RO358

TEXACO REFINING AND MARKETING INC.
100 CUTTING BOULEVARD
RICHMOND CA 94804

February 23, 1989

Ms. Jan Lamer
Alameda County Environmental
Health Department
Hazardous Materials Division
80 Swan Way
Room 200
Oakland, CA 94621

Dear Ms. Lamer:

Enclosed is a completed "Underground Storage Tank Unauthorized Release" form for our former Texaco service station at 2225 Telegraph Avenue, Oakland, California.

As part of our service station exchange with Exxon, we installed 4 observation wells which detected some dissolved hydrocarbons in 2 of these wells.

We have authorized Harding Lawson & Associates to proceed in defining extent of contaminations and preparation of a remedial action plan.

If you have any problems, call me at (415) 236-1770.

Very truly yours,

R.R. ZIELINSKI
Field Environmental
Supervisor

RRZ:cz

Enclosure

cc: Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, CA 94520

RR

A Report Prepared for

Texaco Refining and Marketing, Inc.
10 Universal City Plaza
Universal City, California 91608

SUBSURFACE INVESTIGATION
TEXACO STATION NO. 62488000195
2225 TELEGRAPH AVENUE
OAKLAND, CALIFORNIA

HLA Job No. 2251,052.04

by

James Ordons
Project Geologist

Stephen J. Osborne
Civil Engineer

REGISTERED PROFESSIONAL ENGINEER
STEPHEN J. OSBORNE
No. 656
Exp. 03/31/91
GEOTECHNICAL
STATE OF CALIFORNIA

Harding Lawson Associates
666 Howard Street
San Francisco, California 94105
415/543-8422

July 20, 1988

INTRODUCTION

This report presents the results of the subsurface investigation performed by Harding Lawson Associates (HLA) at Texaco Service Station No. 62488000195, located at 2225 Telegraph Avenue, Oakland, California (see Plate 1). The work was verbally authorized by Mr. Robert Robles, Environmental Conservation Coordinator for Texaco Refining and Marketing, Inc. Our scope of services was provided by Texaco Refining and Marketing, Inc., and it included the following tasks:

1. Obtain utility clearances and well permits
2. Install, develop, and sample three monitoring wells
3. Survey wells and measure water levels
4. Calculate the direction of ground-water flow; if required, install a fourth well at the downgradient property corner
5. Analyze one ground-water sample from each monitoring well for benzene, ethylbenzene, toluene, and xylenes (BETX)
6. Document the results of our investigation in a report.

FIELD INVESTIGATION

Drilling and Sampling

HLA explored subsurface conditions at the site by drilling and sampling four soil borings on June 15 and July 6, 1988. Their locations are shown on Plate 2. The borings were advanced using truck-mounted, 6- and 8-inch-diameter flight auger drilling equipment. They were sampled using a Standard Penetration Test split-barrel sampler. An HLA field geologist directed the drilling and logged the borings. The boring logs are presented on Plates 3 through 6, and the soils have been described in accordance with the Unified Soil Classification System shown on Plate 7. The logs include the blow

counts obtained during sampling; the blow counts have been converted to standard penetration blow counts (N-values).*

The soil samples were screened in the field with a photoionization detector (PID). The PID readings were used to indicate relative concentrations of volatile organic compounds in the soil; they are presented on the logs. No soil samples were retained for chemical testing.

All drill cuttings were placed in Department of Transportation (DOT)-approved drums for subsequent disposal by Texaco Refining and Marketing, Inc. Sampling equipment was washed with a trisodium phosphate (TSP) solution and rinsed with clean water between samples. All drilling equipment was steam-cleaned before and after each boring.

Monitoring Well Installation

We installed a monitoring well in each boring under a permit issued by the Alameda County Flood Control District. The wells were constructed of steam-cleaned, 2-inch-diameter, Schedule 40 PVC casing, as shown on the well construction details, Plates 3 through 6. The annular space between the casing and the borehole wall was filled with No. 3 Monterey sand to approximately 2 feet above the top of the screened casing. A 1- to 2.5-foot-thick bentonite seal was placed above the sand pack, and the remainder of the annulus was filled with a cement/bentonite grout to just below the ground surface. The top of each well was placed slightly below the ground surface. The wells were equipped with locking watertight caps to prevent the inflow of surface water, and a watertight locking traffic box, set slightly above the surrounding grade, was

* Standard penetration N-values are defined as the number of blows of a 140-pound hammer falling 30 inches required to advance a standard sampler (2 inches O.D. and 1.5 inches I.D.) the final 12 inches of an 18-inch drive. The standard hammer driving mechanism utilizes a cathead-drum and rope and pulley system.

installed over each well. Monitoring Wells MW-6A, MW-6B, MW-6C, and MW-6D were completed to depths of 19.5, 19, 19.5, and 19.5 feet below grade, respectively. MW-6D was placed immediately downgradient of the underground tanks; the ground-water gradient was based on the ground-water elevations taken on June 24, 1988.

developed/ sampled in same day!

Well Development and Sampling

On June 24, 1988, Monitoring Wells MW-6A, MW-6B, and MW-6C were developed, sampled, and surveyed by an HLA technician. The sample container from MW-6A was broken during transport to the laboratory; another sample was collected on June 28, 1988. MW-6D was developed, sampled, and surveyed on July 11, 1988. Prior to and after development, a clear lucite bailer was lowered into the well to check for free product. Each well was developed by bailing 10 to 14 well casing volumes with a stainless-steel bailer. The temperature, pH, and conductivity of the purged water were monitored during the development of the well. Purged water was placed in DOT-approved drums for subsequent disposal by Texaco Refining and Marketing, Inc.

Ground-water samples were collected from each well using a clean stainless-steel bailer. The ground-water samples were decanted from the bailer into laboratory-prepared, 40-milliliter volatile organic analysis (VOA) vials. The sample vials were immediately sealed, labeled, and placed in a cooler with ice until delivery to ChemWest Analytical Laboratories, Inc., in Sacramento, California, for chemical testing. All sampling equipment was washed with a TSP solution and rinsed in clean water and distilled water between sampling of each well.

Appropriate quality assurance and quality control (QA/QC) measures were employed during the field investigation. HLA maintains an internal QA/QC program that includes provisions for avoiding cross-contamination during site investigation and

procedures for decontamination, sample handling and preservation, and chain-of-custody.

Well Surveying

The top of each well casing was surveyed to a temporary datum located at the western end of the dispenser island nearest West Grand Avenue with an assumed elevation of 100 feet (HLA datum, Plate 2). Well monitoring and survey data are presented in Table 1.

Table 1. Well Monitoring and Survey Data

Well No.	Top of Casing Elevation* (feet)	Depth to** Ground Water (feet)	Ground-Water Surface Elevation (feet)	Comments
MW-6A	98.99	13.25	85.74	No petroleum odors were noticed in the ground-water samples from Wells 6A, 6B, or 6C.
MW-6B	98.81	12.86	85.95	
MW-6C	99.89	14.21	85.68	
MW-6D	98.72	13.48	85.24	1/40 inch of floating product was noticed in MW-6D.

* HLA datum.
** On July 11, 1988.

RESULTS AND CONCLUSIONS

Surface and Subsurface Conditions

The site is relatively flat and paved with 4 inches of asphaltic concrete and 4 inches of aggregate baserock. Discontinuous layers of sand and clay of both estuarine and continental origins, with an aggregate thickness of as much as 21.5 feet, were encountered. Petroleum odors were noticed in the soil samples from MW-6C and MW-6D. The strongest odors were noticed in the samples from MW-6D taken between depths of 12.5 and 15.5 feet below the ground surface.

Ground Water

The depth to ground water across the site ranges from 13 to 14.5 feet below the ground surface. The calculated ground-water flow is to the southwest, as shown on Plate 2. The ground-water gradient of the upper aquifer is 0.002 feet per foot, based on the information in Table 1.

Chemical Analysis

Ground-water samples from each well were analyzed for BETX using EPA Method 602, and the reportable concentrations are summarized in Table 2. The laboratory reports are presented in the Appendix. The drinking water action levels* (DWAL) for benzene, ethylbenzene, toluene, and xylenes are 0.7, 680, 100, and 620 parts per billion (ppb), respectively. As indicated, the concentrations measured in the samples from MW-6A and MW-6B are below the DWALs. The concentrations measured in the sample from MW-6C exceed the DWAL for benzene and xylenes. The sample from MW-6D exceeds the DWAL for benzene.

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* Drinking water action levels were recommended by the State Department of Health Services in their letter dated October 1987.

Table 2. Results of Ground-Water Analyses (concentrations in micrograms per liter [µg/l])

Well No.	Benzene	Ethyl-benzene	Toluene	Xylenes
MW-6A	ND (0.5)	ND (2)	ND (1)	ND (1)
MW-6B	ND (0.5)	ND (2)	ND (1)	5.0
MW-6C	7400	170	7.1	2300
MW-6D	220	ND (20)	27	ND (10)
DWAL	0.7	680	100	620

ND = Nondetectable.
Detection limits are given in parentheses.

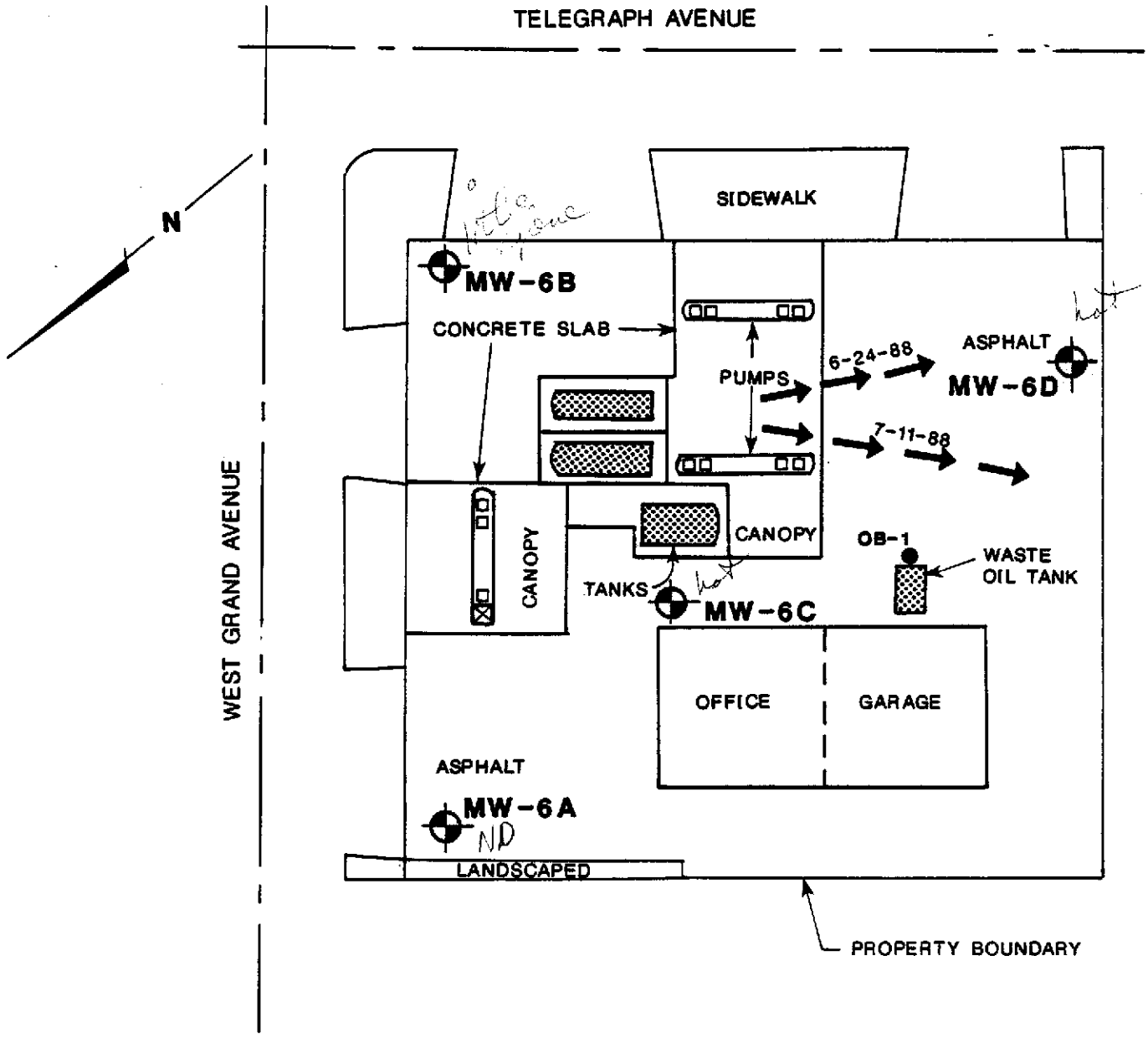
Harding Lawson Associates
Engineers and Geoscientists

Vicinity Map

Texaco Station -62488000195
2225 Telegraph Avenue
Oakland, California

PLATE **1**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2251.052.04	MO	5/88		



EXPLANATION

MW-6A — Monitoring Well Location and Number

OB-1 — Observation Well Location and Number

Ground-water Flow Direction

Bench Mark (HLA Datum El. = 100 feet)

0 30
Scale in feet

Harding Lawson Associates
Engineers and Geoscientists

Site Plan

Texaco Station-62488000195
2225 Telegraph Avenue
Oakland, California

PLATE 2

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
AG	2251,052.04	JO	5/88		

Equipment 8-inch Hollow Stem Auger

Elevation 99.4 feet*** Date 6/15/88

Laboratory Tests	Blows/foot **	PID * Reading (ppm)	Depth (ft)	Sample
		1	0	asphaltic concrete pavement; aggregate baserock; GRAY SILTY CLAY WITH SAND (CH) stiff, moist
	21	1	5	GRAY SILTY SAND TRACE CLAY (SM) dense, moist
	14	<1	10	Top screen; BROWN SILTY CLAY (CL) stif, moist
				▽ BROWN SAND (SP) very dense, saturated
	20/5"	<1	15	
				GRAYISH BROWN CLAYEY SAND (SC) medium dense, saturated
				BLUISH GRAY SILTY CLAY (CH) very stiff, moist
	11	<1	20	
				bottom of boring 21.5 feet
				boring cleaned out to 20 feet
			25	stabilized water level at 13.5 feet on 7/11/88
			30	
			35	
			40	

*PID = photo ionization detector, HNU PI 101
ppm = parts per million

**S&H Sampler blow counts converted to SPT blow counts

***Reference Elevation (arbitrary datum)

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Log of Boring MW-4A

Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE 3

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
RS	2251,052.04	JO	7/88		

Equipment 8-inch Hollow Stem Auger

Elevation 99.2 feet*** Date 6/15/88

Laboratory Tests	Blows/foot	PID* Reading (ppm)	Depth (ft)	Sample
			0	
				asphaltic concrete pavement
				aggregate baserock
				BROWN [redacted] (SP) medium dense, moist
	12	<1	5	
				Top screen
	4	1	10	becomes wet
				BROWNISH GRAY SILTY CLAY WITH SAND (CL) soft, very moist, very slight petroleum odor
				BROWN SILTY CLAY (CL) medium stiff, moist, with lenses of clayey sand
	8	<1	15	
				sand (SP) layer
	9	<1	20	
				bottom of boring 21.5 feet
				boring cleaned out to 20 feet
			25	stabilized water level at 13 feet on 7/11/88
			30	
			35	
			40	

*PID = photo ionization detector, HNU PI 101
ppm = parts per million

**Reference Elevation (arbitrary datum)

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Log of Boring MW-6S

Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE 4

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
RS	2251,052.04	JD	7/88		

Equipment 8-inch Hollow Stem Auger

Elevation 100.2 feet*** Date 6/15/88

Laboratory Tests	Blows/foot	PID * Reading (ppm)	Depth (ft)	Sample
			0	
		2		
		<1		
	35	1	5	
			10	
	28	25		
			15	
	48	60		
			20	
	30	10		
			25	
			30	
			35	
			40	

asphaltic concrete pavement
aggregate baserock

GRAYISH BROWN SILTY CLAY WITH SAND (CL)
very moist, with slight petroleum odor

stained gray between 2 and 2-1/2 feet, with petroleum odor

becomes brown

GRAY MOTTLED BROWN SANDY CLAY (CL)
very stiff, moist, very slight petroleum odor

BROWN SILTY CLAY TRACE SAND (CL)
very stiff, moist, very slight petroleum odor

GRAY CLAYEY SAND (SC)
dense,

GRAY SILTY SAND (SM)
dense, moist

GRAYISH BROWN SILTY CLAY (CL)
hard, moist

bottom of boring 21.5 feet

boring cleaned out to 20 feet

stabilized water level at 14.5 feet on 7/11/88

*PID = photo ionization detector, HNU PI 101
ppm = parts per million

**Reference Elevation (arbitrary datum)

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Log of Boring MW-8C
Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

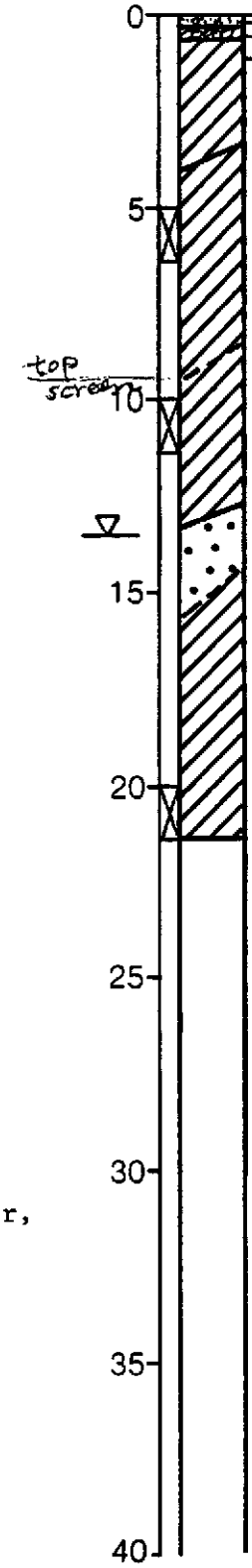
PLATE 5

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
RS	2251.052.04		7/88		

Equipment 6-inch Flight Auger

Elevation 99 feet** Date 7/6/88

Laboratory Tests	Blows/foot	PID * Reading (ppm)	Depth (ft)	Sample
			0	
	22	<1	5	
	14	5	10	
	--	70	15	
	12	3	20	
			25	
			30	
			35	
			40	



asphaltic concrete pavement
aggregate baserock
YELLOW BROWN CLAY (CL)
stiff, moist

LIGHT BROWN CLAY TRACE SAND (CL)
very stiff, moist

GRAYISH BROWN CLAY TRACE SAND (CL)
very stiff, moist

strong petroleum odors between
12.5 and 15.5 feet

SAND (SP)
dense, saturated

GRAYISH BROWN SILTY CLAY (CL)
WITH SAND
very stiff, moist
no petroleum odors

bottom of boring 20 feet

stabilized water level at
13.5 feet on 7/11/88

*PID = photo ionization detector, HNU PI 101

**Reference Elevation (arbitrary datum)

Harding Lawson Associates
Engineers, Geologists & Geophysicists

Log of Boring MW-6D
Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE 6

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
RS	2251,052.04	JO	7/88		

6196

MAJOR DIVISIONS					TYPICAL NAMES
COARSE-GRAINED SOILS MORE THAN HALF IS COARSER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
			GP		POORLY GRADED GRAVELS WITH OR WITHOUT SAND, LITTLE OR NO FINES
		GRAVELS WITH OVER 12% FINES	GM		SILTY GRAVELS, SILTY GRAVELS WITH SAND
			GC		CLAYEY GRAVELS, CLAYEY GRAVELS WITH SAND
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
			SP		POORLY GRADED SANDS WITH OR WITHOUT GRAVEL, LITTLE OR NO FINES
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS WITH OR WITHOUT GRAVEL
			SC		CLAYEY SANDS WITH OR WITHOUT GRAVEL
FINE-GRAINED SOILS MORE THAN HALF IS FINER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS		ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTS WITH SANDS AND GRAVELS
			CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, CLAYS WITH SANDS AND GRAVELS, LEAN CLAYS
			OL		ORGANIC SILTS OR CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%		MH		INORGANIC SILTS, MICACEOUS OR DIATOMACIOUS, FINE SANDY OR SILTY SOILS, ELASTIC SILTS
			CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH		ORGANIC SILTS OR CLAYS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			Pt		PEAT AND OTHER HIGHLY ORGANIC SOILS

UNIFIED SOIL CLASSIFICATION - ASTM D2487-85

Perm — Permeability
Consol — Consolidation
LL — Liquid Limit (%)
PI — Plastic Index (%)
G_s — Specific Gravity
MA — Particle Size Analysis
■ — "Undisturbed" Sample
⊠ — Bulk or Classification Sample

	Shear Strength (psf)	Confining Pressure	
TxUU (FM) or (S)	3200	(2600)	— Unconsolidated Undrained Triaxial Shear (field moisture or saturated)
TxCU (P)	3200	(2600)	— Consolidated Undrained Triaxial Shear (with or without pore pressure measurement)
TxCD	3200	(2600)	— Consolidated Drained Triaxial Shear
SSCU (P)	3200	(2600)	— Simple Shear Consolidated Undrained (with or without pore pressure measurement)
SSCD	3200	(2600)	— Simple Shear Consolidated Drained
DSCD	2700	(2000)	— Consolidated Drained Direct Shear
UC	470		— Unconfined Compression
LVS	700		— Laboratory Vane Shear

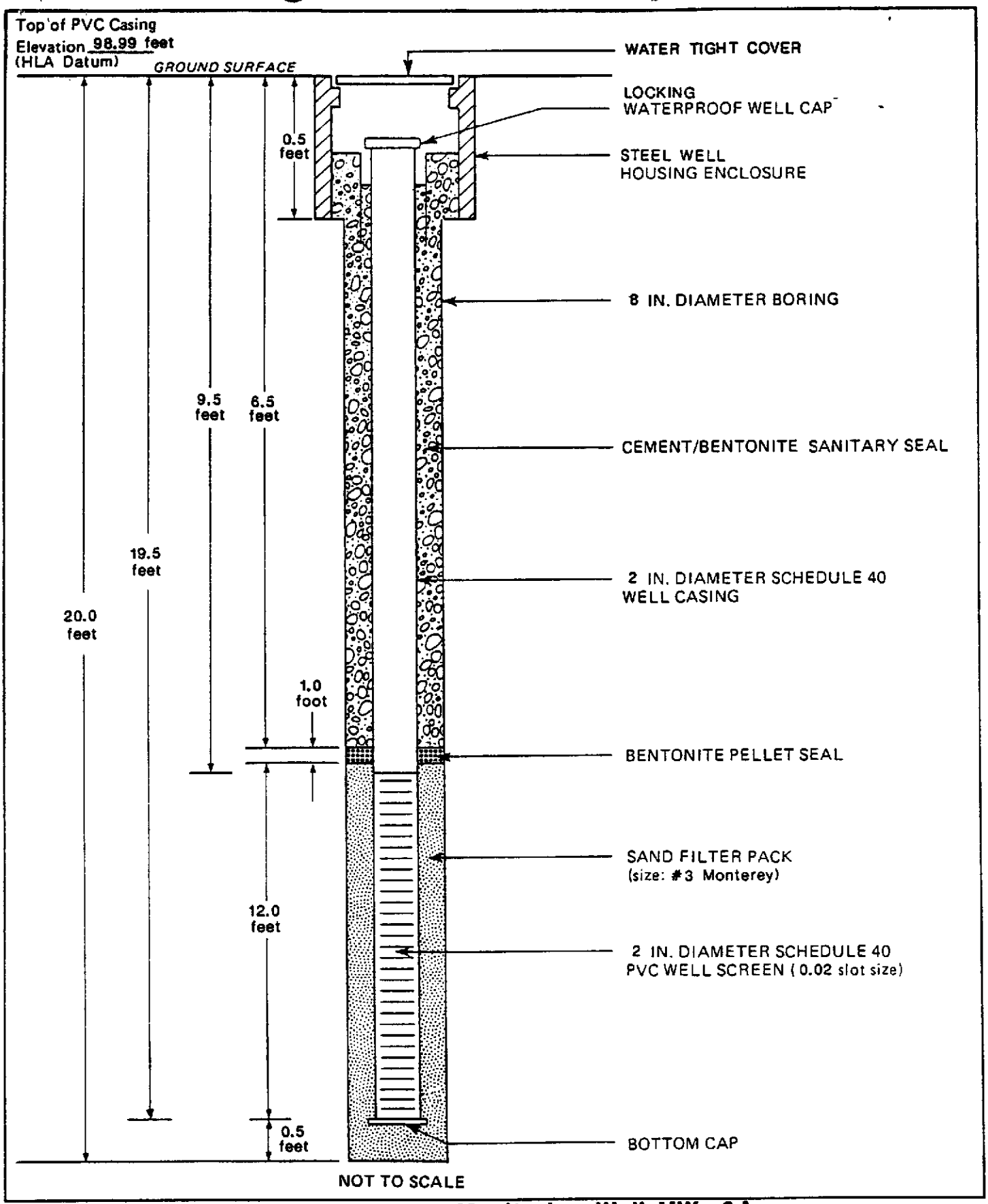
KEY TO TEST DATA

Harding Lawson Associates
Engineers and Geoscientists

Soil Classification Chart and Key to Test Data
Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE **7**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2251,052.04	[illegible]	7/88		



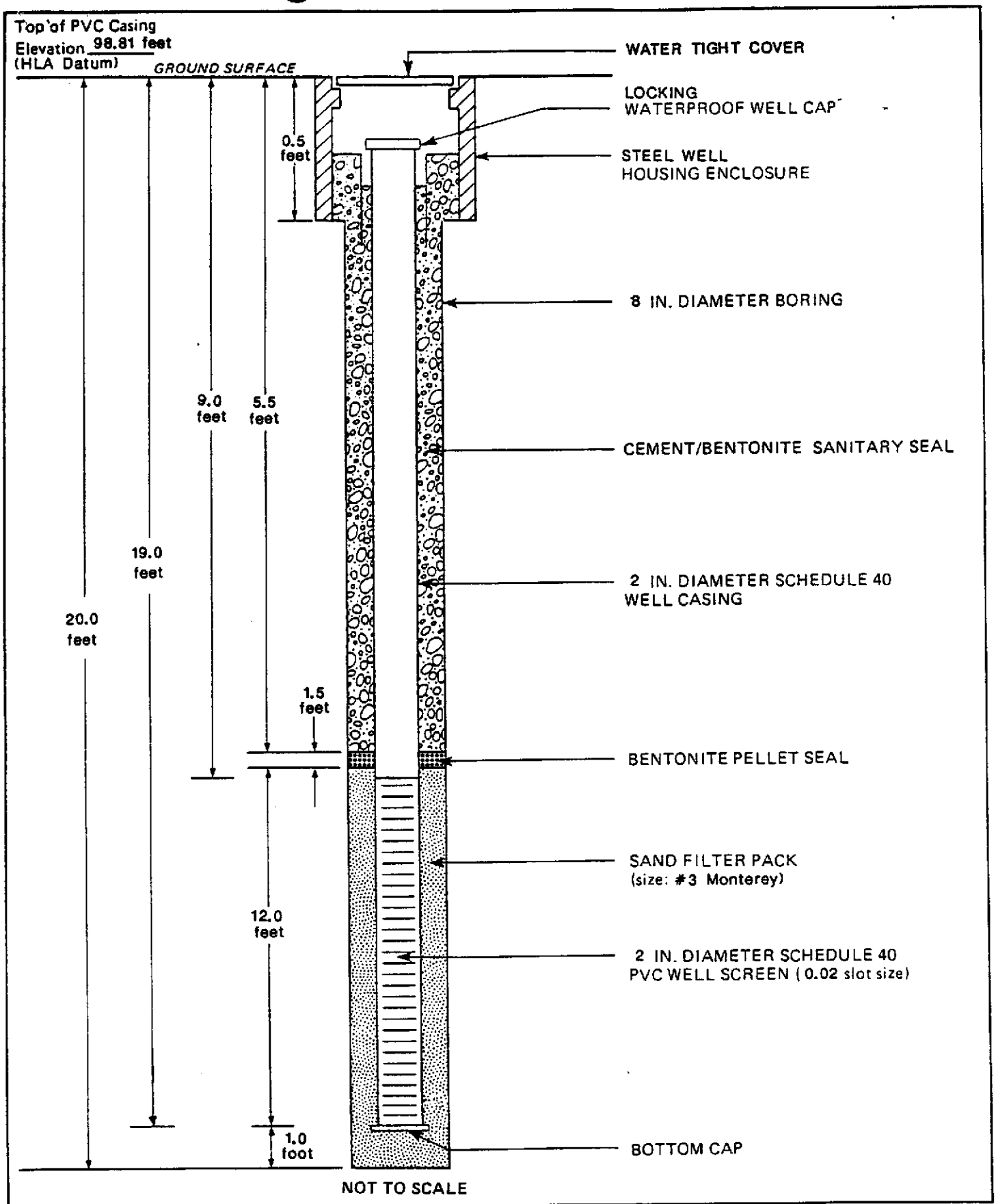
Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Monitoring Well MW-6A Completion Detail

Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE
8

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2251.052.04	JO	7/88		



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

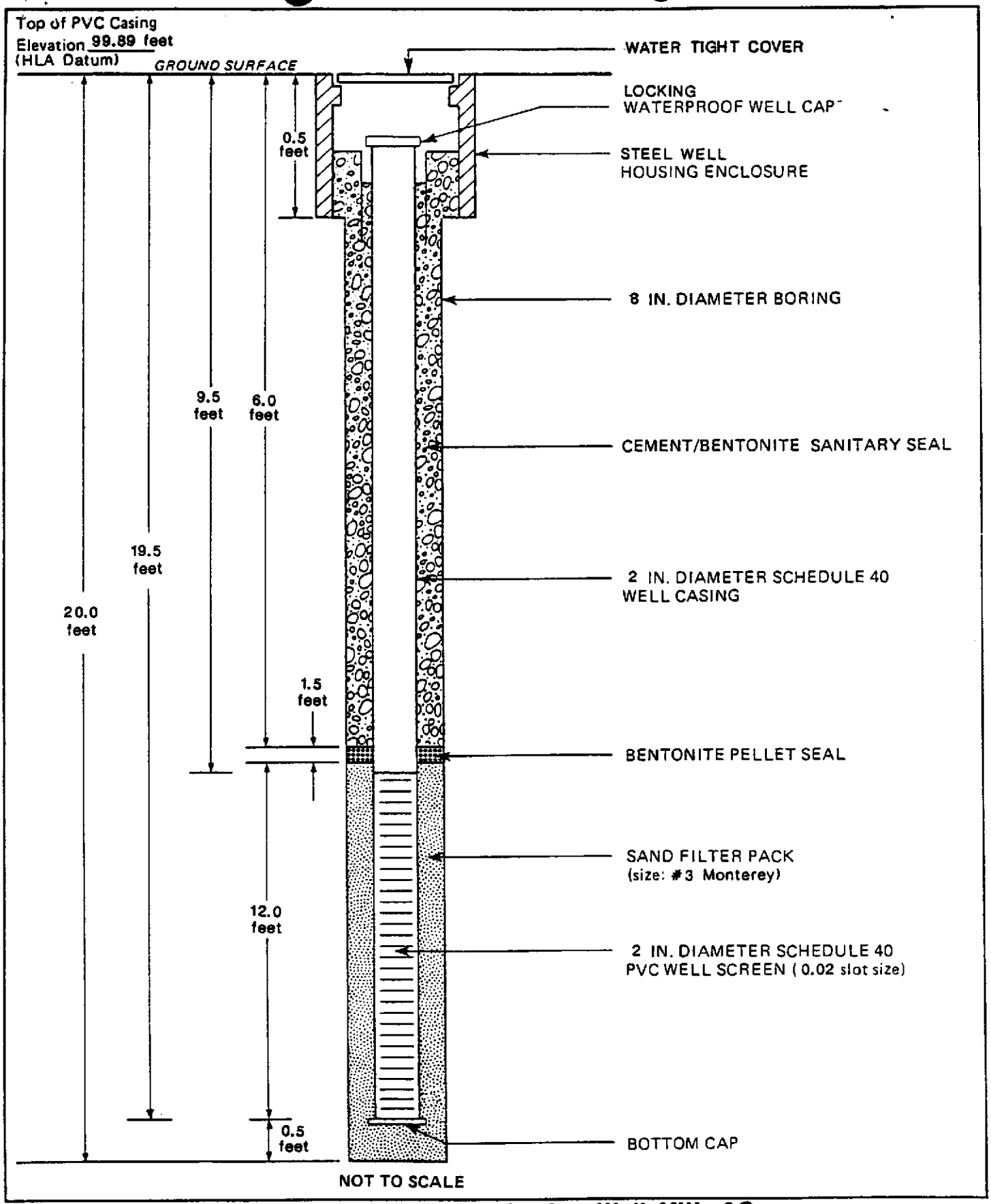
Monitoring Well MW-6B Completion Detail

Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE **9**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2251,052.04	40	7/88		

FORM GW2



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

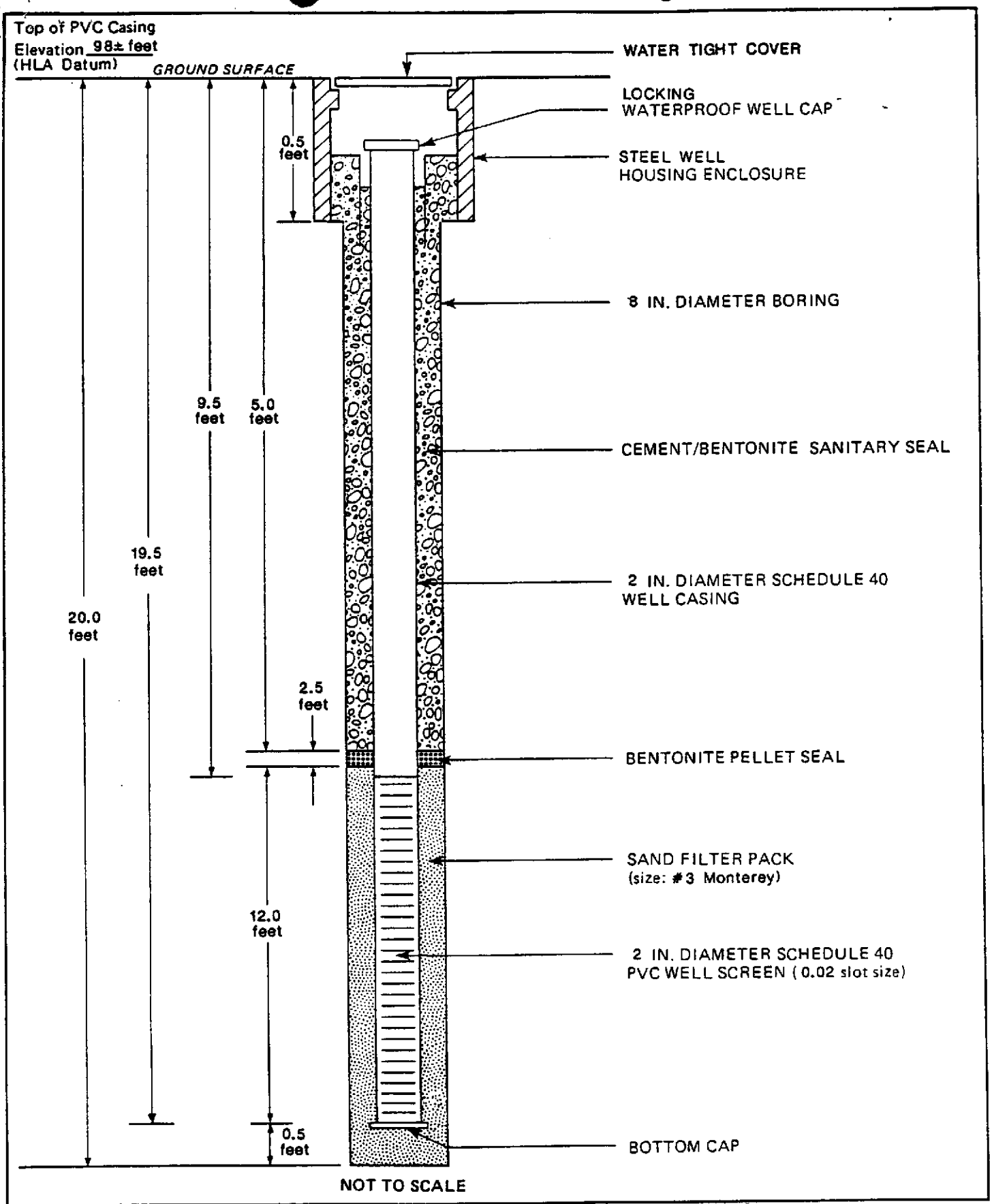
Monitoring Well MW-6C Completion Detail

Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE **10**

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2251,052.04	JO	7/88		

FORM GW3



Harding Lawson Associates
Engineers, Geologists
& Geophysicists

Monitoring Well MW-6D Completion Detail

Texaco Station - 62488000195
2225 Telegraph Avenue
Oakland, California

PLATE
11

DRAWN	JOB NUMBER	APPROVED	DATE	REVISED	DATE
	2251,052.04	40	7/88		

FORM GW3

CHEMWEST
ANALYTICAL LABORATORIES, INC.

July 11, 1988

Harding & Lawson Associates
1355 Willow Way, Suite 109
Concord, CA 94520

Attention: Greg Fasiano

Subject: Report of Data - Case Number 1838

Dear Mr. Fasiano:

The technical staff at CHEMWEST is pleased to provide our report for the analysis you requested: BTEX - EPA Method 602.

One water samples for Project Texaco SL 6, Project Number 225105204, was received July 1, 1988 in good condition. Results of the analysis, along with the analytical methodology and appropriate reporting limits, are presented on the following pages.

Thank you for choosing CHEMWEST Laboratories. Should you have questions concerning this data report or the analytical methods employed, please do not hesitate to contact either Margie Namba, our Sales Representative or your Project Manager. We hope that you will consider CHEMWEST Laboratories for your future analytical support and service requirements.

Sincerely,

Jill B. Henes, Ph. D.
Vice President of Technical Services

and

Joel Bird
Project Manager

JB:mc

cc: File

ANALYTICAL METHODOLOGY

BTEX (Benzene, Toluene, Ethyl Benzene, and Xylenes) by Purge & Trap and GC-PID

WATER - Method 602 or 8020

A 5 ml sample volume, or 5 ml of a suitable dilution, is purged on a suitable purge and trap system with helium. The purged sample is analyzed on a Gas Chromatograph equipped with a Photoionization Detector (PID). A packed column is used to separate the compounds.

SOIL - Method 8020

A 10 gram, or other appropriate aliquot of soil, is weighed into a clean VOA vial. Soils received in brass core tubes are sampled by discarding 2-5 centimeters of soil from each end of the tubes (this is done to reduce the possibility of analyzing a portion of soil that has been exposed to sampling technique contamination). Equal aliquots of soil are then removed from each end of the tube and combined in the VOA vial. Soil in jars or bags is aliquoted using a similar technique, which discards exposed sample surfaces. A 10 ml, or other appropriate volume of methanol, is added to the soil and the soil is shaken with the solvent. 100 ul of the extract, or a reduced aliquot or volume of a suitable dilution, is injected into 5 ml of laboratory blank water and analyzed by the same technique used for water samples.

CHEMWEST ANALYTICAL LABORATORIES
BENZENE, TOLUENE, ETHYL BENZENE, XYLENES

Client I.D.: 6-A
Date(s) Analyzed: 7/07/88
thru : 7/08/88

CHEMWEST I.D.: 1838
Matrix : Water

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	1
Ethyl Benzene	BRL	2
Total-Xylenes (1)	BRL	1

Surrogate	% Recovery	Acceptance Window
ortho-Chlorotoluene	150%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.

Approved by: _____

REV2:1.88

CHEM WEST ANALYTICAL LABORATORIES,INC.
600 West North Market Blvd.
Sacramento, California 95834
(916) 923-0840 FAX (916) 923-1938

Order No. 1838
Date Rec'd. 7/1/98 @ 1740
Compl. Date
Section Joel Bird

CLIENT: Harding Lawson Associates
1355 Willow Way
Suite 109
Concord, CA 94520

Project Name: Texaco SL 6
Project No. 225105204
P.O. NO.
Contact Giez Fasiano/Steve Osborne
Phone (415) 687-9660

ANALYSIS:
One (1) water sample received under chain of custody in 40ml vials (2), duplicated, to be analyzed for BTEX

Sample ID	Time	Loc.	Date	Analysis	Matrix	Container
1838-6-A	1030	MW-1	SL6	6/28/98	BTEX	Water	2-40ml VOA vials

*NOTE: SEVEN (7) DAY TURN AROUND TIME

GC
MT - Martina Travis

CHEMNEST
Courier

Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, California 94520
415/687-9660
Telecopy: 415/687-9673

CHAIN OF CUSTODY FORM

Lab: Chem West

Samplers: Pamela Lassiter

b Number: 2251 052 04

ıme/Location: Travis AFB 6

oject Manager: Greg Forman

Recorder: _____ (Signature Required)

CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	4°C		SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES	ANALYSIS REQUESTED: EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pltnt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.
3	X							2		6	A		8	8	0	6	2	3	1	0	3	0	7 Day Turn-around							

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME: 7/6/88 1510
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME: 7/6/88 1740
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME: 7/6 1740

METHOD OF SHIPMENT CHEMWEST COURIER

Laboratory Copy Project Office Copy Field or Office Copy

6533

CHEMWEST
ANALYTICAL LABORATORIES, INC.

July 19, 1988

Harding & Lawson
1355 Willow Way, Suite 109
Concord, CA 94520

Attention: Mr. Steve Osborne

Subject: Report of Data - Case Number 1899

Dear Mr. Osborne:

The technical staff at CHEMWEST is pleased to provide our report for the analysis you requested: BTEX - EPA Method 602.

One water sample for Project Texaco - Station #6, Project Name 2251,052.04 was received June 12, 1988 in good condition. Results of the analysis, along with the analytical methodology and appropriate reporting limits, are presented on the following page(s).

Thank you for choosing CHEMWEST Laboratories. Should you have questions concerning this data report or the analytical methods employed, please do not hesitate to contact Margie Namba, our sales representative or your project manager. We hope that you will consider CHEMWEST Laboratories for your future analytical support and service requirements.

Sincerely,

Jill B. Henes, Ph.D.
Vice President of Technical Services

and

Joel Bird
Project Manager

JB:rth

cc: File

600W North Market Boulevard • Sacramento, CA 95834 • Phone (916) 923-0840 • FAX (916) 923-1938

ANALYTICAL METHODOLOGY

BTEX (Benzene, Toluene, Ethyl Benzene, and Xylenes) by Purge & Trap and GC-PID

WATER - Method 602 or 8020

A 5 ml sample volume, or 5 ml of a suitable dilution, is purged on a suitable purge and trap system with helium. The purged sample is analyzed on a Gas Chromatograph equipped with a Photoionization Detector (PID). A packed column is used to separate the compounds.

SOIL - Method 8020

A 10 gram, or other appropriate aliquot of soil, is weighed into a clean VOA vial. Soils received in brass core tubes are sampled by discarding 2-5 centimeters of soil from each end of the tubes (this is done to reduce the possibility of analyzing a portion of soil that has been exposed to sampling technique contamination). Equal aliquots of soil are then removed from each end of the tube and combined in the VOA vial. Soil in jars or bags is aliquoted using a similar technique, which discards exposed sample surfaces. A 10 ml, or other appropriate volume of methanol, is added to the soil and the soil is shaken with the solvent. 100 ul of the extract, or a reduced aliquot or volume of a suitable dilution, is injected into 5 ml of laboratory blank water and analyzed by the same technique used for water samples.

CHEMWEST ANALYTICAL LABORATORIES
BENZENE, TOLUENE, ETHYL BENZENE, XYLENES

Client I.D.:TEX-006-D-1 & 2 CHEMWEST I.D.: 1899-1
Date(s) Analyzed: 07/13/88 Matrix : Water

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	220	5.0
Toluene	27	10
Ethyl Benzene	BRL	20
Total-Xylenes (1)	BRL	10

Surrogate	% Recovery	Acceptance Window
ortho-Chlorotoluene	*	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.
*: Matrix interference.

Approved by: 

REV2:1.88

CHEM WEST ANALYTICAL LABORATORIES,INC.
600 West North Market Blvd.
Sacramento, California 95834
(916) 923-0840 FAX (916) 923-1938

CLIENT

Order No. 1899
Date Rec'd. 7/12/88 1745
Compl. Date
Section Joel Bird

CLIENT: Harding Lawson Assoc.
1355 Willow Way Suite 109
Concord, CA 94520

Project Name: Texaco - Station #6
Project No. 2251,052.04
P.O. NO.
Contact Steve Ozbane
Phone (415) 687-9600

ANALYSIS: One water sample rec'd under chain of custody in 40ml VOA vials (2) to be analyzed for BTEX (7 day Turnaround)

Sample Id	Date	Time	Matrix	Container
1899 Texaco-D1-2	7/11/88	1300	water	2-40ml VOAs

GC
M.T. MICHELLE TOLIVER

Chemist Courier

Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, California 94520
415/687-9660
Telecopy: 415/687-9673

CHAIN OF CUSTODY FORM

Lab: CHEMWEST

Samplers: David R. Hoar

Job Number: 2251, 052.04

Name/Location: TEXACO - STATION #6

Project Manager:

Recorder: David R. Hoar (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	VOA	HCL	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
29	X							X	X	TEX	00	6D1	88	07	11	1300	7 day Turnaround
23	X							X	X	TEX	00	6D2	88	07	11	1306	

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pllmt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.
					X	
					X	

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
David R. Hoar	Thomas L. Lutt	7/12/88 14:
RELINQUISHED BY: (Signature) Thomas L. Lutt	RECEIVED BY: (Signature)	DATE/TIME 7/12/88 17
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature) Michelle Olivier	DATE/TIME 7/12 17:
METHOD OF SHIPMENT		

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Appendix

LABORATORY ANALYSIS REPORTS

CHEMWEST
ANALYTICAL LABORATORIES, INC.

July 6, 1988

Harding Lawson
1355 Willow Way, Suite 109
Concord, CA 94520

Attention: Mr. Greg Fasiano

Subject: Report of Data - Case Number 1802

Dear Mr. Fasiano:

The technical staff at CHEMWEST is pleased to provide our report for the analysis you requested: BTEX - EPA Method 602.

Two water samples for Project number 2251-052-03 were received June 27, 1988 in good condition. Results of the analysis along with the analytical methodology and appropriate reporting limits are presented on the following page(s).

Thank you for choosing CHEMWEST Laboratories. Should you have questions concerning this data report or the analytical methods employed, please do not hesitate to contact Margie Namba, our sales representative or your project manager. We hope that you will consider CHEMWEST Laboratories for your future analytical support and service requirements.

Sincerely,

Jill B. Henes, Ph.D.
Vice President of Technical Services

and

Joel Bird
Project Manager

JB:ds

cc: Joel Bird, President

File

600W North Market Boulevard • Sacramento, CA 95834 • Phone (916) 923-0840 • FAX (916) 923-1938

A Subsidiary of CompuChem Corporation

ANALYTICAL METHODOLOGY

BTEX (Benzene, Toluene, Ethyl Benzene, and Xylenes) by Purge & Trap and GC-PID

WATER - Method 602 or 8020

A 5 ml sample volume, or 5 ml of a suitable dilution, is purged on a suitable purge and trap system with helium. The purged sample is analyzed on a Gas Chromatograph equipped with a Photoionization Detector (PID). A packed column is used to separate the compounds.

SOIL - Method 8020

A 10 gram, or other appropriate aliquot of soil, is weighed into a clean VOA vial. Soils received in brass core tubes are sampled by discarding 2-5 centimeters of soil from each end of the tubes (this is done to reduce the possibility of analyzing a portion of soil that has been exposed to sampling technique contamination). Equal aliquots of soil are then removed from each end of the tube and combined in the VOA vial. Soil in jars or bags is aliquoted using a similar technique, which discards exposed sample surfaces. A 10 ml, or other appropriate volume of methanol, is added to the soil and the soil is shaken with the solvent. 100 ul of the extract, or a reduced aliquot or volume of a suitable dilution, is injected into 5 ml of laboratory blank water and analyzed by the same technique used for water samples.

CHEMWEST ANALYTICAL LABORATORIES
BENZENE, TOLUENE, ETHYL BENZENE, XYLENES

Client I.D.: 6B
Date(s) Analyzed: 07/05/88
thru : 07/05/88

CHEMWEST I.D.: 1802 -1
Matrix : Water

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	BRL	0.5
Toluene	BRL	1
Ethyl Benzene	BRL	2
Total-Xylenes (1)	5.0	1

Surrogate	% Recovery	Acceptance Window
ortho-Chlorotoluene	106%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.

Approved by: KP

REV2:1.88

CHEMWEST ANALYTICAL LABORATORIES
BENZENE, TOLUENE, ETHYL BENZENE, XYLENES

Client I.D.: 6C
Date(s) Analyzed: 07/05/88
thru : 07/05/88

CHEMWEST I.D.: 1802-2
Matrix : Water

Compound	Amount Detected (ug/L)	RL (ug/L)
Benzene	7400	0.5
Toluene	170	1
Ethyl Benzene	7.1	2
Total-Xylenes (1)	2300	1

Surrogate	% Recovery	Acceptance Window
ortho-Chlorotoluene	91%	50-150%

BRL: Below Reporting Limit.
RL: Reporting Limit.

(1): Total of P-, M-, and O- Xylenes.

Approved by: KP

REV2:1.88

CHEM WEST ANALYTICAL LABORATORIES,INC.
600 West North Market Blvd.
Sacramento, California 95834
(916) 923-0840 FAX (916) 923-1938

Order No. 1802
Date Rec'd. 6/27/88@1645
Compl. Date
Section Joel Bird

CLIENT: HARDING LAWSON ASSOCIATES
1355 WILLOW WAY
SUITE 109
CONCORD, CA 94520

Project Name: Texaco SL6
Project No. 225105203
P.O. NO.
Contact GREG Fagiano
Phone (415) 687-9660

ANALYSIS:

Two (2) water samples received under chain of custody in duplicate in 40ml VOA vials (4) to be analyzed for BTEX.

*NOTE: Sample I.D: 6B (1) VOA vial broken upon received and chain of custody does not note analysis.

Sample I.D	Loc.	Time	Date	Analysis	Matrix	Containers
1802-1	6B	MW-2 Site6	1610	6/24/88	BTEX	Water	1-40ml VOA vial
-2	6C	MW-3 Site6	1600	6/24/88	BTEX	Water	2-40ml VOA vial

*NOTE: SEVEN (7) DAY TURN AROUND

GC
MJ - Martina Jesus

CHEMWEST COURIER

Harding Lawson Associates
1355 Willow Way, Suite 109
Concord, California 94520
415/687-9660
Telecopy: 415/687-9673

CHAIN OF CUSTODY FORM

Lab: Chem West

Samplers: Paul Carlter

Job Number: 2251 052 03

Name/Location: Tosco Stn 6

Project Manager: Greg Fasiano

Recorder: _____ (Signature Required)

SOURCE CODE	MATRIX: Water	Sediment	Soil	Oil	#CONTAINERS & PRESERV.: Unpres.	H_2SO_4	HNO_3	HCl	SAMPLE NUMBER OR LAB NUMBER: Yr	Wk	Seq	DATE: Yr	Mo	Dy	Time	STATION DESCRIPTION/ NOTES
23	X							2	6	A		88	06	24	1620	7 Day Turnaround
23	X							2	✓	B					1610	
23	X							2	✓	C					1600	

ANALYSIS REQUESTED

EPA 601/8010	EPA 602/8020	EPA 624/8240	EPA 625/8270	Priority Pllnt. Metals	Benzene/Toluene/Xylene	Total Petrol. Hydrocarb.

LAB NUMBER: Yr	Wk	Seq	DEPTH IN FEET	COL MTD CD	QA CODE	MISCELLANEOUS

CHAIN OF CUSTODY RECORD

RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME 6/27/88 1430
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME 6/27/88 1640
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
RELINQUISHED BY: (Signature)	RECEIVED BY: (Signature)	DATE/TIME
DISPATCHED BY: (Signature) DATE/TIME	RECEIVED FOR LAB BY: (Signature)	DATE/TIME 6/28/88 1645
METHOD OF SHIPMENT		

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