CET Environmental Services, Inc.

5845 Doyle Street, Suite 104
Emeryville, California 94608
Telephone: (510) 652-7001
Fax. (510) 652-7002

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March 2, 1994

Ms. Juliet Shin
Hazardous Materials Specialist
Department of Environmental Health
ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
80 Swan Way, Room 200
Oakland, CA 94621

Subject: **Workplan**
Monitoring Well Installations & Soil Sample Collection from
Former Waste Oil Tank Excavation at
186 East Lewelling Boulevard
San Lorenzo, California
Project No. 3602

Dear Ms. Shin:

CET Environmental Services, Inc. (CET) is pleased to submit this workplan for the installation of three groundwater monitoring wells and soil sampling of the former waste oil tank excavation at the subject site. CET is submitting this workplan in accordance with the Alameda County Health Care Services Agency (ACHCSA) letter dated January 20, 1994. This workplan was written in accordance with the regulatory protocol of the Regional Water Quality Control Board - San Francisco Bay Region (RWQCB). The scope of work, as summarized below, includes monitoring well installation and development, soil and groundwater sample collection and analysis, soil sample collection from the former waste oil tank excavation, and reporting.

INTRODUCTION

The subject site is located approximately 0.25 miles south of Interstate 238 and approximately 0.5 miles east of Interstate 880. A site location map is shown on Plate 1, Attachment A.

On September 5, 1990, three underground storage tanks were removed from the subject site located at 186 East Lewelling Boulevard, San Lorenzo, California. The removed tanks included two (2) gasoline tanks of 4,000 gallon capacity each, and one (1) waste oil tank of 350 gallon capacity. Four soil samples were collected from beneath the two gasoline tanks, and one soil sample was collected from beneath the removed waste oil tank. The laboratory analytical results indicated that the soil samples collected from beneath the removed gasoline tanks contained elevated levels of gasoline and aromatic compounds.

SCOPE OF WORK

Task 1 - Drilling, Soil Sample Collection, and Well Installation

Proposed Drilling Locations

CET proposes to drill and sample three exploratory soil borings at the subject site. The proposed drilling locations are shown on Plate 2, Attachment A. The final monitoring well locations will be determined by site specific conditions, site facility requirements, and ACHCSA recommendations.

The proposed locations were determined in accordance with inferred directions of groundwater flow within approximately a 0.5 mile radius of the subject site. Groundwater flow directions were obtained for the following sites during CET's February 23, 1994 file review at the ACHCSA offices:

- 44 Lewelling Boulevard located approximately 0.25 miles west of the subject site. Flow directions were obtained for 23 measurement events beginning August 1987 and ending June 23, 1993 (Applied GeoSystems, Du Pont Environmental Services, Ultramar Inc., RESNA, AEGIS Environmental Inc., and Delta Environmental Consultants Inc.). Flow directions ranged from northwest to southwest, and was predominantly towards the west - northwest during 1993.

- 376 Lewelling Boulevard located approximately 0.5 miles west - northwest of the subject site. Flow directions were obtained for 11 measurement events beginning December 5, 1990 and ending September 9, 1993 (GeoStrategies Inc.). Flow directions ranged from northwest to west, and was predominantly towards the west during 1993.

- 15599 Hesperian Boulevard located approximately 0.55 miles west - northwest of the subject site. Flow directions were obtained for seven (7) measurement events beginning May 4, 1991 and ending October 28, 1992 (Kaprealian Engineering Inc.). Flow directions ranged from northwest to southwest.

- 15526 Hesperian Boulevard located approximately 0.6 miles west - northwest of the subject site. Flow directions were obtained for six (6) measurement events beginning June 4, 1992 and ending October 1, 1993 (Groundwater Technology). Flow directions ranged from northwest to west.

- 15884 Hesperian Boulevard located approximately 0.6 miles west - southwest of the subject site. Flow directions were obtained for six (6) measurement events beginning February 12, 1992 and ending August 19, 1993 (Hydro Environmental Technologies, Inc.). Flow directions ranged from northwest to west.

- 15900 Hesperian Boulevard located approximately 0.6 miles west - southwest of the subject site. Flow directions were obtained for 13 measurement events beginning December 8, 1989 and ending October 27, 1993 (GeoStrategies Inc., Alton Geoscience, Groundwater Technology, and Weiss Associates). Flow directions ranged from northwest to southwest, and were predominantly towards the west - southwest during 1993.

Drilling

CET will notify Underground Service Alert (USA) and review utility plans for the subject site (if available) prior to initiating drilling activities. If warranted, CET will retain a private underground utility locating service to clear the proposed drilling locations.

A California licensed C-57 contractor will be retained to provide drilling services. A truck mounted, hollow-stem auger drilling rig will be utilized for all subsurface exploration, soil sample retrieval, and monitoring well construction. Soil cuttings will be placed on and covered with visqueen plastic sheeting or contained in DOT 17H 55 gallon drums, as appropriate. All subsurface equipment will be decontaminated prior to and between each use. Decontamination will be accomplished by steam cleaning or by scrubbing in a solution of Alconox and potable water followed by two purified water rinses. All decontamination rinseate water will be contained in DOT 17H 55 gallon drums.

Soil Sample Collection

Soil samples will be collected at five-foot intervals and/or at zones of obvious contamination or significant changes in lithology from each borehole. All soil samples will be inspected for potential contamination (soil discoloring, staining, odors) and screened using a portable photoionization detector (PID). Boreholes will be logged in accordance with the Unified Soil Classification System (USCS) under the supervision of a California Registered Geologist (R.G.) or Professional Engineer (P.E.).

Monitoring Well Installation

The three soil borings will be completed as groundwater monitoring wells. CET will complete application documentation and obtain necessary permits from the Alameda County

Flood Control & Water Conservation District (Zone 7) to install three, two-inch diameter groundwater monitoring wells at the subject site.

The monitoring wells will be constructed in accordance with the protocol presented in Attachment B. The monitoring wells will be screened within the first significant water bearing zone, which is believed to occur between 10 and 20 feet below grade, and extend approximately 10 feet into the water bearing zone.

Task 2 - Monitoring Well Development, Survey, & Groundwater Sample Collection

The newly constructed monitoring wells will be developed by CET field personnel not less than 24 hours following installation, and will be sampled not less than 24 hours following development. All well installation and development protocols will be in accordance with ACHCSA and RWQCB guidelines. The elevations of the top of the well casings (TOC) for the three wells will be determined relative to mean sea level (msl) by a California licensed surveyor.

Task 3 - Laboratory Sample Analysis

Both groundwater and soil samples will be collected in accordance with the protocol presented in Attachment B. All samples will be placed in an ice chest containing ice immediately following collection. Chain-of-custody documentation will accompany the samples to a California Department of Health Services (DHS) certified hazardous materials testing laboratory for analysis.

A minimum of nine (9) soil samples, three from each borehole, will be analyzed for total petroleum hydrocarbons as gasoline (TPH-G), and for benzene, toluene, ethyl benzene, and total xylenes (BTEX) by United States Environmental Protection Agency (EPA) Test Methods 5030/8015 and 8020, respectively.

The groundwater samples will be analyzed for TPH-G and BTEX by EPA Test Methods 5030/8015 and 602, respectively. The samples will be submitted to a California certified hazardous materials testing laboratory under standard turn around time (10 working days).

Task 4 - Soil Sample Collection and Analysis from the Former Waste Oil Tank Excavation

A soil sample will be collected from the former waste oil tank excavation on the same day the monitoring wells are installed. A borehole will be drilled through the center of the

backfill and a soil sample collected at the backfill - native soil interface, assumed to occur at approximately 10 feet below ground surface.

This soil sample will be analyzed for TPH-G, BTEX, chlorinated hydrocarbons, and LUFT metals (cadmium, chromium, lead, nickel, and zinc) using EPA Test Methods 5030/8015, 8020, 8010, and 6010, respectively. The purpose of this sample analysis is to comply with the requirements of the Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites (November 10, 1990), and the customary ACHCSA protocol for waste oil tanks.

Task 5 - Data Evaluation and Report Preparation

CET will evaluate the laboratory analytical and hydrogeologic data, and will prepare a report which presents the findings of the soil and groundwater sampling activities. The report will provide a summary of well installation activities, groundwater and soil sample collection activities, laboratory analytical results, and conclusions and recommendations regarding the extent of contamination, if present, and additional site characterization, if required.

The report will include a tabulated summary of analytical results, a site plan showing contours of water elevation and estimated direction of groundwater flow, and a site plan showing the extent of groundwater contamination, if any, based on existing data. Additionally, the report will include copies of permits, laboratory analytical reports, sample collection records, borehole logs, and chain of custody documentation. The report will be signed by a California R.G. or P.E. The report will be prepared in a format suitable for submission to the ACHCSA and other regulatory agencies.

Site Safety Plan

A site specific health and safety plan, for the scope of work outlined above, is provided in Attachment C.

Please do not hesitate to contact us If you have any questions or comments regarding this workplan.

Sincerely,

CET ENVIRONMENTAL SERVICES, INC.

Benjamin Berman
Staff Scientist

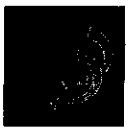
Grover S. Buhr
California Registered Geologist No. 5596

Terrance E. Carter
Senior Environmental Engineer
Project Manager

BB/TEC/GSB:kaa

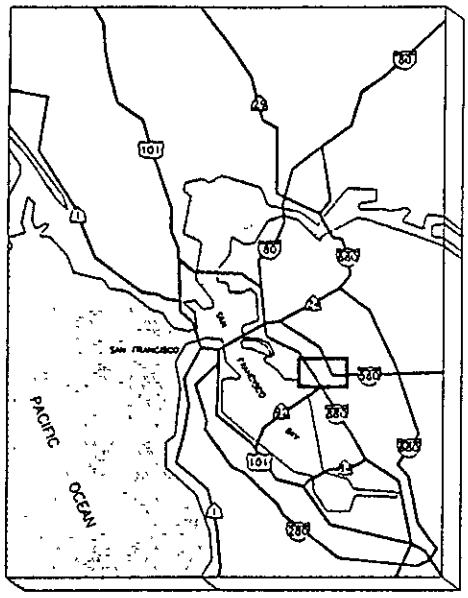
Attachments

cc: Mr. Carl Graffenstate



ATTACHMENT A

Plates



SCALE

MILE 0 1/2 1 MILE

N

San Leandro

WASHINGTON AV
HESPERIAN BLVD
14TH ST
ASHLAND AV
LEWELLING BLVD
LAKE CHABOT RD
Castro Valley
San Lorenzo
SITE
CASTRO VALLEY BLVD
HESPERIAN BLVD
FOOTHILL BLVD
MISSION BLVD
A ST

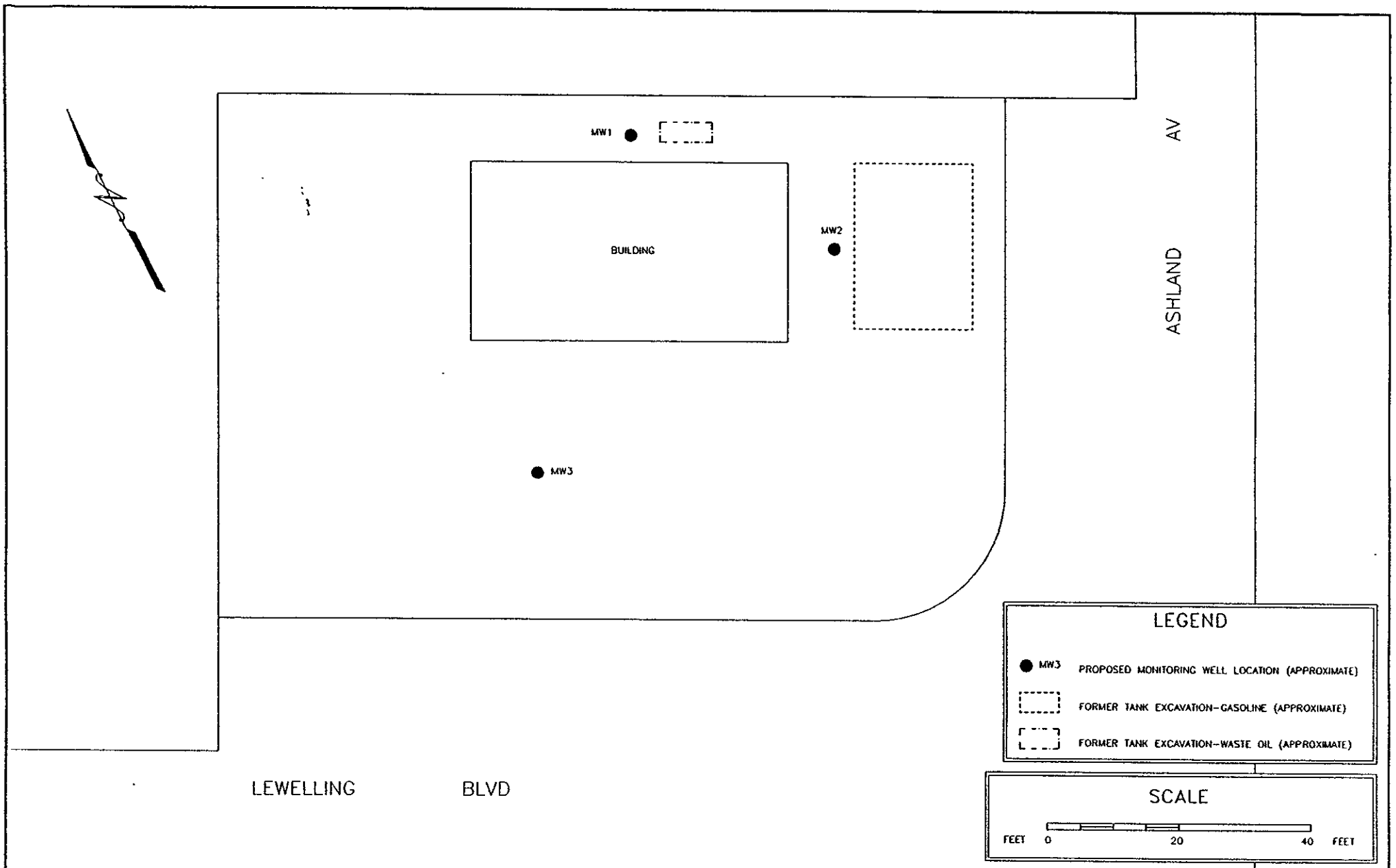
CET Environmental Services, Inc.

SITE LOCATION
GRAFFENSTATTE PROPERTY
186 E. LEWELLING BLVD
SAN LORENZO, CALIFORNIA

JOB NUMBER 3602

DATE 02/94

PLATE 1



CET Environmental Services, Inc.

SITE PLAN
GRAFFENSTATTE PROPERTY
186 E. LEWELLING BLVD
SAN LORENZO, CALIFORNIA

JOB NUMBER 3602

DATE 02/94

PLATE 2

ATTACHMENT B

Drilling & Sampling Protocols

SOIL & GROUNDWATER SAMPLE COLLECTION & HANDLING PROTOCOL

INTRODUCTION & PURPOSE

Because reliable and representative test results must be generated from soil and groundwater samples, it is essential to establish a sampling procedure which assures that all samples are:

- Collected by approved and repeatable methods
- Representative of the materials(s) at the desired location and depth
- Uncontaminated by container and sampling equipment

The following sampling protocol was designed to be a guide to the sampling and handling procedures for soil and groundwater samples. Based on conditions which may be encountered in the field, some modifications to this protocol may be required to fit the needs of an individual site.

SAMPLING PROCEDURES

Groundwater Sampling

Prior to collecting groundwater samples, monitoring wells were purged by bailing until pH, conductivity, and temperature levels stabilize. A minimum of four well casing volumes was purged from each well. Wells were purged and groundwater samples were obtained using a teflon bailer, or disposable polyethelene bailer, and nylon rope. New nylon rope is used for each well.

The appropriate number of sample containers and type were used for each sample collected, in accordance with the analytical laboratory requirements and EPA protocol. The bottles were filled using the bailer. All sample bottles were pre-cleaned by the supplier according to EPA protocols.

To prevent cross contamination of groundwater samples by the sampling equipment, all reusable equipment used in sampling was washed with a trisodium phosphate solution (TSP), triple rinsed with purified water, and allowed to air dry prior to each use. A sample of the purified water was retained for analysis as part of sample quality assurance.

Soil Sampling

After the soil sampler was driven to the desired depth and the samples were retrieved, each end of the tube containing the soil sample retained for laboratory analysis was sealed with teflon sheeting, covered with plastic end caps, and sealed with PVC tape. All sample containers (tubes) were steamed cleaned (or washed with TSP, as above) and air dried prior to use. The soil sample recovered in the tube just above the sample retained for chemical analysis was examined in the field for visual and olfactory indications of chemical contamination and used for lithologic description.

The Unified Soil Classification System (USCS) was used to log and describe the soil by the onsite geologist. These logs also include details of the sampling process such as depth, apparent odors, discoloration, and any other factors which may be required to evaluate the presence of contamination at the site.

POST SAMPLING PROCEDURES

One field/travel blank consisting of one sample bottle filled with purified water accompanied soil and groundwater sample containers at all times, including during transport to and from the site. Purified water field/travel blanks were analyzed according to the appropriate EPA Methods corresponding to the soil/groundwater sample analyses.

Sample containers were labeled with sample number, project number, date, and the initials of the person collecting the sample. A separate sample collection record was maintained for each groundwater sample collected.

Soil and groundwater samples collected were analyzed by an analytical laboratory certified by the California Department of Health Services (DHS). Quality assurance documentation accompanied all analytical reports generated by the laboratory.

The samples were placed in a cooler with dry ice (for soil samples) or bagged ice (for water samples) immediately following collection, and remained in the cooler until refrigerated at the analytical laboratory. The samples were delivered to the laboratory direct by courier or overnight freight within 48 hours of time of collection. Appropriate chain of custody forms were used for all samples.

DRILLING PROCEDURES & GROUNDWATER MONITORING WELL CONSTRUCTION/DESIGN

DRILLING AND SAMPLING PROCEDURES

All borings for well construction were drilled using eight-inch diameter or larger hollow stem auger equipment. A California Registered Geologist or Professional Engineer directed or supervised the collection of undisturbed samples of the soils encountered and the preparation of detailed logs for each boring.

Soil sampling was conducted using a modified California split-spoon sampler, a standard penetration sampler, or a five-foot continuous sampler. Samples were retained in two-inch to three-inch diameter, six-inch long, clean brass or stainless steel tubes. The samples were retained for verification of soil classification and for chemical laboratory analytical testing, as appropriate. Teflon sheeting was placed between the soil sample and the cap, and the cap was sealed with PVC tape.

Where access limitations did not allow drilling with truck mounted equipment, either a trailer mounted drilling rig, portable power driven, or manually operated soil sampling equipment was utilized. If soil samples were to be retained for analysis, they were collected in clean brass tubes fitted within a thin walled drive sampler. The soil samples were capped and sealed as described above.

All down hole sampling, drilling, and well construction equipment and materials, including augers, casing, and screens were steam cleaned prior to their initial use. The sampling equipment was cleaned prior to their initial use. The sampling equipment was cleaned prior to each assembly by washing with a solution of Alconox and potable water, rinsing with purified water, and allowing to air dry. The auger flights, drill bit, and sampler were steam cleaned at each boring location.

MONITORING WELL CONSTRUCTION

Monitoring wells were constructed in accordance with applicable local water district or California Department of Water Resources guidelines. The specific completion details for each well were determined in the field at the time of drilling by a California Registered Geologist or Professional Engineer experienced in groundwater monitoring system design and installation.

Monitoring wells consist of two or four-inch diameter, Schedule 40 PVC casing and screens with flush, threaded joints. No PVC glue was used. The screened sections are machine slotted with either 0.010-inch (0.255 mm) or 0.020-inch (0.51 mm) openings. The smaller slot size was used where the wells are screened within fine-grained sandy soils, and the larger slots were used where coarse sand or gravels are encountered. The slotted sections were fitted with a slip-on cap and placed opposite the water-bearing strata in the boring. The blank pipe was connected to the perforated pipe and extends to just below the ground surface.

The annulus between the side of the borehole and the slotted section was filled with a clean sand pack to variable depths, but not less than one or two feet above the perforated pipe. The annulus was packed with either Lonestar No. 1/20 (where 0.010-inch slotted pipe is used) or No. 3 (where 0.020-inch slotted pipe is used), or equivalent, washed sand filter material. The gradation of the filter material is summarized below:

U.S. Sieve No.	Opening (mm)	Percent Passing (No. 3)	Percent Passing (No. 1/20)
6	3.35	100	
8	2.36	99 - 100	
12	1.70	62 - 78	
16	1.18	15 - 33	100
20	0.85	0 - 8	90 - 100
30	0.60	0 - 4	14 - 40
40	0.425		0 - 5

A seal of bentonite pellets approximately 0.5 to 1.0 foot thick was placed above the sand pack to reduce the risk of grout penetration into the sand. The bentonite pellets were hydrated with purified water to form a tight plug. A cement/bentonite grout was placed above the bentonite plug to a depth of approximately 0.5 to 2.0 feet below the ground surface. The grout was pumped into the boreholes using a tremie pipe when it was required by local guidelines or regulations. A flush mounted traffic box or aboveground security enclosure was set in concrete above the cement/bentonite mixture.

At most sites in sedimentary formations, it is not practical to "rationally design" a filter pack based on sieve analyses. From experience, Lonestar No. 1/20 or No. 3 washed sand as a filter material was selected for use in wells. The 0.010-inch and 0.020-inch slot sizes were selected to retain 100 percent of the filter material.

The completed wells were enclosed in a traffic rated enclosure placed flush with grade or in an above-ground metal enclosure, and were fitted with a locking cap. Well head elevations were determined by a level survey, and well coordinates were determined by a traverse survey. The level/traverse survey was referenced to a bench mark or known or assigned elevation, and known coordinates. Once water levels stabilized, water levels in all wells were measured.

Soil cuttings generated during drilling were stored in 55-gallon drums or wrapped in plastic sheeting, and water generated during well development and sampling was retained in secured 55-gallon drums until chemical analytical data from samples were received.

MONITORING WELL DEVELOPMENT

After the wells had been completed, they were developed by pumping and surging to clean and stabilize the soils around the screens. A manually operated, positive displacement surge pump and teflon bailer, surge block, and/or centrifugal pump was used for development. A minimum of 10 well casing volumes of water was removed during development; however, development continued until turbidity or sediment content had stabilized. All development equipment was steam cleaned or triple rinsed in a solution of purified water and Alconox prior to its initial use in each well. A well development record was maintained which included 1) a description of development water characteristics at frequent intervals, 2) the quantity of water removed during development.

ATTACHMENT C

Site Safety Plan

SITE SAFETY PLAN
CET ENVIRONMENTAL SERVICES, INC.

A. GENERAL INFORMATION

Site:

Location: 186 East Lewelling Blvd., San Lorenzo, California

Plan Prepared By: Benjamin Berman **Date:** February 11, 1994
Site Safety Manager

Objective: To secure work area from unauthorized personnel, to prevent equipment accidents, to provide for emergency response (if required, to protect onsite personnel from potential health and safety hazards.

Proposed Date of Investigation: February/March, 1994

Background Review: Complete: Preliminary: X

Documentation/Summary:

Overall Hazard: Serious: Moderate:
Low: X Unknown:

B. SITE/WASTE CHARACTERISTICS

Waste Type(s): Liquid: X Solid: Sludge: Gas: X
(Gasoline, and Waste Oil)

Characteristic(s): Corrosive: Ignitable: X Radioactive:

Volatile: X Toxic: Reactive: Unknown: Other(name):

Facility Description:

Principal Disposal Method (type and location): Groundwater, rinsate and soil, will be treated onsite or transported to a Class I, II, or III landfill in accordance with sample analytical results.

Unusual Features: None Known

Status: Active: X Inactive: Unknown:

History (agency action, complaints, injuries, etc.): None known.

C. HAZARD EVALUATION

Parameter:	TLV (ppm)	IDLH (ppm)	HEALTH skin/eyes/inge./inha.			
Benzene	1	3,000	___	___	___	x
Gasoline	50	___	___	___	___	x

Special Precautions and Comments: No smoking, eating or drinking in the work area. Respirators (halfmask air purifying w/organic vapor cartridge) must be worn when the downwind concentration of benzene is more than or equal to 10 ppm (PEL); or when volatile hydrocarbon concentrations as indicated by a field PID equal 100 ppm (instantaneous spike) or greater.

D. SITE SAFETY WORK PLAN

Perimeter Establishment: Map/Sketch Attached: X (Plate SP-1)

Site Secured:

Perimeter Identified:

Zone(s) of Contamination Identified: To be determined during drilling and will be based on soil and groundwater sample analytical results

Personal Protection:

Level of Protection: A___B___C___D X

Modifications: Level C (includes half-mask air purifying respirators with organic vapor cartridge and dust prefilters) at discretion of site safety officer and/or per criteria outlined below (surveillance equipment).

Surveillance Equipment & Materials:

Instrument: Hnu PID Action Level: Instantaneous spike of 100 ppm or more

Site Entry Procedures: Permission of onsite, authorized personnel. Level D personnel protective equipment (with Level C standby).

Decontamination Procedures:

Personnel: Wash hands with soap and water after leaving the work zone.

Equipment: Steam clean or scrub in a solution of Alconox and potable water, followed by two water rinses.

First Aid (type of equipment available): Standard first aid kit available in company vehicles.

Work Limitations (time of day, weather, heat/cold stress): Daylight hours only, work will stop during periods of heavy rainfall or strong winds.

Investigation-Derived Material Disposal: See "Principal Disposal Method", above.

Team Composition:

Team Member	Responsibility
Terrance E. Carter	Project Manager
Benjamin Berman	Project Scientist/Safety Manager

E. EMERGENCY INFORMATION

Local Resources:

Ambulance:	911
Hospital Emergency Room:	(510) 889-5015 (Eden Medical Center)
Poison Control Center:	1-800-523-2222
Police:	911
Fire Department:	911
Explosives Unit:	911
Agency Contact:	
National Response Center (NAC)	
Toxic Chemical and Oil Spills:	1-800-424-8802

Site Resources:

Water Supply:	Onsite
Telephone:	Onsite
Radio:	In company vehicle
Other:	N/A

Emergency Contacts:

Name: Mr. Terrance E. Carter Phone: 1-510-652-7001
CET Environmental Services, Inc.

Emergency Routes:

To Hospital:

East on Lewelling Blvd. to Interstate 238/580 Eastbound (from Mission Blvd. on ramp), exit Castro Valley Blvd. east, to Lake Chabot Road - North, left turn into Eden Medical Center at 20103 Lake Chabot Road, in Castro Valley, (510) 889-5015, approximately 2.5 miles from the project site (see attached route map on Plate SP-1).