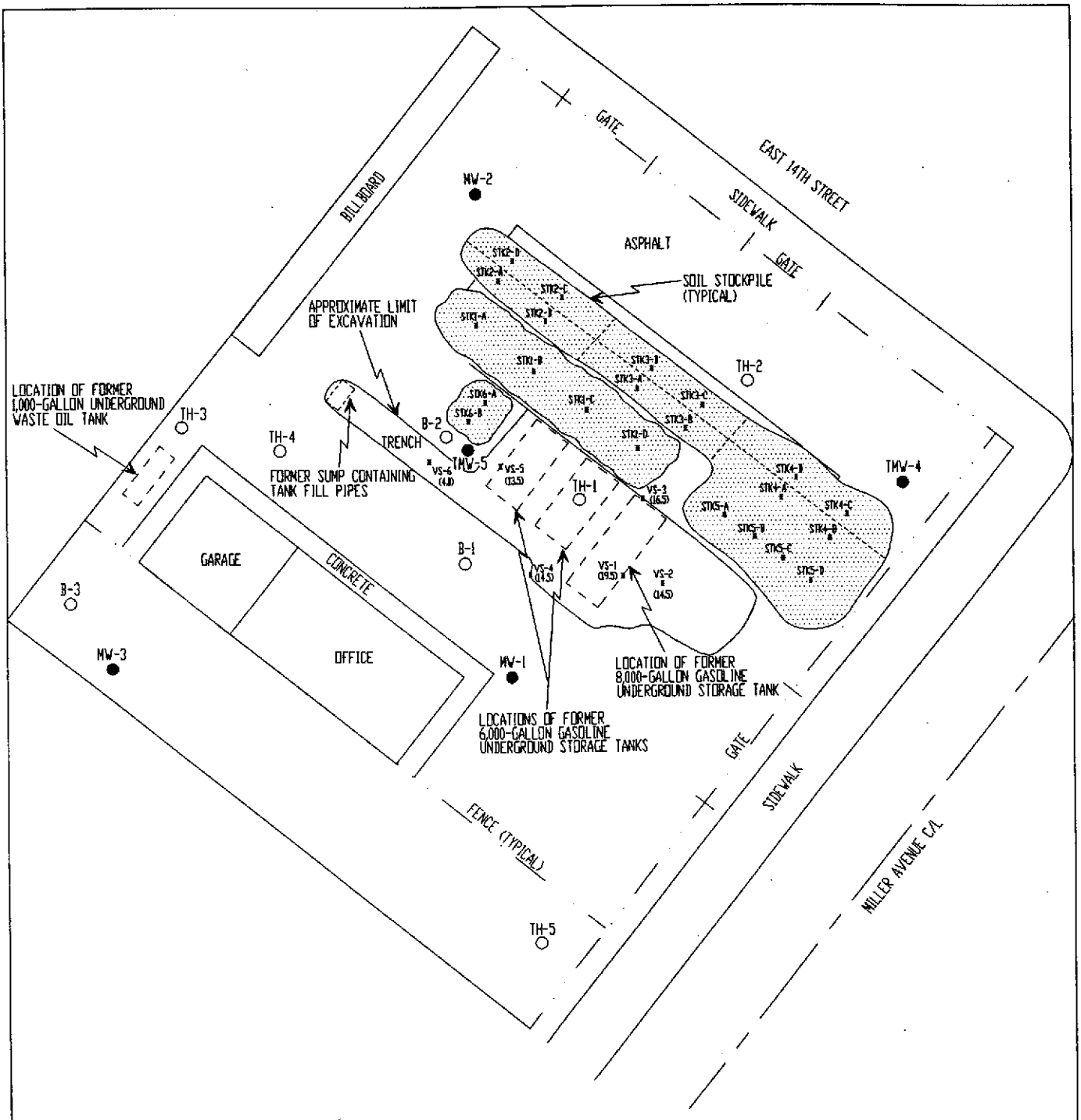
schedule. Access difficulties, adverse weather, and regulator review could also delay the proposed time schedule. TPE will make every effort to adhere to the project schedule.

Week 1: Client Submits WP for Regulator Approval.

Week 2: Regulator Approval Received. Stockpiled Soil Remediation Begins.

Week 4: Collect Verification Soil Samples.

Week 5: Receive Chemical Analyses.



LEGEND

TMW-4 ●	NAME AND LOCATION OF GROUNDWATER MONITORING WELL INSTALLED BY TPE
MW-1 ●	NAME AND LOCATION OF GROUNDWATER MONITORING WELL INSTALLED BY OTHERS
B-1 ○	NAME AND APPROXIMATE LOCATION OF SOIL BORING DRILLED BY OTHERS
VS-1 ✱ (19.5)	NAME, LOCATION, AND DEPTH OF SOIL SAMPLE

-N-

0 30

APPROXIMATE SCALE IN FEET

TANK PROTECT ENGINEERING

SITE PLAN

CREDIT WORLD AUTO SALES
2345 E. 14TH STREET
OAKLAND, CA 94601

DATE	12/21/94
FIGURE	1
FILE #	267D
DRAWN BY	MT
CHECKED BY	

APPENDIX A

CERTIFIED ANALYTICAL REPORT AND CHAIN-OF-CUSTODY DOCUMENTATION

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

December 12, 1994

Mr. Jeff Farhoomand
Tank Protect Engineering
2821 Whipple Road
Union City, California 94587

Dear Mr. Farhoomand:

Trace Analysis Laboratory received twenty-eight soil samples on December 7, 1994 for your Project No. 267-120694, Credit World Auto Sales, 2345 East 14th Street (our custody log number 4993).

These samples were analyzed for Total Petroleum Hydrocarbons as Gasoline and Benzene, Toluene, Ethylbenzene, and Xylenes. Our analytical report and the completed chain of custody form are enclosed for your review.

Trace Analysis Laboratory is certified under the California Environmental Laboratory Accreditation Program. Our certification number is 1199.

If you should have any questions or require additional information, please call me.

Sincerely yours,

Scott T. Ferriman

Scott T. Ferriman
Project Specialist

Enclosures

Trace Analysis Laboratory, Inc.
3423 Investment Boulevard, #8 • Hayward, California 94545
Telephone (510) 783-6960
Facsimile (510) 783-1512

TAL

LOG NUMBER: 4993
DATE SAMPLED: 12/06/94
DATE RECEIVED: 12/07/94
DATE EXTRACTED: 12/07/94
DATE ANALYZED: 12/08/94
DATE REPORTED: 12/12/94

might consider 10ppm g + 1ppm total voc.

CUSTOMER: Tank Protect Engineering
REQUESTER: Jeff Farhoomand
PROJECT: No. 267-120694, Credit World Auto Sales, 2345 East 14th Street

Sample Type: Soil

Method and Constituent:	Units	VS-1 Concentration	VS-1 Reporting Limit	VS-2 Concentration	VS-2 Reporting Limit	VS-3 Concentration	VS-3 Reporting Limit
DHS Method:		ok		>		>	
Total Petroleum Hydrocarbons as Gasoline	ug/kg	1,300	500	51,000	3,700	210,000	7,400
Modified EPA Method 8020 for:							
Benzene	ug/kg	10	5.0	610	74	1,100	150
Toluene	ug/kg	61	5.0	100	74	300	150
Ethylbenzene	ug/kg	27	5.0	1,300	74	4,500	150
Xylenes	ug/kg	190	15	940	220	14,000	440

Method and Constituent:	Units	VS-4 Concentration	VS-4 Reporting Limit	VS-5 Concentration	VS-5 Reporting Limit	VS-6 Concentration	VS-6 Reporting Limit
DHS Method:		>		>		ok	
Total Petroleum Hydrocarbons as Gasoline	ug/kg	20,000	740	100,000	7,400	2,700	500
Modified EPA Method 8020 for:							
Benzene	ug/kg	1,200	15	440	150	46	5.0
Toluene	ug/kg	94	15	ND	150	ND	5.0
Ethylbenzene	ug/kg	470	15	2,200	150	ND	5.0
Xylenes	ug/kg	2,400	44	8,500	440	ND	15

Concentrations reported as ND were not detected at or above the reporting limit.

LOG NUMBER: 4993
DATE SAMPLED: 12/06/94
DATE RECEIVED: 12/07/94
DATE EXTRACTED: 12/07/94
DATE ANALYZED: 12/08/94
DATE REPORTED: 12/12/94
PAGE: Two

Sample Type: Soil

Method and Constituent:	Units	Composite of STK1-A,B,C, and D Concentration	Composite of STK1-A,B,C, and D Reporting Limit	Composite of STK2-A,B,C, and D Concentration	Composite of STK2-A,B,C, and D Reporting Limit	Composite of STK3-A,B,C, and D Concentration	Composite of STK3-A,B,C, and D Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	5,300	710	9,200	720	45,000	7,200
Modified EPA Method 8020 for:							
Benzene	ug/kg	ND	14	15	14	ND	140
Toluene	ug/kg	ND	14	ND	14	180	140
Ethylbenzene	ug/kg	23	14	84	14	710	140
Xylenes	ug/kg	120	43	300	43	4,400	430

Method and Constituent:	Units	Composite of STK4-A,B,C, and D Concentration	Composite of STK4-A,B,C, and D Reporting Limit	Composite of STK5-A,B,C, and D Concentration	Composite of STK5-A,B,C, and D Reporting Limit	Composite of STK6-A and STK6-B Concentration	Composite of STK6-A and STK6-B Reporting Limit
DHS Method:							
Total Petroleum Hydrocarbons as Gasoline	ug/kg	40,000	7,200	78,000	7,100	9,800	730
Modified EPA Method 8020 for:							
Benzene	ug/kg	380	140	200	140	52	15
Toluene	ug/kg	ND	140	780	140	ND	15
Ethylbenzene	ug/kg	750	140	1,200	140	46	15
Xylenes	ug/kg	2,500	430	8,100	420	240	44

Concentrations reported as ND were not detected at or above the reporting limit.

TAL Trace Analysis Laboratory, Inc.

LOG NUMBER: 4993
DATE SAMPLED: 12/06/94
DATE RECEIVED: 12/07/94
DATE EXTRACTED: 12/07/94
DATE ANALYZED: 12/08/94
DATE REPORTED: 12/12/94
PAGE: Three

Sample Type: Soil

Method and Constituent:	Units	Method Blank Concentration	Method Blank Reporting Limit
DHS Method:			
Total Petroleum Hydrocarbons as Gasoline	ug/kg	ND	500
Modified EPA Method 8020 for:			
Benzene	ug/kg	ND	5.0
Toluene	ug/kg	ND	5.0
Ethylbenzene	ug/kg	ND	5.0
Xylenes	ug/kg	ND	15

QC Summary:

% Recovery: 96
% RPD: 4.6

Concentrations reported as ND were not detected at or above the reporting limit.

Louis W. DuPuis
Quality Assurance/Quality Control Manager

TANK PROTECT ENGINEERING

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

4993

LAB: TAL

TURNAROUND: 3 DAYS

P.O. #: 977

PAGE 1 OF 4

CHAIN OF CUSTODY

PROJECT NO.: 26770694

SITE NAME & ADDRESS: Credit World Auto Sales, 7345 E. 14th St

SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER:
Lee Huckins
2821 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	ANALYTES REQUESTED: TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER	REMARKS
VSP-1	12/6	1512	X		19.5	Brass	X	X					
VSP-2	12/6	1526	X		14.5	Brass	X	X					
VSP-3	12/6	1533	X		16.5	Brass	X	X					
VSP-4	12/6	1540	X		14.5	Brass	X	X					
VSP-5	12/6	1550	X		13.5	Brass	X	X					
VSP-6	12/6	1555	X		4.0	Brass	X	X					

Relinquished by: (Signature)	Date / Time	Received by: (Signature)	Relinquished by: (Signature)	Date / Time	Received by: (Signature)
Lee Huckins	12/7/94 9:00			12/7/94 3:05	
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	
		Scott Freeman	12/7/94 3:05 pm		

p/u, soil, Y-8, 1-BT each, 3-Day

DATE: 12/7/94

TANK PROTECT ENGINEERING
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FAX(415)429-8089

4993

LAB: Trace
TURNAROUND: 3 days
P.O. #: 977

PAGE 2 OF 4

CHAIN OF CUSTODY

PROJECT NO.	SITE NAME & ADDRESS
267 120694	Creditworld Auto Sales 2345 E 14th Street

SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER
Lee Huckins
2821 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	ANALYTES REQUESTED: TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	POC SCAN (624's)	OTHER	REMARKS
STK1-A	12/6	1015	X		2.5	Brass	X	X					Composite into 1 sample
STK1-B	12/6	1015	X		2.5	Brass	X	X					
STK1-C	12/6	1015	X		2.5	Brass	X	X					
STK1-D	12/6	1015	X		2.5	Brass	X	X					
STK2-A	12/6	1121	X		3.5	Brass	X	X					Composite into 1 sample
STK2-B	12/6	1052	X		3.5	Brass	X	X					
STK2-C	12/6	1118	X		3.5	Brass	X	X					
STK2-D	12/6	1115	X		3.5	Brass	X	X					

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
Lee Huckins	12/7/94 9:00	Dale Miller	Dale Miller	12/7/94 3:05	
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	
		Scott J Fenner	12/7/94 3:05 pm		

DATE: 12/7/94

TANK PROTECT ENGINEERING
2821 WHIPPLE ROAD
UNION CITY, CA 94587
(415)429-8088
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4993

LAB: Trace
TURNAROUND: 3 days
P.O. #: 977

CHAIN OF CUSTODY

PROJECT NO.: 767.120694
SITE NAME & ADDRESS: Creditworld Auto Sales, 2345 E 14th Street
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER: Lee Hudkins, 2821 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER	REMARKS
STK3-A	12/6	1047	1		35	Brass	X	X					Composite into 1 sample
STK3-B	12/6	1040	1		35	Brass	X	X					
STK3-C	12/6	1105	1		35	Brass	X	X					
STK3-D	12/6	11:11	1		35	Brass	X	X					
STK4-A	12/6	1080	1		35	Brass	X	X					Composite into 1 sample
STK4-B	12/6	1033	1		35	Brass	X	X					
STK4-C	12/6	1055	1		35	Brass	X	X					
STK4-D	12/6	1058	1		3.5	Brass	X	X					

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
Lee Hudkins	12/7/94 9:00	[signature]	[signature]	12/7/94 3:05	
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] Scott Fenn	Date / Time	Remarks	
			12/7/94 3:05 pm		

DATE: 12/7/94

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

4993

LAB: Trace Analysis Labs
TURNAROUND: 3 days
P.O. #: 977

CHAIN OF CUSTODY

PROJECT NO.: 267120694
SITE NAME & ADDRESS: Caddiwork Auto Sales, 2345 E. 14th Street
SAMPLER NAME, ADDRESS AND TELEPHONE NUMBER: Lee Huckins, 2821 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088

ID NO.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION	(1) TYPE OF CONTAINER	TOTAL LIGHT HC	AROMATIC HC (BTX)	TOTAL HEAVY HC	OIL & GREASE	VOC SCAN (624's)	OTHER	REMARKS
STK5-A	12/6	1618	X		4.0	Brass	X	X					
STK5-B	12/6	1616	X		4.0	Brass	X	X					
STK5-C	12/6	1614	X		4.0	Brass	X	X					Composite into 1 sample
STK5-D	12/6	1612	X		4.0	Brass	X	X					
STK6-A	12/6	1623	X		2.5	Brass	X	X					
STK6-B	12/6	1628	X		2.5	Brass	X	X					Composite into 1 sample

Relinquished by : (Signature)	Date / Time	Received by : (Signature)	Relinquished by : (Signature)	Date / Time	Received by : (Signature)
Lee Huckins	12/7/94 9:00			12/7/94 3:05	
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	
			12/7/94 13:05 pm		

DATE: 12/7/94

APPENDIX B

SAMPLE HANDLING PROCEDURES

APPENDIX B

SAMPLE HANDLING PROCEDURES

Soil and groundwater samples will be packaged carefully to avoid breakage or contamination, and will be delivered to the laboratory in an iced-cooler. 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.

- A chain-of-custody form will be completed for all samples and accompany the sample cooler to the laboratory.

- Ice, blue ice, or dry ice (dry ice will be used for preserving soil samples collected for the Alameda County Water District) will be used to cool samples 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 site identification, sample identification number, date and time of sample collection, and the collector's initials.

- Soil samples collected in brass tubes will be preserved by covering the ends with Teflon tape and capped with plastic end-caps. The tubes will be labeled, sealed in quart size bags, and placed in an iced-cooler for transport to the laboratory.

All groundwater sample containers will be precleaned and will be obtained from a State Department of Health Services certified analytical laboratory.

Sample Control/Chain-of-Custody: All field personnel will refer to this workplan to verify the methods to be employed during sample collection. All sample gathering activities will be recorded in the site file; all sample transfers will be documented in the chain-of-custody; samples are to be identified with 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 or professional 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: site identification, name of person collecting the samples, date and time 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.

Records will be maintained by a designated TPE field employee for each sample, site identification, 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.