File No. 12-99-702-SI

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PROPOSED WORK PLAN FOR SOIL AND GROUNDWATER INVESTIGATION FOR THE PROPERTY LOCATED AT 15595 WASHINGTON AVENUE SAN LORENZO, CALIFORNIA

SEPTEMBER 20, 2004

PREPARED FOR:
MR. MEHDI MOHAMMADIAN
CAL GAS
15595 WASHINGTON AVENUE
SAN LORENZO, CALIFORNIA 94580

BY:
ENVIRO SOIL TECH CONSULTANTS
131 TULLY ROAD
SAN JOSE, CALIFORNIA 95111

ENVIRO SOIL TECH CONSULTANTS

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September 20, 2004

File No. 12-99-702-SI

Mr. Mehdi Mohammadian
Cal Gas
15595 Washington Avenue
San Lorenzo, California 94580

SUBJECT: PROPOSED WORK PLAN FOR SOIL AND GROUNDWATER INVESTIGATION FOR THE PROPERTY
Located at 15595 Washington Avenue, in
San Lorenzo, California

Dear Mr. Mohammadian:

Enclosed is the proposed work plan for soil and groundwater investigation for the subject property located at 15595 Washington Avenue, in San Lorenzo, California.

This proposed work plan has been prepared in according to the request of Mr. Barney Chan with Alameda County Health Care Services Agency-Environmental Health Services (ACHCSA-EHS) in a letter dated August 6, 2004.

If you have any questions or require additional information, please feel free to contact our office at (408) 297-1500.

Sincerely,

ENVIRO SOIL TECH CONSULTANTS

VICTOR B. CHERVEN, Ph.D. *REGISTERED GEOLOGIST #3475*	LAWRENCE KOO, P. E. *C. E. #34928*

FRANK HAMEDI-FARD
GENERAL MANAGER

WORK PLAN FOR SOIL AND WATER INVESTIGATION
FOR CAL GAS PROPERTY
15595 WASHINGTON AVENUE
SAN LORENZO, CALIFORNIA 94580

INTRODUCTION AND SITE BACKGROUND

Cal Gas is a gasoline service station located at the intersection of Washington Avenue and Via Enrico Street in the City of San Lorenzo, California (Figure 1). The station is owned by Mr. Mehdi Mohammadian at the present time, but was previously owned and/or operated by several other parties. In 1986, the property was owned by Texaco, Inc., and soil and groundwater contamination was detected when Texaco removed the underground storage tanks and began initial investigation of the contamination by drilling three borings and three groundwater-monitoring wells in August of that year. Texaco sold the property in 1987 and new tanks were installed, but apparently the investigation of the pre-1986 contamination was discontinued until 1992, when the wells were re-sampled by the new owner, Mr. Mohammadian. Investigation was again suspended until 1998, when two additional wells were installed and high concentrations of MTBE and other gasoline constituents were detected. The results from the 1998 investigation suggested that a new gasoline release had occurred from the tanks that were installed in 1987. The wells have been monitored and sampled quarterly since August 1998.

In early 2000, Mr. Mohammadian retained Enviro Soil Tech Consultants (ESTC) to renew the investigation and bring the site into compliance with regulatory directives issued by the Alameda County Environmental Health Department (ACEHD). ESTC submitted a work plan to drill between 10 to 15 borings on City property along Via Enrico Street south and west of the site. ACEHD modified this scope of work, reducing the number of borings along Via Enrico Street from 13 to 7 and increasing the number of borings along Lorenzo Avenue (west of the site) from 3 to 5. The borings were drilled in April 2000, and a soil sample from the capillary fringe and a water sample from the top of the saturated zone were collected from each boring and analyzed for gasoline constituents. No hydrocarbons were detected by the laboratory, but ACEHD rejected the laboratory results because Priority Environmental Labs had lost its State of California certification in January 1998. Lacking valid laboratory data, the results of ETSC’s investigation were inconclusive.

Continued monitoring of the on-site wells demonstrated that moderate to high concentrations of Total Petroleum Hydrocarbons in the gasoline range (TPH-g) and MTBE were present in all wells except MW-4 through 2001. Beginning in 2002, concentrations dropped abruptly in MW-1 and MW-2, but have remained elevated in MW-3 and MW-5, which are the two wells that are downgradient (west) of the pre-1986 underground storage tanks. Volatile aromatic compounds (BTEX) have been detected primarily in MW-5, but their absence in other wells is undoubtedly due to the elevated reporting limits of the laboratory. Apparently, matrix interference from the high TPH-g and MTBE concentrations prevented the lab from attaining the standard (low) detection limits for benzene and other aromatic compounds. As documented in the *Second Quarter of 2004 Groundwater Monitoring and Sampling Report* prepared by ETSC in July 2004, concentrations of TPH-g and MTBE have steadily declined since 1999 in MW-1, MW-2, and MW-3, but have remained constant or risen in MW-4 and MW-5. This could indicate that the dissolved-phase plume has migrated to the northwest during that time. In July 2004, the groundwater flow direction was westward or perhaps slightly south of west (Figure 2), but in previous quarters or years it may have been to the north or northwest. Westward flow is consistent with contaminant isocontours for July 2004, which indicate that the plume is centered west of the pre-1986 UST's and concentrations decrease eastward toward Washington Avenue (Figures 3 and 4).

Due to the continued high concentrations of gasoline in groundwater and the uncertainties regarding the source(s) and extent of contamination, direction of groundwater flow, and potential migration paths, ACEHD has requested that this work plan be prepared to address these issues and lead to the development of a comprehensive interpretation of the site's hydrogeology and contaminant history. Such interpretations are now being termed "Site Conceptual Models" by the regulatory community. In its August 2004 letter to Mr. Mohammadian, ACEHD identified several "data gaps" and investigative tasks that will be required in order to develop and validate a Site Conceptual Model and properly assess the contaminant problem at the site. This work plan is designed to address those issues.

ACEHD requested submission of the work plan and initial Conceptual Model by September 22, 2004, but in view of the volume of information that must be developed and/or reviewed, it is impractical to propose a Conceptual Model at this time. Further, several important tasks are obvious now and it is not necessary to develop a model in order to identify these tasks. We believe that it would be prudent to delay proposing a Site Conceptual Model until we have performed an additional phase of field work and gathered the data that we know are needed to meet the regulatory objectives. At the same time, published data on the local geology can be obtained and reviewed, a sensitive receptor study can be completed, and data from previous quarterly monitoring events can be utilized to prepare a series of groundwater elevation maps and contaminant isocontour maps. All of this information can then be incorporated into the model when the field work is completed.

REQUIRED INFORMATION AND EXISTING DATA GAPS

ACEHD listed numerous shortcomings in the existing data base for the site, and requested that they be addressed in future reports. Some of these items need to be addressed during the next phase of field work, and are listed below:

- Soil analytical data. No depth-specific analyses were performed by Groundwater Technology, Inc. during the 1986 preliminary site investigation. Therefore, the vertical and lateral distribution of gasoline hydrocarbons in soil was not and cannot be determined from that investigation. A limited amount of soil data was obtained in the 1998 Toxichem Management Systems investigation, but the data are insufficient to map the extent of soil contamination or characterize the contaminant source(s).

- Vertical extent of investigation. Previous consultants terminated most or all borings at or near the water table (15-20 feet below grade) and failed to investigate the stratigraphy and lithology of deeper strata. The depth of soil and/or groundwater contamination are unknown, and pathways for hydrocarbon migration to deeper water-bearing zones have not been identified.

- Groundwater analytical data. Insufficient water samples have been collected to delineate the full extent of groundwater contamination. Water samples collected from borings on the property north of the site indicate that shallow groundwater is impacted at that site, but the full magnitude and extent have not been determined. The western limit of groundwater contamination is also undefined due to lack of monitoring wells west of the site.

- Groundwater flow patterns. ACEHD is concerned that there may be considerable variability in groundwater flow over time at this site, perhaps related to changes in the depth to groundwater. The impact of such variations on the migration of MTBE and other hydrocarbons must be determined.

PROPOSED FIELD INVESTIGATION

Define Extent of Soil Contamination

We propose to drill 8 borings in the vicinity of the pre-1986 and post-1986 UST's to gather data on the vertical and lateral extent of soil contamination (Figure 5). As recommended by ACEHD, all borings will be continuously cored and will be drilled deep enough to investigate the possibility that permeable strata are present and impacted at depths of 20-50 feet below grade. A hollow-stem auger drilling rig and a California-modified split-spoon sampler lined with brass sample sleeves will be used for these borings. Upon removal from the sampler, the sample sleeves will be screened for hydrocarbon odor. If odors are observed, one sleeve will be covered with Teflon sheets and plastic end caps and placed into a cooled ice chest for laboratory analysis. We anticipate that samples for analysis will be collected at approximately 5-foot intervals. A portion of one of the remaining sleeves will then be extruded into a plastic bag and allowed to volatilize, after which it will be screened with a portable photo-ionization detector (PID) and the vapor reading will be recorded on the boring log. Remaining sleeves will be placed into a cardboard core box and retained for later detailed examination and description.

At a minimum, two samples from each boring will be preserved for hydraulic conductivity testing to provide data on permeability pathways and flow barriers. These samples will be transported to a materials testing laboratory.

The 8th boring will be converted to groundwater monitoring well MW-6 (Figure 5). This well is discussed further below.

After termination, the borings will be grouted to the surface with neat cement.

Define Extent of Groundwater Contamination

The borings described above will not be used to investigate groundwater contamination, and no water samples will be collected. This is because 1) they will be located in areas of known groundwater contamination and existing monitoring wells provide more reliable data on groundwater concentrations in the first aquifer and 2) additional multi-zone wells are proposed to investigate deeper aquifers (see below).

We anticipate completing the last (8th) on-site boring as monitoring well MW-6 and MW-6A. This well will be drilled with 10-inch diameter augers so that a nested 2-inch diameter well completed in two water-bearing zones can be installed. Because this boring will be the last one drilled, data from the other borings will be used to identify the second water-bearing zone and select the interval to be perforated. No more than 5 feet of screen will be placed in the second zone to insure that the resulting laboratory data are representative of the second zone only. Figure 6 illustrates the anticipated construction of nested wells.

It is already clear that groundwater contamination extends west and north of the site an unknown distance. ACEHD has requested that a series of monitoring wells be installed in linear transects, but this is not practical on the private parcels that are adjacent to the site because of the large buildings located there. However, in our experience, wells can be suitably located to provide the needed data without being aligned in grid networks. Therefore, we will investigate the extent of contamination by installing 7 monitoring wells in accessible locations between these buildings (Figure 5). This will require obtaining permission from those property owners. At least two of these wells will be nested in two zones, not only to further investigate the possibility of impact to the second aquifer but also to examine the groundwater flow direction in that aquifer.

Although we do not anticipate encountering soil contamination in the off-site borings, soil samples will be collected at 5-foot intervals and screened with the PID. If hydrocarbon vapors are detected, samples will be preserved for laboratory analysis.

After the wells have been installed and developed, they will be surveyed and incorporated into the regular quarterly monitoring program. The inclusion of 8 new wells with the previous 5 should provide much more information on the extent of groundwater contamination in the first aquifer, as well as help to evaluate the possibility of contamination in a lower aquifer.

Groundwater Flow Patterns

Both existing groundwater elevation maps and existing contaminant isocontour maps imply that groundwater flow is predominantly toward the west. However, all wells are located relatively close together and therefore provide only a very localized view of the flow direction. The new wells will greatly enlarge the area of investigation and are therefore likely to reveal a more complex flow pattern, possibly including changes in the flow direction west or north of the site. The proposed well network should be adequate to resolve any questions regarding the predominant flow direction in the vicinity.

Additional Items of Concern

There are several additional items discussed in the letter from ACEHD dated August 6, 2004. Some of these are housekeeping issues, which can be brought into compliance in future reports. Others are office tasks that we will undertake as the field work progresses, so that the data can be incorporated into the Site Model. A few of the items deal with the development of interim remedial action or Corrective Action plans, and are issues for the future. It would be premature to include a discussion of those items in this work plan, and we defer their consideration until after we have gathered the data that are needed to begin to formulate an interpretation of the site's hydrogeology.

File No. 12-99-702-SI

If you have any questions or require additional information, please feel free t contact our office at (408) 297-1500.

Sincerely,

ENVIRO SOIL TECH CONSULTANTS

VICTOR B. CHERVEN
No. 3475

VICTOR B. CHERVEN, Ph.D.
REGISTERED GEOLOGIST #3475

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Exp. 9/30/07
CIVIL

LAWRENCE KOO, P. E.
C. E. #34928

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GENERAL MANAGER

ENVIRO SOIL TECH CONSULTANTS 2

File No. 12-99-702-SI

APPENDIX "A"

FIGURES

ENVIRO SOIL TECH CONSULTANTS

File No. 12-99-702-SI

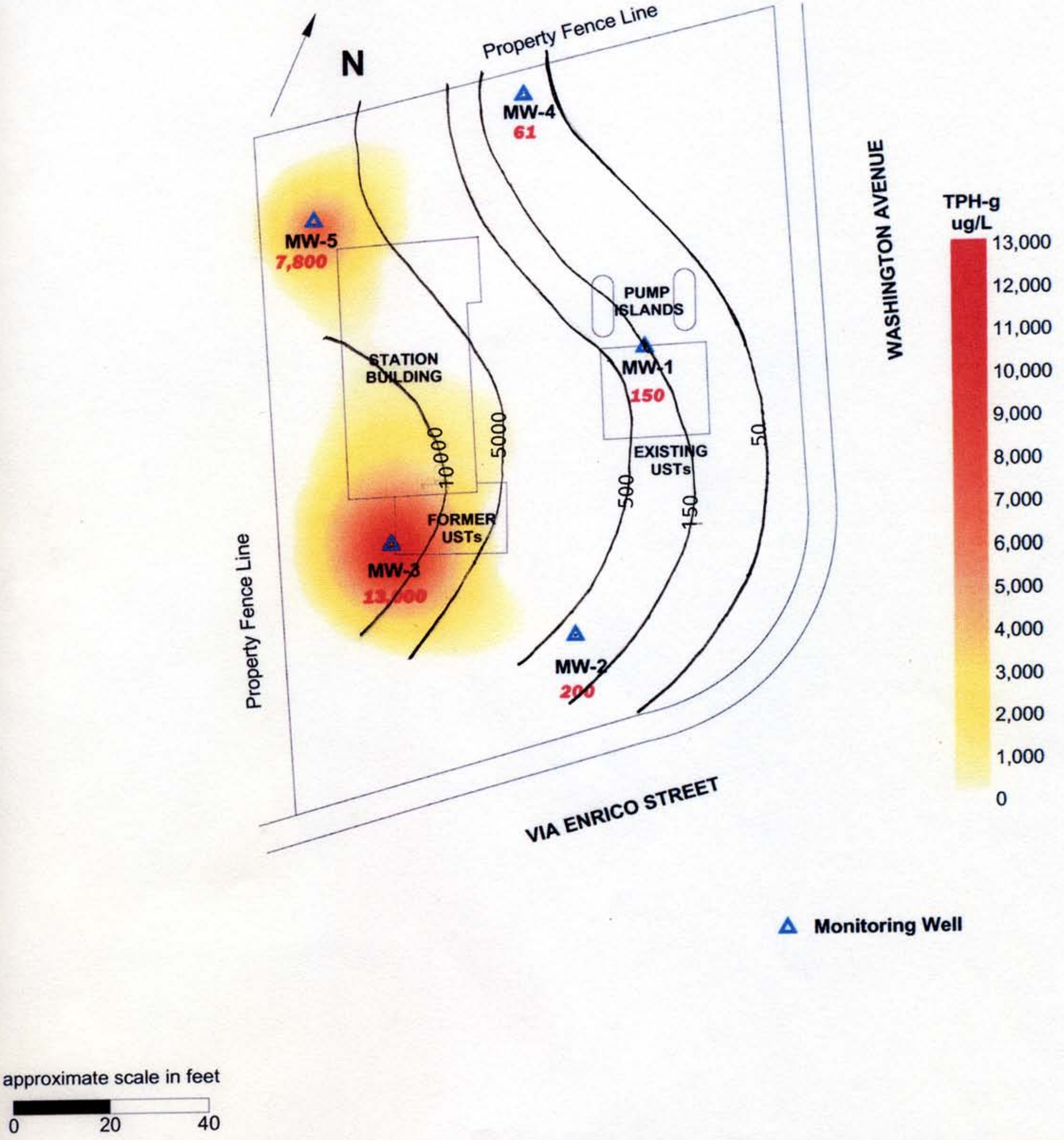


Figure 3: Contour map of TPH-g concentrations in the groundwater. July 6, 2004.

Enviro Soil Tech Consultants

M3

File No. 12-99-702-SI

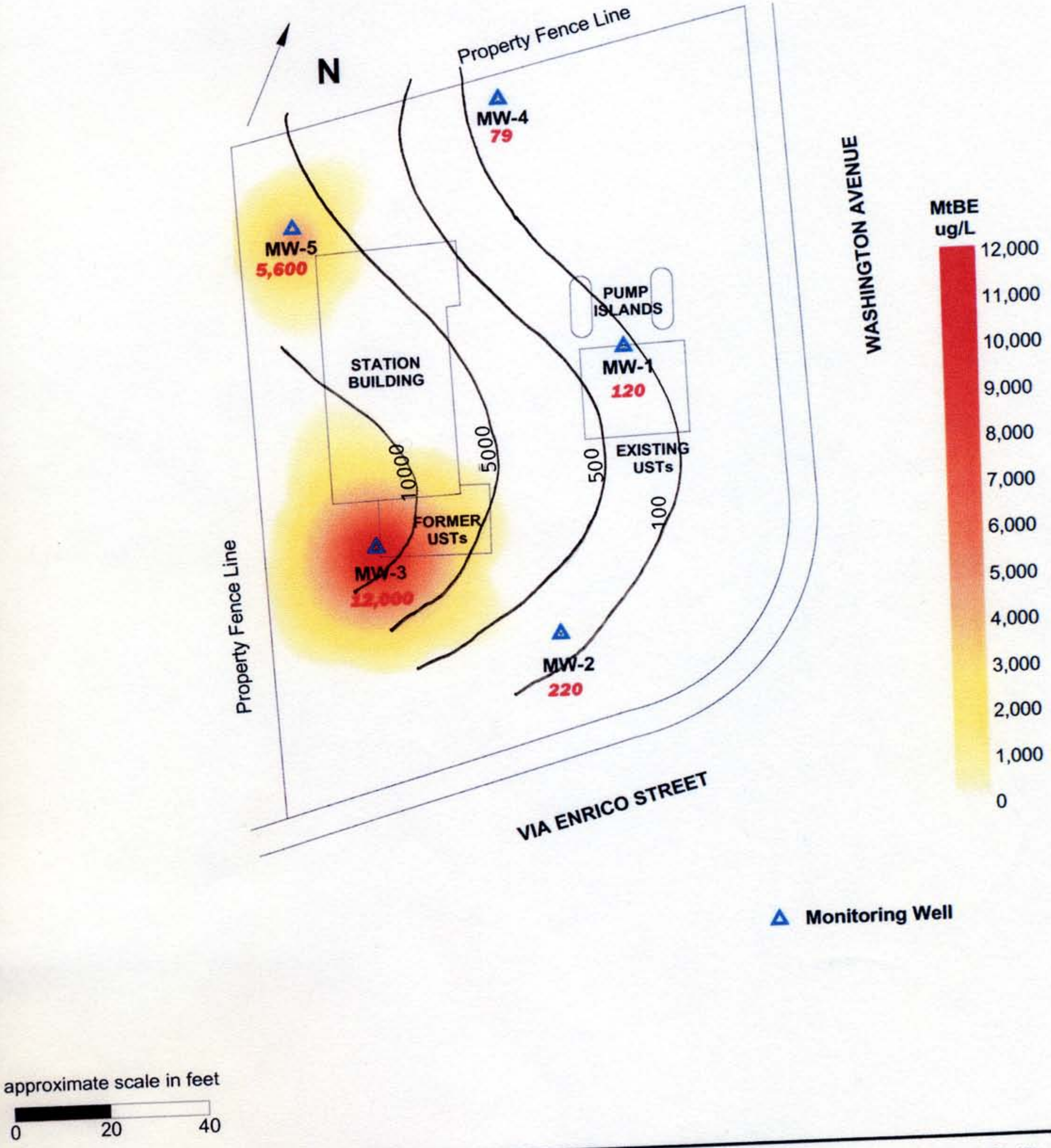


Figure 4: Contour map of MtBE concentrations in the groundwater.
July 6, 2004.

Enviro Soil Consultants
M4

File No. 12-99-702-SI

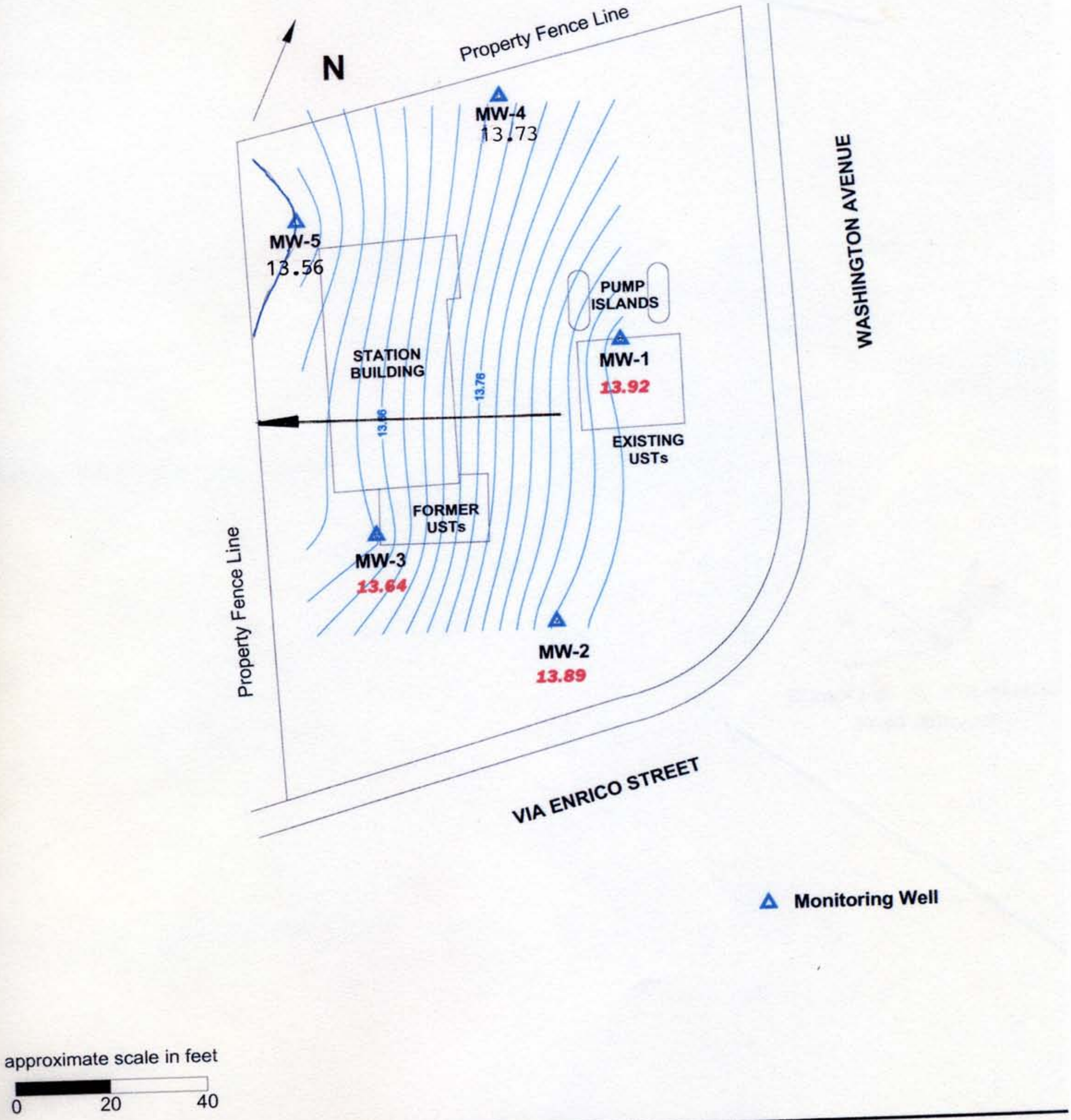


Figure 2: Groundwater elevation contour map.
July 6, 2004.

Enviro Soil
Tech Consultants
M2

File No. 12-99-702-SI

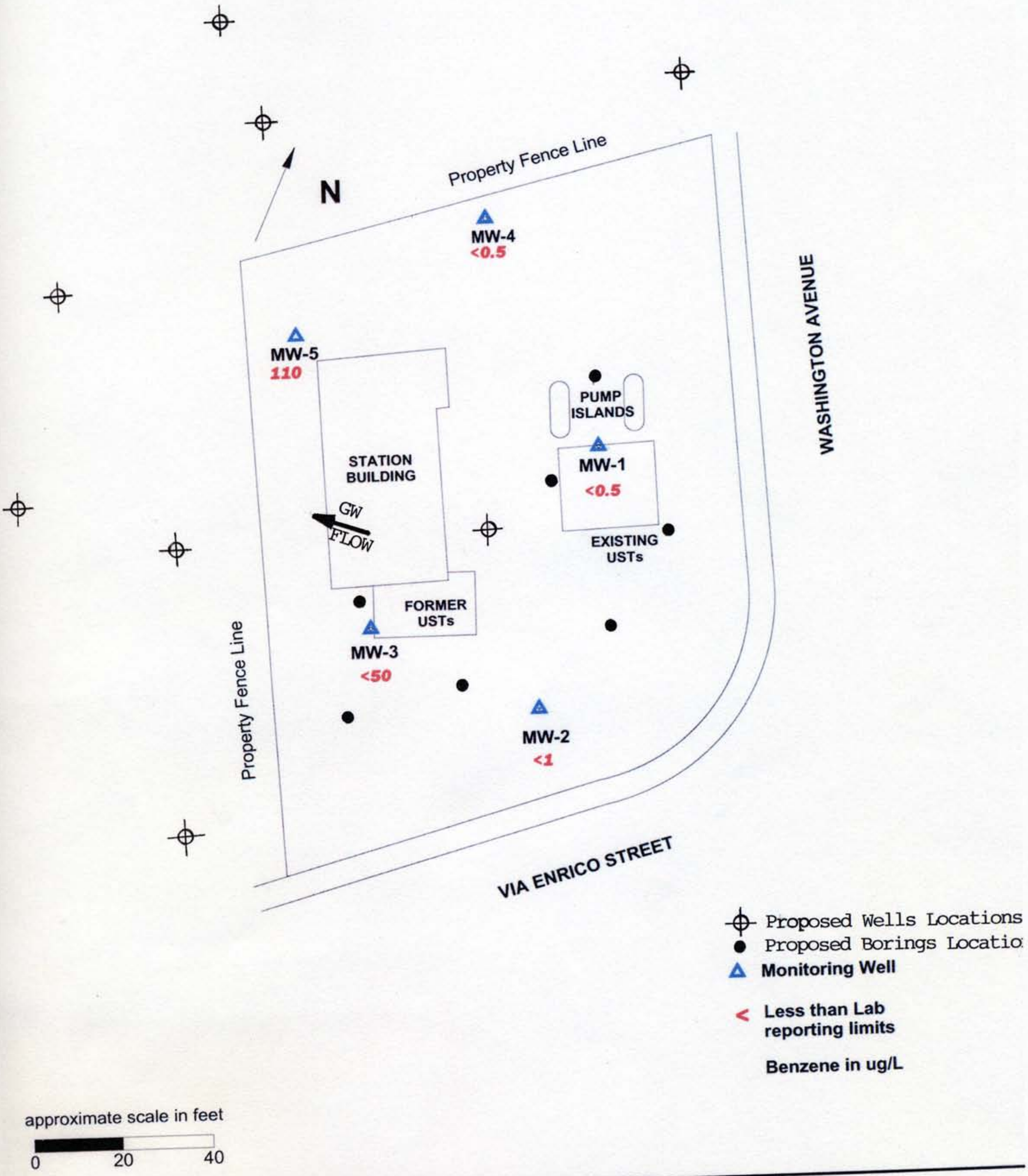
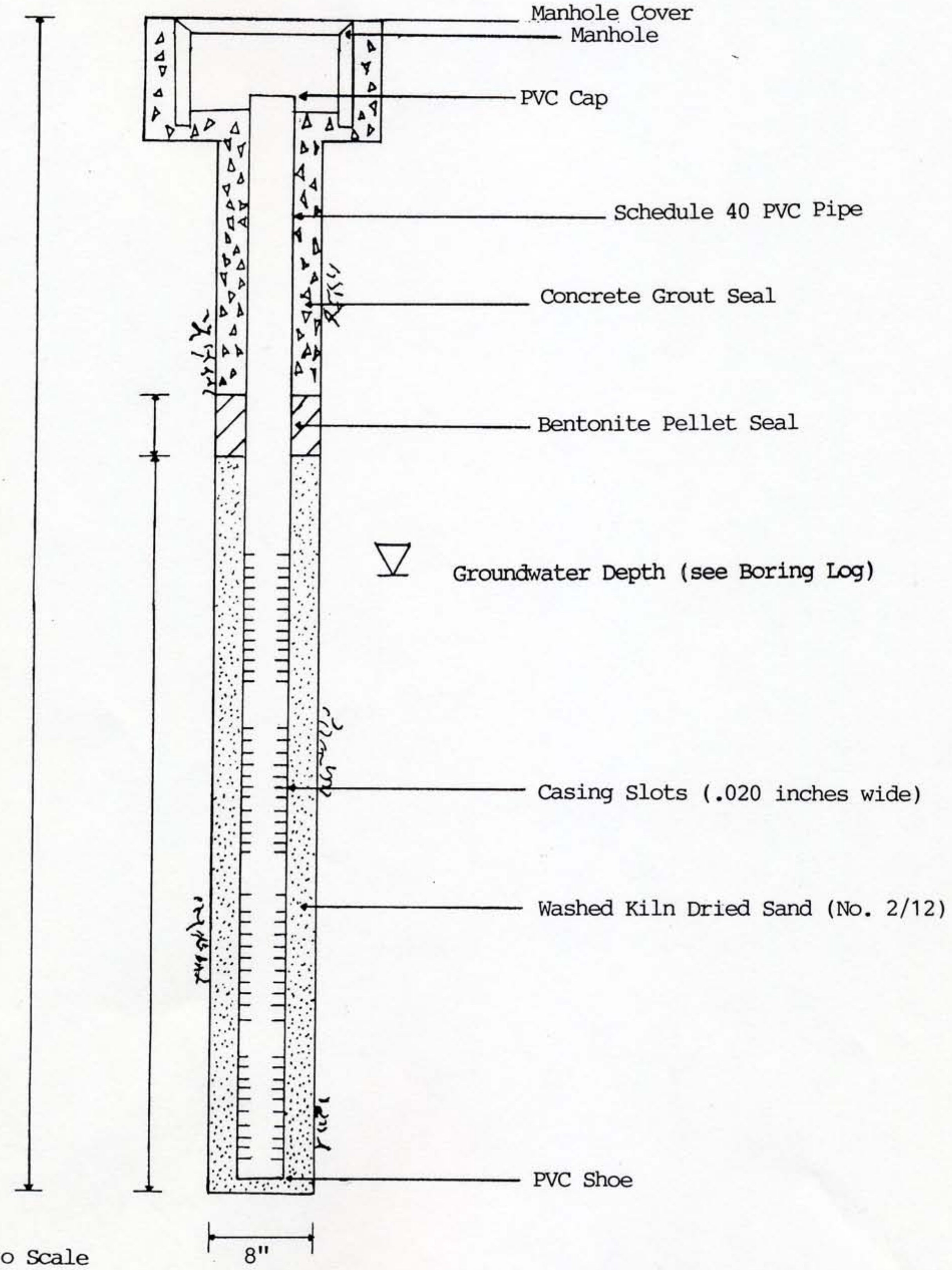


Figure 5: Proposed Subsurface Investigation

Enviro Soil Consultants

M5



Not to Scale

Figure 6 - Nested Well Construction

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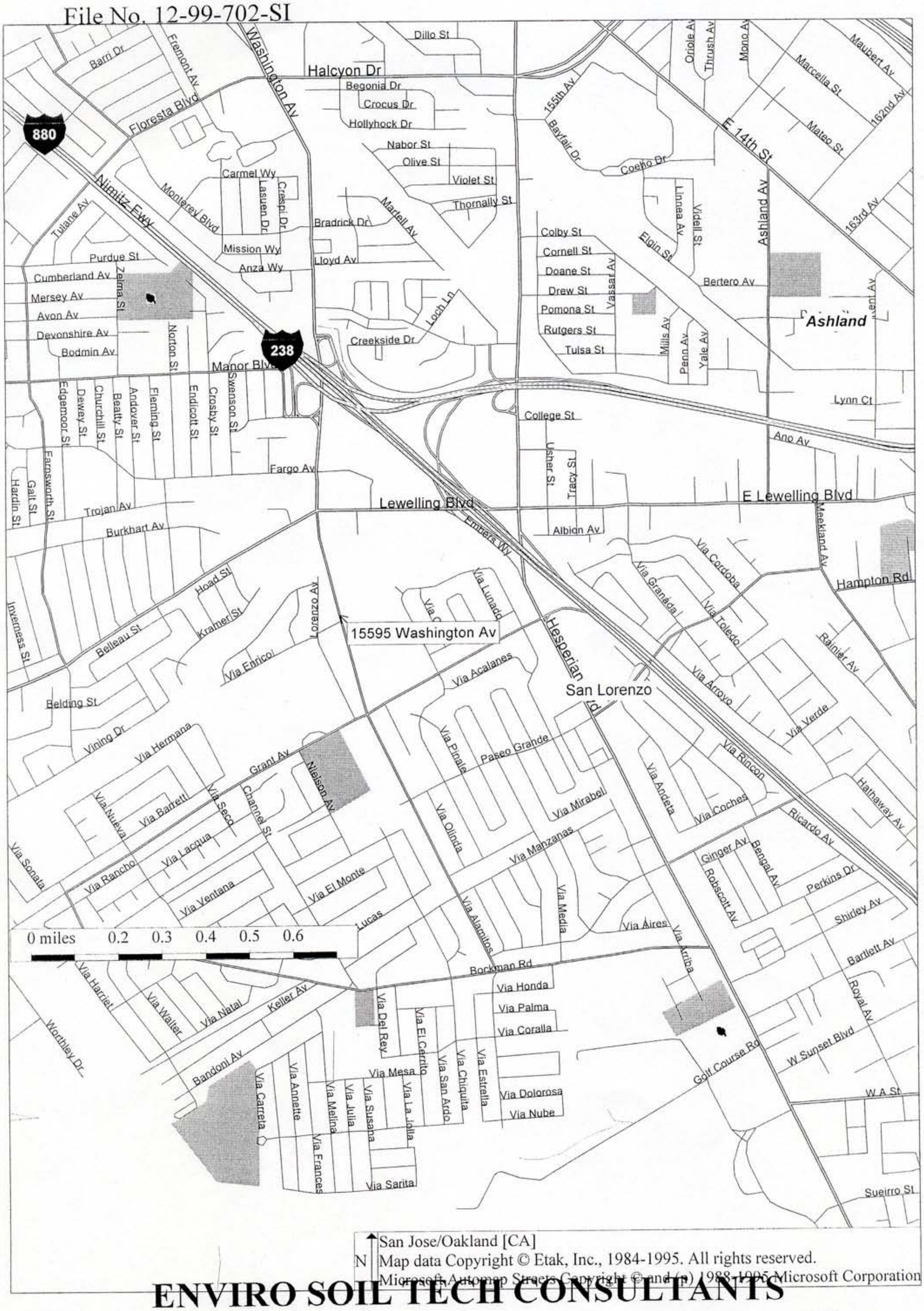


San Jose/Oakland [CA]
Map data Copyright © Etak, Inc., 1984-1995. All rights reserved.
Microsoft Automap Streets Copyright © and (p) 1988-1995 Microsoft Corporation

ENVIRO SOIL TECH CONSULTANTS

Figure 1

M1

File No. 12-99-702-SI

APPENDIX "B"

STANDARD FIELD PROCEDURES FOR GEOPROBE SAMPLING

ENVIRO SOIL TECH CONSULTANTS

STANDARD FIELD PROCEDURES
FOR GEOPROBE SAMPLING

DESCRIPTION:

This document describes ESTC's standard field methods for Geoprobe soil and groundwater sampling. These procedures are designed to comply with Federal, State and Local regulatory guidelines. Specific field procedures are summarized below:

OBJECTIVES:

Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor odor or staining, estimate groundwater depth and quality and to submit samples for chemical analysis.

SOIL CLASSIFICATION/LOGGING:

All soil samples are classified according to the Unified Soil Classification System by a trained geologist or engineer working under the supervision of a California Registered Geologist (RG) or Civil Engineer (CE). The following soil properties are noted for each soil sample:

- Principal and secondary grain size category (i.e. sand, silt, clay or gravel).
- Approximate percentage of each grain size category.

- Color.
- Approximate water or separate-phase hydrocarbon saturation percentage.
- Observed odor and/or discoloration.
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy) and estimated permeability.

SOIL SAMPLING:

Geoprobe soil samples are collected from borings driven using hydraulic push technologies. A minimum of one and one-half feet of the soil column is collected for every five feet of drilled depth. Additional soil samples can be collected near the water table and at lithologic changes. Samples are collected using samplers lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole. The ground surface immediately adjacent to the boring is used as a datum to measure sample depth. The horizontal location of each boring is measured in the field relative to a permanent on-site reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned or washed prior to drilling and between borings to prevent cross-contamination. Sampling equipment is washed between samples with trisodium phosphate or an equivalent EPA-approved detergent.

SAMPLE STORAGE, HANDLING AND TRANSPORT:

Sampling tubes chosen for analysis are trimmed off excess soil and capped with aluminum foil, Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4° C on either crushed or dry ice, depending upon local regulations. Samples are transported under chain-of-custody to a State-certified analytic laboratory.

FIELD SCREENING:

After a soil sample has been collected, soil from the remaining tubing is placed inside a sealed plastic bag and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable GasTech or photoionization detector measures volatile hydrocarbon vapor concentrations in the bag's headspace, extracting the vapor through a slit in the plastic bag. The measurements are used along with the field observations, odors, stratigraphy and groundwater depth to select soil samples for analysis.

GRAB GROUNDWATER SAMPLING:

Groundwater samples are collected from the open borehole using bailers, advancing disposable Tygon tubing into the borehole and extracting groundwater using a diaphragm pump, or using a hydro-punch style sampler with a bailer or tubing. The groundwater samples are decanted into the appropriate containers supplied by the analytic laboratory. Samples are labeled, placed in protective foam sleeves, stored on crushed ice at or below 4°C, and transported under chain-of-custody to the laboratory.

DUPLICATES AND BLANKS:

Blind duplicate water samples are usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells samples. Laboratory supplied trip blanks accompany samples collected for all sampling programs to check for cross-contamination caused by sample handling and transport. These trip blanks are analyzed if the internal laboratory quality assurance/quality control (QA/QC) blanks contain the suspected field contaminants. An equipment blank may also be analyzed if non-dedicated sampling equipment is used.

GROUTING:

If the borings are not completed as wells, the borings are filled to the ground surface with cement grout poured or pumped through a tremie pipe.

SAMPLE MANAGEMENT

Sample Type: Soil, Oil Solvents, Solids, Highly Contaminated Liquid (c)

General Composition	***Sample Volume***	***Sample Container***	***Preservative***	***Holding Time*** **(recommended/regulatory)**
Weak Acids and Bases		plastic or glass		
Photosensitive materials		amber glass		
Volatile Organic		40 ml glass vial with TFE lined septum		
Non-Volatile Organic		glass with TFE lined cap		
Measurement – General Chemical Categories, Inorganic				
Inorganic, general		plastic or glass		
Metals, total		plastic or glass		
Measurement – General Chemical Categories, Organic				
Acid extractables		glass with TFE lined cap		
Base/neutral extractables		glass with TEF lined cap		
Measurement Specified Chemicals – Inorganic				
Hydrofluoric Acid		plastic		
Phosphoric Acid		plastic		

SAMPLE MANAGEMENT

Sample Type: Waste

General Composition	***Sample Volume***	***Sample Container***	***Preservative***	***Holding Time*** **(recommended/regulatory)**
Measurement – General Chemical Categories, Inorganic				
Ammonia			add 1 ml conc H_3PO_4	24 hours
Arsenic			add 6 ml conc HNO_3/L	6 months
Chlorine			cool 4°C	24 hours
Chromium VI			add 6 ml conc H_2SO_4/L	24 hours
Cyanide, total			add 2.5 ml of 50% NaOH/L, cool 4°C	24 hours
Fluoride			cool 4°C	7 days
Mercury, total			add 5 ml conc HNO_3L	28 days
Mercury, dissolved			filter, add 5 ml conc HNO_3/L	38 days
Selenius			add 5 ml conc HNO_3/L	
Sulfide			add 2 ml conc HCl/l	
Zinc			add 2 ml conc HC1/1	

Sample Type: Soil, Oil, Solvents, Solids, Highly Contaminated Liquids (c)

Strong acids, pH<2		glass		
Strong bases, pH>12.5		plastic		

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	*Sample Volume*	*Sample Container*	*Preservative*	*Holding Time* (recommended/regulatory)
Sulfate	50 ml	plastic or glass	cool 4°C	7 days/28 days
Sulfide	500 ml	plastic or glass	cool 4°C, add 4 drops 2N Zn acetate/100 ml	24 hours/28 days
Sulfite	50 ml	plastic or glass lined septum	determine on site	No Holding
Measurement – Specific Chemicals Organic				
NTA	50 ml	plastic or glass waterline & center	cool 4°C	24 hours
Measurement – Physical Properties				
Acidity			cool 4°C	24 hours
Alkalinity			cool 4°C	24 hours
pH			determine on site cool 4°C	6 hours
Measurement – General Chemical Categories, Inorganic				
Metals, dissolved			filter on site, add 5 ml conc HNO_3/L	6 months
Metals, total			add 5 ml conc HNO_3/L	6 months
Measurement – General Chemical Categories, Organic				
Phenolics			add H_2PO_4 to pH 4 & 1 g $CuSO_4$/L, cool 4°C	24 hours

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	***Sample Volume***	***Sample Container***	***Preservative***	***Holding Time*** **(recommended/regulatory)**
Measurement – Specific Chemicals, Inorganic				
Ammonium	50 ml	plastic or glass	cool 4°C, add H_2SO_4 To pH<2	24 hours/28 days
Boron	100 ml	plastic	None Required	28 days/28 days
Chlorine	200 ml	plastic or glass	determine on site	No Holding
Chromium VI	300 ml	plastic or glass rinse with 1:1 HNO_3	cool 4°C	24 hours/28 days
Cyanide, total	500 ml	plastic or glass add NaOH to pH>12	cool 4°C	24 hours/14 days
Cyanide, amenable to chlorination	50 ml	plastic or glass	add 100 mg NaS_2O_3	
Fluoride	300 ml	plastic	None Required	7 days/28 days
Iodide	100 ml	plastic or glass	cool 4°C	24 hours/-
Iodine	500 ml	plastic or glass	determine on site	½ hour/-
Mercury, total	500 ml	plastic or glass rinsed with 1:1 HNO_3	cool 4°C add HNO_3 to pH<2	28 days/28 days
Mercury, dissolved	100 ml	plastic or glass	filter on site add HNO_3 to pH<1	glass: 38 days hard plastic: 13 days
Nitrate	100 ml	plastic or glass	cool 4°C add H_2SO_4	24 hours/48 hours
Nitrate & nitrate	200 ml	plastic or glass	cool 4°C add H_2SO_4	24 hours//28 days
Nitrate	100	plastic or glass	cool 4°C or freeze	

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater

General Composition	***Sample Volume***	***Sample Container***	***Preservative***	***Holding Time*** **(recommended/regulatory)**
Measurement – General Chemical, Organic				
Acid extractables		2 liter glass with TFE lined cap		
Base//neutral extractable		2 liter glass with TFE lined cap		
MBA’s	250 ml	plastic or glass	cool 4°C	24 hours
Oil and Grease	1000 ml	glass, wide mouthed, calibrated	cool 4°C H_2SO_4 to pH<2	24 hours/28 days
Organic		glass rinsed with organic solvents, TFE cap		
Phenolics	500 ml	glass		24 hours/28 days
Purgeables by purge	50 ml	glass with TFE cap		

SAMPLE MANAGEMENT

Sample Type: Water and Wastewater (a, b, c)

General Composition	***Sample Volume***	***Sample Container***	***Preservative***	***Holding Time*** **(recommended/regulatory)**
Non-Volatile Organic		2 liter glass with TFE with lined cap		
Photosensitive materials		1 liter amber glass		
Volatile Organic		40 ml glass vial with TFE lined cap (collect in duplicate)		
Volatile	100 ml		cool 4°C	7 days
Measurement – Physical Properties				
Acidity	100 ml	plastic or borosilioate glass	cool 4°C	24 hours/14 days
Alkalinity	200 ml	plastic or glass	cool 4°C	24 hours/14 days
pH	25 ml	plastic or glass	determine on site	2 hours/2 hours
Temperature	1000 ml	plastic or glass	determine on site	No Holding
Measurement – General Chemical Categories, Inorganic				
Metals, dissolved	200 ml	plastic(g) or glass	filter on site (f)	6 months(e)
Metals, total	100 ml	plastic(g) or glass rinsed with 1:1 HNO_3	HNO_3 to pH<2 (g)	6 months/6 months (e)

File No. 12-99-702-SI

APPENDIX "C"

STANARD OPERATION PROCEDURES

ENVIRO SOIL TECH CONSULTANTS

ENVIRO SOIL TECH CONSULTANTS

Environmental & Geotechnical Consultants

131 TULLY ROAD, SAN JOSE, CALIFORNIA 95111

Tel: (408) 297-1500 **Fax: (408) 292-2116**

FILE NO.:______________________

DATE:______________________

DEPTH TO WELL:______________

DEPTH TO WATER:______________

HEIGHT OF WATER COLUMN:_____

WELL NO.:______________________

SAMPLER:______________________

1 WELL VOLUME:______________

5 WELL VOLUME:______________

ACTUAL PURGED VOLUME:_______

CASING DIAMETER: __________**2"** __________**4"**

CALCULATIONS:

2" x 0.1632____

4" x 0.653____

PURGE METHOD:_____**BAILER** _____**DISPLACEMENT PUMP** _____**OTHER**

SAMPLE METHOD:_____**BAILER** _____**OTHER**

SHEEN:_____**NO** _____**YES, DESCRIBE:**______________________________

ODOR:_____**NO** _____**YES, DESCRIBE:**______________________________

FIELD MEASUREMENTS

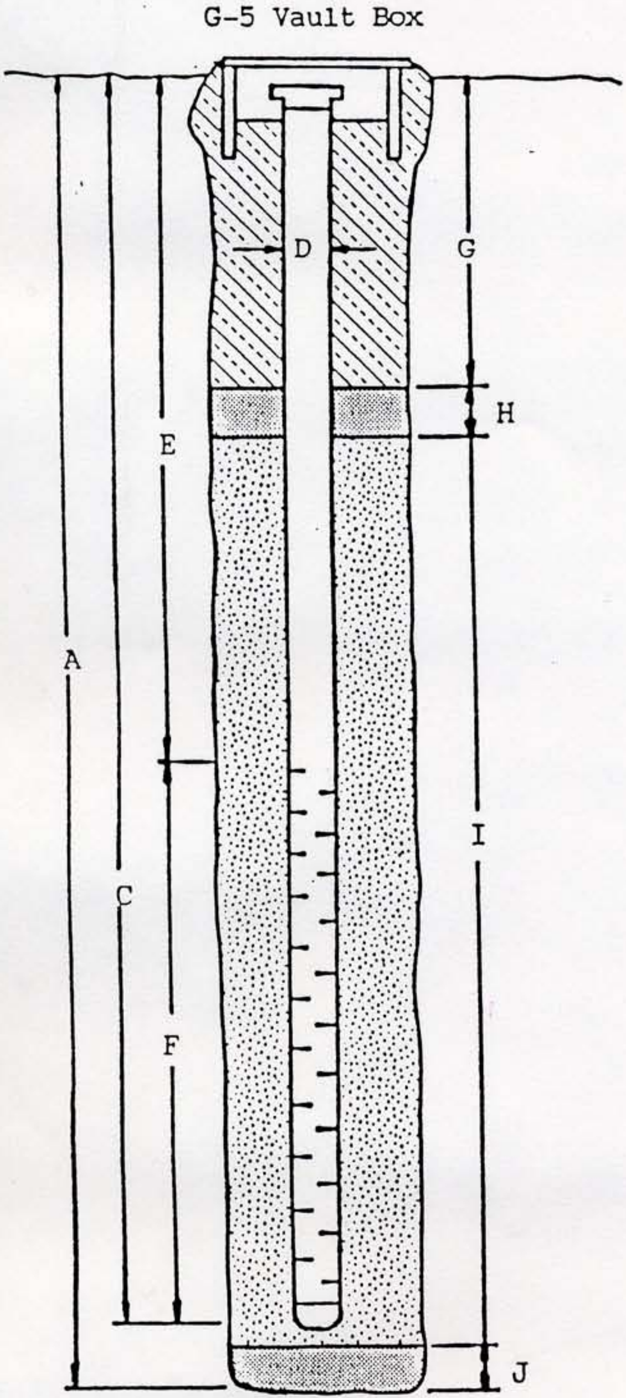
TIME	**VOLUME**	**Ph**	**TEMP.**	**E.C.**

WELL DETAILS

PROJECT NAME: ______________________ BORING/WELL NO. ________

PROJECT NUMBER: ______________________ CASING ELEVATION: ________

WELL PERMIT NO.: ______________________ SURFACE ELEVATION: ________



A. Total Depth: ________

B. Boring Diameter: ________

Drilling method: ________

C. Casing Length: ________

Material: ________

D. Casing Diameter: ________

E. Depth to Perforations: ________

F. Perforated Length: ________

Perforated Interval: ________

Perforation Type: ________

Perforation Size: ________

G. Surface Seal: ________

Seal Material: ________

H. Seal: ________

Seal Material: ________

I. Gravel Pack: ________

Pack Material: ________

Size: ________

J. Bottom Seal: ________

Seal Material: ________

ENVIRO SOIL TECH CONSULTANTS
Environmental & Geotechnical Consultants
131 TULLY ROAD, SAN JOSE, CALIFORNIA 95111
Tel: (408) 297-1500 Fax: (408) 292-2116

MONITORING WELL SURVEY SHEET

NAME: ______________________ **DATE:** ______________________

FACILITY NAME AND ADDRESS: ______________________

____

PROJECT NO.: ______________________

FIELD ACTIVITIES

WELL NUMBER	ROD READING	RIM ELEVATION	WATER ELEVATION

WARNING: HAVE YOU SURVEYED ALL WELLS? LOCATED ALL WELLS?

HAVE YOU CHECKED FOR & SURVEYED EXISTING MONITORING WELLS ON ADJACENT PROPERTIES OR PROPERTIES ACROSS THE STREET?

DO WE HAVE ACCURATE SKETCHES AT 1"=30' (AND 1"=100' IF NECESSARY)? IF NOT, MAKE THEM.

DRILLING AND SOIL SAMPLING PROCEDURE

Mobile drill rig B-40L, using a continuous, solid-flight, hollow stem-auger will be used in drilling the soil borings to the desired depths.

Prior to drilling, all drilling equipment (i.e. auger, pin, drilling head) will be thoroughly steam-cleaned to minimize the possibility of cross-contamination and/or vertical migration of possible contaminants.

In addition, sampling equipment will be washed between samples with Tri-sodium Phosphate (TSP) solution or an equivalent EPA-approved detergent followed by a rinse in distilled water.

During the drilling operation, undisturbed soil samples will be taken from the required depth by forcing a 2-inch I.D. split-spoon sampler insert with a brass liner into the ground at various depths by means of 140 lb. hammer falling 30-inches or by hydraulic forces.

The samplers will contain relatively undisturbed soil. In general, the first section of soil from the sampler (shoe) will be used in the field for lithologic inspection and evidence of contamination. The selected brass liner will be immediately trimmed, the ends of the brass liner will be covered tightly with aluminum foil and plastic caps, sealed with tape, labeled, placed in a plastic bag and stored in a cold ice chest in order to minimize the escape of any volatile present in the samples. Soil samples for analysis will then be sent to a state-certified hazardous waste laboratory for analysis accompanied by a chain-of-custody record.

Soil samples collected at each sampling interval will be inspected for any possible contamination (odor or peculiar colors). Soil vapor concentrations will be measured in the field by using a Photoionization Detector (PID), Photovac Tip Air Analyzer. The soil sample will be sealed in a Zip-Loc plastic bag and placed in the sun to enhance volatilization of the hydrocarbons from the sample. The purpose of this field analysis is to qualitatively determine the presence or absence of hydrocarbons and to establish which soil samples will be analyzed at the laboratory. The data will be recorded on the drilling log at the depth corresponding to the sampling point.

Other soil samples may be collected to document the stratigraphy and estimate relative permeability of the subsurface materials.

Soil tailings that are obtained during drilling will be stored at the site, pending the analytical test results to determine proper disposal.

MONITORING WELL INSTALLATION

The boreholes for the monitoring wells were hand augered with a diameter of at least two inches larger than the casing outside diameter (O.D.).

The monitoring wells will be cased with threaded, factory-perforated and blank, schedule 40 PVC. The perforated interval consisted of slotted casing, generally 0.010 to 0.040 inch wide by 1.5-inch long slot size, with 42 slots per foot (slots which match formation grain size as determined by field grain-size distribution analysis). A PVC cap will be fastened to the bottom of the casing (no solvents, adhesive, or cements were used), the well casing will be thoroughly washed and steam-cleaned.

After setting the casing inside the borehole, kiln-dried sand or gravel-filter material will be poured into the annular space to fill from the bottom of the boring to two feet above the perforated interval. A one to two feet thick bentonite plug will be placed above this filter material to prevent grout from infiltrating down into the filter material. Approximately one to two gallons of distilled water will be added to hydrate the bentonite pellets. Then the well will be sealed from the top of the bentonite seal to the surface with concrete or neat cement containing about 5% bentonite (see Well Construction Detail).

To protect the well from vandalism and surface water contamination, Christy box with a special type of Allen screw will be installed around the wellhead, (for wells in parking lots, driveways and building areas). Steel stove pipes with padlocks will be usually set over wellheads in landscaped areas.

In general, groundwater monitoring wells extend to the base of the upper aquifer, as defined by the consistent (less than 5 feet thick) clay layer below the upper aquifer, or at least 10 to 15 feet below the top of the upper aquifer, whichever is shallower. The wells do not extend through the laterally extensive clay layer below the upper aquifer. The wells are terminated one to two feet into such a clay layer.

WELL DEVELOPMENT

For all newly installed groundwater monitoring wells, the well casing, filter pack and adjacent formations were cleared of disturbed sediment and water.

Well development techniques including pumping, bailing, surging, swabbing, jetting, flushing or air lifting by using a stainless steel or Teflon bailer, a submersible stainless steel pump, or air lift pump. The well development will continued until the discharged water appeared to be relatively free of all turbidity.

All water and sediment generated by well development will be collected in 55-gallon steel drums (Department of Transportation approved), closed head (17-H) for temporarily storage, and then will be disposed of properly, depending on analytical results.

to assure that cross-contamination did not occur between wells, all well development tools will be steam-cleaned or thoroughly washed in a Trisodium Phosphate (TSP) solution followed by a rinse in distilled water before each well development.

GROUNDWATER SAMPLING

Prior to collection of groundwater samples, all of the sampling equipment (i.e. bailer, cables, bladder pump, discharge lines and etc...) will be cleaned by pumping TSP water solution followed by distilled water.

Prior to purging, the well "Water Sampling Field Survey Forms" will be filled out (depth to water and total depth of water column will be measured and recorded). The well then will be bailed or pumped to remove four to ten well volumes or until the discharged water temperature, conductivity and pH stabilized. "Stabilized" is defined as three consecutive readings within 15% of one another.

The groundwater sample will be collected when the water level in the well recovered to 80% of its static level.

Forty milliliter (ml.) glass volatile organic analysis (VOA) vials with Teflon septa will be used as sample containers. The groundwater sample will be decanted into each VOA vial in such a manner that there will be a meniscus at the top. The cap quickly will be placed over the top of the vial and securely tightened. The VOA vial will then be inverted and tapped to see if air bubbles is present. If none is present, then the sample will be labeled and refrigerated for delivery under chain-of-custody to the laboratory. The label information should include a sample identification number, job identification number, date, time, type of analysis requested and the sampler's name.

CHAIN OF CUSTODY RECORD

PROJ. NO.

NAME

SAMPLERS: *(Signature)*

NO.	DATE	TIME	SOIL	WATER	LOCATION	CON-TAINER	ANALYSES REQUESTED (2)						REMARKS

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Receive 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	

SOP12

ENVIRO SOIL TECH CONSULTANTS

Environmental & Geotechnical Consultants
131 TULLY ROAD, SAN JOSE, CALIFORNIA 95111
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File No.____________________

Date____________________

By____________________

Job____

Site Description____________________________________ (continued on reverse side)

Type of Drill Rig____________________________________ Hole Diameter____________________

(NOTE: WATER LEVEL, TIME, DATE AT END OF LOG, CAVING, ETC...)

Sample Quality	**Blows/6-inch**	**Sample**		**Depth**		**Soil Classification**	**Penetrometer**
		Loc.	**No.**				
				1			
				2			
				3			
				4			
				5			
				6			
				7			
				8			
				9			
				0			
				1			
				2			
				3			
				4			
				5			
				6			
				7			
				8			
				9			
				0			
				1			
				2			

SOP3

APPENDIX "D"

OUTLINE OF DRUM HANDLING PROCEDURES

OUTLINE OF DRUM HANDLING PROCEDURES
FOR THE PROPERTY
LOCATED AT 15595 WASHINGTON AVENUE
SAN LORENZO, CALIFORNIA

1. Test material per site-specific test requirements.
2. Classify Material as : Clean/Non-Hazardous.
3. Labeling of Drums:
   - Pending Label: Used to describe material pending final analytical testing. Labels must be immediately affixed to drum during field work.
   - Non-Hazardous Label: Required within 24 hours after analytical results are received.
   - Hazardous Label: Required within 24 hours after analytical results are received.
   - For Pick-Up Label: Must be affixed to drum prior to arranged pick-up date by certified hauler.
4. Remove within 21 days of generation. Empty drums, where material was disposed in bulk, must be removed the same day they are emptied.
5. Disposal of Material:
   - Clean: Any local landfill.
   - Non-Hazardous: Class III Landfill.
   - Hazardous: Class I landfill.

6. Manifests may be signed by the on-site contractor or consultant, owner, or other authorized representatives. The transporter should not sign the manifest. It is the responsibility of the contractor, consultant and owner to arrange for a person to sign the manifest on the day of pick-up.

7. Reporting:

   Reports shall include the following:

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

SOIL:

1. Test Requirements and Methods: Per STE site-specific test requirements.

   - TPH: EPA Method 8015.
   - BTEX: EPA Method 8020.
   - TOG: 503 D&E.
   - Lead:

- Total Lead - EPA Method 7421.
- Inorganic (soluble) Lead: DOS Title 22, Waste Extraction Test, 22-66700.
- Organic - EPA Method 8240.

∗ Ignitable:

2. Classification:

∗ Clean: TPH, BTEX, TOG, VOC and non-detectable (<100 ppm).

∗ Non-Hazardous if any are true:

- TPH less than 1,000 ppm.
- Lead - Inorganic (soluble) Lead less than 5 ppm (STLC) or less than 100 ppm (TTLC).
  - Organic Lead less than 13 ppm (TTLC).

∗ Hazardous if any are true:

- TPH greater than 1,000 ppm.
- Lead - Inorganic (soluble) Lead greater than 5 ppm (STLC) or greater than than 1,000 ppm (TTLC).
  - Organic Lead greater than 13 ppm (TTLC).
  - Ignitable - If TPH>1,000 ppm, then conduct Bunsen Burner Test. If soil bums vigorously and persistently soils are RCRA D001.

∗ VOC - less than 1,000 ppm.

3. Responsibility for Disposal:

- Clean: Consultant, contractor or owner.
- Non-Hazardous: Consultant, contractor or owner.

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

5. Disposal Facility:
   - Clean: Any local landfill.
   - Non-Hazardous: Class III or II landfill.
   - Hazardous: Class I landfill.

WATER:

1. Test Requirements and Methods: Per site-specific test requirements.
   - TPH: EPA Method 8015.
   - BTEX: EPA Method 602.

2. Classification:
   - Clean Water: TPH and BTEX non-detectable.
   - Hazardous:

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

3. Responsibility for Disposal:

   - Clean: Consultant/Contractor.
   - Non-Hazardous: Consultant, contractor or owner.

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

5. Disposal Facility:

   - Clean Water: Into sanitary sewer per Local Sewer District approval or into storm sewer with proper approval from Water Board.

   - Non-Hazardous:

     - Water with TPH and BTEX only.
     - Water with free product.
     - Arrange certified waste hauler to pick and dispose.

   - Hazardous:

     - Free product only.
     - Arrange disposal by a certified hazardous waste hauler.

File No. 12-99-702-SI

APPENDIX "E"

HEALTH AND SAFETY PLAN

ENVIRO SOIL TECH CONSULTANTS

HEALTH AND SAFETY PLAN
FOR THE PROPERTY
LOCATED AT 15595 WASHINGTON AVENUE
SAN LORENZO, CALIFORNIA

GENERAL:

This Health and Safety Plan (HSP) contains the minimum requirements for the subject site field work. The field activities include drilling, soil sampling and/or water sampling. All personnel and contractors will be required to strictly adhere with this HSP requirements.

The objective of the HSP plan is describe procedures and actions to protect the worker, as well as unauthorized person, from inhalation and ingestion of and direct skin contact with potentially hazardous materials that may be encountered at the site. The plan describes (1) personnel responsibilities and (2) protective equipment to be used as deemed when working on the site. At a minimum, all personnel working at the site must read and understand the requirements of this HSP. A copy of this HSP will be on-site easily accessible to all staff and government field representatives.

HAZARD ASSESSMENT:

The major contaminants expected to be encountered on the project are gasoline and its hydrocarbon constituents. The anticipated contaminants and their exposure standards are listed in Table 1. It is not anticipated that the potential levels of exposure will reach the permissible exposure limits (PEL) or threshold limit values (TLV). Inhalation and dermal contact are the potential exposure pathways. Protective clothing will be mandatory for field personnel specified in this Plan. In addition, respiratory protective devices are required to be worn by each person on-site or to be within easy reach should irritating odors be detected or irritation of the respiratory tract occur.

TABLE 1
EXPOSURE LIMITS OF ANTICIPATED CHEMICAL CONTAMINANTS IN PARTS PER MILLION (ppm)

Contaminant	PEL	EL	ED	CL	TWA	STEL
Benzene*[skin] & [carc]	1	---	---------	---	10	5
Ethylbenzene	100	---	---------	---	100	125
Toluene [skin]	100	200	10 min per 8 hours	500	100	150
Xylene (o, m & p isomers) [skin]	100	200	30 min per 8 hours	300	100	150

PEL - permissible exposure limit: 8 hours, time-weighted average, California Occupational Safety and Health Administration Standard (CAL-OSHA).

EL - excursion limit: maximum concentration of an airborne contaminant to which an employee may be exposed without regard to duration provided the 8 hours time-weighted average for PEL is not exceeded (CAL-OSHA).

ED - excursion duration: maximum time period permitted for an exposure above the excursion limit but not exceeding the ceiling limit (CAL-OSHA).

CL - Ceiling limit: maximum concentration of airborne contaminant which employees may be exposed permitted (CAL-OSHA).

TWA - time-weighted average: 8 hours, [same as threshold limit value (TLV)], American Conference of Governmental Industrial Hygienists (ACGIH).

STEL - Short-term exposure limit: 15 minutes time-weighted average (ACGIH).

[carc] - substance identified as a suspected or confirmed carcinogen.

[skin] - substance may be absorbed into the bloodstream through the skin, mucous membranes or eyes.

* - Federal OSHA Benzene limits given for PEL and STEL; STEL has a 50 minutes duration limit.

A brief description of the physical characteristics, incompatibilities, toxic effects, routes of entry and target organs has been summarized from the NIOSH Pocket Guide to Chemical Hazards for the contaminants anticipated to be encountered. This information is used in on-site safety meetings to alert personnel to the hazards associated with the expected contaminants.

Benzene:

Benzene is a colorless, aromatic liquid. Benzene may create an explosion hazard. Benzene is incompatible with strong oxidizers, chlorine and bromine with iron. Benzene is irritating to the eyes, nose and respiratory system. Prolonged exposure may result in giddiness, headache, nausea, staggering gait, fatigue, bone marrow depression or abdominal pain. Routes of entry include inhalation, absorption, ingestion and skin or eye contact. The target organs are blood, the central nervous system (CNS), skin, bone marrow, eyes and respiratory system. Benzene is carcinogenic.

Ethylbenzene:

Ethylbenzene is a colorless, aromatic liquid. Ethylbenzene may create an explosion hazard. Ethylbenzene is incompatible with strong oxidizers. Ethylbenzene is irritating to the eyes and mucous membranes. Prolonged exposure may result in headache, dermatitis, narcosis or coma. Routes of entry include inhalation, ingestion and skin or eye contact. The target organs are the eyes, upper respiratory system, skin and the CNS.

Toluene:

Toluene is a colorless, aromatic liquid. Toluene may create an explosion hazard. Toluene is incompatible with strong oxidizers. Prolonged exposure may result in fatigue, confusion, euphoria, dizziness, headache, dilation of pupils, lacrimation, insomnia, dermatitis or photophobia. Routes of entry are inhalation, absorption, ingestion and skin or eye contact. The target organs are the CNS, liver, kidneys and skin.

Xylene Isomers:

Xylene is a colorless, aromatic liquid. Xylene may create an explosion hazard. Xylene is incompatible with strong oxidizers. Xylene is irritating to the eyes, nose and throat. Prolonged exposure may result in dizziness, excitement, drowsiness, staggering gait, corneal vacuolization, vomiting, abdominal pain or dermatitis. Routes of entry are inhalation, absorption, ingestion and skin or eye contact. The target organs are the CNS, eyes, gastrointestinal tract, blood, liver, kidneys and skin.

GENERAL PROJECT SAFETY RESPONSIBILITIES:

Key personnel directly involved in the investigation will be responsible for monitoring the implementation of safe work practices and the provisions of this plan are (1) the drilling project supervisor and (2) Enviro Soil Tech Consultants *(ESTC)* project field engineer. These personnel are responsible for knowing the provisions of the plan, communicating plan requirements to workers under their supervision and regulatory agencies inspectors and for enforcing the plan.

The personnel-protective equipment will be selected to prevent field personnel from exposure to fuel hydrocarbons that may be present at the site. To prevent direct skin contact, the following protective clothing will be worn as appropriate while working at the site:

1. Tyvek coveralls.
2. Butyl rubber or disposable vinyl gloves.
3. Hard hat with optional face shield.
4. Steel toe boots.
5. Goggles or safety glasses.

The type of gloves used will be determined by the type of work being performed. Drilling personnel will be required to wear butyl rubber gloves because they may have long duration contact with the subsurface materials. *ESTC* sampling staff will wear disposable gloves when handling any sample. These gloves will be changed between each sample.

Personnel protective equipment shall be put on before entering the immediate work area. The sleeves of the overalls shall be outside of the cuffs of the gloves to facilitate removal of clothing with the least potential contamination of personnel. If at any time protective clothing (coveralls, boots and gloves) become torn, wet or excessively soiled, it will be replaced immediately.

Total organic vapors will be monitored at the site with a portable PID. should the total organic vapor content approach that of the threshold limit value (TLV) for any of the substances listed in Table 1, appropriate safety measures will be implemented under the supervision of the site project engineer. These precautions include, but are not limited to, the following: (1) donning of respirators (with appropriate cartridges) by site personnel, (2) forced ventilation of the site, (3) shutdown of work until such time as appropriate safety measures sufficient to insure the health and safety of site personnel can be implemented.

No eating, drinking or smoking will be allowed in the vicinity of the drilling operations. *ESTC* will designate a separate area on site for eating and drinking. Smoking will not be allowed at the vicinity of the site except in designated areas. No contact lenses will be worn by field personnel.

WORK ZONES AND SECURITY MEASURES:

The project engineer will call Underground Service Alert (USA), and the utilities will be marked before any drilling is conducted on-site, and the borings will be drilled at safe distances from the utilities. The client will also be advised to have a representative on-site to advise us in selecting locations of borings with respect to utilities or underground structures. Enviro Soil Tech Consultants assumes no responsibility to utilities not so located. The first 5 feet will be hand augered before any drilling equipment is operated.

Each of the areas where the borings will be drilled will be designated as Exclusion Zones. Only essential personnel will be allowed into an Exclusion Zone. When it is practical and local topography allows, approximately 25 to 75 feet of space surrounding those Exclusion Zones will be designated as Contamination Reduction Zones.

Cones, wooden barricades or a suitable alternative will be used to deny public access to these Contamination Reduction Zones. The general public will not be allowed close to the work area under any conditions. If for any reason the safety of a member of the public (e.g. motorist or pedestrian) may be endangered, work will cease until the situation is remedied. Cones and warning signs will be used when necessary to redirect motorists or pedestrians.

LOCATION AND PHONE NUMBERS OF EMERGENCY FACILITIES:

For emergency reasons, the closest facilities addresses and phone numbers are listed below:

City of San Lorenzo Fire Department	911
Fairmont Hospital 15400 Foothill Boulevard, San Leandro, CA	(510) 667-7800

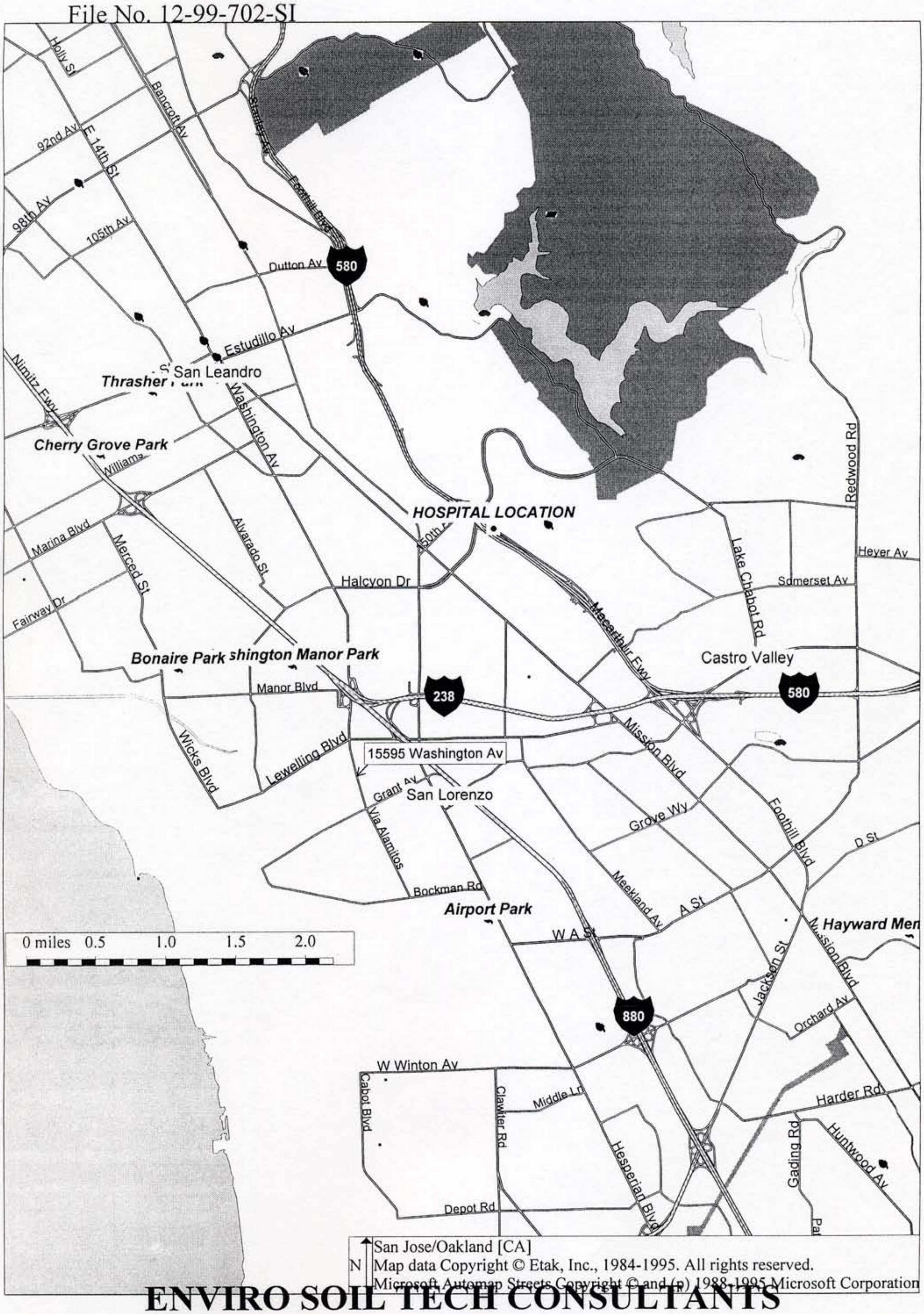
ADDITIONAL CONTINGENCY TELEPHONE NUMBERS:

Poison Control Center.	(800) 523-2222
Enviro Soil Tech Consultants Administrative Office.	(408) 297-1500
CHEMTREC.	(800) 424-9300

NOTE: Only call CHEMTREC stands for Chemical Transportation Emergency Center, a public service of the Chemical Manufacturer's Association. CHEMTREC can usually provide hazard information, warnings and guidance when given identification number or the name of the product and the nature of the problem. CHEMTREC can also contact the appropriate experts.

This Site Safety Plan has been reviewed by the project engineer, *ESTC*'s field personnel and all subcontractors.

Amendments or modifications to this Plan may be written on a separate page and attached to this Plan. Any amendments or modifications must be reviewed and approved by the personnel name above.



San Jose/Oakland [CA]

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File No. 12-99-702-SI

APPENDIX "F"

TYPES OF PROTECTIVE CLOTHING AND RESPIRATION SHOULD BE USED

ENVIRO SOIL TECH CONSULTANTS

TYPES OF PROTECTIVE CLOTHING AND RESPIRATION THAT SHOULD BE USED AT HAZARDOUS WASTE SITES LOCATED AT 15595 WASHINGTON AVENUE SAN LORENZO, CALIFORNIA

The degree of hazard is based on the waste material's physical, chemical, biological properties and anticipated concentrations of the waste. The level of protective clothing and equipment worn must be sufficient to safeguard the individual. A four category system is described below.

LEVEL A:

Level A consists of pressure-demand SCBA (air supplying respirator with back mounted cylinders), fully encapsulated resistant suit, inner and outer chemical resistant steel safety boots (toe, shank and metatarsal protection), and hard hat. Optional equipment might include cooling systems, abrasive resistant gloves, disposable oversuit and boot covers, communication equipment and safety line. Level A is worn when the highest level of respiratory, skin, and eye protection is required. Most samplers will never wear Level A protection.

LEVEL B:

Level B protection is utilized in areas where full respiratory protection is warranted, but a lower level of skin and eye protection is sufficient (only a small area of head and neck is exposed). Level B consists of SCBA, splash suit (one or two piece) or disposable chemical resistant coveralls, inner and outer chemical resistant gloves, chemical resistant safety boots, and hard hat with face shield. Optional items include glove and boot covers and inner chemical resistant fabric coveralls.

LEVEL C:

Level C permits the utilization of air-purifying respirators. Level B body, foot and hand protection is normally maintained. Many organizations will permit only the use of approved full-face masks equipped with a chin or harness-mounted canister. However, many sites are visited by personnel wearing a half-mask cartridge respirator.

LEVEL D:

Level D protection consists of a standard work uniform of coveralls, gloves, safety shoes or boots, hard hat and goggles or safety glasses.

Two basic types of respirators are air-purifying and air-supplying. Air-purifying respirators are designed to remove specific contaminants by means of filters and/or sorbents. Air-purifying respirators come in various sizes, shapes and models, and can be outfitted with a variety of filters, cartridges and canisters. Each mask and cartridge or canister is designed for protection against certain contaminant concentrations. Just because a cartridge says it is for use against organic vapors does not mean that it is good for all organic vapors.

Air-supplying respirators are utilized in oxygen-deficient atmospheres (less than 19.5 percent) or when an air-purifying device is not sufficient. air is supplied to a face-mask from an uncontaminated source of air via and air line from stationary tanks, from a compressor or from air cylinders worn on the back (SCBA). Rated capacities of the

SCBA's are normally between 30 and 60 minutes. Only positive pressure (pressure demand) respirators should be used in high concentration hazardous environments.

Respirators often malfunction during cold weather or after continued use. Only NIOSH (National Institute for Occupational Safety and Health) and MSHA (Mine Safety and Health Administration) approved respirators should be used.

Contact lenses are not permitted for use with an respirator. Contact lenses should not be worn at any site since they tend to concentrate organic materials around the eyes; soft plastic contact lenses can absorb chemicals directly. In addition, rapid removal of contact lenses may be difficult in an emergency. Since eye glasses can prevent a good seal around the temple when wearing goggles or full face masks, spectacle adapters are available for masks and goggles.