Re 374

Environmental Management Company
6001 Bollinger Canyon Rd, K2256
P.O. Box 6012
San Ramon, CA 94583-2324
Tel 925-842-1589
Fax 925-842-8370

Karen Streich
Project Manager

ChevronTexaco

September 17, 2004

Mr. Barney Chan
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Investigation Workplan
Cal Gas Service Station, Former Texaco Station # 211285
15595 Washington Avenue, San Leandro, California

Dear Mr. Chan,

Cambria Environmental Technology is sending you the referenced report under separate cover. This letter is to confirm that I have reviewed the referenced report and I agree with the conclusions and recommendations presented. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by Cambria Environmental Technology, Inc., upon whose assistance and advice I have relied.

This letter is submitted pursuant to the requirements of California Water Code Section 13267(b)(1) and the regulating implementation entitled Appendix A pertaining thereto.

I declare under penalty of perjury that the foregoing is true and correct.

Sincerely,

Karen Streich

Karen Streich
Project Manager

Copy to: Scott MacLeod, Cambria

0374

CAMBRIA

September 17, 2004

Mr. Barney Chan
Alameda County Environmental Health
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: **Investigation Workplan**
Cal Gas Service Station
Former Texaco Station # 211285
15595 Washington Avenue
San Leandro, California

Dear Mr. Chan:

Alameda County Environmental Health (ACEH) sent a letter dated August 6, 2004 to the Responsible Parties (RPs) for the site referenced above. Cambria Environmental Technology, Inc. (Cambria) is sending this letter on behalf of Chevron Environmental Management Company (Chevron), on of the RPs.

As you may know, a petition is currently being reviewed by the State Water Resources Control Board (SWRCB) requesting that Chevron, as successor to Texaco, be de-designated as an RP for the site. ACEH has indicated in previous correspondence that the Primary Responsible Party (PRP) for this site is Mr. Mohammadian for the major issue of concern at the site, which is elevated MTBE concentrations detected in groundwater from a recent oxygenated fuels release at the site. The scope of work proposed in this letter is intended to address the questions ACEH raised regarding an investigation performed by Texaco at the site in 1986. We propose that this work be performed in conjunction with the scope of work the PRP will be implementing to address the oxygenated fuels release at the site.

If the SWRCB issues a decision that de-designates Chevron prior to the time that our proposed investigation is performed, we expect that the scope of work described in this workplan will not be necessary.

SITE DESCRIPTION AND BACKGROUND

Site Conditions

The site was operated as an active service station from approximately 1964 through 1983 and from 1986 through to the present. From 1974 to 1983, the site was owned by the Calleris family, who

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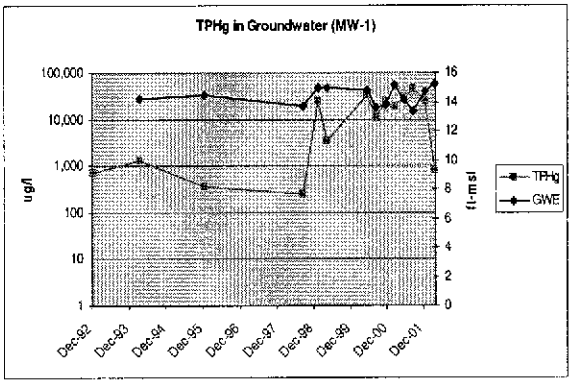
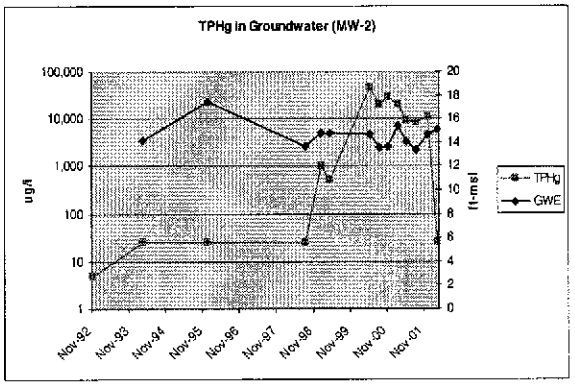
5900 Hollis Street
Suite A
Emeryville, CA 94608
Tel (510) 420-0700
Fax (510) 420-9170

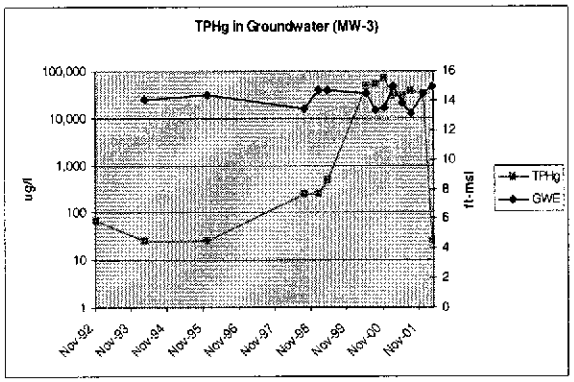
operated a service station. Texaco owned the site from 1983 through 1986, but did not operate the facility and neither stored nor dispensed gasoline during that period.

Texaco proactively conducted a baseline assessment for a property transfer in 1986 to determine site conditions and identify potential environmental liabilities prior to selling the property to Mr. Bertram Kubo. Texaco installed wells MW-1, MW-2 and MW-3 and drilled borings B-1, B-2 and B-3. A figure with boring and well locations is presented in Attachment A.

Because the investigation objectives were to screen the site for hydrocarbon releases to support a property transaction and not for a regulated environmental investigation, samples collected at 5, 10 and 15 ft below grade (fbg) were composited for analysis. No hydrocarbons were detected in soil at detection limits of 10 mg/kg total petroleum hydrocarbons as gasoline (TPHg), 0.5 mg/kg benzene and toluene, and 1.0 mg/kg xylene isomers in the six samples analyzed. Based on these detection limits for a 3-point composite sample, no discrete soil sample that comprised the 3-point composite sample contained more than 30 mg/kg TPHg, 1.5 mg/kg benzene and toluene and 3.0 mg/kg xylene isomers (three times the detection limit).







Groundwater samples were collected from the 3 borings and 3 wells to assess potential impacts to groundwater. No benzene, toluene or xylenes were detected in wells MW-2 and MW-3, or in borings SB-2 and SB-3 at detection limits of 0.05 ug/l. Well MW-1 contained 82 ug/l xylenes and boring SB-1 contained 220 ug/l benzene, 390 ug/l toluene and 680 ug/l xylenes. Based on these analytical results for soil and groundwater and the sample locations, there is no indication of a large hydrocarbon release prior to the 1986 investigation. Analytical data for soil and groundwater from the 1986 investigation are presented in Attachment A.

As indicated in the adjacent figures, there was a release in about 2000 resulting in elevated TPHg concentrations in groundwater. MTBE concentrations were elevated prior to this TPHg concentration spike, indicating the possibility of a vapor-phase MTBE release prior to the

TPHg release. The ACEH named Chevron as a secondary RP for the hydrocarbons present prior to 1986.

Sensitive Receptor Survey

Cambria reviewed the area surrounding the site for potential sensitive land use receptors that could be impacted by hydrocarbon releases at the site. The properties immediately adjacent to the site are primarily commercial and residential as indicated in Attachment B.

Cambria also reviewed Department of Water Resources well logs for wells within a ½ mile radius of the site. Eleven total wells were identified within ½ mile of the site: 1 industrial well, 5 irrigation wells, 1 domestic well, 1 test well, and 3 wells of unknown or "other" use. No municipal or drinking water supply wells were identified. The nearest well is an irrigation well southwest (about 1/16-mile cross and down-gradient) of the site. This well is screened from 56 to 76 feet below grade (Texaco wells MW-1, MW-2 and MW-3 are screened from 5 to 15 feet below grade). The domestic well is over ¼ mile southeast (cross and up-gradient of the site). Because of the large distance to this well, it is not likely to be impacted by the hydrocarbons detected during Texaco's 1986 assessment. Well survey data are presented in Attachment B.

San Lorenzo Creek is about 1/8 mile northwest of the site and flows west-southwestward. Due to the distance, it is unlikely that the low concentrations detected in the source area at the Texaco station in 1986 could impact the creek.

Based on the sensitive receptor survey data, no sensitive receptors were identified that would have been adversely impacted by hydrocarbons originating from the pre-1986 release.

Site Hydrogeology

The subsurface soil conditions were described in reports documenting site investigations completed in 1986, 1998, and 2000. Based on boring logs presented in these reports, the water-bearing zone beneath the site is comprised of predominately clay and silty clay from depths of approximately 8 to 20 fbg, the total depth explored.

Groundwater occurs in these fine-grained soils at depths ranging from approximately 8 to 10 fbg. Groundwater generally flows westward at an average gradient of 0.007 ft/ft. Based on the westerly flow of groundwater, no potential receptors have been identified downgradient of the site.

In general, the clay and silty clay that comprise the water-bearing zone beneath the site have a relatively low hydraulic conductivity that will act to impede the flow of groundwater and thereby reduce the potential for significant downgradient migration of petroleum hydrocarbons. This is

supported by the limited extent of MTBE from the most recent release(s).[1] The ACEH has indicated that higher permeability sediments may be encountered at greater depths in which MTBE could migrate. This will be addressed in the recommended scope of work presented below.

PROPOSED SCOPE OF WORK

The ACEH previously questioned the validity of the 1986 environmental screening sampling performed on behalf of Texaco for the property transaction, as well as questioning the sample depths. Therefore, we recommend conducting: 1) a similar phase of investigation including borings to collect composite samples from the same depths in the 1986 boring/well locations, and 2) analyzing discrete samples from those same depths to compare to the composite samples. The results of the discrete and composite will also be compared to the composite sampling conducted in 1986. This will allow us to confirm the validity of the original sampling program, as well as better assess the extent of the recent release.

We will drill new borings immediately adjacent to former borings B-1, B-2 and B-3 and wells MW-1, MW-2 and MW-3. The borings will be drilled to depths of 40 ft. This is 30 ft below the average water table and should be sufficient to determine the vertical extent of hydrocarbons in the source area. Specific tasks proposed for this investigation are discussed below.

Site Health and Safety Plan: Cambria will prepare a site safety plan to inform site workers of known hazards and to provide health and safety guidance. The plan will be kept on site at all times and signed by all site workers prior to beginning work.

Underground Utility Location: Cambria will review the as-built site plans and piping diagrams (if they can be provided) to assist in boring placement. We will also contract an underground utility locator to clear the well locations prior to drilling. Cambria will clear all boring locations prior to drilling to 8 fbg using a hand-auger per our safety regulations.

Permits: Cambria will obtain boring permits from the ACHCS prior to beginning field operations. A minimum of 72-hours notice will be given to the ACHCS prior to field work.

Borings: Each boring will be advanced to approximately 40 fbg using a GeoProbe. Cambria's standard field procedure for borings is presented in Attachment C.

Soil Sampling: To confirm the validity of the 1986 investigation, we propose collecting samples at 5, 10 and 15 fbg for both discrete and composite analysis. Because our safety regulations prevent drive samples at depths shallower than 8 fbg, the sample from 5 fbg will be collected from minimally

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[1] *Preliminary Off-site Soil and Groundwater Assessment*, Enviro Soil Tech Consultants, May 15, 2000

disturbed peds within the hand auger bucket using an EnCore® sampler. Deeper samples will be collected by the GeoProbe to 40 fbg. We will log the borings continuously and select samples for analysis at approximately 5 ft intervals and at obvious lithologic changes.

Soil Screening: Soil samples will be screened using a photoionization detector (PID). PID readings, evidence of discoloration, stratigraphic location, depth to groundwater, and the collection depth of previous samples containing hydrocarbons will be used to select soil samples for laboratory analysis. Samples will also be immersed in water to assess the presence of potential non-aqueous-phase liquid hydrocarbons (NAPL).

Chemical Analysis: Select discrete and all composite soil samples will be analyzed for:

- TPHg by EPA Method 8015M, and
- Benzene, toluene, ethylbenzene, and xylenes (BTEX), methyl tertiary butyl ether (MTBE), di-isopropyl ether (DIPE), ethyl tertiary butyl ether (ETBE), tertiary amyl methyl ether (TAME), tertiary butyl alcohol (TBA), 1,2-dichloroethane (1,2-DCA), and ethyl dibromide (EDB) by EPA Method 8260B.

GeoTracker: The analytical data collected during this investigation will be provided to the PRP. Because the PRP will need to survey new wells installed during their upcoming investigation, we will mark the boring locations so the PRP can survey the borings and upload the data into GeoTracker in compliance with AB2886.

Soil and Water Disposal: Soil cuttings will be temporarily stockpiled and covered with plastic or placed in sealed DOT-approved drums on-site. Rinsate water will be stored in drums pending proper disposal. These wastes will be transported to an appropriate Chevron-approved disposal facility following receipt of sample analytical results.

Reporting: Upon completion, Cambria will document all field activities and analytical results in a report which, at a minimum, will contain:

- A brief summary of the site background and history,
- A description of the drilling technique,
- Sampling methodology and well locations,
- Boring logs,
- Tabulated soil sample results,
- A figure illustrating the location of the borings and site features,
- Analytic reports and chain-of-custody forms,
- Soil/water disposal methods,
- A discussion of hydrocarbon distribution at the site, and
- Conclusions and recommendations.

SCHEDULE

Cambria and Chevron have not been provided with the PRP's investigation workplan. Cambria will, however, coordinate its work with the PRP's investigation once the PRP's workplan is submitted. Cambria will drill a few days before or after the PRP's planned investigation date to minimize site disruption. Our investigation report will be submitted 60-90 days after the fieldwork is completed. Investigation results will also be submitted to the PRP for inclusion in their site assessment report.

CLOSING

Cambria will coordinate and perform these activities upon receiving written approval of this work plan from the ACHCS and determining the PRP's investigation schedule. Please contact Scott MacLeod at (510) 420-3301 if you have any questions or comments.

Sincerely,
Cambria Environmental Technology, Inc.

N. Scott MacLeod, R.G,
Principal Geologist

cc: Ms. Karen Streich, Chevron Environmental Management Company, P.O. Box 6012, San Ramon, CA 94583

Attachments: A – 1986 Investigation Results
B – Area Use and Well Survey Results
C – Standard Field Procedures for Soil Borings and Monitoring Well Installations

C:\Documents and Settings\smacleod.CAMBRIA-ENV\Desktop\211285\211285 San Lorenzo\Investigation 2004\Workplan.doc

CAMBRIA

ATTACHMENT A

1986 Investigation Results

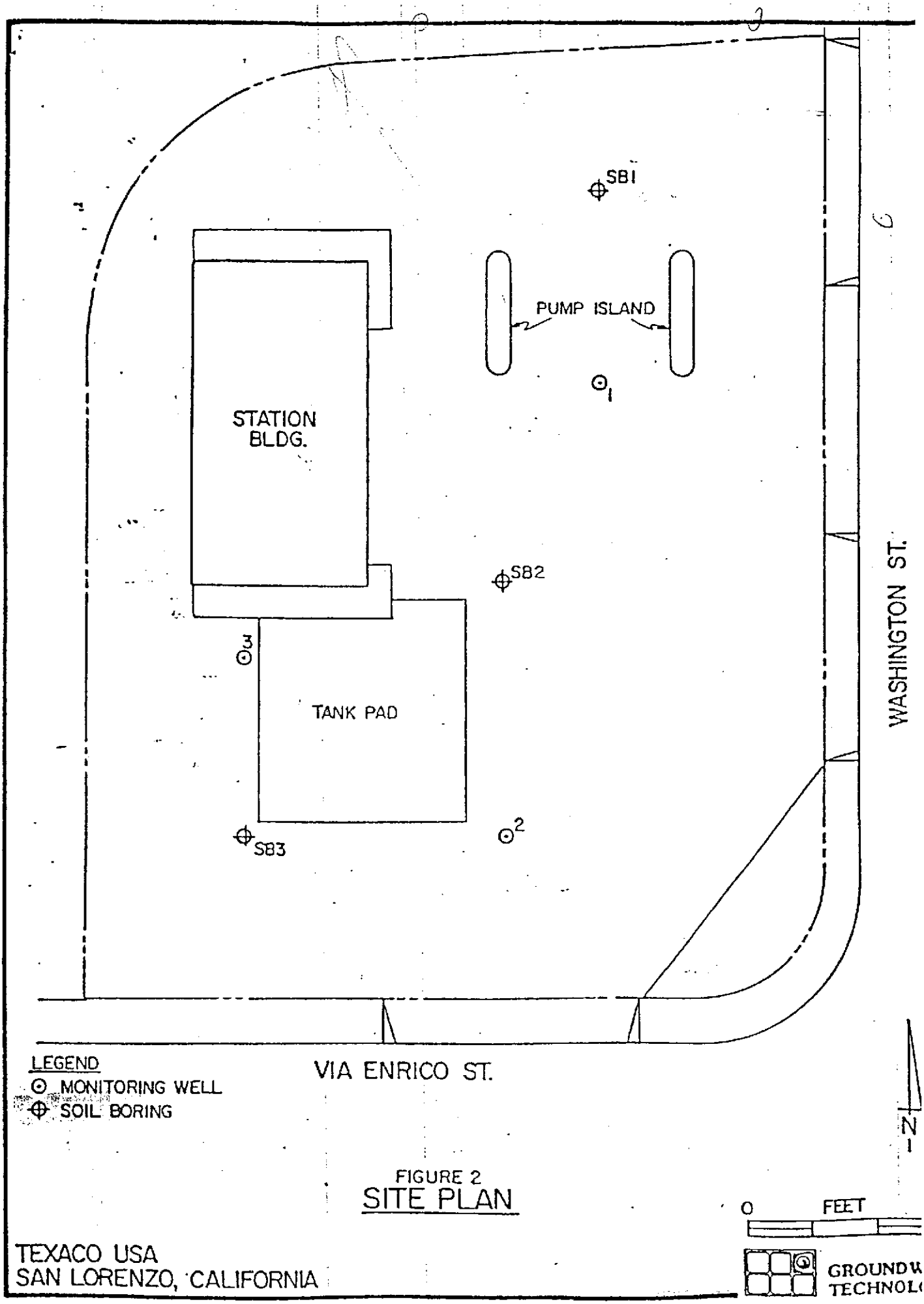

FIGURE 2
SITE PLAN

TEXACO USA
SAN LORENZO, CALIFORNIA

GROUNDW
TECHNOL

BROWN AND CALDWELL

ANALYTICAL LABORATORIES

RECEIVED
AUG 28 1986

LOG NO: E86-08-202

Received: 11 AUG 86
Reported: 28 AUG 86

Ms. Amy Sager
Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: 464

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
08-202-1	MW-1 Composite	08 AUG 86
08-202-2	MW-2 Composite	08 AUG 86
08-202-3	MW-3 Composite	08 AUG 86
08-202-4	SB-1 Composite	08 AUG 86
08-202-5	SB-2 Composite	08 AUG 86

PARAMETER	08-202-1	08-202-2	08-202-3	08-202-4	08-202-5
Lead, mg/kg	12	12	18	14	20
Nitric Acid Digestion, Date	08.18.86	08.18.86	08.18.86	08.18.86	08.18.86
Benzene,Toluene,Xylene Isomers					
Benzene, mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene, mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene Isomers, mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Total Fuel Hydrocarbons, mg/kg	<10	<10	<10	<10	<10

BROWN AND CALDWELL

ANALYTICAL LABORATORIES

LOG NO: E86-08-202

Received: 11 AUG 86
Reported: 28 AUG 86

Ms. Amy Sager
Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: 464

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
08-202-6	SB-3 Composite	08 AUG 86

PARAMETER	08-202-6
Lead, mg/kg	12
Nitric Acid Digestion, Date	08.18.86
Benzene,Toluene,Xylene Isomers	
Benzene, mg/kg	<0.5
Toluene, mg/kg	<0.5
Total Xylene Isomers, mg/kg	<1.0
Total Fuel Hydrocarbons, mg/kg	<10

BROWN AND CALDWELL

ANALYTICAL LABORATORIES

LOG NO: E86-08-202

Received: 11 AUG 86
Reported: 28 AUG 86

Revised 09/17/86

Ms. Amy Sager
Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: Texaco/San Lorenzo

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
08-202-1	MW-1 Composite	08 AUG 86
08-202-2	MW-2 Composite	08 AUG 86
08-202-3	MW-3 Composite	08 AUG 86
08-202-4	SB-1 Composite	08 AUG 86
08-202-5	SB-2 Composite	08 AUG 86

PARAMETER	08-202-1	08-202-2	08-202-3	08-202-4	08-202-5
Lead, mg/kg	12	12	18	14	20
Nitric Acid Digestion, Date	08.18.86	08.18.86	08.18.86	08.18.86	08.18.86
Benzene,Toluene,Xylene Isomers					
Benzene, mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Toluene, mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Total Xylene Isomers, mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0
Total Fuel Hydrocarbons, mg/kg	<10	<10	<10	<10	<10

BROWN AND CALDWELL
ANALYTICAL LABORATORIES

LOG NO: E86-08-202

Received: 11 AUG 86
Reported: 28 AUG 86

Ms. Amy Sager
Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: Texaco/San Lorenzo

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , SOIL SAMPLES	DATE SAMPLED
08-202-6	SB-3 Composite	08 AUG 86

PARAMETER	08-202-6
Lead, mg/kg	12
Nitric Acid Digestion, Date	08.18.86
Benzene,Toluene,Xylene Isomers	
Benzene, mg/kg	<0.5
Toluene, mg/kg	<0.5
Total Xylene Isomers, mg/kg	<1.0
Total Fuel Hydrocarbons, mg/kg	<10

BROWN AND CALDWELL
ANALYTICAL LABORATORIES

LOG NO: E86-08-202

Received: 11 AUG 86
Reported: 28 AUG 86

Ms. Amy Sager
Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: Texaco/San Lorenzo

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , GROUND WATER SAMPLES	DATE SAMPLED
08-202-7	MW-1	08 AUG 86
08-202-8	MW-2	08 AUG 86
08-202-9	MW-3	08 AUG 86
08-202-10	SB-1	08 AUG 86
08-202-11	SB-2	08 AUG 86

PARAMETER	08-202-7 (MW-1)	08-202-8 (MW-2)	08-202-9 (MW-3)	08-202-10 (SB-1)	08-202-11 (SB-2)
Benzene, Toluene, Xylene Isomers					
Benzene, mg/L	<0.05	<0.05	<0.05	0.22 220	<0.05
Toluene, mg/L	<0.05	<0.05	<0.05	0.39 390	<0.05
Total Xylene Isomers, mg/L	0.082 82	<0.05	<0.05	0.68 680	<0.05

PPB measured (1000 fold) MW-1

50ppb detection limit

SB-1

BROWN AND CALDWELL
ANALYTICAL LABORATORIES

LOG NO: E86-08-202

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Reported: 28 AUG 86

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Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: 464

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , GROUND WATER SAMPLES	DATE SAMPLED
08-202-7	MW-1	08 AUG 86
08-202-8	MW-2	08 AUG 86
08-202-9	MW-3	08 AUG 86
08-202-10	SB-1	08 AUG 86
08-202-11	SB-2	08 AUG 86

PARAMETER	08-202-7	08-202-8	08-202-9	08-202-10	08-202-11
Benzene,Toluene,Xylene Isomers					
Benzene, mg/L	<0.05	<0.05	<0.05	0.22	<0.05
Toluene, mg/L	<0.05	<0.05	<0.05	0.39	<0.05
Total Xylene Isomers, mg/L	0.082	<0.05	<0.05	0.68	<0.05

BROWN AND CALDWELL

ANALYTICAL LABORATORIES

LOG NO: E86-08-202

Received: 11 AUG 86
Reported: 28 AUG 86

Ms. Amy Sager
Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: Texaco/San Lorenzo

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , GROUND WATER SAMPLES	DATE SAMPLED
08-202-12	SB-3	08 AUG 86

PARAMETER	08-202-12
Benzene,Toluene,Xylene Isomers	
Benzene, mg/L	<0.05
Toluene, mg/L	<0.05
Total Xylene Isomers, mg/L	<0.05

Robert B Pitkin for

D. A. McLean, Laboratory Director

BROWN AND CALDWELL

ANALYTICAL LABORATORIES

LOG NO: E86-08-202

Received: 11 AUG 86
Reported: 28 AUG 86

Ms. Amy Sager
Groundwater Technology
4080 Pike Lane, Suite D
Concord, California 94520

Purchase Order: 464

REPORT OF ANALYTICAL RESULTS

LOG NO	SAMPLE DESCRIPTION , GROUND WATER SAMPLES	DATE SAMPLED
08-202-12	SB-3	08 AUG 86

PARAMETER	08-202-12
Benzene,Toluene,Xylene Isomers	
Benzene, mg/L	<0.05
Toluene, mg/L	<0.05
Total Xylene Isomers, mg/L	<0.05

Linda Black FOR
D. A. McLean, Laboratory Director

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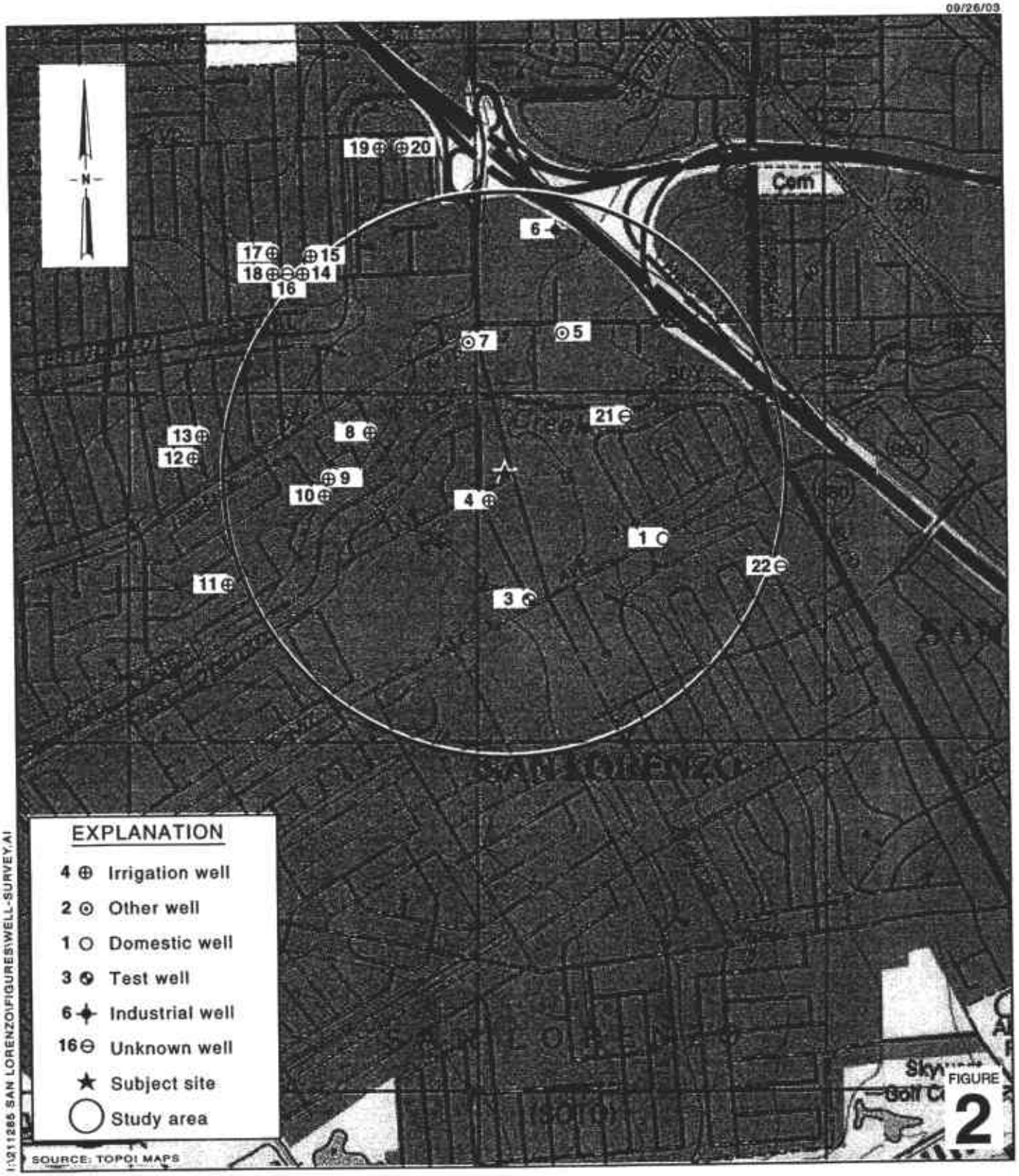
ATTACHMENT B

Area Use and Well Survey Data

09/26/03



I:\211285 SAN LORENZO\FIGURES\WELL-SURVEY.AI

Chevron Service Station 211285

15595 Washington Avenue

San Lorenzo, California

CAMBRIA

Area Well Survey

1/2 Mile Radius

09/29/03

EXPLANATION

SOG Slab on Grade

CS Crawl Space

Residential
SOG

Residential
CS

Residential
CS

Elementary
School
SOG

Business

Apartments
SOG

Church

Vacant
Lot

Site

Business

Vacant
Lot

7-11

Apt.s
SOG

Apt.s
CS

Res.
SOG

Apt.s
SOG

Church

Business

High School

Surrounding Land Use Map

Chevron Service Station
15595 Washington Avenue
San Lorenzo, California

FIGURE
3

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I:\2128\SAN LORENZO\FIGURES\PARCEL MAP.AI

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TABLE 1: 1/2 MILE RADIUS WELL SURVEY - Former Texaco 211285 - 15595 Washington Avenue, San Lorenzo, CA 95840

Table 1. Location ID#	Township	Range	Section	Well ID	Owner	Depth (fbg)	Screen Interval (fbg)	Address (based on information from DWR-188 forms)	Location	Installation Date	Well Use
1	3S	2W	7	7725	Paul R. Frink	29'	10.5' to 30'	754 Grant Street, San Lorenzo, CA	As stated	Jun-77	Dom
2	3S	3W	12	--	Gus and Francis Paretti	100'	52' to 96'	15785 Washington Avenue, San Lorenzo, CA	As stated	Oct-77	O
3	3S	3W	12	--	Arroyo High School	600'	--	15701 Lorenzo Avenue, San Lorenzo, CA	Along Grant Avenue	1955	Test
4	3S	3W	12	--	Frank Perry	76'	56' to 76'	15600 Lorenzo Avenue, San Lorenzo	As stated	Aug-78	Irr
5	3S	2W	7	--	F. J. Goyette Machine Works	71'	32' to 35'; 52' to 60'; 61' to 71'	624 Lewelling Boulevard, San Lorenzo, CA	As stated	Jul-37	O
6	3S	3W	12	1	San Lorenzo Nursery	524'	341' to 354'; 490' to 511'	10500 Washington Avenue, San Lorenzo, CA	As stated	Jun-57	Ind
7	3S	3W	12	--	San Lorenzo Nursery	720'	--	10500 Washington Avenue, San Lorenzo, CA	On Washington Avenue	Oct-47	O
8	3S	3W	12	--	Dewey Roole	30'	15' to 30'	15547 Sedgeman Street, San Lorenzo, CA	As stated	--	Irr
9	3S	3W	12	--	Robert Perino	30'	13' to 30'	15596 Tilden Street, San Leandro, CA	As stated	Mar-77	Irr
10	3S	3W	12	--	Aubrey Elliot	30'	15' to 30'	1018 Kramer Street, San Leandro, CA	As stated	Apr-77	Irr
11	3S	3W	12	577	George and Loretta Bolla	27'	13' to 27'	1335 Sayre Street, San Leandro, CA	As stated	Jun-77	Irr
12	3S	3W	12	--	Ronald Stanley	30'	10' to 30'	15368 Churchill Street, San Leandro, CA	As stated	May-77	Irr
13	3S	3W	12	--	Donald Woolery	22.5'	--	15340 Churchill Street, San Leandro, CA	As stated	Mar-77	Irr
14	3S	3W	12	--	Christ Presbyterian Church	28'	10' to 28'	890 Fargo Avenue, San Leandro, CA	As stated	Jul-77	Irr
15	3S	3W	12	77377	Jan Tisby	20'	10' to 20'	15193 Endicott, San Leandro, CA	As stated	Aug-77	Irr
16	3S	3W	12	--	Richard D. Armstrong	40'	15' to 40'	15177 Norton Street, San Leandro, CA	As stated	Aug-77	--
17	3S	3W	12	77306	Sal Campilongo	30'	10' to 30'	15190 Norton Street, San Leandro, CA	As stated	May-76	Irr
18	3S	3W	12	--	Herman C. Albright	46'	21' to 46'	15185 Norton Street, San Leandro, CA	As stated	Apr-77	Irr
19	3S	3W	12	--	Roy Swatman	28'	10' to 28'	15054 Alexandria Street, San Leandro, CA	As stated	May-77	Irr
20	3S	3W	12	--	Lyle S. Bates	28'	22' to 28'	15028 Grenda Street, San Leandro, CA	As stated	May-77	Irr
21	3S	3W	12	--	A. L. Christensen	358'	275' to 279'; 318' to 323'; 326' to 330'; 348' to 358'	--	--	Mar-40	--
22	3S	2W	11	--	Ratti	124'	57' to 59'; 104' to 112'; 119' to 124'	--	--	Aug-45	--

M = Municipal, Dom = Domestic, P = Public, Irr = Irrigation, Ind = Industrial, O = Other, Test = Test Well
-- = no data available
? = unknown
fbg = feet below grade

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ATTACHMENT C

Standard Field Procedures for Soil Borings

STANDARD FIELD PROCEDURES FOR SOIL BORINGS

This document describes Cambria Environmental Technology's standard field methods for drilling and sampling soil borings. 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 ground water 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 a Certified Engineering Geologist (CEG). 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 product saturation percentage,
- Observed odor and/or discoloration,
- Other significant observations (i.e. cementation, presence of marker horizons, mineralogy), and
- Estimated permeability.

Soil Boring and Sampling

Soil borings are typically drilled using hollow-stem augers or hydraulic push technologies. Prior to drilling, the first 8 ft of the boring are cleared using hand augers, or an air or water knife and vacuum extraction. This minimizes the potential for impacting utilities.

At least one and one half ft of the soil column is collected for every five ft of drilled depth. Additional soil samples are collected near the water table and at lithologic changes. Samples are collected using lined split-barrel or equivalent samplers driven into undisturbed sediments beyond the bottom of the borehole. The vertical location of each soil sample is determined by measuring the distance from the middle of the soil sample tube to the end of the drive rod used to advance the split barrel sampler. All sample depths use the ground surface immediately adjacent to the boring as a datum. The horizontal location of each boring is measured in the field from an onsite permanent reference using a measuring wheel or tape measure.

Drilling and sampling equipment is steam-cleaned 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 of excess soil and capped with Teflon tape and plastic end caps. Soil samples are labeled and stored at or below 4oC 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

One of the remaining tubes is partially emptied leaving about one-third of the soil in the tube. The tube is capped with plastic end caps and set aside to allow hydrocarbons to volatilize from the soil. After ten to fifteen minutes, a portable photoionization detector (PID) measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. PID measurements are used along with the field observations, odors, stratigraphy and ground water depth to select soil samples for analysis.

Water Sampling

Water samples, if they are collected from the boring, are either collected using a driven Hydropunch type sampler or are collected from the open borehole using bailers. The ground water 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 4oC, and transported under chain-of-custody to the laboratory.

Duplicates and Blanks

Blind duplicate water samples are collected usually collected only for monitoring well sampling programs, at a rate of one blind sample for every 10 wells sampled. 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 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.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite on top of and covered by plastic sheeting. At least four individual soil samples are collected from the stockpiles for later compositing at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Ground water removed during sampling and/or rinsate generated during decontamination procedures are stored onsite in sealed 55 gallon drums. Each drum is labeled with the drum number, date of generation, suspected contents, generator identification and consultant contact. Disposal of the water is based on the analytic results for the well samples. The water is either pumped out using a vacuum truck for transport to a licensed waste treatment/disposal facility or the individual drums are picked up and transported to the waste facility where the drum contents are removed and appropriately disposed.

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