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Alameda County Environmental Health

CAL GAS 15595 WASHINGTON AVENUE SAN LORENZO, CA 94580

January 26, 2012

Mr. Mark Detterman ACHCSA 1131 Harbor Bay Parkway, Suite 250 Alameda, California 94502-6577

SUBJECT: ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION WORK PLAN

15595 Washington Avenue, San Lorenzo, CA

Dear Mr. Detterman:

Enclosed, please find a copy of the January 24, 2012 subject Additional Soil and Groundwater Investigation Work Plan prepared by my consultant, Enviro Soil Tech Consultants.

I declare, under penalty of perjury, that the information and/or recommendations contained in this report are true and correct to the best of my knowledge.

Sincerely,

M. Kohamma dian

MEHDI MOHAMMADIAN

File No. 12-99-702-SI

ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION WORK PLAN FOR THE PROPERTY LOCATED AT 15595 WASHINGTON AVENUE SAN LORENZO, CALIFORNIA JANUARY 24, 2012

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

LIST OF FIGURES

FIGURE 1 ... Vicinity Map Showing the Location of Property

FIGURE 2 ... Site Plan Showing Locations of Proposed Geoprobe Borings

LIST OF APPENDICES

- APPENDIX "A" ... Figures 1 and 2
- APPENDIX "B" ... Standard Operation Procedures
- APPENDIX "C" ... Attachment A
- APPENDIX "D" ... Health and Safety Plan
- **APPENDIX "E"** ... Type of Protective Clothing and Respiration Should Be Used
- APPENDIX "F" ... Outline of Drum Handling Procedures

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TABLE OF CONTENTS

PAGE NO.

Letter of Transmittal	1
Introduction	2
Preferential Pathway Survey	3
Borings to Assess Contamination Southwest of Site	3-4
Borings to Assess Groundwater Contamination Near The Post-1990 UST's	4
Borings to Assess Soil and Groundwater Contamination Near the Pre-1986 UST's	4
Installation of Monitor Wells	5
Schedule	5-6

APPENDIX "A"

Figure 1 - Vicinity Map	F1
Figure 2 - Proposed Geoprobe Borings Locations Plan	F2

APPENDIX "B"

Drilling and Soil Sampling Procedure	SOP1-SOP2
Boring Log Sheet	SOP3
Monitoring Well Installation	SOP4-SOP5
Well Details Sheet	SOP6
Well Development	SOP7
Monitoring Well Survey Sheet	SOP8
Groundwater Sampling	SOP9
Field Measurements Sheet	SOP10
Volume of Water in Casing or Hole	SOP11
Chain-of-Custody Sheet	SOP12
Sample Management	SOP13-SOP18

TABLE OF CONTENTS CONT'D	<u>PAGE NO.</u>
APPENDIX "C"	
Attachment A	A1-A4
APPENDIX "D"	
Health and Safety Plan	HSP1-HSP9
APPENDIX "E"	
Types of Protective Clothing and Respiration Should Be Used	TPCR1-TPCR3
APPENDIX "F"	
Outline of Drum Handling Procedures	ODH1-ODH5

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

January 24, 2012

File No. 12-99-702-SI

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

SUBJECT: ADDITIONAL SOIL AND GROUNDWATER INVESTIGATION WORK PLAN FOR THE PROPERTY Located at 15595 Washington Avenue, in

San Lorenzo, California

Dear Mr. Mohammadian:

Attached is the additional soil and groundwater investigation work plan that has been prepared in response to the request of Mr. Mark Detterman with the Alameda County Health Care Services Agency-Environmental Health Department (ACHCSA-EHD) in letter dated November 28, 2011, for the property located at 15595 Washington Avenue in San Lorenzo, California.

If you have any questions or require additional information, please feel free to contact our office at (408) 297-1500 or via email at <u>info@envirosoiltech.com</u>.

C'HAMEDI-FARD

GENERAL MANAGER

VICTOR B. CHERVEN, PH.D. PROFESSIONAL GEOLOGIST #3475

Sincerely,

ENVIRO SOIL TECH CONSULTANTS

LAWRENCE KO C. E. #34928 C 34928

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ADDITIONAL SOIL & WATER INVESTIGATION WORK PLAN FOR CAL GAS PROPERTY AT 15595 WASHINGTON AVENUE SAN LORENZO, CALIFORNIA

INTRODUCTION

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 and has been under environmental investigation since 1986. Mr. Mehdi Mohammadian has owned the property since 1987, and several phases of drilling and sampling have been undertaken to assess the extent of contamination. These led to the submittal of a Site Conceptual Model Report and Corrective Action Plan in August 2007.

The ACHCSA-EHD responded to this submittal in February 2009 and disagreed with several of its findings. Enviro Soil Tech Consultants (ESTC) subsequently submitted further correspondence and continued to monitor the existing groundwater wells semi-annually. Dissolved concentrations have continued to track downward in accordance with predictions made in prior reports, and no further work has been proposed or performed.

In November 2011, ACHCSA-EHD transmitted a request for a new work plan for additional drilling. This plan is intended to address the concerns expressed in the November 2011 letter.

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PREFERENTIAL PATHWAY SURVEY

ESTC has provided information in the past regarding potential receptors and preferential migration pathways for this site, but ACHCSA-EHD has requested additional information, including a door to door survey of unmarked residential wells. These activities will require additional funding from the State UST Cleanup Fund beyond the minimum that was budgeted to this project for fiscal year 2012. Although we intend to comply with this request, ESTC is unable to perform this work until it has been approved for reimbursement by the Fund. We will contact the Fund while this work plan is being reviewed by ACEHD, and are hopeful that funding will be authorized in time for the survey to be performed at approximately the same time as the drilling proposed below.

BORINGS TO ASSESS CONTAMINATION SOUTHWEST OF SITE

Figure 2 shows the locations of five proposed Geoprobe® borings near the intersection of San Lorenzo and Via Enrico Streets, and three borings in the driveway between apartment buildings in that vicinity. The purpose of these borings is to respond to ACEHD's request for data on groundwater concentrations in the vicinity of a groundwater trough that appears in groundwater elevation contour maps of the site.

These borings will be advanced to a depth of 25 feet and sampled continuously in polyethylene liners. Soil samples will be cut from the core at 5-foot intervals or at closer intervals if soil contamination is observed. The samples will be preserved on ice for subsequent transport to the analytical laboratory. Prior to drilling, the depth to groundwater will be measured in the nearest well to aid in predicting the depth at which groundwater will be encountered during drilling. Past experience has shown that a low-permeability layer at approximately 15 feet tends to retard groundwater flow and confine it below that depth, so it is possible that groundwater will not enter the borings until that clay layer has

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been breached. When groundwater is reached, the Geoprobe® rig will be used to collect a water sample, which will be poured into glass vials and preserved on ice for analysis.

BORINGS TO ASSESS GROUNDWATER CONTAMINATION NEAR THE POST-1990 UST's

We propose to drill 2 borings in the vicinity of borings CPT-1 and SB-E to ascertain current groundwater concentrations downgradient of those borings. The proposed borings are located less than 20 feet west (downgradient) of the existing borings and will be drilled and sampled the same way as the previously described off-site borings.

BORINGS TO ASSESS SOIL AND GROUNDWATER CONTAMINATION NEAR THE PRE-1986 UST's

Lastly, four borings will be drilled in a semi-circular pattern around boring GP-4. The main purpose of these is to assess the lateral extent of soil contamination in the vicinity of GP-4 so that a better estimate of the dimensions of an over-excavation could be calculated. These borings will also provide information about the magnitude of groundwater contamination east and south of the pre-1986 UST's. It is important to remember than when GP-4 was drilled in 2006, it had an MTBE concentration of 4,200 µg/L, four times higher than any other boring or well at that time. Using the data from the September/ October 2006 monitoring event, ESTC constructed an MTBE isoconcentration map for which only one interpretation was geologically reasonable: that GP-4 was very near the core of the contaminant plume, and the plume was rather tear-dropped in shape, extending northwestward from GP-4.

INSTALLATION OF MONITOR WELLS

ACHCSA has requested that "multiple" monitoring wells be installed. At this time we cannot predict the number or location of these wells, because this depends on the results from the Geoprobe® borings. We anticipate that one well will be installed near GP-4, but beyond that we cannot speculate on the number of wells that might be needed to monitor groundwater conditions. We intend to discuss potential locations with ACHCSA prior to installing any wells.

When drilled, ESTC will use the Geoprobe rig equipped with hollow-stem augers to drill 8-inch diameter borings. Two-inch diameter PVC casing will be used, and the well completion procedures will conform to those used on the wells that were installed in 2006. This includes well screens from 7 to 22 feet and #2/12 sand from 6 to 22 feet, with 1 foot of bentonite pellets from 5 to 6 feet.

SCHEDULE

The work proposed here is not within the annual budget that was submitted to the UST Cleanup Fund for 2012. Therefore, prior to performing the work, ESTC will contact the Fund to request authorization to increase the budget accordingly so that this work may move forward in a timely matter. When this request is submitted to the Fund, a copy of the letter from ACHCSA requesting this work will be attached so that Fund personnel may be assured that this work has been directed by ACHCSA.

Within 30 days after approval of this work plan, or approval to adjust the budget adjustment from the Fund, whichever comes later, ESTC will mobilize the drilling rig and perform the first phase of fieldwork.

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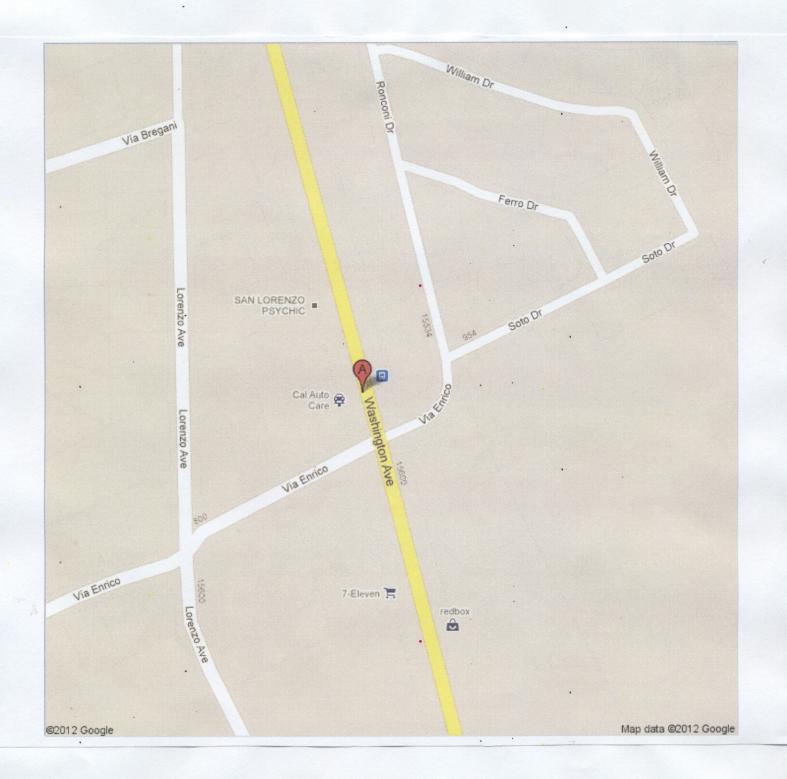
After the laboratory results from the borings have been received, ESTC suggests a meeting in the ACHCSA offices to discuss the next step, including well installation.

When all field and laboratory work has been completed, ESTC will prepare a final report of the investigation.

A P P E N D I X "A"

FIGURES

File No. 12-99-702-SI

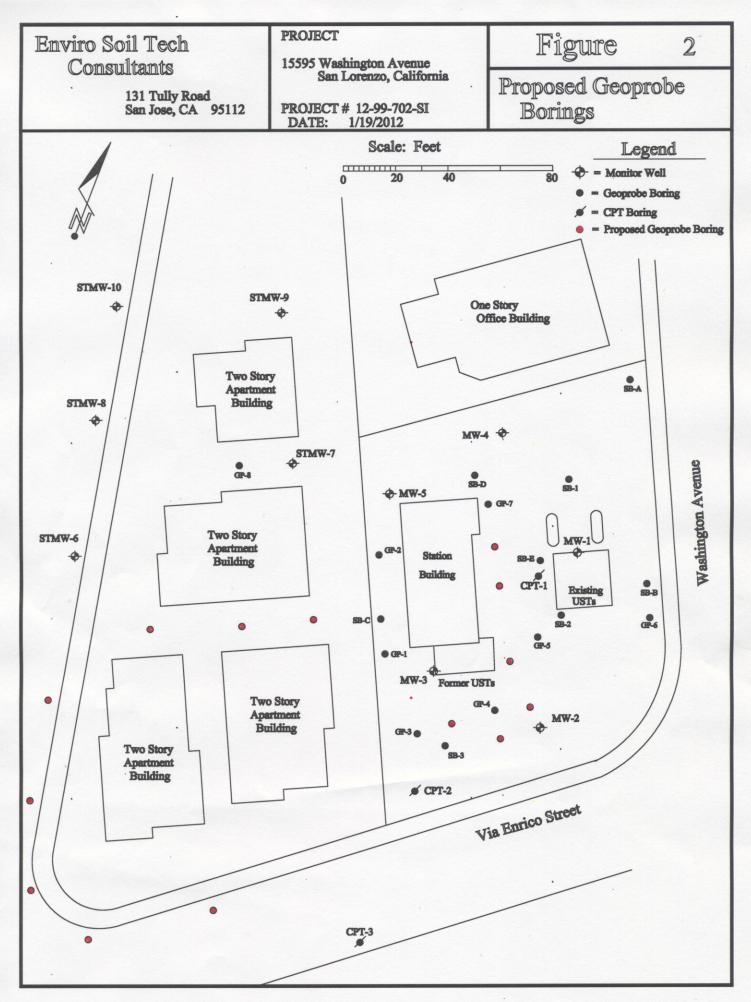


15595 WASHINGTON AVENUE, SAN LORENZO, CA

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Figure 1

F1



A P P E N D I X "B"

STANDARD OPERATION PROCEDURES

DRILLING AND SOIL SAMPLING PROCEDURE

A direct push technology (Geoprobe) tool will be used in drilling the soil borings to the desired depths.

Prior to drilling, all drilling equipment 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 Trisodium 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 sampler lined with polyethylene or brass tubes driven into undisturbed sediments at the bottom of the borehole by means of hydraulic push technologies.

The selected sampling tubes will be immediately trimmed, the ends 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 will 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.

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

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-	Samp Loc.	ole	Depth	Soil Classification	Penetrometer
Quality	inch	Loc.	No.			
		T				1
				-		-
				_1		
				2		-
				3		
				4		
			-			
				5.		
				6		
						-
				7		
				8 -		
				9		
				0 -	-	
						-
				2		
				3-		
		1				
				4		
• • •				_5		-
				6		
				7		1
					•	
				8		
			-	9-		
				_0		
				1-	·····	
				-		
				2		
				-		

MONITORING WELL INSTALLATION

The boreholes for the monitoring wells will be 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.

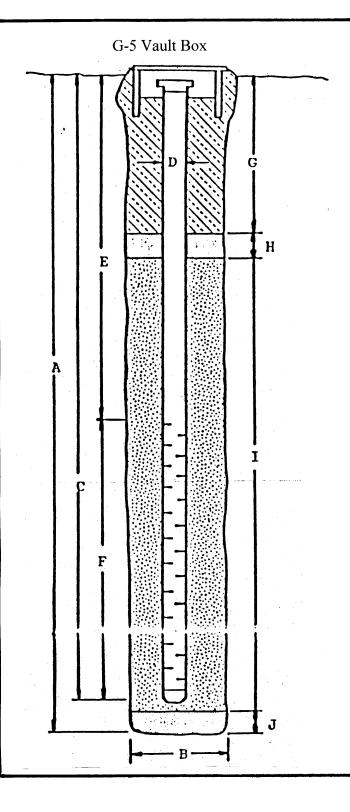
In general, groundwater monitoring wells extend to the base of the upper aquifer, as defined by the consistent (less than 5 feet thick) clay layer below the upper aquifer, or at least 10 to 15 feet below the top of the upper aquifer, whichever is shallower. The wells do not extend through the laterally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

WELL DETAILS

PROJECT NAME:

PROJECT NUMBER:_____

WELL PERMIT NO.:_____



BORING/WELL NO.:_____ CASING ELEVATION: 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: Perforated Type: Perforated Size: G. Surface Seal:_____ Seal Material: H. Seal: Seal Material: I. Gravel Pack: ·Pack Material:_____ Size: J. Bottom Seal: Seal Material:

SOP6

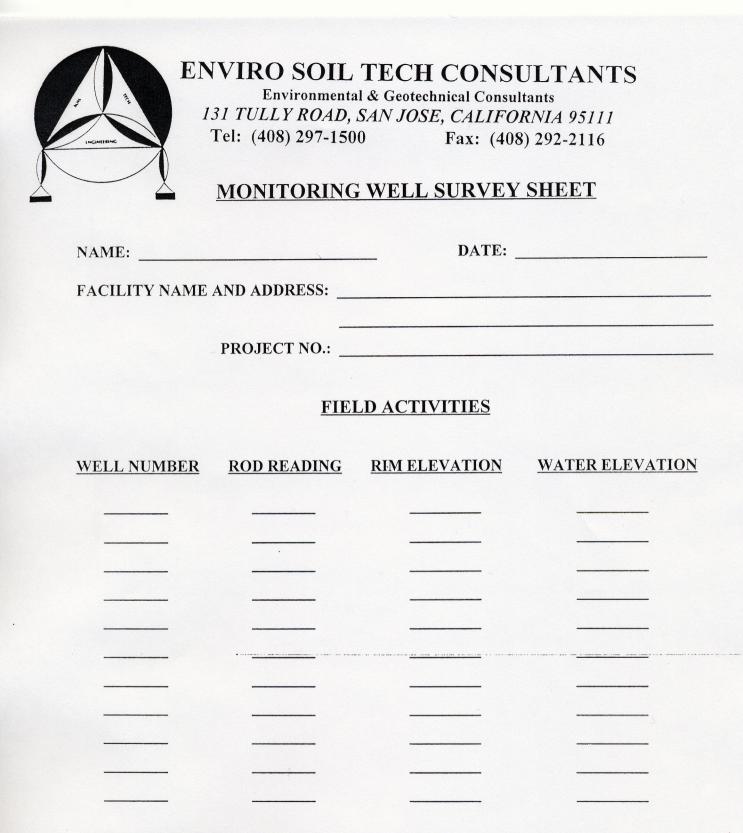
WELL DEVELOPMENT

For all newly installed groundwater monitoring wells, the well casing, filter pack and adjacent formations will be 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 continue until the discharged water appeared to be relatively free of all turbidity.

All water and sediment generated by well development will be collected in 55gallon 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.



WARNING: HAVE YOU SURVEYED <u>ALL</u> 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.

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.

One liter amber glass bottle and forty milliliter (ml.) glass volatile organic vials (VOA) 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 are 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.

			WELL NO.:	
FILE NO.:			SAMPLER:	
DATE: DEPTH TO WELL:			1 WELL VOLUME:	
DEPTH TO WATER:			5 WELL VOLUME:	
HEIGHT OF WATER			ACTUAL PURGED VO	
CASING DIAMETER:	2'	"	4''	
CALCULATIONS:				
2" x 0.1632 4" x 0.653 PURGE METHOD:	BAILER	DISPLAC		OTHER
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD:	BAILER BAILER	DISPLAC OTHER		OTHER
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD:	BAILER BAILER YES, DE	DISPLAC OTHER ESCRIBE:	CEMENT PUMP	
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD: SHEEN:NO	BAILER BAILER YES, DE	DISPLAC OTHER ESCRIBE:	CEMENT PUMP	
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD: SHEEN:NO	BAILER BAILER YES, DE YES, DE	DISPLAC OTHER ESCRIBE:	CEMENT PUMP	
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD: SHEEN:NO	BAILER BAILER YES, DE YES, DE	DISPLAC OTHER ESCRIBE: ESCRIBE:	CEMENT PUMP	
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD: SHEEN:NO ODOR:NO	BAILER BAILER YES, DE YES, DE FIELI	DISPLAC OTHER CSCRIBE: CSCRIBE: D MEASURE	CEMENT PUMP	5
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD: SHEEN:NO ODOR:NO	BAILER BAILER YES, DE YES, DE FIELI	DISPLAC OTHER CSCRIBE: CSCRIBE: D MEASURE	CEMENT PUMP	5
2" x 0.1632 4" x 0.653 PURGE METHOD: SAMPLE METHOD: SHEEN:NO ODOR:NO	BAILER BAILER YES, DE YES, DE FIELI	DISPLAC OTHER CSCRIBE: CSCRIBE: D MEASURE	CEMENT PUMP	5

Diameter of Casing or Hole (inch)	Gallon per Foot of Depth	Cubic Feet per Foot of Depth	Liter per Meter of Depth	Cubic Meter per Meter of Depth
1	0.041	0.0055	0.509	$0.509 \ge 10^{-3}$
11/2	0.092	0.0123	1.142	1.142 x 10 ⁻³
2	0.163	0.0218	2.024	2.024 x 10 ⁻³
21/2	0.255	0.0341	3.167	3.167 x 10 ⁻³
3	0.367	0.0491	4.558	4.558 x 10 ⁻³
31/2	0.500	0.0668	6.209	6.209 x 10 ⁻³
4	0.653	0.0873	8.110	8.113 x 10 ⁻³
41/2	0.826	0.1104	10.26	10.26 x 10 ⁻³
5	1.020	0.1364	12.67	12.67 x 10 ⁻³
51/2	1.234	0.1650	15.33	15.33 x 10 ⁻³
6	1.469	0.1963	18.24	18.24 x 10 ⁻³
7	2.000	0.2673	24.84	24.84 x 10 ⁻³
8	2.611	0.3491	32.43	32.43 x 10 ⁻³
9	3.305	0.4418	41.04	41.04 x 10 ⁻³
10	4.080	0.5454	50.67	50.67 x 10 ⁻³
11	4.937	0.6600	61.31	61.31 x 10 ⁻³
12	5.875	0.7854	72.96	72.96 x 10 ⁻³
14	8.000	1.069	99.35	99.35 x 10 ⁻³
16	10.44	1.396	129.65	129.65 x 10 ⁻³
18	13.22	1.767	164.18	164.18 x 10 ⁻³
20	16.32	2.182	202.68	202.68 x 10 ⁻³
22	19.75	2.640	245.28	245.28 x 10 ⁻³
24	23.50	3.142	291.85	291.85 x 10 ⁻³
26	27.58	3.687	342.52	342.52 x 10 ⁻³
28	32.00	4.276	397.41	397.41 x 10 ⁻³
30	36.72	4.909	456.02	456.02 x 10 ⁻³
32	41.78	5.585	518.87	518.87 x 10 ⁻³
34	47.16	6.305	585.68	585.68 x 10 ⁻³
36	52.88	7.069	656.72	656.72 x 10 ⁻³

VOLUME OF WATER IN CASING OR HOLE

CHAIN OF CUSTODY RECORD

	PROJ	. NO.				NAME			ANA	YSES	REQU	ESTED				
						<u> </u>	CON-									
SAMP	LERS: (Sigana	iture)				TAINER									REMARKS
NO.	DATE	TIME	SOIL	WATER	AIR	LOCATION										
																•
		 			•					ŀ						•
															·	
						· · · · · · · · · · · · · · · · · · ·										
																•
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											-					
	[-		·····	_							· · ·		
Relinqı	l Jished b	l y: (Signo	l ature)	Date/	/Time	Received by: (<i>Signature</i>)	Date/	Time	Relinc	l Juished	by: (<i>Sig</i>	Inature)	Date,	/Time	Received by: (Signature)
Relinq	uished b	y: (Signi	ature)	Dated	/Time	Received by: (Signature)	Date/	Time	Relinc	Juished	by: (<i>Sig</i>	Inature)	Date	/Time	Received by: (<i>Signature</i>)
Relinq	uished b	y: (Sign	ature)	Date,	/Time	Received for Laboratory by: (Signature)	Date/	Time	Rem	arks:		46 A. F. J.		•	-	



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

SOP12

SOP13

SAMPLE MANAGEMENT

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

General Composition	<u>Sample Volume</u>	Sample Container	<u>Preservative</u>	<u>Holding Time</u> (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		
<u> Measurement – General Cher</u>	<u>nical Categories, Inorganic</u>			
Inorganic, general		plastic or glass		
Metals, total		plastic or glass		
<u> Measurement – General Cher</u>	nical Categories, Organic			
Acid extractables		glass with TFE lined cap		
Base/neutral extractables		glass with TEF lined cap		
Measurement Specified Chem	<u>icals – Inorganic</u>			
Hydrofluoric Acid		plastic		
Phosphoric Acid		plastic		

Sample Type: Waste

General Composition	Sample Volume	<u>Sample Container</u>	<u>Preservative</u>	<u>Holding Time</u> (recommended/regulatory)
<u>Measurement – General Chemic</u>	cal Categories, Inorga	unic .		
Ammonia			add 1 ml conc H ₃ PO 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 ₂ SO 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 ₃ L	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

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SOP14

Sample Type: Water and Wastewater

General Composition	<u>Sample Volume</u>	Sample Container	<u>Preservative</u>	<u>Holding Time</u> (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		
<u>Measurement – Specific Chemicals Organic</u>						
NTA	50 ml	plastic or glass waterline & center	cool 4°C	24 hours		
<u> Measurement – Physical Propert</u>	ies					
Acidity			cool 4°C	24 hours		
Alkalinity			cool 4°C	24 hours		
рН			determine on site cool 4°C	6 hours		
<u> Measurement – General Chemical Categories, Inorganic</u>						
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 ₂ PO ₄ to pH 4 & 1 g CuSO ₄ /L, cool 4°C	24 hours		

Sample Type: Water and Wastewater

General Composition	<u>Sample Volume</u>	<u>Sample Container</u>	<u>Preservative</u>	<u>Holding Time</u> (recommended/regulatory)		
<u> Measurement – Specific Chemicals, Inorganic</u>						
Ammonium	50 ml	plastic or glass	cool 4°C, add H ₂ SO 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	¹ / ₂ 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 ₂ SO ₄	24 hours/48 hours		
Nitrate & nitrate	200 ml	plastic or glass	cool 4°C add H ₂ SO ₄	24 hours//28 days		
Nitrate	100	plastic or glass	cool 4°C or freeze			
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SOP16

Sample Type: Water and Wastewater

General Composition	<u>Sample Volume</u>	Sample Container	<u>Preservative</u>	<u>Holding Time</u> (recommended/regulatory)		
<u>Measurement – General Chemical, Organic</u>						
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 ₂ SO 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				

SOP17

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

General Composition	Sample Volume	Sample Container	<u>Preservative</u>	<u>Holding Time</u> (recommended/regulatory)		
Non-Volatile Organic		2 liters glass with TFE with lined cap				
Photosensitive materials		1 liter amber glass				
Volatile Organic		40 ml glass vial with TFE lined cap (collect in duplica	te)			
Volatile	100 ml		cool 4°C	7 days		
<u>Measurement – Physical Properties</u>						
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		
рН	25 ml	plastic or glass	determine on site	2 hours/2 hours		
Temperature	1000 ml	plastic or glass	determine on site	No Holding		
<u> Measurement – General Chemical Categories, Inorganic</u>						
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)		

SOP18

APPENDIX "C"

ATTACHMENT A

ATTACHMENT A STANDARD FIELD PROCEDURES FOR GEOPROBE@ SAMPLING

DECRIPTION:

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:

OBJECTIVE:

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 observation (i.e. concentration, presence of marked horizon, 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 equipped 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.

APPENDIX "D"

HEALTH AND SAFETY PLAN

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 fieldwork. The field activities include drilling, soil sampling and/or water sampling. All personnel and contractors will be required to strictly adhere with 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 that easily accessible to all staff and government field representatives.

HAZARD ASSESSMENT:

The major contaminants expect 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 1EXPOSURE LIMITS OF ANTICIPATED CHEMICAL CONTAMINANTSIN PARTS PER MILLION (ppm)

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

- 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 limits (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 <u>NIOSH Pocket Guide to</u> <u>Chemical Hazards</u> 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, pupil's dilation, 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, that will be used, will be determined by the type of works 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. Field personnel will not be allowed to wear any contact lenses.

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
San Leandro Hospital 13855 East 14 th Street, San Leandro, CA	(510) 667-4545

ADDITIONAL CONTINGENCY TELEPHONE NUMBERS:

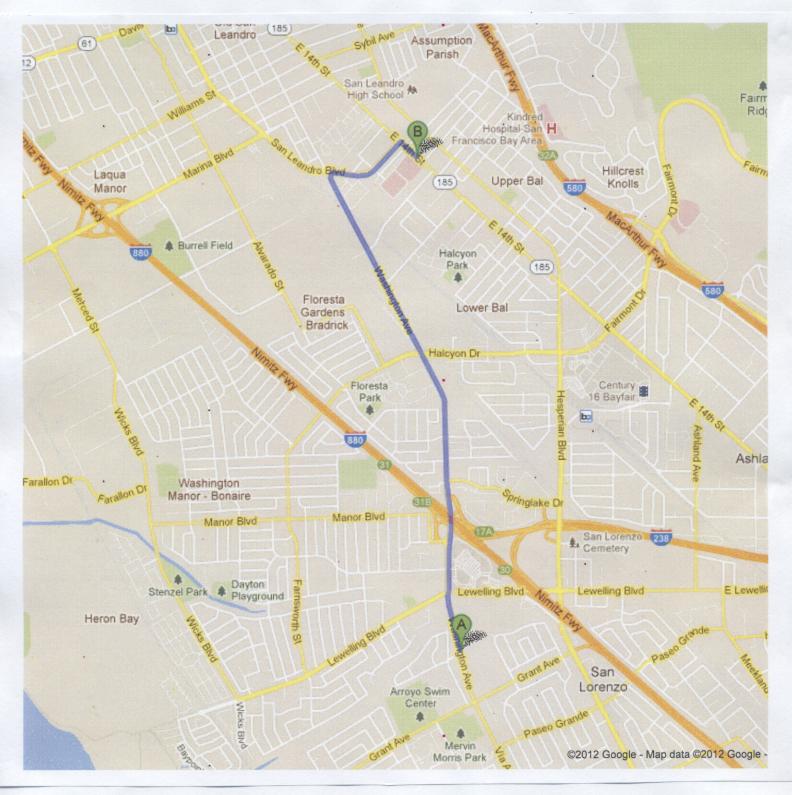
Poison Control Center
Enviro Soil Tech Consultants Administrative Office (408) 297-1500
CHEMTREC

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.

File No. 12-99-702-SI



ROUTE TO NEAREST HOSPITAL FROM SITE POINT A – 15595 WASHINGTON AVE., SAN LORENZO POINT B – 13855 EAST 14TH ST., SAN LEANDRO

ENVIRO SOIL TECH CONSULTANTS

HSP9

A P P E N D I X "E"

TYPES OF PROTECTIVE CLOTHING AND RESPIRATION SHOULD BE USED

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. Four categories 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 hardhat. Optional equipment might include cooling systems, abrasive resistant gloves, disposable over-suit 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

disposal chemical resistant coveralls, inner and outer chemical resistant gloves, chemical resistant safety boots, and hardhat 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, hardhat 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 facemask from an uncontaminated source of air via and airline 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 a 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 eyeglasses can prevent a good seal around the temple when wearing goggles or full-face masks, spectacle adapters are available for masks and goggles.

A P P E N D I X "F"

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 fieldwork.
 - * 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 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.