CONESTOGA-ROVERS & ASSOCIATES

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Emeryville, California 94608
Telephone: (510) 420-0700 Fax: (510) 420-9170
www.CRAworld.com

TRANSMITTAL

DATE: March 30, 2011

REFERENCE NO.: 060058

PROJECT NAME: 21-1253 Former Chevron, Livermore
ACEHS RO #189

TO: Mr. Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-65770

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12:03 pm, Apr 04, 2011
Alameda County
Environmental Health

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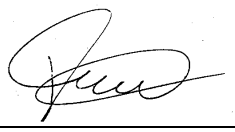
QUANTITY	DESCRIPTION
1	Site Conceptual Model and Work Plan

- ☐ As Requested
- ☐ For Your Use
- ☒ For Review and Comment
- ☐
- ☐

COMMENTS:
Please contact David Grunat of CRA at (510)420-3353 or Tom Bauhs of Chevron at (925)790-6231 with any questions or concerns.

Copy to: Mr. Ken Hilliard, 7-Eleven, Inc
Mr. Kirk Sniff, Strasburger & Price, LLP

Completed by: David Grunat [Please Print]

Signed: 

Chevron

Thomas Bauhs
Project Manager
Marketing Business Unit

Chevron Environmental Management Company
6101 Bollinger Canyon Road
San Ramon, CA 94583
Tel (925) 790-6231

Alameda County Health Care Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577

Re: Former Chevron Service Station No. 21-1253
930 Springtown Road
Livermore, California

I accept the **Site Conceptual Model and Work Plan** dated March 30, 2011.

I agree with the conclusions and recommendations presented in this document. The information included is accurate to the best of my knowledge, and appears to meet local agency and Regional Board guidelines. This **Site Conceptual Model and Work** was prepared by Conestoga Rovers & Associates, 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 to the best of my knowledge.

Sincerely,

Thomas Bauhs
Project Manager

Attachment: Site Conceptual Model and Work

SITE CONCEPTUAL MODEL AND WORK PLAN

FORMER TEXACO SERVICE STATION #21-1253
930 SPRINGTOWN BOULEVARD
LIVERMORE, CALIFORNIA

Fuel Leak Case No. RO 0000189

Prepared For:

Mr. Jerry Wickham
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502

Prepared by:
Conestoga-Rovers & Associates

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MARCH 30, 2011
REF. NO. 060058 (11)
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SITE CONCEPTUAL MODEL AND WORK PLAN

FORMER TEXACO SERVICE STATION #21-1253
930 SPRINGTOWN BOULEVARD
LIVERMORE, CALIFORNIA

Fuel Leak Case No. RO 0000189

David Grunat

Brandon S. Wilken PG #7564

Prepared by:
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MARCH 30, 2011
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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) is submitting this Site Conceptual Model and Work Plan (SCM/WP) for former Texaco Service Station #21-1253 (Figure 1) on behalf of Chevron Environmental Management Company (Chevron). Alameda County Environmental Health (ACEH) requested that a Draft Corrective Action Plan be submitted in a letter dated December 29, 2010. During a meeting on February 10, 2011, ACEH, Chevron, and CRA agreed to submit a SCM/WP for source area delineation. ACEH correspondences are presented in Appendix A. The purpose of this SCM/WP is to characterize current subsurface conditions, identify potential data gaps, and recommend work to address the identified data gaps.

2.0 SITE BACKGROUND

The site is a former Texaco service station located on the south corner of Springtown Boulevard and Lassen Road in Livermore, California (Figure 2). In the summer of 1985, Texaco sold the site to Southland Corporation who removed the USTs, dispenser islands, and product piping and constructed a 7-Eleven convenience store. The site is still occupied by a 7-Eleven convenience store, surrounded by a paved parking area (Figure 2). No fuel is currently dispensed at the site.

After the USTs were removed in 1985, ten monitoring wells, one soil vapor extraction well, one air sparge well, and one groundwater extraction well were installed, six soil borings were advanced, and a soil vapor extraction (SVE) system operated for approximately nine months. In 2002, all wells were destroyed based on ACEH and the San Francisco Bay Region-Regional Water Quality Control Board (RWQCB) concurrence that no further action was required. No remedial action completion certificate was ever issued by the ACEH or RWQCB. In 2007, ACEH required additional investigative work to fill data gaps prior to issuing case closure. Since then, ACEH has required advancing seven cone penetration test (CPT) borings and installing eight new monitoring wells. A summary of environmental investigations and remediation conducted at the site is included as Appendix B.

3.0 SITE CONCEPTUAL MODEL

This SCM was prepared to characterize current subsurface conditions at the site using all available site data, identify potential data gaps, and recommend work to assess the identified data gaps.

3.1 SITE CHARACTERIZATION

3.1.1 SITE GEOLOGY AND HYDROGEOLOGY

Regional subsurface soil is identified as a heterogeneous mixture of alluvial and colluvial silty clays, clayey silts, sandy silts, silty sands, and gravelly sands of Holocene age. These regional sediments have a maximum thickness of approximately 150 feet. The Pliocene-aged Tassajara Formation consists of sandstone, shale and limestone, and forms the bedrock beneath the site.[1] Soil encountered beneath the site consists of clay, silt, and sandy silt to approximately 10 feet below grade (fbg), underlain by silty sand, sand, and gravels to the maximum depth explored of 60 fbg. Boring logs are included in Appendix C.

The site is located in the Mocho II sub-basin of the Main Basin in the Livermore Valley, as defined by the DWR and the Zone 7 Water Agency. The Mocho II sub-basin is defined by the Livermore Fault on the west, thinning Quaternary alluvium on the east, the Livermore Uplands to the south, and the Tassajara Formation to the north. Main Basin groundwater is currently used as a drinking water resource. Depth to groundwater beneath the site is approximately 9.50 to 13 feet below grade, and groundwater flows toward the west.

The nearest surface water bodies are Arroyo Seco and Arroyo Las Positas, which converge approximately one mile west of the site.

3.1.2 HYDROCARBON SOURCE

Based on the distribution of hydrocarbons in soil and groundwater it appears the primary source of hydrocarbons in soil and groundwater is the former gasoline USTs and/or product piping that were removed in 1985. However, concentrations detected near MW-A and the presence of LNAPL in MW-14 could be the result of a secondary source not previously identified. CRA was unable to locate any previous geophysical survey data searching for the presence of orphaned USTs.

[1] California Department of Water Resources (DWR), *California's Groundwater, Bulletin 118,* updated in 2003.

3.1.3 SOURCE REMEDIATION

The USTs, product piping, and dispenser island were removed in 1985. Beginning in 1994, a SVE system operated for approximately one year and was shutdown due to low hydrocarbon removal rates.

In 2009, the Zone 7 water agency excavated to approximately 15 fbg along Springtown Boulevard to install the Altamont water pipeline. Approximately 240 cubic yards of petroleum hydrocarbon-affected soil was removed and disposed of by the Zone 7 water agency.

3.1.4 LNAPL

LNAPL was initially detected during installation of wells MW-A and MW-B in 1984. No LNAPL was detected again until July 2009 at a maximum thickness of 0.31 inch in well MW-14. LNAPL has continued to be observed in well MW-14.

3.1.5 HYDROCARBON DISTRIBUTION IN SOIL

The primary constituents of concern are total petroleum hydrocarbons as gasoline (TPHg) and benzene. The maximum post-remediation TPHg concentration is 6,400 milligrams per kilogram (mg/kg) in MW-15 at 19.5 fbg. The maximum post-remediation benzene concentration is 4.5 mg/kg in MW-15 at 9.5 fbg. No MTBE has been detected in soil and is not a constituent of concern.

Hydrocarbons detected in soil are adequately horizontally delineated in all directions. The highest hydrocarbon concentrations in soil are primarily detected between approximately 5 to 30 fbg and are vertically delineated by borings CPT1, CPT2, and CPT7. Geologic cross sections illustrating the vertical extent of hydrocarbons in soil are presented in Figures 3 through 5. TPHg and benzene soil concentration maps illustrating the horizontal extent are presented on Figures 6 and 7, respectively. Cumulative soil analytical data are summarized on Table 1.

3.1.6 HYDROCARBON DISTRIBUTION IN GROUNDWATER

Because wells screened at different depths have similar groundwater elevations, it appears that there is one hydraulically connected water-bearing zone. The shallow wells

are MW-9, MW-11, and MW-14; the intermediate wells are MW-10, MW-12, MW-13, and MW-16; the only deep well is MW-15. Well construction specifications are presented on Table 2.

The primary constituents of concern are TPHg and benzene. Dissolved hydrocarbon concentrations are detected in the shallow and intermediate wells. No hydrocarbons are detected in deep well MW-15. LNAPL is detected in shallow well MW-14. On January 31, 2011, the highest hydrocarbon concentrations were detected in intermediate well MW-13, which contained 22,000 micrograms per liter (µg/L) TPHg and 1,600 µg/L benzene.

Shallow groundwater is horizontally delineated downgradient of the site by historical well data and CPT grab-groundwater samples. The vertical extent of hydrocarbons is delineated by well MW-15 and historical CPT grab-groundwater samples. Figures 8 through 13 illustrate the horizontal extent of hydrocarbons in groundwater. Cumulative grab-groundwater analytical data and current groundwater concentrations are summarized on Table 3. Current and historical groundwater monitoring and sampling data is presented in Appendix D.

Hydrocarbon Trend and Degradation Calculations

CRA calculated dissolved-phase TPHg and benzene concentration trends to estimate the time to meet Environmental Screening Levels (ESLs)[2] established by the San Francisco Regional Water Quality Control Board (RWQCB). The degradation calculations were performed for total purgeable petroleum hydrocarbon (TPPH) and benzene in the former remediation wells MW-A, MW-B, and MW-5 and for TPHg and benzene in the current monitoring wells. The trends were generated using the well's historic peak concentration and include the most recent groundwater sampling event conducted on January 31, 2011. CRA used the following first order exponential decay rate calculation[3] to estimate the time to meet the applicable ESLs:

$$y = be^{(ax)}$$

Where "a" is a decay constant, "b" is a concentration at time (x), y is concentration (ESL) and "x" is time. A summary of maximum, current concentrations for all active site wells, the last historical concentration for wells destroyed, and projections to meet the

[2] San Francisco Bay Regional Water Quality Control Board Environmental Screening Levels – *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* – Interim Final November 2007 (Revised May 2008).

[3] EPA-Groundwater Issue; Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies; Charles J. Newell, et al., 2003.

ESLs are presented in Table A below. Trend graphs and degradation calculations are presented as Appendix E.

Table A - Summary of Degradation Rate Calculations

Well		*Analyte*	*Maximum Concentration (ug/L)*	*Current or Last Concentration[a] (ug/L)*	*Half-Life (years)*	*Date to Reach ESL*	*Years to Reach ESL*
		TPPH	1,400,000	9,100	3.29	May-16	5
MW-A[b]		Benzene	6,900	4	1.39	Jun-04	Below ESL
		TPPH	560,000	10,000	1.76	Nov-10	Below ESL
MW-B[b]		Benzene	780	11	3.8	Oct-16	6
		TPPH	15,000	3,400	7.69	Oct-32	22
MW-5[c]		Benzene	890	9	2.49	Jul-11	Near ESL
		TPHg	6,200	68	0.63	Dec-11	1
MW-9[c]		Benzene	9	< 0.5	0.91	Jun-11	Near ESL
		TPHg	16,000	250	0.3	Aug-11	Near ESL
MW-10[c]		Benzene	220	< 0.5	0.22	Sep-10	Below ESL
		TPHg	5,400	790	0.89	Nov-13	3
MW-11[c]		Benzene	25	1	0.47	Jan-11	Near ESL
		TPHg	48,000	9,600	0.88	Nov-16	6
MW-12[c]		Benzene	340	64	0.72	Aug-15	4
		TPHg	52,000	22,000	1.98	Feb-25	14
MW-13[c]		Benzene	1,600	1,600	NA	Increasing	NA
		TPHg	48,000	LNAPL	NA	NA	NA
MW-14[c]		Benzene	3,600	LNAPL	NA	NA	NA
		TPHg	20,000	< 50	0.18	Aug-10	Below ESL
MW-15[c]		Benzene	110	< 0.5	0.2	Jul-10	Below ESL
		TPHg	430	< 50	0.53	Mar-10	Below ESL
MW-16[c]		Benzene	0.6	< 0.5	7.95	Sep-02	Below ESL

Notes and Abbreviations:

a	=	Maximum concentration is reported as the highest reported value above any detection limit
b	=	Last concentration collected January 4, 2002
c	=	Current concentration collected January 31, 2011
TPPH	=	Total Purgeable Petroleum Hydrocarbons
TPHg	=	Total petroleum hydrocarbons as gasoline
LNAPL	=	Not sampled due to the presence of light non-aqueous phase liquid (LNAPL)
ug/L	=	Micrograms per liter
ESL	=	Environmental Screening Level
NA	=	Not applicable

Based on the calculations, dissolved hydrocarbons will reach the groundwater ESLs for a drinking water resource within 22 years in destroyed wells and in 14 years for active wells, except for active wells MW-13 and MW-14. Well MW-13 has an apparent increasing benzene concentration trend based on the last sampling event being the highest historical benzene concentration out of a total of six sampling events. Well MW-14 contains LNAPL; therefore, a concentrations trend could not be calculated.

3.2 SUPPLY WELL SURVEY

In 2001, KHM Environmental Management (KHM) conducted a water well survey to determine the location of wells in the site vicinity and to identify potential receptors to the site's groundwater. The Alameda County Flood Control and Water Conservation District, Zone 7 provided a map with the locations of all registered wells within approximately ½ mile of the site. In addition KHM visited the Zone 7 office in Pleasanton to obtain well construction information and data on any other wells identified in the vicinity.

No wells were identified within ½ mile of the site. The closest wells 3S2E3E2 and 3S2E3H1 are both located approximately 2,800 feet from the site. Due to the long distance from the site, the size of the small hydrocarbon plume, and lack of MTBE, it is unlikely any wells will be affected by groundwater originating at the site.

3.3 RISK ASSESSMENT

CRA evaluated potential health risks associated with onsite commercial occupants, and potential future construction workers and residents by comparing representative hydrocarbon concentrations to the applicable ESLs. The ESLs are used to determine if further evaluation is warranted, in prioritizing areas of concern, in establishing initial cleanup goals, and in the estimation of potential health risks. The presence of a chemical at concentrations exceeding an ESL does not necessarily indicate that adverse impacts to human health or the environment may occur. This simply indicates that additional assessment may be warranted. Based on historical soil and current groundwater data, TPHg and benzene are the constituents of concern. Tables 1 and 3 present the ESLs that were evaluated and the soil and groundwater analytical data at the site, respectively. Soil and groundwater data compared to ESLs are discussed below.

3.3.1 POTENTIAL EXPOSURE ROUTES

Soil

The site is convenience store and with the exception of the planter located on the north side of the site is capped with asphalt. CRA compared analytical data for soil to construction/trench worker ESLs for direct exposure (ESL Table K-3). In addition, CRA compared soil concentrations to soil leaching ESLs (ESL Table G) where groundwater is a drinking water resource. CRA did not evaluate the residential and commercial direct exposure ESLs since the majority of hydrocarbon concentrations in soil are below 10 fbg. In addition, the only area where hydrocarbons are above 10 fbg is in the driveway near well MW-15. A comparison of historical soil data to ESLs is shown on Table 1.

Groundwater

The site is in an area where the groundwater is a drinking water resource. Therefore CRA compared current groundwater concentrations to ESLs for groundwater that is a drinking water resource (ESL Table F-1A).

Surface Water

As discussed above, the nearest surface water bodies are located over one-mile from the site. Because the surface water bodies are located such a great distance from the site and the extent of hydrocarbons is limited to near the site, there is no risk to surface waters. Therefore dissolved hydrocarbon concentrations were not compared to surface water ESLs.

Indoor & Outdoor Vapor Intrusion

The site is a convenience store and is expected to remain so for the foreseeable future. The hydrocarbon plume is located in the parking lot and planter onsite. However, as a conservative measure, CRA compared current groundwater analytical data to the ESLs for potential vapor intrusion concerns for both residential and commercial use (Table E-1). A comparison of current groundwater data to ESLs is shown on Table 3.

3.3.2 ESL COMPARISON FOR SOIL

Of the 90 soil samples collected between 1984 and 2009 from soil borings, monitoring wells and compliance soil samples, 28 samples contained one or more hydrocarbon concentrations greater than the ESLs for soil leaching concerns where groundwater is a drinking water source (Table 1). Of those 28 samples, only 2 samples were above 10 fbg in the vadose zone. The remaining 26 samples were collected within the water-bearing

zone. Based on this information, the soil leaching pathway is already being monitored by dissolved hydrocarbon concentrations.

Two soil samples from well MW-15 at 9.5 and 19.5 fbg exceed the construction worker direct exposure ESL for TPHg (Table 1). There are no plans to redevelop the site in the foreseeable future and CRA is currently proposing to collect additional source area assessment data prior to evaluating remedial options to address the hydrocarbon source area.

3.3.3 ESL COMPARISON FOR GROUNDWATER

Wells MW-10 through MW-14 currently contain one or more hydrocarbon concentrations that exceed the drinking water ESLs. Additionally, shallow well MW-14 contains gasoline LNAPL, which would likely exceed the ESLs for potential vapor intrusion concerns. CRA is currently proposing to collect additional source area assessment data prior to evaluating remedial options to address the hydrocarbon source area. A comparison of current groundwater data to ESLs is shown on Table 2.

4.0 DATA GAPS AND RECOMMENDATIONS

Secondary Source Identification

CRA was unable to locate information pertaining to a previous geophysical survey to identify if any orphaned USTs are currently located on the property. CRA proposes contracting a licensed geophysicist to utilize a metal detector and ground penetrating radar (GPR) to identify the presence of any potential secondary sources.

Groundwater Delineation

The ACEH has requested additional wells to more closely define the extent of LNAPL near well MW-14. The ACEH has also requested additional monitoring wells in the intermediate zone downgradient of wells MW-12 and MW-13. CRA proposes installing four shallow groundwater wells surrounding MW-14 and an intermediate groundwater monitoring well downgradient of MW-12 and MW-13 (Figure 2).

Soil Delineation

To further characterize the extent of hydrocarbons remaining in soil CRA proposes advancing the proposed shallow groundwater wells to 45 fbg to collect soil samples prior to backfilling to the depth proposed for the bottom of the proposed shallow

groundwater wells. Additionally, soil samples will be collected while advancing the borehole for the proposed intermediate groundwater well.

Preferential Pathway Study

CRA proposes to map the subsurface utility structures by noting exposed features (e.g. manhole covers) and underground service alert markings, and reviewing engineering drawings from the utility purveyors, and completing a private utility mark out onsite. CRA will attempt to determine the top and bottom of utility trenches. All utilities will be shown on a scaled site plan, and if available the diameter, depth, and flow direction of the utilities will also be represented. CRA will also identify underground utilities on scaled cross-sections.

5.0 WORK PLAN FOR ADDITIONAL ASSESSMENT

To fulfill the data gaps and recommendations made above, CRA proposes to conduct the following activities:

Utility Location

CRA will mark the site for Underground Service Alert (USA) clearance. USA and a licensed geophysicist will be contacted a minimum of 48 hours prior to field activities to mark and identify locations of utilities near the boring and well locations and identify any potential secondary sources onsite.

Utility Clearance

Per Chevron and CRA safety requirements, each boring and well location will be cleared to 8 fbg using an air-knife assisted vacuum truck and/or hand augers to detect any unknown utilities prior to drilling.

Site Health and Safety Plan

CRA will prepare a site health and safety plan to provide safety guidelines to all site workers and visitors. The plan will be kept onsite at all times and followed by all site workers and visitors each day of operation.

Permits

CRA will obtain a drilling permit from the Zone 7 water agency prior to beginning field operations. A minimum of 48 hours of notice will be given to ACEHS prior to beginning activities.

Monitoring Well Installation

After clearing to 8 fbg, four borings will be advanced to 45 fbg (or deeper if hydrocarbons are observed) using 6-inch outside diameter hollow stem augers. After soil samples are collected, the borings will be backfilled with grout to 15 fbg. These boring locations will be re-drilled using 10-inch outside diameter hollow stem augers to approximately 15 fbg and completed as 4-inch diameter wells. The wells will be screened from approximately 5 to 15 fbg. The intermediate well located downgradient of well MW-13 will be advanced to 37 fbg using 10-inch outside diameter hollow stem augers. After soil samples are collected, the boring will be completed as a 4-inch diameter well screened from approximately 32 to 37 fbg.

All wells will be constructed using 0.010 slotted 4-inch diameter Schedule 40 PVC pipe with Monterey Sand #2/12. The sand pack will be placed to a minimum of one foot above the screen. The well annulus will have a 2 -foot hydrated bentonite seal above the sand pack and be filled with neat Portland cement to approximately 1 fbg. The screen interval and well construction may be modified based on conditions encountered in the field. A well box equipped with a traffic rated lid will be installed at grade. Exact well locations and final depths will be based on site and utility constraints and the extent of soil impacts, if any, encountered at depth. CRA's *Standard Field Procedures for Soil Boring and Monitoring Well Installation* is presented in Appendix F.

Well Development and Sampling

The wells will be developed using agitation and pumping. Gettler-Ryan, Inc. will develop and sample the wells no sooner than 72 hours after installation.

Soil Sampling Protocol

CRA geologists will log collected soils using the ASTM D 2488-06 Unified Soil Classification System. Soil samples will be field-screened using a photo ionization detector (PID) and visual observations. Approximately one 6-inch soil sample will be collected every 5 feet for laboratory analysis and at obvious changes in soils, and where hydrocarbon staining or PID readings are observed. Soil samples above 8 fbg will be collected by driving steel tubes into disturbed sediments removed by a hand auger bucket. Soil samples below 8 fbg will be collected by either driving a modified California split spoon sampler lined with three 6-inch brass tubes or a 4-foot acetate lined direct push sampler into undisturbed sediments. All samples will be capped using Teflon tape and plastic caps, labeled, placed in a cooler with ice, and transported under chain-of-custody to a Chevron and State-approved laboratory for analysis.

Chemical Analysis

Selected soil samples based on visual observations and PID readings will be analyzed for the following:

- TPHg by EPA Method 8015 modified
- Benzene, toluene, ethylbenzene, and xylenes by EPA Method 8260B
- Total lead by EPA Method 6010 (waste composite samples only)

Soil Disposal

Soil cuttings, decontamination water, and groundwater will be temporarily stored onsite in properly labeled 55-gallon drums pending soil profiling results. The wastes will transported and disposed of at appropriate Chevron and State-approved disposal facilities.

Reporting

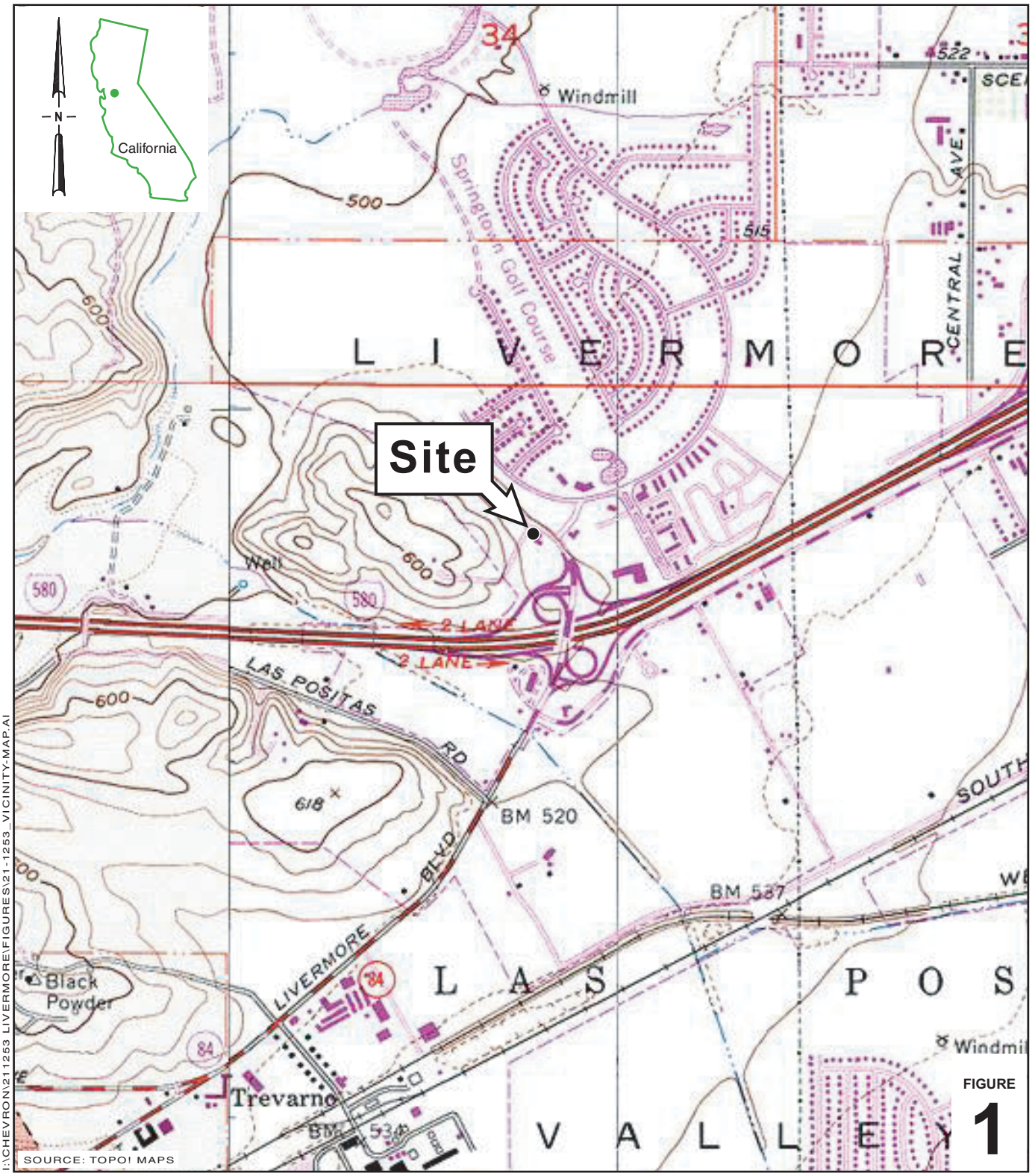
Upon completion of field activities and review of the analytical results, we will prepare an investigation report that at a minimum will contain:

- Geophysical survey findings
- Descriptions of drilling and sampling methods
- Well installation details
- Tabulated soil and groundwater analytical results
- A figure illustrating the well locations
- Analytical reports and chain-of-custody forms
- Soil disposal methods
- An updated SCM with discussion of the hydrocarbon distribution in soil and groundwater
- Conclusions and recommendations

CRA will conduct this work following approval from the ACEHS. After approval, CRA will obtain the necessary permits, meet with utility service providers, and schedule a drilling subcontractor. CRA will submit the investigation report approximately eight weeks after completion of field activities, which includes the development, and monitoring and sampling of the newly installed wells.

FIGURES

04/06/07



I:\CHEVRON\211253 LIVERMORE\FIGURES\21-1253_VICINITY-MAP.AI

FIGURE 1

0 1/8 1/4 1/2 1

SCALE : 1" = 1/4 MILE

Former Texaco Service Station

930 Springtown Boulevard

Livermore, California

CONESTOGA-ROVERS & ASSOCIATES

Vicinity Map

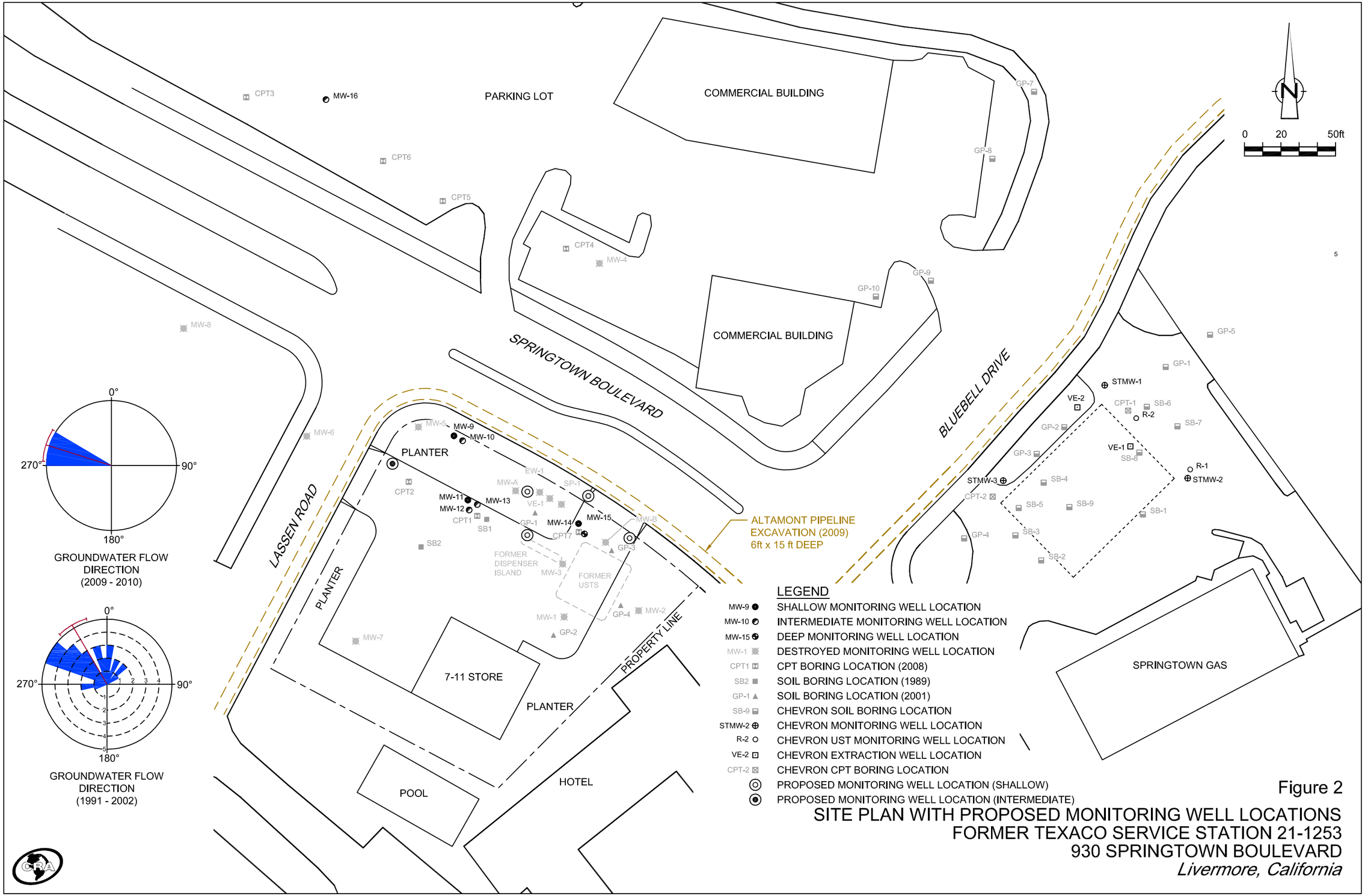


Figure 2

SITE PLAN WITH PROPOSED MONITORING WELL LOCATIONS
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA001 MAR 01/2011

A
NORTHWEST

A'
SOUTHEAST

LASSEN ROAD

FORMER USTs

PROPOSED WELL

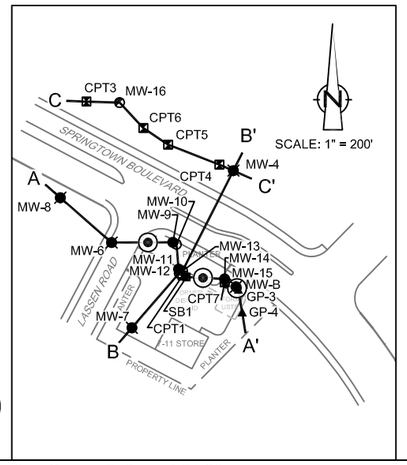
MW-8 MW-6 MW-9 MW-10 MW-11 (INTERSECTION WITH B-B') MW-12 (INTERSECTION WITH B-B') MW-13 (INTERSECTION WITH B-B') CPT1 SB1 PROPOSED WELL MW-14 CPT7 MW-15 MW-B PROPOSED WELL GP-3 GP-4

ELEVATION (feet above mean sea level)

APPROXIMATE DEPTH (feet below ground surface)

DISTANCE (feet)

SCALE: HORZ. 1" = 30'
VERT. 1" = 20'

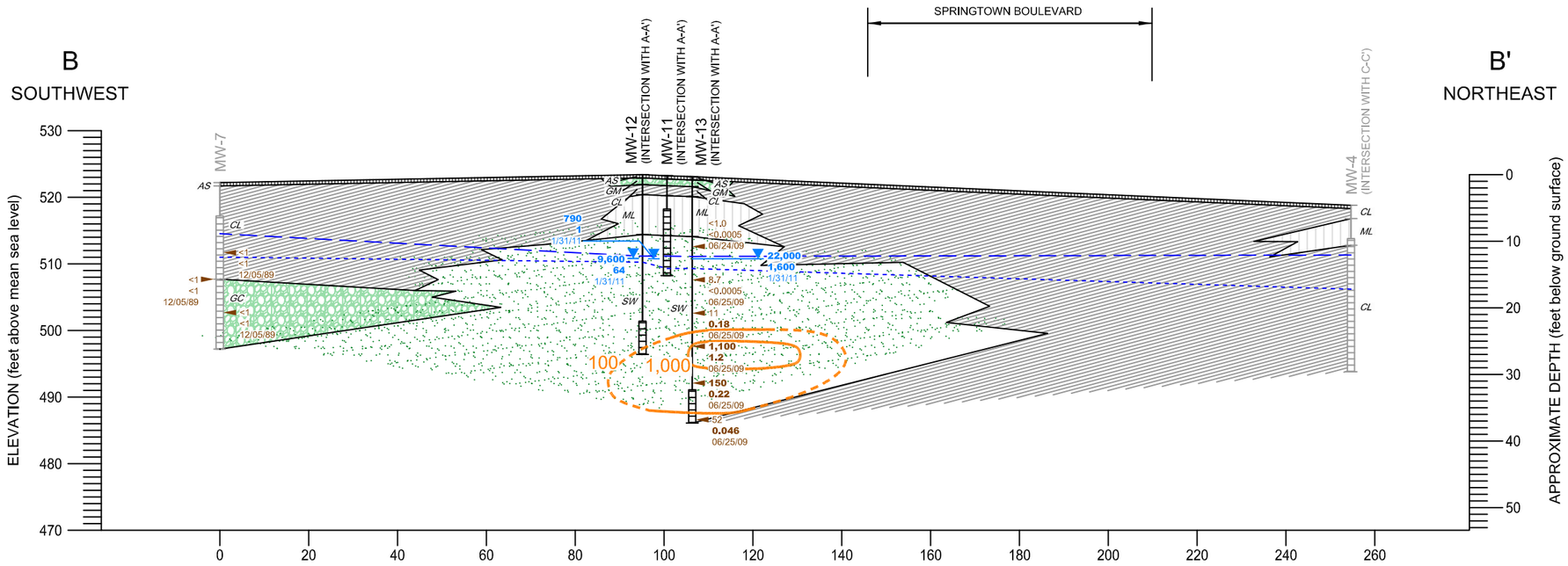


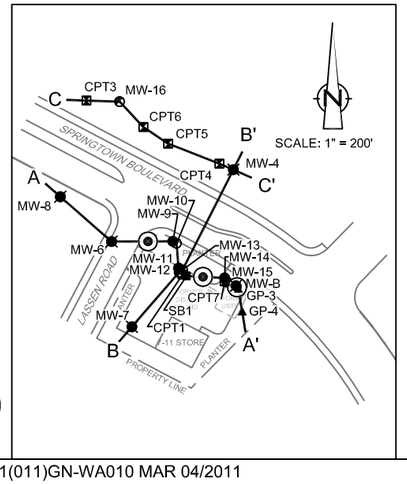
LEGEND

- MW-12 — WELL DESIGNATION
- GROUND SURFACE
- OBSERVATION WELL INSTALLATION
- STRATIGRAPHIC BOUNDARY
- CL — TYPICAL SOIL CLASSIFICATION
- SCREENED INTERVAL
- BOTTOM OF BORING
- APPROXIMATE SOIL SAMPLE LOCATION
- TPHg / BENZENE / DATE — HYDROCARBON CONCENTRATIONS IN SOIL (mg/kg)
- APPROXIMATE GROUNDWATER SAMPLE LOCATION
- TPHg / BENZENE / DATE — HYDROCARBON CONCENTRATIONS IN GROUNDWATER (µg/L)
- *FILL*
- *TS* - TOPSOIL
- *AS* - ASPHALT
- *CL* - INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
- *SM* - SILTY SANDS, SAND-SILT MIXTURES
- *SC* - CLAYEY SANDS, SAND-CLAY MIXTURES
- *GP* - POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
- *GW* - WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
- *ML* - INORGANIC SILTS, VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
- *SW* - WELL-GRADED SAND, GRAVELLY SANDS, LITTLE OR NO FINES
- *SP* - POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
- *GM* - SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
- *GC* - CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
- 100 - - - TPHg CONTOUR, DASHED WHERE INFERRED
- HIGHEST GROUNDWATER ELEVATION (MSL)
- LOWEST GROUNDWATER ELEVATION (MSL)
- < NOT DETECTED AT OR ABOVE STATED REPORTING LIMITS
- **BOLD** EXCEEDS ESLs
- -- NOT ANALYZED
- NS NOT SAMPLED

Figure 3

GEOLOGIC CROSS SECTION A-A'
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California





LEGEND

- MW-12 — WELL DESIGNATION
- GROUND SURFACE
- OBSERVATION WELL INSTALLATION
- STRATIGRAPHIC BOUNDARY
- CL — TYPICAL SOIL CLASSIFICATION
- SCREENED INTERVAL
- BOTTOM OF BORING
- APPROXIMATE SOIL SAMPLE LOCATION
- TPHg / BENZENE / DATE — HYDROCARBON CONCENTRATIONS IN SOIL (mg/kg)
- APPROXIMATE GROUNDWATER SAMPLE LOCATION
- TPHg / BENZENE / DATE — HYDROCARBON CONCENTRATIONS IN GROUNDWATER (µg/L)
- 100 - - - TPHg CONTOUR DASHED WHERE INFERRED

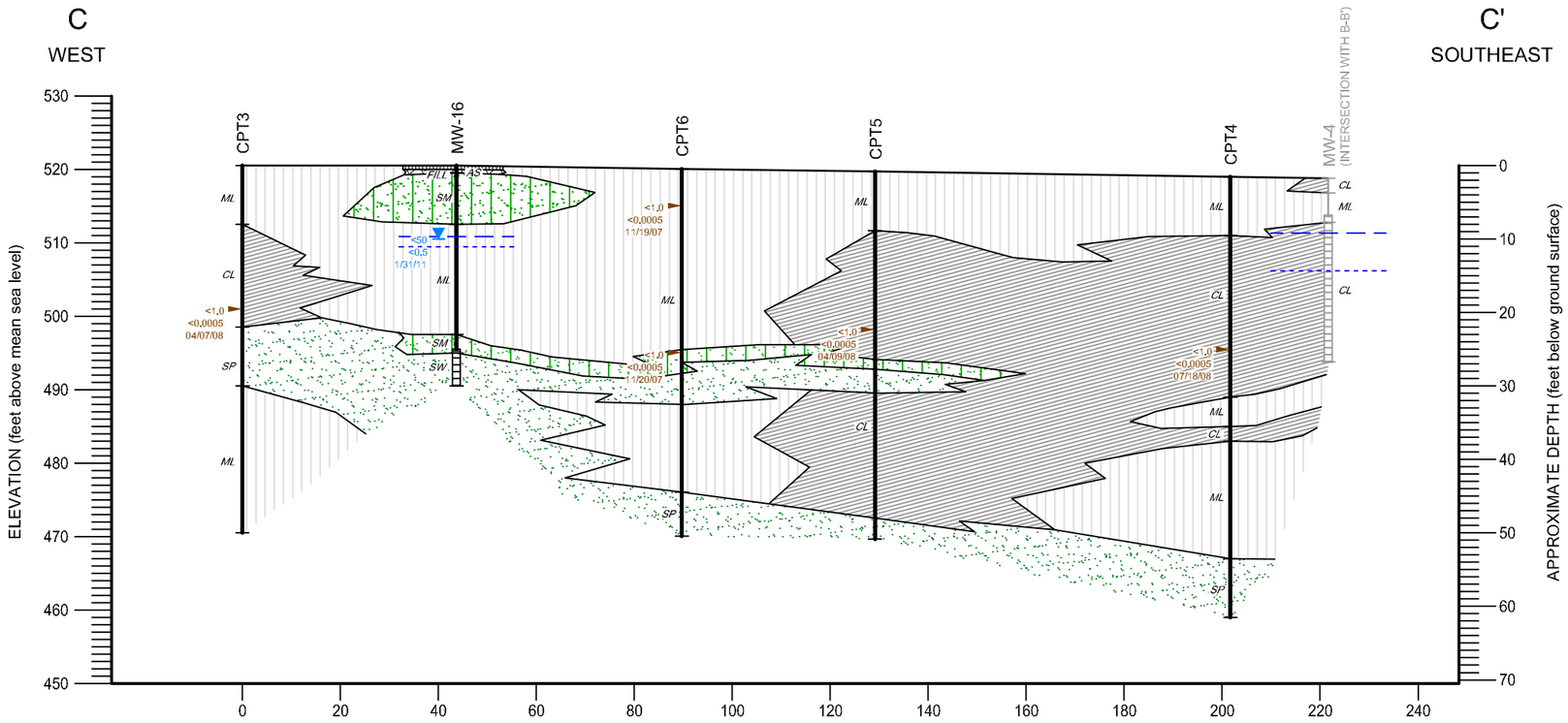
- *AS* - ASPHALT
- *CL* - INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
- *ML* - INORGANIC SILTS, VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
- *SW* - WELL-GRADED SAND, GRAVELLY SANDS, LITTLE OR NO FINES
- *GM* - SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
- *GC* - CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES

- HIGHEST GROUNDWATER ELEVATION (MSL)
- LOWEST GROUNDWATER ELEVATION (MSL)
- < NOT DETECTED AT OR ABOVE STATED REPORTING LIMITS
- **BOLD** EXCEEDS ESLs

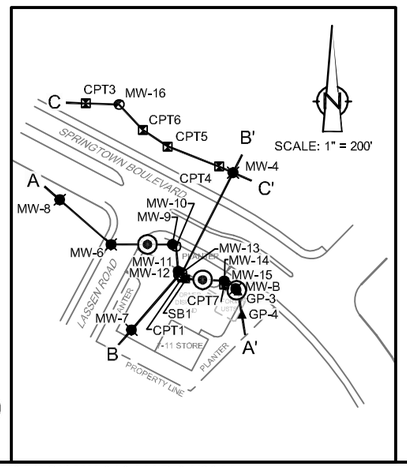
Figure 4

GEOLOGIC CROSS SECTION B-B'
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA010 MAR 04/2011



SCALE: HORZ. 1" = 30'
VERT. 1" = 20'



LEGEND

- MW-4 — WELL DESIGNATION
- GROUND SURFACE
- OBSERVATION WELL INSTALLATION
- STRATIGRAPHIC BOUNDARY
- CL — TYPICAL SOIL CLASSIFICATION
- SCREENED INTERVAL
- BOTTOM OF BORING
- APPROXIMATE SOIL SAMPLE LOCATION
- TPHg / BENZENE / DATE — HYDROCARBON CONCENTRATIONS IN SOIL (mg/kg)
- APPROXIMATE GROUNDWATER SAMPLE LOCATION
- TPHg / BENZENE / DATE — HYDROCARBON CONCENTRATIONS IN GROUNDWATER (µg/L)

- *FILL*
- *AS* - ASPHALT
- *CL* - INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
- *SM* - SILTY SANDS, SAND-SILT MIXTURES
- *ML* - INORGANIC SILTS, VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, CLAYEY SILTS WITH SLIGHT PLASTICITY
- *SW* - WELL-GRADED SAND, GRAVELLY SANDS, LITTLE OR NO FINES
- *SP* - POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES

- HIGHEST GROUNDWATER ELEVATION (MSL)
- LOWEST GROUNDWATER ELEVATION (MSL)
- < NOT DETECTED AT OR ABOVE STATED REPORTING LIMITS

Figure 5

GEOLOGIC CROSS SECTION C-C'
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

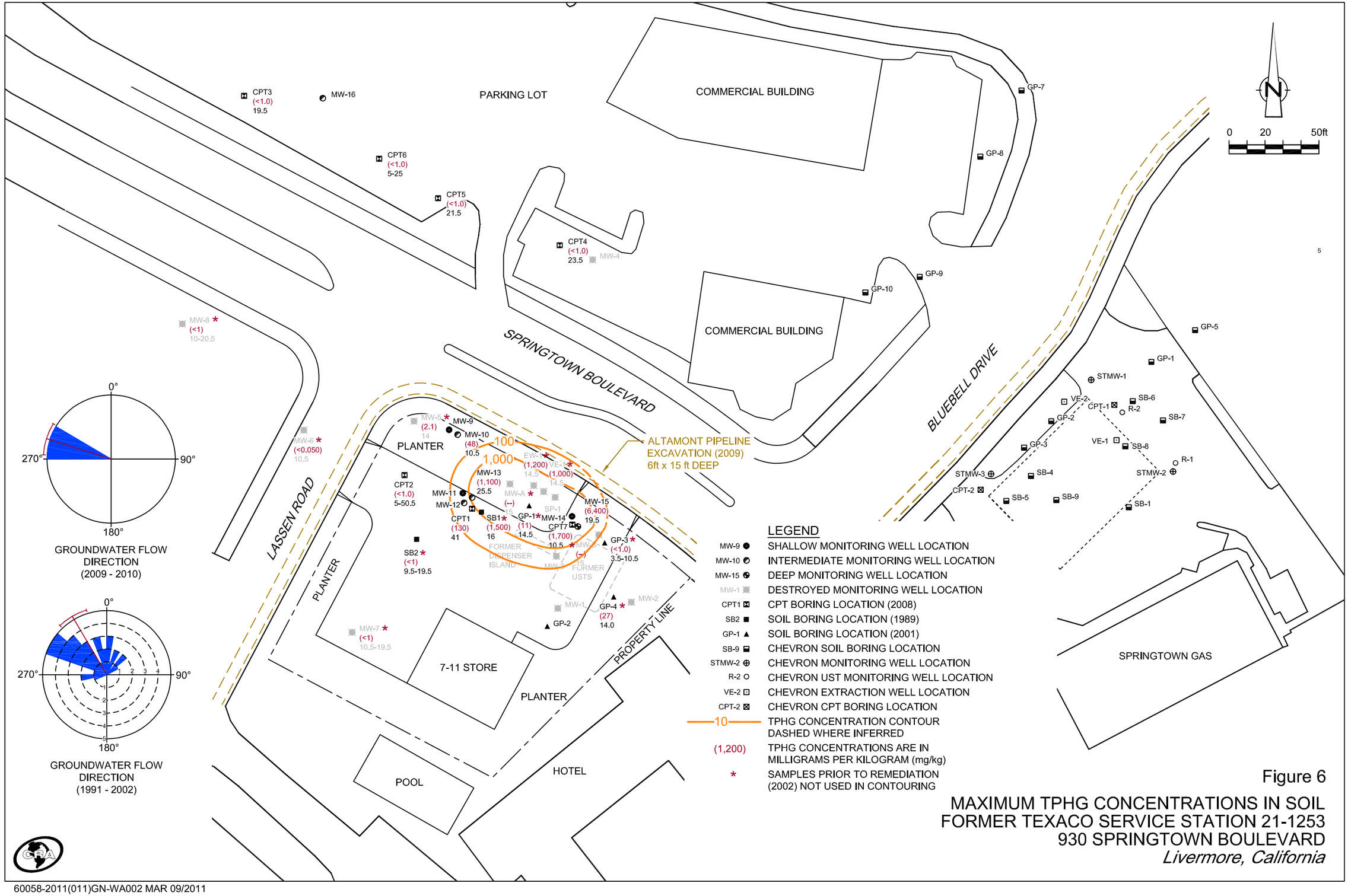


Figure 6

MAXIMUM TPHG CONCENTRATIONS IN SOIL
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA002 MAR 09/2011

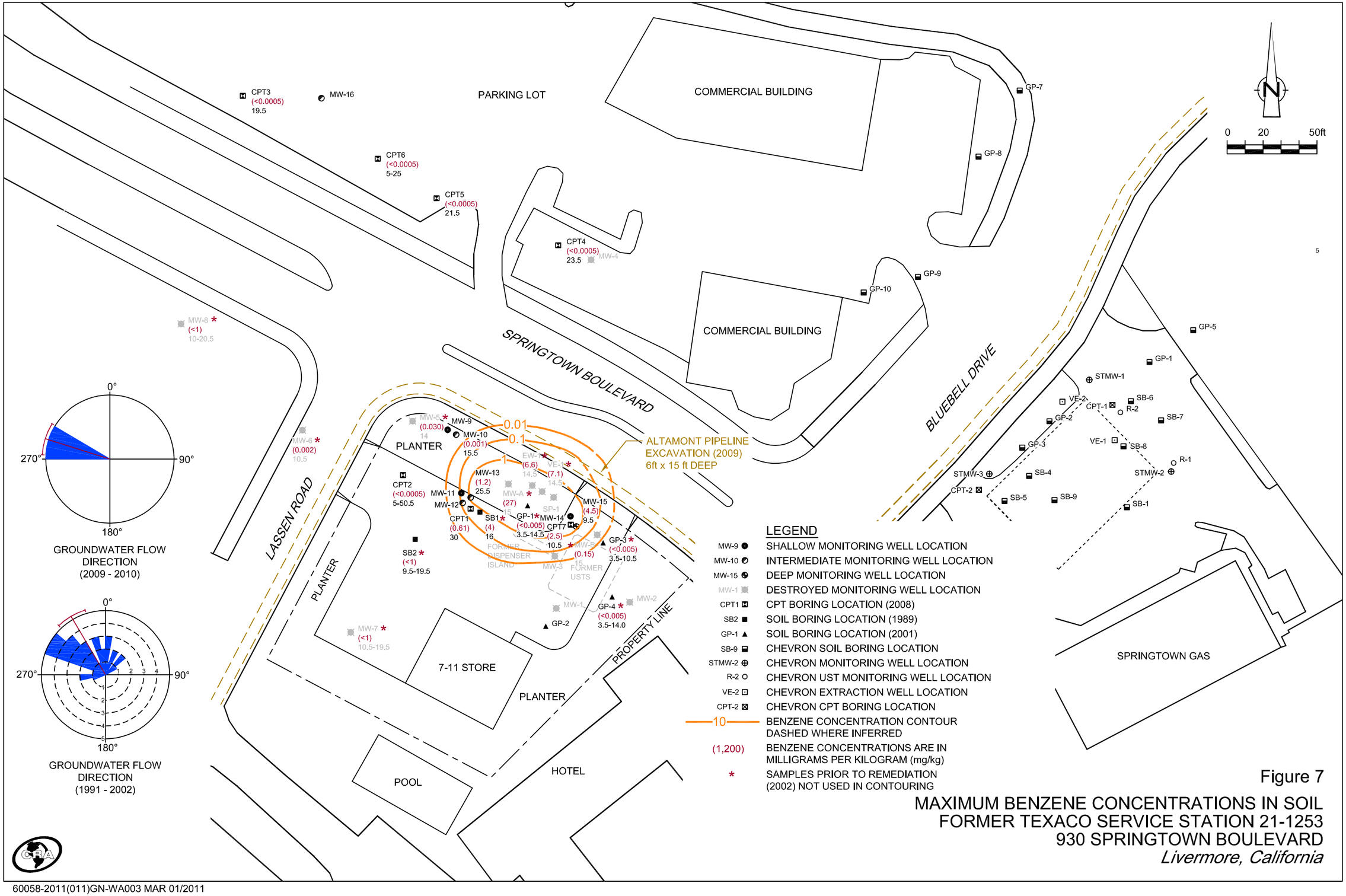


Figure 7

MAXIMUM BENZENE CONCENTRATIONS IN SOIL
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA003 MAR 01/2011

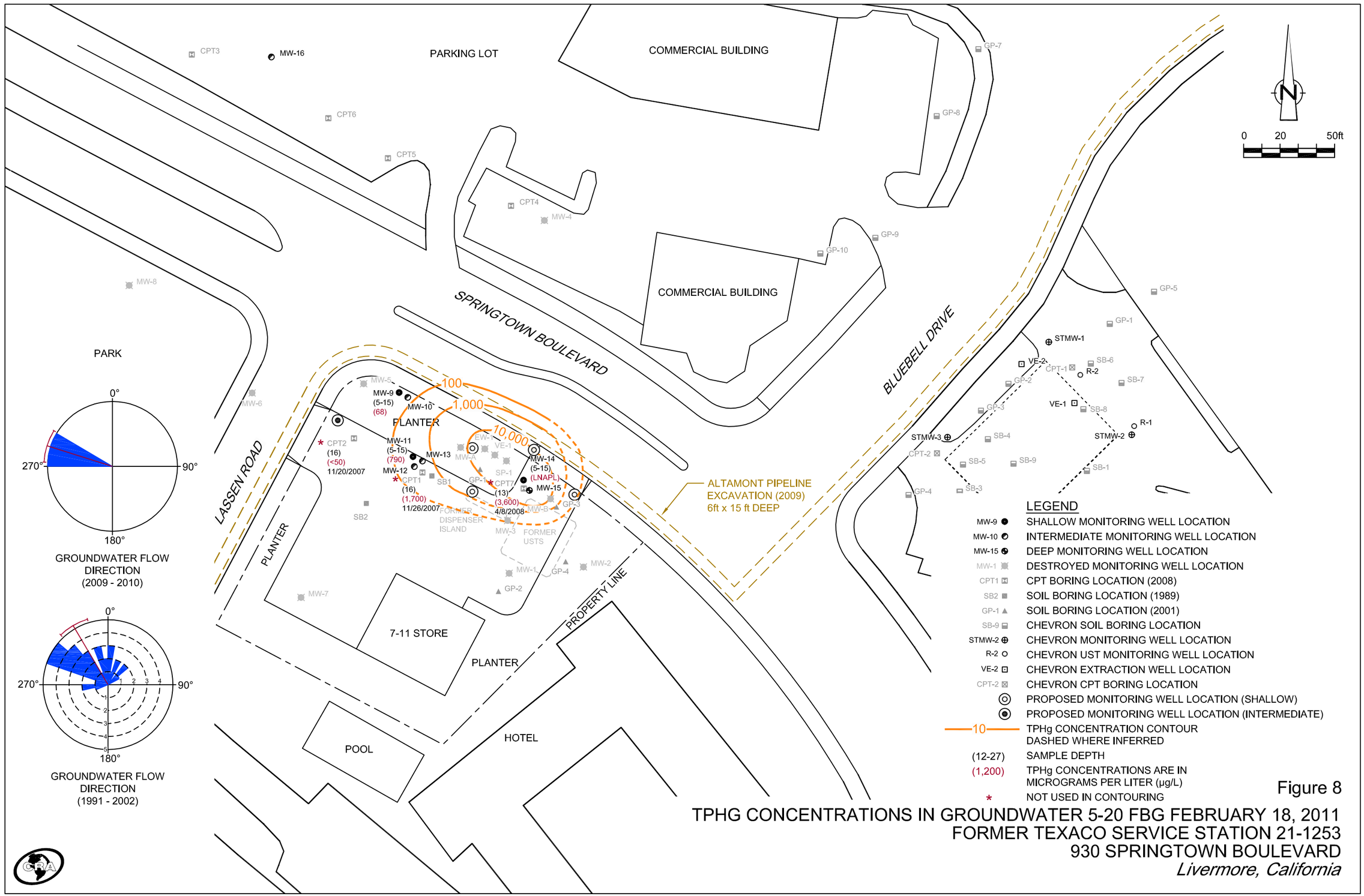


Figure 8

TPHG CONCENTRATIONS IN GROUNDWATER 5-20 FBG FEBRUARY 18, 2011
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA004 MAR 03/2011

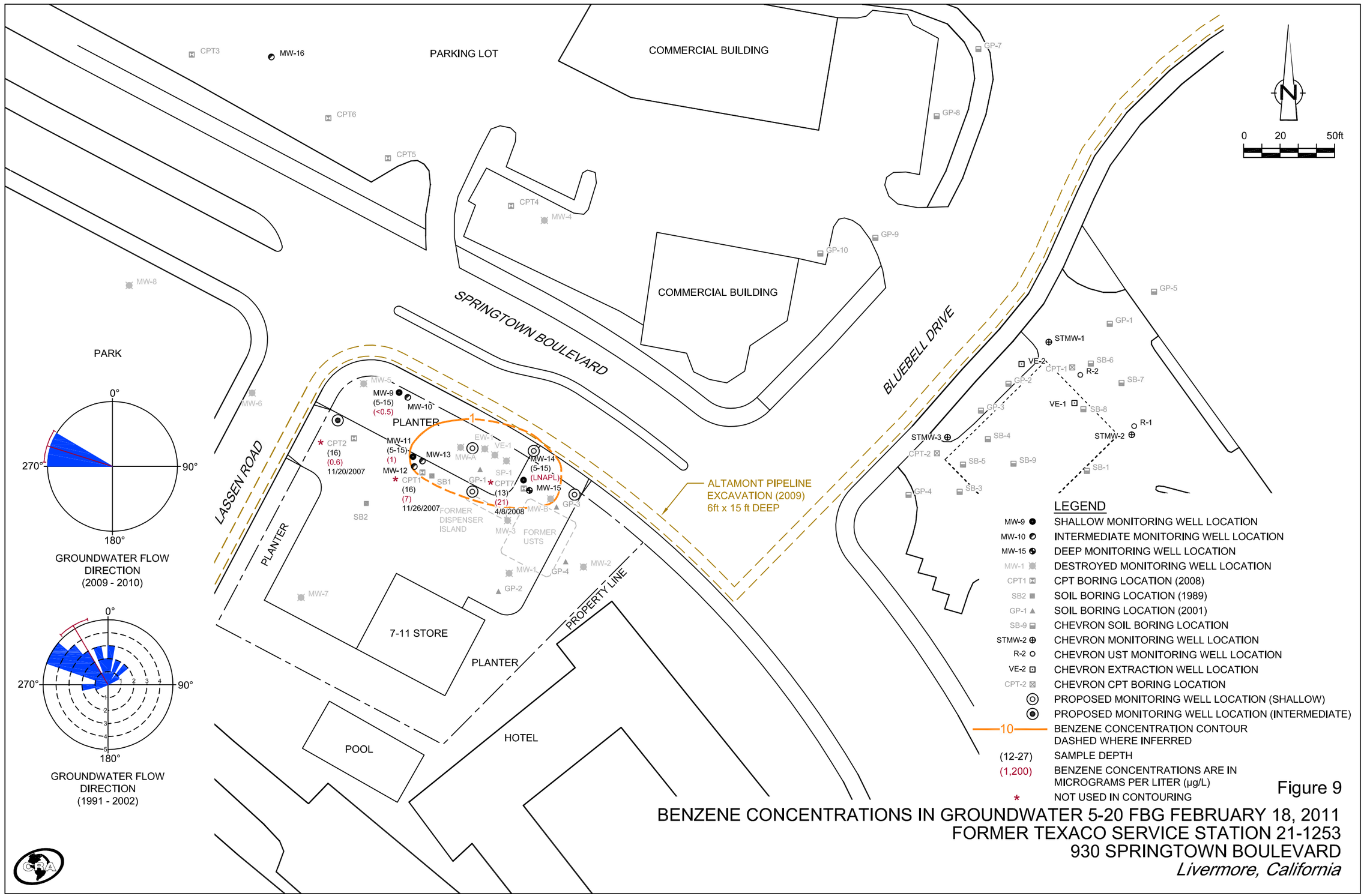


Figure 9

BENZENE CONCENTRATIONS IN GROUNDWATER 5-20 FBG FEBRUARY 18, 2011
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA005 MAR 03/2011

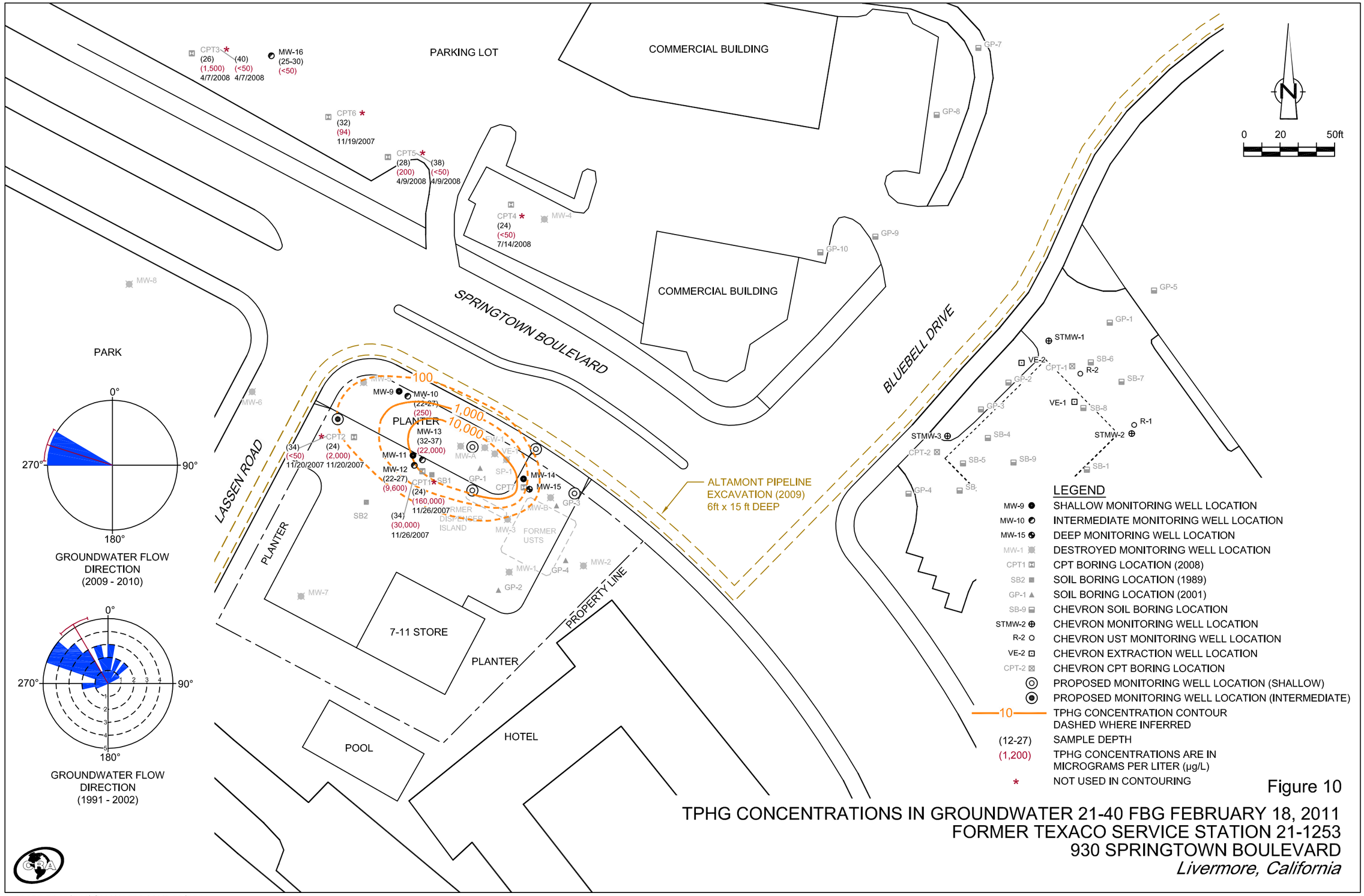


Figure 10

TPHG CONCENTRATIONS IN GROUNDWATER 21-40 FBG FEBRUARY 18, 2011
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA006 MAR 09/2011

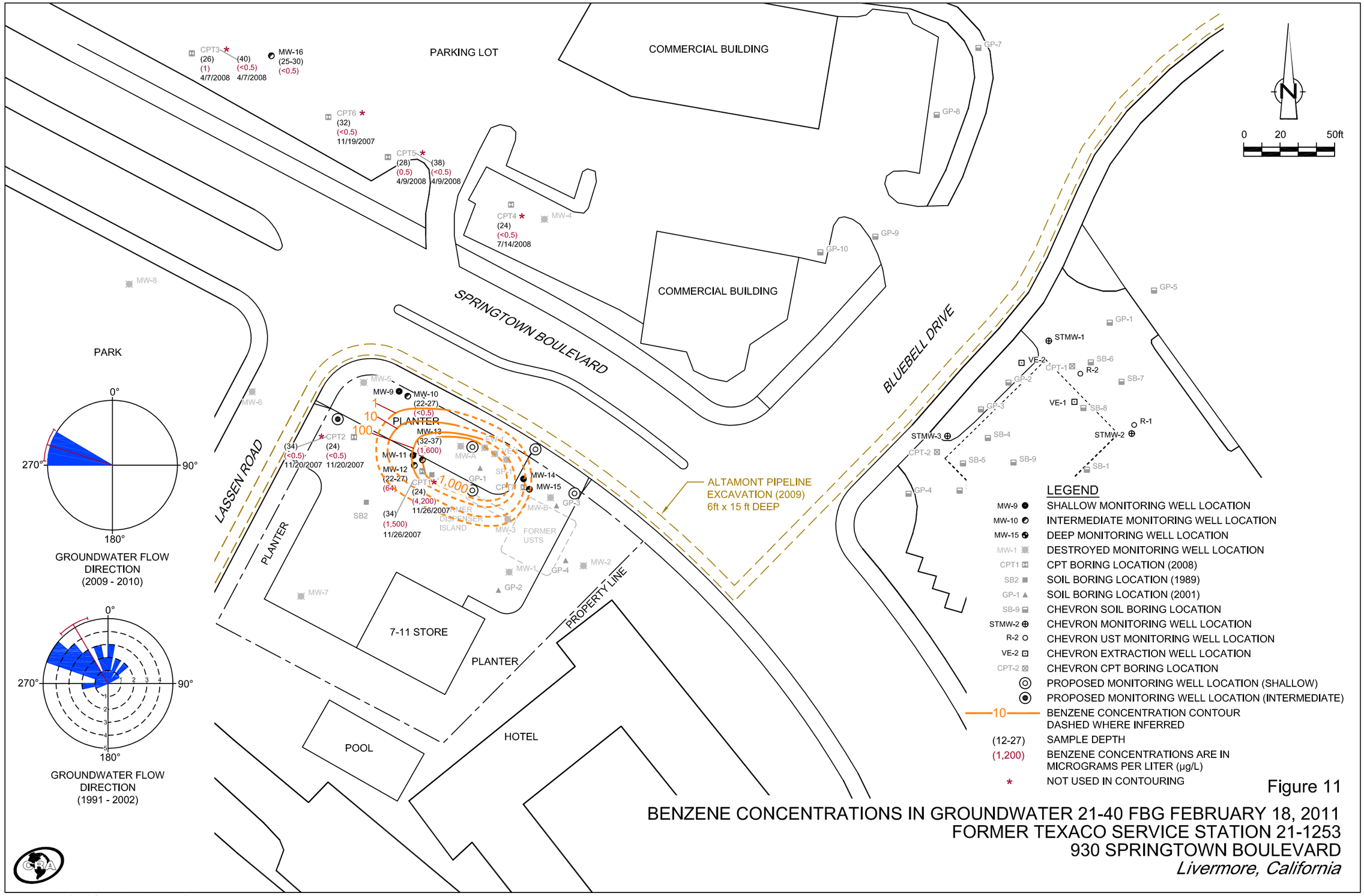


Figure 11

BENZENE CONCENTRATIONS IN GROUNDWATER 21-40 FBG FEBRUARY 18, 2011
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA007 MAR 03/2011

CPT3 *
(50)
(<50)
4/7/2008

MW-16

PARKING LOT

COMMERCIAL BUILDING

GP-7

CPT6 *
(48)
(<50)
11/20/2007

GP-8

CPT5 *
(45)
(<50)
4/9/2008

CPT4 *
(48)
(<50)
7/14/2008

MW-4

GP-9

GP-10

COMMERCIAL BUILDING

MW-8

SPRINGTOWN BOULEVARD

BLUEBELL DRIVE

GP-5

PARK

GP-1

STMW-1

VE-2

SB-6

CPT-1

R-2

SB-7

GP-2

VE-1

SB-8

GP-3

R-1

STMW-3

SB-4

STMW-2

CPT-2

SB-5

SB-9

SB-1

GP-4

MW-6

MW-5

MW-9

MW-10

PLANTER

CPT2

EW-1

MW-11

MW-13

MW-A

VE-1

MW-12

CPT1

SP-1

MW-14

MW-15
(42-47)
(<50)

SB1

GP-1

CPT7 *
(43)
(11,000)
4/9/2008

GP-3

MW-B

FORMER
DISPENSER
ISLAND

MW-3

FORMER
USTS

SB2

LASSEN ROAD

PLANTER

MW-1

MW-2

GP-4

GP-2

MW-7

PROPERTY LINE

7-11 STORE

PLANTER

HOTEL

POOL

ALTAMONT PIPELINE
EXCAVATION (2009)
6ft x 15 ft DEEP

N

0 20 50ft

0°
270° 90°
180°

GROUNDWATER FLOW
DIRECTION
(2009 - 2010)

0°
270° 90°
180°
1 2 3 4

GROUNDWATER FLOW
DIRECTION
(1991 - 2002)

LEGEND

MW-9	SHALLOW MONITORING WELL LOCATION
MW-10	INTERMEDIATE MONITORING WELL LOCATION
MW-15	DEEP MONITORING WELL LOCATION
MW-1	DESTROYED MONITORING WELL LOCATION
CPT1	CPT BORING LOCATION (2008)
SB2	SOIL BORING LOCATION (1989)
GP-1	SOIL BORING LOCATION (2001)
SB-9	CHEVRON SOIL BORING LOCATION
STMW-2	CHEVRON MONITORING WELL LOCATION
R-2	CHEVRON UST MONITORING WELL LOCATION
VE-2	CHEVRON EXTRACTION WELL LOCATION
CPT-2	CHEVRON CPT BORING LOCATION
	PROPOSED MONITORING WELL LOCATION (SHALLOW)
	PROPOSED MONITORING WELL LOCATION (INTERMEDIATE)
(12-27)	SAMPLE DEPTH
(1,200)	TPHG CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
*	NOT USED IN CONTOURING

Figure 12

TPHG CONCENTRATIONS IN GROUNDWATER 41-50 FBG FEBRUARY 18, 2011
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA008 MAR 09/2011

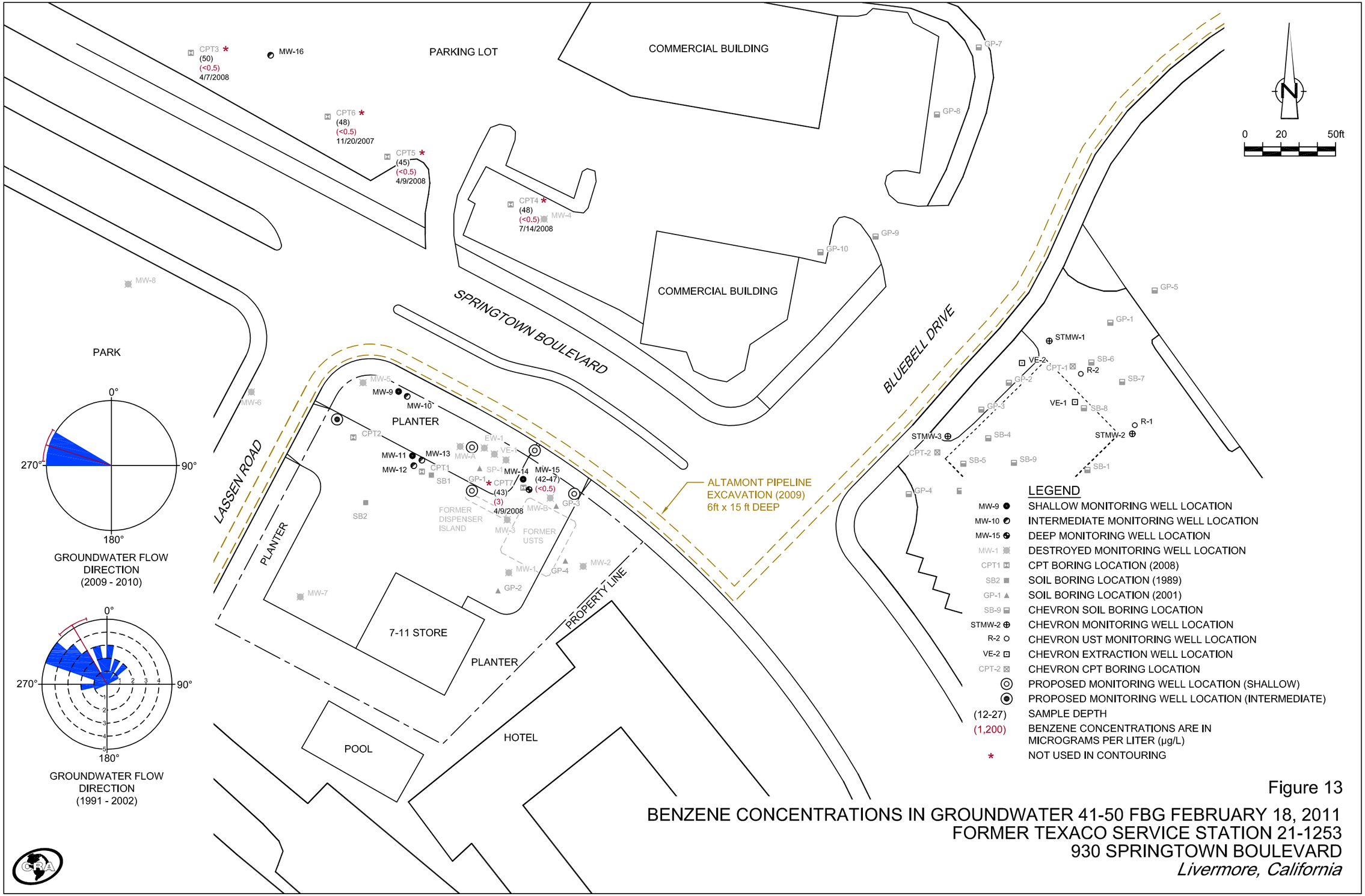


Figure 13

BENZENE CONCENTRATIONS IN GROUNDWATER 41-50 FBG FEBRUARY 18, 2011
FORMER TEXACO SERVICE STATION 21-1253
930 SPRINGTOWN BOULEVARD
Livermore, California

60058-2011(011)GN-WA009 MAR 03/2011

TABLES

TABLE 1

SOIL ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPH*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			← *Reported in milligrams per kilogram (mg/kg)* →												
ESLs for Soil Leaching Screening Level (Drinking Water Sourse) Table G			***NE***	***83***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***	***0.075***	***NE***	***NE***	***NE***	***0.0045***	***0.00033***
ESLs for Soil Direct Exposure Construction/Trench Worker Table K-3			***NE***	4,200	12	650	210	420	2,800	320,000	***NE***	***NE***	***NE***	21	1.7
2009 CRA Well Installation															
MW-10	06/24/09	10.5	--	48	<0.025	<0.051	0.094	<0.051	--	--	--	--	--	--	--
MW-10	06/24/09	15.5	--	1.7	0.001	0.006	0.16	0.12	--	--	--	--	--	--	--
MW-10	06/24/09	20.5	--	1.8	<0.0005	<0.001	0.005	0.001	--	--	--	--	--	--	--
MW-10	06/24/09	26	--	<1.0	<0.0005	<0.001	<0.001	<0.001	--	--	--	--	--	--	--
MW-13	06/24/09	10.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	--	--	--	--	--	--	--
MW-13	06/25/09	15.5	--	8.7	<0.0005	<0.0009	<0.0009	<0.0009	--	--	--	--	--	--	--
MW-13	06/25/09	20.5	--	11	**0.18**	0.005	0.017	0.008	--	--	--	--	--	--	--
MW-13	06/25/09	25.5	--	**1,100**	**1.2**	**50**	**13**	**90**	--	--	--	--	--	--	--
MW-13	06/25/09	31	--	**150**	**0.22**	**8.1**	**3.5**	**22**	--	--	--	--	--	--	--
MW-13	06/25/09	36.5	--	52	**0.046**	0.85	0.30	1.8	--	--	--	--	--	--	--
MW-15	06/30/09	9.5	--	**5,200**	**4.5**	**44**	**55**	**260**	--	--	--	--	--	--	--
MW-15	06/30/09	14.5	--	**150**	0.003	0.014	0.065	0.24	--	--	--	--	--	--	--
MW-15	06/30/09	19.5	--	**6,400**	<0.50	**31**	**170**	**530**	--	--	--	--	--	--	--
MW-15	06/30/09	24.5	--	34	<0.025	0.12	0.23	0.94	--	--	--	--	--	--	--
MW-15	06/30/09	29.5	--	4.9	<0.0005	0.028	0.037	0.20	--	--	--	--	--	--	--
MW-15	06/30/09	34.5	--	**86**	<0.023	0.34	0.65	**3.0**	--	--	--	--	--	--	--
2007 - 2008 CRA Subsurface Investigation															
CPT1	11/21/07	5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.021	<0.001	<0.001	<0.001	<0.001	<0.001
CPT1	11/21/07	16	--	1.3	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001

TABLE 1

SOIL ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPH*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			Reported in milligrams per kilogram (mg/kg)												
ESLs for Soil Leaching Screening Level (Drinking Water Sourse) Table G			***NE***	***83***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***	***0.075***	***NE***	***NE***	***NE***	***0.0045***	***0.00033***
ESLs for Soil Direct Exposure Construction/Trench Worker Table K-3			***NE***	4,200	12	650	210	420	2,800	320,000	***NE***	***NE***	***NE***	21	1.7
CPT1	11/21/07	20	--	<1.0	**0.073**	0.002	0.001	<0.001	<0.0005	<0.019	<0.001	<0.001	<0.001	<0.001	<0.001
CPT1	11/21/07	30	--	59	**0.61**	2.8	0.42	**5.8**	<0.024	<0.97	<0.048	<0.048	<0.048	<0.048	<0.048
CPT1	11/21/07	37	--	16	0.004	0.056	0.039	0.30	<0.005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT1	11/21/07	41	--	**130**	0.043	1.1	0.52	**3.4**	<0.024	<0.97	<0.049	<0.049	<0.049	<0.049	<0.049
CPT1	11/21/07	45	--	1.8	0.004	0.059	0.018	0.13	<0.0005	<0.019	<0.001	<0.001	<0.001	<0.001	<0.001
CPT1	11/21/07	50	--	<1.0	0.0008	0.022	0.009	0.060	<0.0005	<0.021	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	10.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.021	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	15.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.021	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	20.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	30.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	35.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	40.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	45.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.021	<0.001	<0.001	<0.001	<0.001	<0.001
CPT2	11/19/07	50.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT3	04/07/08	19.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT4	07/18/08	23.5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.019	<0.001	<0.001	<0.001	<0.001	<0.001
CPT5	04/09/08	21.5	--	<1.0	<0.0005	<0.0009	<0.0009	<0.0009	<0.0005	<0.019	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009
CPT6	11/19/07	5	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.021	<0.001	<0.001	<0.001	<0.001	<0.001
CPT6	11/20/07	25	--	<1.0	<0.0005	<0.001	<0.001	<0.001	<0.0005	<0.019	<0.001	<0.001	<0.001	<0.001	<0.001

TABLE 1

SOIL ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPH*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			Reported in milligrams per kilogram (mg/kg)												
ESLs for Soil Leaching Screening Level (Drinking Water Sourse) Table G			***NE***	***83***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***	***0.075***	***NE***	***NE***	***NE***	***0.0045***	***0.00033***
ESLs for Soil Direct Exposure Construction/Trench Worker Table K-3			***NE***	4,200	12	650	210	420	2,800	320,000	***NE***	***NE***	***NE***	21	1.7
CPT7	04/08/08	5	--	**510**	<0.026	<0.053	**3.6**	**16**	<0.026	<1.1	<0.053	<0.053	<0.053	<0.053	<0.053
CPT7	04/09/08	10.5	--	**1,700**	**2.5**	**20**	**14**	**70**	<0.025	<0.99	<0.050	<0.050	<0.050	<0.050	<0.050
CPT7	04/09/08	12	--	**510**	**0.28**	<0.050	2.8	1.4	<0.025	<1.0	<0.050	<0.050	<0.050	<0.050	<0.050
CPT7	04/09/08	17	--	**700**	**0.45**	**5.7**	**6.0**	**27**	<0.023	<0.92	<0.046	<0.046	<0.046	<0.046	<0.046
CPT7	04/09/08	20	--	**430**	**0.15**	**6.6**	**4.2**	**19**	<0.024	<0.97	<0.049	<0.049	<0.049	<0.049	<0.049
CPT7	04/09/08	25	--	53	0.039	1.6	2.4	**11**	<0.026	<1.0	<0.052	<0.052	<0.052	<0.052	<0.052
CPT7	04/09/08	30	--	82	**0.048**	0.60	0.50	2.2	<0.025	<0.98	<0.049	<0.049	<0.049	<0.049	<0.049
CPT7	04/09/08	35	--	16	<0.026	0.16	0.13	0.61	<0.026	<1.1	<0.053	<0.053	<0.053	<0.053	<0.053
CPT7	04/09/08	40	--	2.1	0.0007	0.031	0.049	0.24	<0.0005	<0.019	<0.0009	<0.0009	<0.0009	<0.0009	<0.0009
CPT7	04/09/08	42	--	3.7	0.005	0.037	0.046	0.20	<0.0005	<0.020	<0.001	<0.001	<0.001	<0.001	<0.001
CPT7	04/09/08	50.5	--	38	0.026	0.46	0.72	**3.3**	<0.026	<1.0	<0.051	<0.051	<0.051	<0.051	<0.051
CPT7	04/09/08	55	--	32	<0.026	0.52	0.83	**3.9**	<0.026	<1.0	<0.052	<0.052	<0.052	<0.052	<0.052
2001 KHM Vadose Zone Investigation															
GP-1	06/21/01	3.5	--	<1.0**	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
GP-1	06/21/01	6.0	--	<1.0**	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
GP-1	06/21/01	11.0	--	<1.0**	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
GP-1	06/21/01	14.5	--	11**	<0.005	<0.005	<0.005	<0.010	<0.005	--	--	--	--	--	--
GP-3	06/21/01	3.5	--	<1.0**	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
GP-3	06/21/01	7.0	--	<1.0**	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
GP-3	06/21/01	10.5	--	<1.0**	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--

TABLE 1

SOIL ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPH*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			← *Reported in milligrams per kilogram (mg/kg)* →												
ESLs for Soil Leaching Screening Level (Drinking Water Sourse) Table G			***NE***	***83***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***	***0.075***	***NE***	***NE***	***NE***	***0.0045***	***0.00033***
ESLs for Soil Direct Exposure Construction/Trench Worker Table K-3			***NE***	4,200	12	650	210	420	2,800	320,000	***NE***	***NE***	***NE***	21	1.7
GP-4	06/21/01	3.5	--	<1.0**	<0.005	<0.005	<0.005	0.0097	<0.005	--	--	--	--	--	--
GP-4	06/21/01	6.0	--	<1.0**	<0.005	<0.005	<0.005	<0.005	<0.005	--	--	--	--	--	--
GP-4	06/21/01	14.0	--	27**	<0.005	<0.005	<0.005	<0.010	<0.005	--	--	--	--	--	--
1992 Weiss Extraction Well Installation															
B-1 (EW-1)	10/19/92	9.7	--	<1.0	<0.005*	<0.005*	<0.005*	<0.005*	--	--	--	--	--	--	--
B-1 (EW-1)	10/19/92	14.5	--	**1,200**	**6.6***	**21***	**15***	**50***	--	--	--	--	--	--	--
B-1 (EW-1)	10/19/92	24.7	--	3	0.017*	0.051*	0.050*	0.21*	--	--	--	--	--	--	--
B-1 (EW-1)	10/19/92	29.5	--	<1.0	<0.005*	<0.005*	<0.005*	<0.005*	--	--	--	--	--	--	--
B-2 (VE-1/SP-1)	10/20/92	14.5	--	**1,000**	**7.1***	**22***	**13***	**56***	--	--	--	--	--	--	--
B-2 (VE-1/SP-1)	10/20/92	16.7	--	**990**	**2.9***	**15***	**14***	**53***	--	--	--	--	--	--	--
B-2 (VE-1/SP-1)	10/20/92	18.5	--	<1.0	0.007*	0.029*	<0.005*	<0.005*	--	--	--	--	--	--	--
1984-1989															
B3-15 (MW-A)	09/27/84	15	--	--	**27**	**86**	**190**	**310**	--	--	--	--	--	--	--
B4-15 (MW-B)	09/27/84	15	--	--	**0.15**	0.83	0.97	3.1	--	--	--	--	--	--	--
Bottom	06/26/85	--	3.2*	--	**0.58***	0.24*	0.40*	0.009*	--	--	--	--	--	--	--
North	06/26/85	--	1.4*	--	<0.001*	<0.001*	<0.001*	<0.001*	--	--	--	--	--	--	--
South	06/26/85	--	<0.01*	--	<0.001*	<0.001*	<0.001*	<0.001*	--	--	--	--	--	--	--
East	06/26/85	--	1.3*	--	0.02*	0.02*	0.01*	0.01*	--	--	--	--	--	--	--

TABLE 1

SOIL ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPH*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			← *Reported in milligrams per kilogram (mg/kg)* →												
ESLs for Soil Leaching Screening Level (Drinking Water Sourse) Table G			***NE***	***83***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***	***0.075***	***NE***	***NE***	***NE***	***0.0045***	***0.00033***
ESLs for Soil Direct Exposure Construction/Trench Worker Table K-3			***NE***	4,200	12	650	210	420	2,800	320,000	***NE***	***NE***	***NE***	21	1.7
West	06/26/85	--	<0.01*	--	<0.001	<0.001*	<0.001*	<0.001*	--	--	--	--	--	--	--
MW-5C	11/11/86	14	--	2.1	0.030	0.025	--	0.070	--	--	--	--	--	--	--
MW-6B	11/11/86	10.5	--	<0.050	0.002	0.005	--	0.003	--	--	--	--	--	--	--
SB-1D	12/04/89	12.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
SB-1E	12/04/89	16	--	**1,500**	**4**	<3	**19**	**24**	--	--	--	--	--	--	--
SB-1F	12/04/89	21	--	5	<1	<3	<4	<15	--	--	--	--	--	--	--
SB-1G	12/04/89	27	--	31	<1	<3	<4	<15	--	--	--	--	--	--	--
SB-1H	12/04/89	32	--	**310**	**1**	**5**	<4	**15**	--	--	--	--	--	--	--
SB-2A	12/05/89	9.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
SB-2C	12/05/89	14.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
SB-2D	12/05/89	19.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
MW7C	12/05/89	10.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
MW7D	12/05/89	14.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
MW7F	12/05/89	19.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
MW8C	12/05/89	10	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
MW8D	12/05/89	17.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--
MW8E	12/05/89	20.5	--	<1	<1	<3	<4	<15	--	--	--	--	--	--	--

Notes:

Total petroleum hydrocarbons as fuel (TPH) analyzed by EPA method 8020 unless otherwise noted

TABLE 1

SOIL ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPH*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			← *Reported in milligrams per kilogram (mg/kg)* →												
ESLs for Soil Leaching Screening Level (Drinking Water Sourse) Table G			***NE***	***83***	***0.044***	***2.9***	***3.3***	***2.3***	***0.023***	***0.075***	***NE***	***NE***	***NE***	***0.0045***	***0.00033***
ESLs for Soil Direct Exposure Construction/Trench Worker Table K-3			***NE***	4,200	12	650	210	420	2,800	320,000	***NE***	***NE***	***NE***	21	1.7

Total petroleum hydrocarbons as gasoline (TPHg) analyzed by EPA method 8015B modified unless otherwise noted

Benzene, toluene, ethylbenzene, and xylenes (BTEX); methyl tertiary-butyl ether (MTBE); t-butyl alcohol (TBA); di-isopropyl ether (DIPE); ethyl tertiary-butyl ether (ETBE); t-amyl methyl ether (TAME); 1,2-dichloroethane (1,2-DCA); 1,2-dibromoethane (EDB) by EPA method 8260B unless otherwise noted

Environmental Screening Levels (ESLs) for commerical land use where groundwater is a current or potential drinking water source from *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* presented by the California Regional Water Quality Control Board - San Francisco Bay Region Interim Final November 2007, revised May 2008.

NE = Not established

fbg = feet below grade

ND = Not detected above various laboratory method detection limits

* = Analyzed by EPA method 8020

**=TPHg analyzed by EPA method 8260B

<x = Not detected at reporting limit x

-- = Not analyzed/not applicable

TABLE 2
WELL CONSTRUCTION SPECIFICATIONS
FORMER TEXACO STATION #21-1253
930 SPRINGTOWN BLVD., LIVERMORE, CALIFORNIA

Well ID	*Date Installed*	*Date Destroyed*	*TOC (ft-msl)*	*Total Depth (fbg)*	*Screen Interval (fbg)*	*Well Casing Diameter (inches)*	*Casing Slot Size (inches)*	*Filter Pack*	*Comments*
MW-A	7/31/1985	12/19/2002	527.96	16	4-15	4	NA	NA	Destroyed by Pressure Grouting
MW-B	7/31/1985	12/19/2002	518.05	16	4-15	4	NA	NA	Destroyed by Pressure Grouting
MW-1	7/31/1985	12/19/2002	520.61	20	5 - 20	4	NA	"Aquarium Sand"	Destroyed by Pressure Grouting
MW-2	7/31/1985	12/19/2002	518.29	20	5 - 20	4	NA	"Aquarium Sand"	Destroyed by Pressure Grouting
MW-3	7/31/1985	12/19/2002	519.6	20	5 - 20	4	NA	"Aquarium Sand"	Destroyed by Pressure Grouting
MW-4	9/10/1985	12/19/2002	518.79	27	5 - 25	3	0.020	NA	Destroyed by Pressure Grouting
MW-5	11/10/1986	12/19/2002	521.19	30	5-25	2	0.02	NA	Destroyed by Pressure Grouting
MW-6	11/10/1986	1/19/1996	522.18	25	5-25	2	0.02	NA	Destroyed by Overdrilling
MW-7	12/5/1989	12/29/1995	522.19	25	5-25	4	0.02	NA	Destroyed by Overdrilling
MW-8	12/6/1989	12/19/2002	524.03	25	5-25	4	0.02	NA	Destroyed by Pressure Grouting
MW-9	6/24/2009	---	523.14	15	5 - 15	4	0.010	Monterey Sand #2/12	Active
MW-10	6/24/2009	---	522.76	27	22 - 27	4	0.010	Monterey Sand #2/12	Active
MW-11	6/24/2009	---	523.25	15	5 - 15	4	0.010	Monterey Sand #2/12	Active
MW-12	6/25/2009	---	523.42	27	22 - 27	4	0.010	Monterey Sand #2/12	Active
MW-13	6/25/2009	---	523.12	37	32 - 37	4	0.010	Monterey Sand #2/12	Active
MW-14	6/29/2009	---	520.88	15	5 - 15	4	0.010	Monterey Sand #2/12	Active
MW-15	6/30/2009	---	520.87	47	41.5 - 46.5	4	0.010	Monterey Sand #2/12	Active
MW-16	6/29/2009	---	520.5	30	25 - 30	4	0.010	Monterey Sand #2/12	Active
EW-1	10/19/1992	12/19/2002	NA	33	8-33	6	0.02	Monterey Sand #3	Destroyed by Pressure Grouting
VE-1	10/20/1992	12/19/2002	NA	12	7-12	2	0.02	Monterey Sand #3	Destroyed by Pressure Grouting
SP-1	10/20/1992	12/19/2002	NA	20	15-20	1	0.01	Monterey Sand #3	Destroyed by Pressure Grouting

Notes:

NA = Not available
fbg= feet below grade
ft-msl= feet above mean sea-level

TABLE 3
GROUNDWATER ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHg*	*Benzene*	*Toluene*	*Ethylbenzene*	*Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			← *Reported in micrograms per liter (µg/L)* →											
ESLs for Final Screening Levels where Groundwater is a Potential or Current Drinking Water Resource (Table F-1a)			***100***	***1.0***	***40***	***30***	***20***	***5.0***	***12***	***NE***	***NE***	***NE***	***0.5***	***0.05***
ESLs for Potential Vapor Intrusion Into Buildings Comercial/Industrial (Table E-1a)			***Uses soil gas***	***1,800***	***530,000***	***170,000***	***160,000***	***80,000***	***Uses soil gas***	***NE***	***NE***	***NE***	***690***	510
First Semi-Annual 2011 Groundwater Monitoring and Sampling Event														
MW-9	1/31/2011	5-15 ***	68	<0.5	3	<0.5	<0.5	--	--	--	--	--	--	--
MW-10	1/31/2011	22-27 ***	**250**	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-11	1/31/2011	5-15 ***	**790**	**1**	<0.5	5	3	--	--	--	--	--	--	--
MW-12	1/31/2011	22-27 ***	**9,600**	**64**	**180**	**180**	**400**	--	--	--	--	--	--	--
MW-13	1/31/2011	32-37 ***	**22,000**	**1,600**	**1,600**	**270**	**1,600**	--	--	--	--	--	--	--
MW-14	1/31/2011	5-15 ***	**Not Sampled due to LNAPL**					--	--	--	--	--	--	--
MW-15	1/31/2011	42-47 ***	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
MW-16	1/31/2011	25-30 ***	<50	<0.5	<0.5	<0.5	<0.5	--	--	--	--	--	--	--
CRA 2007 - 2008 Subsurface Investigation														
CPT1	11/26/2007	16	**1,700**	**7**	**110**	21	**140**	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT1	11/26/2007	24	**160,000**	**4,200**	**20,000**	**1,700**	**15,000**	<25	<100	<25	<25	<25	<25	<25
CPT1	11/26/2007	34	**30,000**	**1,500**	**1,600**	**710**	**2,900**	<2	<8	<2	<2	<2	<2	<2
CPT2	11/20/2007	16	<50	0.6	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT2	11/20/2007	24	**2,000**	<0.5	<0.5	0.6	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT2	11/20/2007	34	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	**4**
CPT3	4/7/2008	26	**1,500**	**1**	**1**	<0.5	1	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT3	4/7/2008	40	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT3	4/7/2008	50	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT4	7/14/2008	24	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT4	7/14/2008	48	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT5	4/9/2008	28	**200**	0.5	6.0	6.0	**31**	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT5	4/9/2008	38	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5

TABLE 3
GROUNDWATER ANALYTICAL DATA
FORMER TEXACO STATION (CHEVRON SITE #21-1253)
930 SPRINGTOWN BOULEVARD, LIVERMORE, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*TPHg*	*Benzene*	*Toluene*	*Ethylbenzene*	*Xylenes*	*MTBE*	*TBA*	*DIPE*	*ETBE*	*TAME*	*1,2-DCA*	*EDB*
			Reported in micrograms per liter (µg/L)											
ESLs for Final Screening Levels where Groundwater is a Potential or Current Drinking Water Resource (Table F-1a)			***100***	***1.0***	***40***	***30***	***20***	***5.0***	***12***	***NE***	***NE***	***NE***	***0.5***	***0.05***
ESLs for Potential Vapor Intrusion Into Buildings Comercial/Industrial (Table E-1a)			*Uses soil gas*	*1,800*	*530,000*	*170,000*	*160,000*	*80,000*	*Uses soil gas*	*NE*	*NE*	*NE*	*690*	510
CPT5	4/9/2008	45	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT6	11/19/2007	32	94	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT6	11/20/2007	48	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<2	<0.5	<0.5	<0.5	<0.5	<0.5
CPT7	4/8/2008	13	**3,600**	**21**	25	**47**	**110**	<0.5	<2	<0.5	<0.5	<0.5	<0.5	**0.8**
CPT7	4/9/2008	43	**11,000**	**3**	**270**	**490**	**2,100**	<1	<5	<1	<1	<1	<1	<1
1985 GTI Hydrocarbon Investigation														
MW-A	8/1/1985	--	**184,000***	**8,950****	**54,300****	**13,700****	**52,100****	--	--	--	--	--	--	--
MW-B	8/1/1985	--	**29,400***	**2,590****	**12,300****	**2,880****	**10,100****	--	--	--	--	--	--	--
MW-1	8/1/1985	--	10*	ND**	4**	2**	8**	--	--	--	--	--	--	--
MW-2	8/1/1985	--	**390***	**9****	9**	3**	6**	--	--	--	--	--	--	--
MW-3	8/1/1985	--	**1,340***	**20****	4**	1**	**26****	--	--	--	--	--	--	--

Notes:

Total petroleum hydrocarbons as gasoline (TPHg) analyzed by EPA Method 8015B modified unless otherwise noted

Benzene, toluene, ethylbenzene, and xylenes (BTEX); methyl tertiary-butyl ether (MTBE); t-butyl alcohol (TBA); di-isopropyl ether (DIPE); ethyl tertiary-butyl ether (ETBE); t-amyl methyl ether (TAME); 1,2-dichloroethane (1,2-DCA); 1,2-dibromoethane (EDB)

ESL's = Environmental Screening Levels for groundwater that is a current or potential drinking water source (commercial/industrial land use) from Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater Interim Final November 2

* =Reported as C4-C12 Aliphatic Hydrocarbons analyzed by EPA Method 602

**= Analyzed by EPA Method 602

fbg = feet below grade

<x = Not detected at reporting limit x

ND = Not detected above various laboratory method detection limits

NE= Not Established

-- = Not analyzed/not applicable

APPENDIX A

REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
ALEX BRISCOE, Director

ENVIRONMENTAL HEALTH SERVICES
ENVIRONMENTAL PROTECTION
1131 Harbor Bay Parkway, Suite 250
Alameda, CA 94502-6577
(510) 567-6700
FAX (510) 337-9335

December 29, 2010

Mr. Eric Frohnapple (*Sent via E-mail to: ericf@chevron.com*)
Chevron Environmental Management Company
6111 Bollinger Canyon Rd., BR Y
San Ramon, CA 94583

Mr. Ken Hilliard
Environmental Services
7-Eleven, Inc.
One Arts Plaza, 1722 Routh St., Suite 1000
Dallas, TX 75201

Subject: Review of Pilot Test Work Plan for Fuel Leak Case No. RO0000189 and Geotracker Global ID T0600101353, Chevron #21-1253/Texaco, 930 Springtown Boulevard, Livermore, CA 94550

Dear Mr. Frohnapple and Mr. Hilliard:

Alameda County Environmental Health (ACEH) staff has reviewed the fuel leak case file for the above-referenced site, including the document entitled, "*Response to the August 30, 2010 Regulatory Letter*," dated October 7, 2010. The document, which was prepared on Chevron's behalf by Conestoga-Rovers & Associates, again proposes pilot testing surfactant-enhanced recovery treatment (SERT) to remove non-aqueous phase liquid (NAPL) from well MW-14. The document also indicates that after the pilot test is complete, additional remedial alternatives will be evaluated in a Draft Corrective Action Plan (CAP).

The purpose of the proposed pilot test of the surfactant-enhanced recovery treatment (SERT) is to remove NAPL and prevent NAPL recurrence in well MW-14. This proposed spot treatment in well MW-14 has limited usefulness for overall site remediation. Well MW-14 is screened within the shallow zone between depths of 5 to 15 feet bgs. Site contamination extends into significantly deeper zones to depths greater than 50 feet bgs.

The proposed pilot test appears to be inadequate in both scope and design for the following reasons:

- The pilot test is limited to one well (MW-14) that is screened between depths of 5 to 15 feet bgs. Site contamination extends to more than 50 feet bgs.
- There are no other monitoring wells near MW-14 that are appropriately screened to monitor the pilot test. The only useful data from the pilot test will be from the injection well (MW-14). The only method for monitoring the effectiveness of the pilot test appears to be long-term monitoring of well MW-14. Therefore, the proposed pilot test will not provide sufficient data to evaluate the effects of the treatment beyond the immediate vicinity of the well MW-14 borehole.

- No background or post-treatment measurements other than water levels, visual inspection for NAPL, and chemical concentrations in MW-14 are proposed to evaluate the effects of the treatment.
- The extent and thickness of NAPL in the area of MW-14 is unknown.

Given these limitations of the proposed pilot test, delaying the preparation of a Draft CAP during long-term monitoring of well MW-14 does not appear to be justified. Therefore, we request that you proceed with preparation of a Draft CAP in accordance with the technical comments below.

If you would like to proceed with the proposed SERT pilot test for spot treatment of well MW-14 in addition to the Draft CAP, please provide the following:

- A revised Pilot Test Work Plan that addresses the comments in the three bullets listed above.
- Relevant case histories and analysis of the effectiveness of SERT when applied at similar Chevron sites.

TECHNICAL COMMENTS

1. **Draft Corrective Action Plan.** Based on the elevated concentrations of the various chemicals of concern that have been detected in soil and groundwater both on-site and off-site, remedial action is required for this site. In order to evaluate remedial actions for the site, we request that you prepare a Draft Corrective Action Plan (Draft CAP) that meets the provisions of section 2725 of the UST regulations (CCR, Title 23, Chapter 16, section 2600, et seq.) and includes the following minimum information:

    - Proposed cleanup goals and the basis for cleanup goals.
    - Summary of site characterization data.
    - Receptor information including likely future land use scenarios, adjacent land use and sensitive receptors, and potential groundwater receptors.
    - Evaluation of a minimum of three active remedial alternatives including discussion of feasibility and limitations for each remedial alternative.
    - Detailed description of proposed remediation including confirmation sampling and monitoring during implementation.
    - Schedule for implementation of cleanup.

    Public participation is a requirement for the Corrective Action Plan process. Therefore, we request that you submit a Draft CAP for ACEH review. Upon ACEH approval of a Draft CAP, ACEH will notify potentially affected members of the public who live or own property in the surrounding area of the proposed remediation described in the Draft CAP. Public comments on the proposed remediation will be accepted for a 30-day period.

2. **Groundwater Monitoring.** Please continue groundwater monitoring on a semi-annual basis and present the results in the groundwater monitoring reports requested below

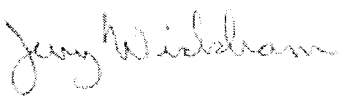
TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Jerry Wickham), according to the following schedule:

- **March 30, 2011** – Draft Corrective Action Plan
- **30 days following end of quarter** – Semi-annual Groundwater Monitoring Report

If you have any questions, please call me at (510) 567-6791 or send me an electronic mail message at jerry.wickham@acgov.org.

Sincerely,



Jerry Wickham, California PG 3766, CEG 1177, and CHG 297
Senior Hazardous Materials Specialist

Attachment: Responsible Party(ies) Legal Requirements/Obligations

Enclosure: ACEH Electronic Report Upload (ftp) Instructions

cc: Danielle Stefani, Livermore Pleasanton Fire Department, 3560 Nevada St, Pleasanton, CA 94566 (*Sent via E-mail to: dstefani@lpfire.org*)

Cheryl Dizon (QIC 8021), Zone 7 Water Agency, 100 North Canyons Pkwy, Livermore, CA 94551 (*Sent via E-mail to: cdizon@zone7water.com*)

Kiersten Hoey, Conestoga-Rovers & Associates, 5900 Hollis Street, Suite A, Emeryville, CA 94608 (*Sent via E-mail to: khoey@craworld.com*)

Donna Drogos, ACEH (*Sent via E-mail to: donna.drogos@acgov.org*)
Jerry Wickham, ACEH (*Sent via E-mail to: jerry.wickham@acgov.org*)
File

Attachment 1

Responsible Party(ies) Legal Requirements/Obligations

REPORT REQUESTS

These reports are being requested pursuant to California Health and Safety Code Section 25296.10. 23 CCR Sections 2652 through 2654, and 2721 through 2728 outline the responsibilities of a responsible party in response to an unauthorized release from a petroleum UST system, and require your compliance with this request.

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of reports in electronic form. The electronic copy replaces paper copies and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. Instructions for submission of electronic documents to the Alameda County Environmental Cleanup Oversight Program FTP site are provided on the attached "Electronic Report Upload Instructions." Submission of reports to the Alameda County FTP site is an addition to existing requirements for electronic submittal of information to the State Water Resources Control Board (SWRCB) GeoTracker website. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for all groundwater cleanup programs. For several years, responsible parties for cleanup of leaks from underground storage tanks (USTs) have been required to submit groundwater analytical data, surveyed locations of monitoring wells, and other data to the GeoTracker database over the Internet. Beginning July 1, 2005, these same reporting requirements were added to Spills, Leaks, Investigations, and Cleanup (SLIC) sites. Beginning July 1, 2005, electronic submittal of a complete copy of all reports for all sites is required in GeoTracker (in PDF format). Please visit the SWRCB website for more information on these requirements (http://www.swrcb.ca.gov/ust/electronic_submittal/report_rqmts.shtml.

PERJURY STATEMENT

All work plans, technical reports, or technical documents submitted to ACEH must be accompanied by a cover letter from the responsible party that states, at a minimum, the following: "I declare, under penalty of perjury, that the information and/or recommendations contained in the attached document or report is true and correct to the best of my knowledge." This letter must be signed by an officer or legally authorized representative of your company. Please include a cover letter satisfying these requirements with all future reports and technical documents submitted for this fuel leak case.

PROFESSIONAL CERTIFICATION & CONCLUSIONS/RECOMMENDATIONS

The California Business and Professions Code (Sections 6735, 6835, and 7835.1) requires that work plans and technical or implementation reports containing geologic or engineering evaluations and/or judgments be performed under the direction of an appropriately registered or certified professional. For your submittal to be considered a valid technical report, you are to present site specific data, data interpretations, and recommendations prepared by an appropriately licensed professional and include the professional registration stamp, signature, and statement of professional certification. Please ensure all that all technical reports submitted for this fuel leak case meet this requirement.

UNDERGROUND STORAGE TANK CLEANUP FUND

Please note that delays in investigation, later reports, or enforcement actions may result in your becoming ineligible to receive grant money from the state's Underground Storage Tank Cleanup Fund (Senate Bill 2004) to reimburse you for the cost of cleanup.

AGENCY OVERSIGHT

If it appears as though significant delays are occurring or reports are not submitted as requested, we will consider referring your case to the Regional Board or other appropriate agency, including the County District Attorney, for possible enforcement actions. California Health and Safety Code, Section 25299.76 authorizes enforcement including administrative action or monetary penalties of up to $10,000 per day for each day of violation.

Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC)	**REVISION DATE:** July 20, 2010
	ISSUE DATE: July 5, 2005
	PREVIOUS REVISIONS: October 31, 2005; December 16, 2005; March 27, 2009; July 8, 2010
SECTION: Miscellaneous Administrative Topics & Procedures	**SUBJECT:** Electronic Report Upload (ftp) Instructions

The Alameda County Environmental Cleanup Oversight Programs (LOP and SLIC) require submission of all reports in electronic form to the county's ftp site. Paper copies of reports will no longer be accepted. The electronic copy replaces the paper copy and will be used for all public information requests, regulatory review, and compliance/enforcement activities.

REQUIREMENTS

- **Please do not submit reports as attachments to electronic mail.**
- Entire report including cover letter must be submitted to the ftp site as **a single portable document format (PDF) with no password protection**.
- It is **preferable** that reports be converted to PDF format from their original format, (e.g., Microsoft Word) rather than scanned.
- **Signature pages and perjury statements must be included and have either original or electronic signature.**
- **Do not password protect the document**. Once indexed and inserted into the correct electronic case file, the document will be secured in compliance with the County's current security standards and a password. **Documents with password protection will not be accepted**.
- Each page in the PDF document should be rotated in the direction that will make it easiest to read on a computer monitor.
- Reports must be named and saved using the following naming convention:

  RO#_Report Name_Year-Month-Date (e.g., RO#5555_WorkPlan_2005-06-14)

Submission Instructions

1) Obtain User Name and Password
   a) Contact the Alameda County Environmental Health Department to obtain a User Name and Password to upload files to the ftp site.
      i. Send an e-mail to dehloptoxic@acgov.org
   b) In the subject line of your request, be sure to include **"ftp PASSWORD REQUEST"** and in the body of your request, include the **Contact Information, Site Addresses**, and the **Case Numbers (RO# available in Geotracker) you will be posting for**.

2) Upload Files to the ftp Site
   a) Using Internet Explorer (IE4+), go to ftp://alcoftp1.acgov.org
      i. Note: Netscape, Safari, and Firefox browsers will not open the FTP site as they are NOT being supported at this time.
   b) Click on Page located on the Command bar on upper right side of window, and then scroll down to Open FTP Site in Windows Explorer.
   c) Enter your User Name and Password. (Note: Both are Case Sensitive.)
   d) Open "My Computer" on your computer and navigate to the file(s) you wish to upload to the ftp site.
   e) With both "My Computer" and the ftp site open in separate windows, drag and drop the file(s) from "My Computer" to the ftp window.

3) Send E-mail Notifications to the Environmental Cleanup Oversight Programs
   a) Send email to dehloptoxic@acgov.org notify us that you have placed a report on our ftp site.
   b) Copy your Caseworker on the e-mail. Your Caseworker's e-mail address is the entire first name then a period and entire last name @acgov.org. (e.g., firstname.lastname@acgov.org)
   c) The subject line of the e-mail must start with the RO# followed by **Report Upload**. (e.g., Subject: RO1234 Report Upload) If site is a new case without an RO#, use the street address instead.
   d) If your document meets the above requirements and you follow the submission instructions, you will receive a notification by email indicating that your document was successfully uploaded to the ftp site.

From: Wickham, Jerry, Env. Health [jerry.wickham@acgov.org]
Sent: Thursday, February 10, 2011 6:19 PM
To: ericf@chevron.com; Hoey, Kiersten; Wilken, Brandon; Brasher, Bill
Subject: RO0189 Meeting of February 10, 2011

Based on our meeting and teleconference today (2/10/2011), the preparation of a Work Plan for Source Area Delineation instead of a Draft Corrective Action Plan is acceptable. Please proceed with Work Plan preparation with a due date of March 30, 2011.

Regards,

Jerry Wickham
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502-6577
phone: 510-567-6791
jerry.wickham@acgov.org

APPENDIX B

PREVIOUS ENVIRONMENTAL INVESTIGATION AND REMDIATION

PREVIOUS ENVIRONMENTAL INVESTIGATION AND REMEDIATION
FORMER TEXACO 21-1253

1984 Initial Investigation
In September 1984, J.H. Kleinfelder and Associates (Kleinfelder) discovered approximately 1-inch of light non-aqueous phase liquid (LNAPL) adjacent to the underground storage tanks (USTs) during an initial investigation. It appears that Kleinfelder installed monitoring wells MW-A and MW-B in September 1984. No additional information was located by CRA.

1985 Hydrocarbon Investigation and UST/Product Line Removal
In May through July 1985, Groundwater Technology Incorporated (GTI) installed monitoring wells MW-1 through MW-3 around the UST pit to assess the extent of hydrocarbons detected by Kleinfelder. On June 26, 1985, GTI collected soil samples beneath the USTs and product lines during the decommissioning of the Texaco station including UST and product line removal. GTI conducted a ½-mile well survey through the Alameda Flood Control and Water Conservation District. Eight wells were identified north, east, and south of the site. Additional information is available in GTI's August 1985 *Hydrocarbon Investigation Report*.

1985 Monitoring Well Installation
In September 1985, GTI installed well MW-4. Additional information is available in GTI's September 17, 1985 *Untitled Report.*

1986 Monitoring Well Installation
In November 1986, GTI installed wells MW-5 and MW-6. Additional information is available in GTI's March 23, 1987 *Status Report.*

1989 Additional Site Assessment
In December 1989, GTI advanced soil borings SB-1 and SB-2 and installed monitoring wells MW-7 and MW-8. More information available in GTI's April 10, 1990 *Report of Additional Environmental Site Assessment*.

1991 Soil Vapor Extraction (SVE) Pilot Test
In July 1991, GTI conducted a SVE pilot test. The radius of vacuum influence was calculated as less than 30 feet. At a flow rate of 100 cubic feet per minute, the hydrocarbon removal rate from MW-5 was calculated to be 135 lbs/day. More information is available in GTI's September 12, 1991 *Work Plan for Soil and Groundwater Remediation.*

1993 Extraction Well Installation and Feasibility Testing
In October 1992, Weiss Associates (WA) installed groundwater extraction well EW-1, vapor extraction well VE-1, and air sparge well SP-1. In November 1992, WA conducted a 24 hour aquifer test using EW-1. Groundwater was extracted at an average flow rate of 7.85 gallons per minute (gpm). The average aquifer transmissivity was estimated to be 3,400 gallons per day per foot. Although most of the monitoring wells are screened over a length of 20 feet, boring logs indicate that the more permeable, sandy gravel zone is 15 feet thick. Using this thickness, an average hydraulic conductivity value of 225 gpd/ft^2 (0.021 ft/min), and a specific storage of 0.001 ft^{-1} are estimated for this aquifer. WA also conducted a vapor extraction test on vapor

extraction well VE-1, groundwater extraction well EW-1, and existing monitoring wells MW-A, MW-B and MW-5. The hydrocarbon mass removal rate ranged between 0.3 and 127 pounds/day total petroleum hydrocarbons as gasoline. WA conducted an air sparging test from the air sparge well SP-1 and vapor extraction wells VE-1, and concluded that air sparging with vapor extraction would effectively remove hydrocarbons from saturated sediments. Additional information is available in WA's January 5, 1993 *Extraction Well Installation and Feasibility Testing*.

1994 Remediation System Start-Up

In November 1994, GTI started operation of a 100 cfm King Buck/Hasstech MMC-5a catalytic oxidizer SVE\Air Sparge system. The system was connected to wells MW-A, MW-B, MW-3, MW-5, VE-1 and SP-1. The system operated intermittently through August 1995, when it was shutdown due low hydrocarbon removal rates. Additional information including system diagrams, startup testing, sampling activities and laboratory analytical data are available in GTI's March 10, 1995 *Remediation System Start-up/Air Monitoring and Sampling Report*.

1996 Well Destruction Report

In February 1996, Kaprealian Engineering Incorporated (KEI) destroyed wells MW-6 and MW-7. Additional information is available in KEI's January 22, 1996 *Report of Destruction of Monitoring Wells*.

1997 Tier 2 Risk Based Corrective Action Analysis

In December 1997, KEI submitted a summary of the input parameters to be used for a subsequent Tier 2 Risk-Based Corrective Action (RBCA) analysis, including subsurface soil and groundwater sample analytic results. KEI modeled BTEX concentrations and concluded no onsite Site-Specific Target Levels were exceeded for any of the pathways modeled, either cumulative or site specific levels. Additional information available in KEI's October 31, 1997 *Risk-Based Corrective Action Analysis*.

2001 RBCA Vadose Zone Investigation and RBCA Analysis

In August 2001, KHM Environmental Management (KHM) submitted an addendum to the previous RBCA in response to an ACEH email requesting an evaluation of risk to a "Residential Setting" and risk associated with potential vapor intrusion to the onsite building. In June 2001, KHM advanced geoprobe borings GP-1 through GP-4. Borings GP-1 and GP-3 were advanced adjacent to groundwater monitoring wells with the highest hydrocarbon concentrations (MW-A and MW-B), GP-2 was advanced outside of the UST complex area, and GP-4 was advanced on the east side of the former UST complex. Borings GP-1, GP-3, and GP-4 were first advanced to 3 fbg for collection of a vadose zone soil gas samples, then advanced to first encountered groundwater at approximately 15 fbg. KHM concluded the only potential pathway of exposure for a residential setting was vapor intrusion; however because no benzene was detected in vadose zone soil gas, there was no risk to human health or the environment. Additional information is available in KHM's August 13, 2001 *Vadose Zone Investigation and Risk-Based Correction Action (RBCA) Analysis*.

2001 Closure Request

In December 2001, KHM submitted a case closure request under the direction of ACEH. KHM concluded all hydrocarbon sources had been removed, the SVE system adequately removed hydrocarbons from the vadose zone, the dissolved hydrocarbons were defined and limited in extent, and no sensitive receptors were at risk. Additional information is available in KHM's December 10, 2001 letter requesting closure.

2002 Case Closure

ACEH's March 2002 letter stated the Regional Water Quality Control Board (RWQCB) concurred with ACEH's recommendation for case closure, and all wells must be destroyed prior to issuing a "Remedial Action Completion" letter.

2002 Well Destruction

In December 2002, KHM destroyed onsite and offsite wells MW-1 through MW-5, MW-A, MW-B, EW-1, VE-1, and SP-1 by pressure grouting. Additional information is available in KHM's January 7, 2003 *Well Destructions – MW-1 through MW-5, MW-8, MW-A, MW-B, EW-1, VE-1 and SP-1*.

2007/2008 Subsurface Investigation

By January 2007, no "Remedial Action Completion" letter had been issued by ACEH or the RWQCB. In a letter dated January 31, 2007, ACEH requested horizontal and vertical delineation of the hydrocarbon plume, preferential pathway evaluation, and well decommissioning documentation. In 2007 and 2008, to address the ACEH's technical comments and re-evaluate the site for closure, Conestoga-Rovers & Associates (CRA) advanced cone penetration testing (CPT) borings CPT1 through CPT7 both on and offsite. Additional information is available in CRA's August 13, 2008 *Subsurface Investigation Report*.

2009 Altamont Pipeline Excavation

In 2009, the Zone 7 water agency installed the Altamont pipeline along the northern boundary of the site property. According to conversations with the water agency, an excavation approximately 6 feet wide by 15 feet deep was advanced removing approximately 240 cubic yards of soil. According to the water agency, no further details regarding this excavation are available.

2009 Monitoring Well Installation

In July 2009, CRA installed monitoring wells MW-9 through MW-16 to delineate dissolved hydrocarbon concentrations. The monitoring wells were installed at three different levels: shallow wells MW-9, MW-11 and MW-14, intermediate wells MW-10, MW-12, MW-13 and MW-16, and deep well MW-15. Additional information is available in CRA's August 19, 2009 *Monitoring Well Installation Report.*

APPENDIX C

BORING LOGS

GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number 1

Project Texaco/Livermore Owner Southland Corp.

Location Springtown&Lassen Project Number 20-4051

Date Drilled 6-20-85 Total Depth of Hole 25 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level, Initial ____ 24-hrs. 11.68

Screen: Dia. 4-inch Length 20-feet Slot Size .020 in.

Casing: Dia. 4-inch Length 5-feet Type PVC

Drilling Company Sierra Pacific Drilling Method H.S. Auger

Driller Lynn Pera Log by Cori Condon

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes Blow Counts	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
1					Asphalt and fill sand and gravel.
2					Brown sandy clay, damp, no odor.
6					Brown-green fine sand with subangular white gravels, damp, no odor.
7.5					Brown-green silty fine sand, stiff, damp, no odor.
10					Brown-green silty fine sand with rounded cobbles and gravels, moist, no odor.
12					Cobbles and gravels in fine sand, moist, no odor.
15		11-12-24	#1 ▽		Gray brown fine sand and silt, less cobbles and pea size gravels, moist, no odor.
20		12-18-18	#2		Gray-brown coarse sand, wet, no odor.
25					Gray-brown coarse sand, wet, no odor, contact with brown sandy clay.
					Drilled 25 feet Cased 20 feet slotted, 5 feet blank Aquarium sand to 3 feet Cement seal to surface Finish with steel manhole

02100144

GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number 2

Project Texaco/Livermore Owner Southland Corp.

Location Springtown & Lassen Project Number 20-4051

Date Drilled 6-20-85 Total Depth of Hole 24 ft. Diameter 7.5 in.

Surface Elevation ____ Water Level, Initial ____ 24-hrs. 10.30

Screen: Dia. 4-inch Length 20-feet Slot Size .020 in.

Casing: Dia. 4-inch Length 4-feet Type PVC

Drilling Company Sierra Pacific Drilling Method H.S. Auger

Driller Lynn Pera Log by Cori Condon

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes Blow Counts	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
1					Asphalt and fill.
					Red-brown clayey sand, occasional gravel, damp, no odor.
9.5					
10		21-33-35	#3		Gray sand and gravel, wet, no odor.
15		9-25-25	#4		Gray sand and gravel, grading to cobbles, wet, very slight gas odor.
20		14-56+	Lost Sample		Gray sand and gravel, wet, slight gas odor, contact with sandy clay.
25					Drilled 25 feet Cased 20 feet slotted, 4 feet blank Aquarium sand to 3 feet Cement seal to surface Finished with steel manhole.

GROUNDWATER TECHNOLOGY

Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number 3

Project Texaco/Livermore Owner Southland Corp

Location Springtown & Lassen Project Number 20-4051

Date Drilled 6-20-85 Total Depth of Hole 24 ft. Diameter 7.5 in

Surface Elevation Water Level, Initial 24-hrs. 11.59

Screen: Dia. 4-inch Length 20-feet Slot Size .020 in

Casing: Dia. 4-inch Length 4-feet Type PVC

Drilling Company Sierra Pacific Drilling Method H.S. Auger

Driller Lynn Pera Log by Cori Condon

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes Blow Counts	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
1					Asphalt and fill.
					Light brown sandy clay with occasional gravel, damp, no odor.
7					Light brown sandy clay with occasional gravel, moist, gasoline odor.
10		13-27-37	# 5		Gray sand and gravel, wet, slight gasoline odor.
15		6-9-19	# 6		Gray sand and gravel, wet, slight gas odor, contact with sandy clay.
20		5-7-12	# 7		Mottled sandy clay, moist, slight gasoline odor.
25		8-22-25	# 8		Gray sand, wet, no odor.
26.5					Drilled 25 feet Cased 20 feet slotted, 4 feet blank Aquarium sand to 3 feet Cement seal to surface Finished with steel manhole

GROUNDWATER TECHNOLOGY
Division of Oil Recovery Systems, Inc.

Drilling Log

Well Number 4

Project Texaco/Livermore Owner Texaco U.S.A., Inc.

Location Springtown/Bluebell Project Number 20-4051

Date Drilled 9/10/85 Total Depth of Hole 25-ft. Diameter 7.5-ft.

Surface Elevation _____ Water Level, Initial 10-ft. 24-hrs. 10.49

Screen: Dia. 3-in. Length 20-ft. Slot Size .020-in.

Casing: Dia. 3-in. Length 5-ft. Type PVC

Drilling Company Sierra Pacific Drilling Method Hollow Stem Auger

Driller Lynn Pera Log by C. Condon

Sketch Map

Notes

Depth (Feet)	Well Construction	Notes	Sample Number	Graphic Log	Description/Soil Classification (Color, Texture, Structures)
0					Dark brown silty clay, occasional gravel, damp, no odor.
1					
2					
3					Light brown sandy silt, damp, no odor.
4					
5					
6					
7					Light brown sandy clay, moist, no odor.
8					
9					
10		3-6-7	1		Light brown coarse sandy clay, wet, no odor.
11					
12					
13					
14					
15					
16					
17					Drilled 27 feet
18					Sand Pack to 4 feet
19					Bentonite and Cement Seal to Surface, Finished with Steel Locking Casing
20					
21					
22					
23					
24					
25					

02100144

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 5

Drilling Log

Project Texaco/Livermore Owner Texaco U.S.A.

Location 930 Springton Blvd Project Number 20-4051

Date Drilled 11/10/86 Total Depth of Hole 30 ft Diameter 7.5 in.

Surface Elevation ____ Water Level, Initial 12 ft. 24-hrs. ____

Screen: Dia. 2 in. Length 25 ft. Slot Size .020 in.

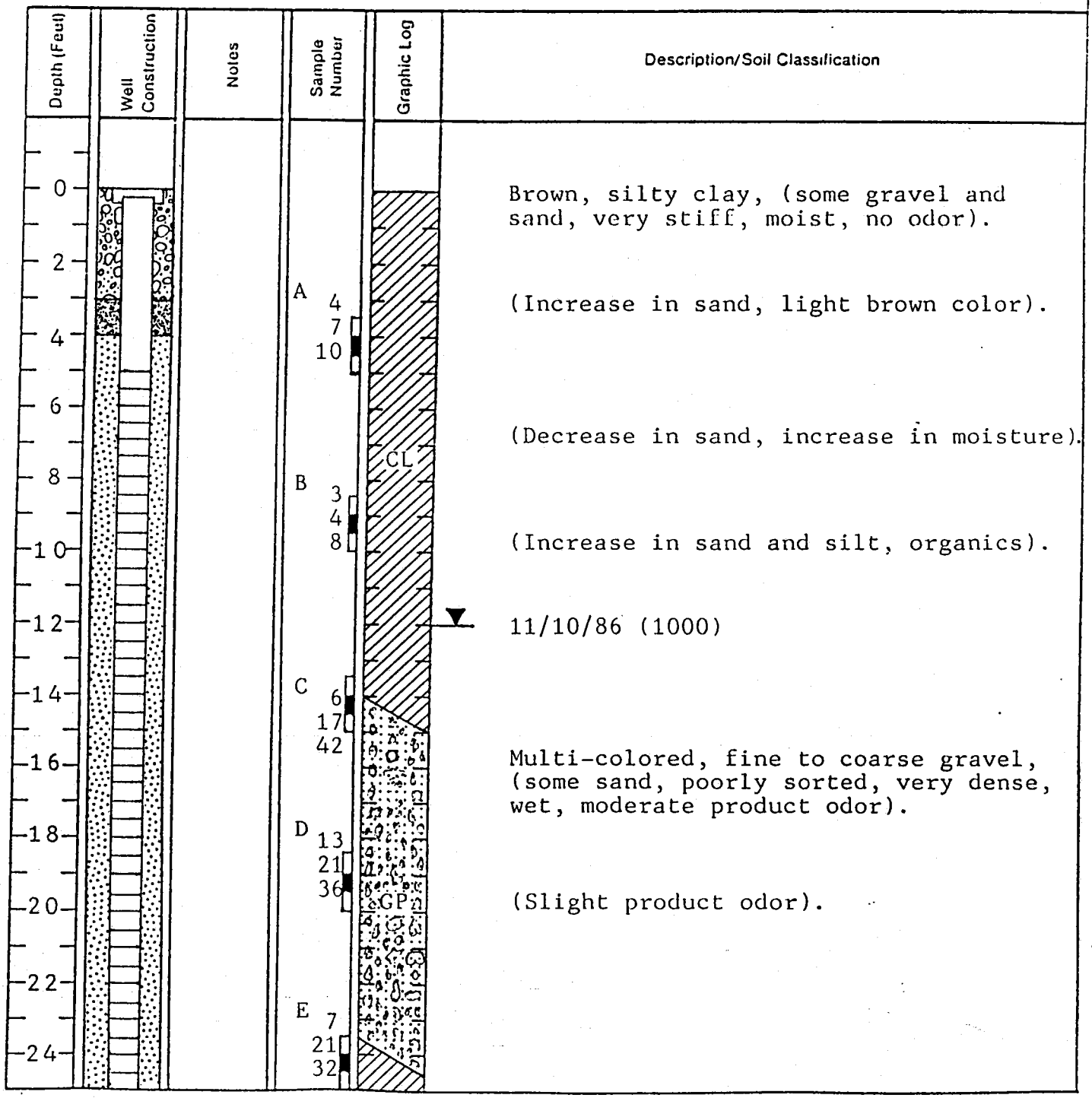
Casing: Dia. 2 in. Length 5 ft. Type PVC

Drilling Company Sierra Pacific Drilling Method hollow stem auger

Driller M. Isom Log by M. Winters

Sketch Map

Notes

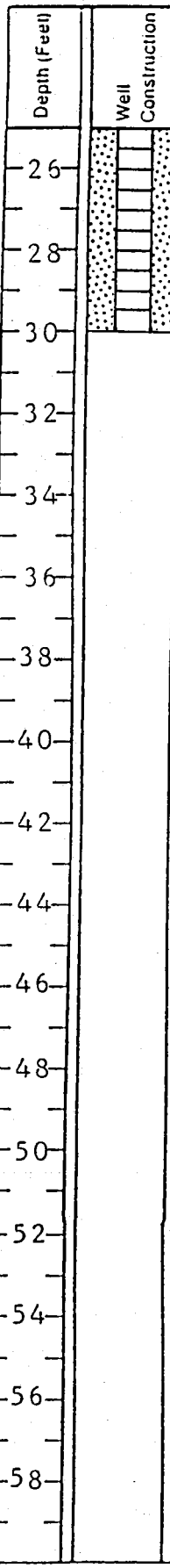


02100144

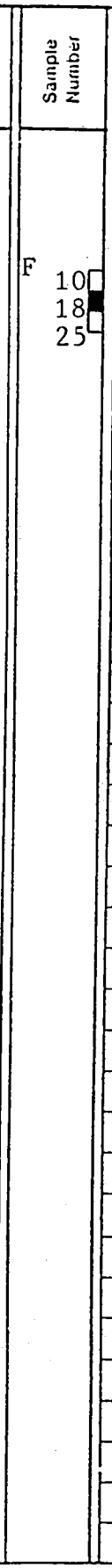
GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

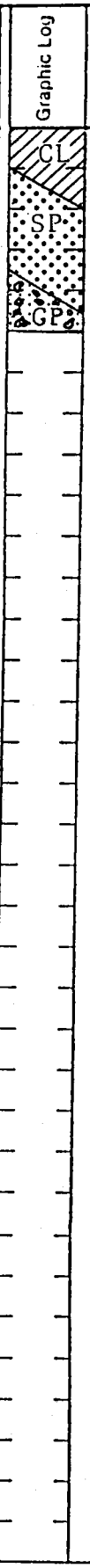
Monitoring Well 5

Drilling Log



Notes





Description/Soil Classification (Color, Texture, Structures)

Brown, sandy clay, (hard, wet, very slight product odor).

Light brown, medium sand, (wet, very slight product odor).

Multi-colored, sandy fine to coarse gravel, (some clay and silt, poorly sorted, dense, wet, very slight product odor).

Drilled to 30 feet.

02100144

GROUNDWATER TECHNOLOGY, INC.
OIL RECOVERY SYSTEMS

Monitoring Well 6

Drilling Log

Project Texaco/Livermore Owner Texaco U.S.A.

Location 930 Springton Blvd. Project Number 20-4051

Date Drilled 11/10/86 Total Depth of Hole 25 ft Diameter 7.5 in.

Surface Elevation ____ Water Level, Initial 13 ft. 24-hrs. ____

Screen: Dia. 2 in. Length 20 ft. Slot Size .020 in.

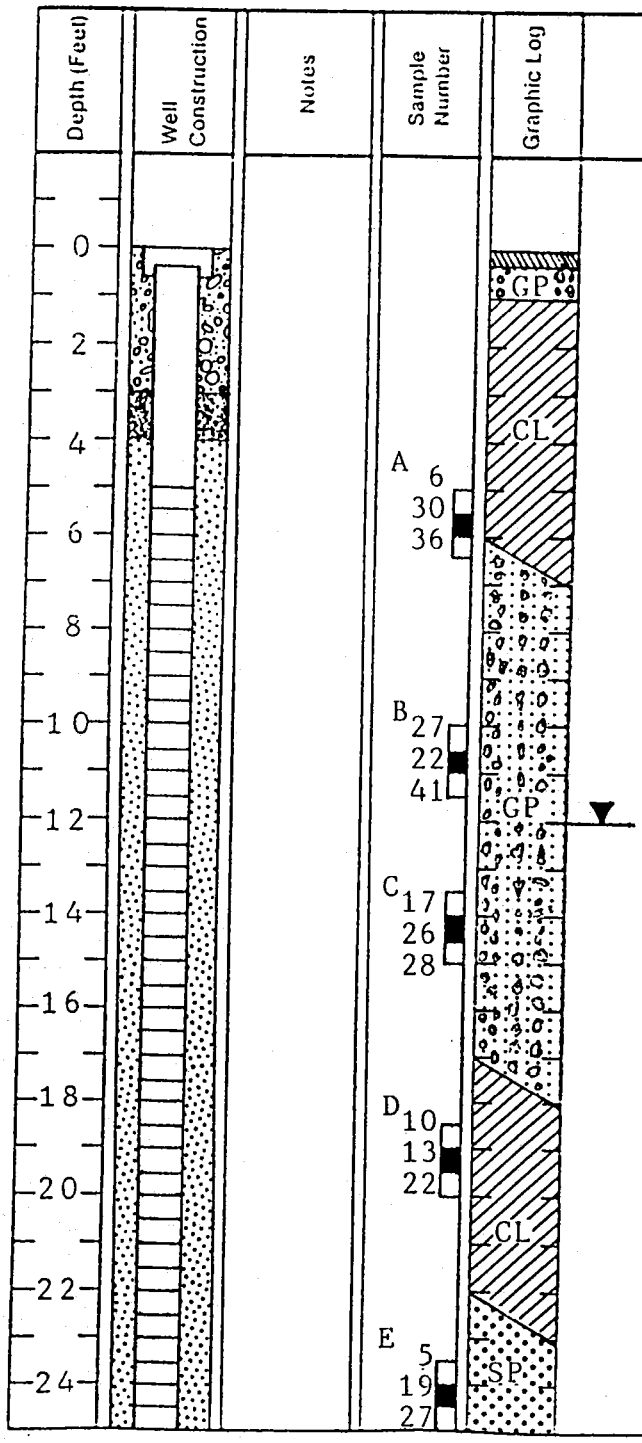
Casing: Dia. 2 in. Length 5 ft. Type PVC

Drilling Company Sierra Pacific Drilling Method hollow stem auger

Driller M. Isom Log by M. Winters

Sketch Map

Notes



Description/Soil Classification

Asphalt

Brown, sandy gravel fill, (slightly moist, very slight product odor).

Brown, silty clay, (some gravel and sand, very stiff, moist, no odor).

(Light brown color)

Multi-colored, sandy fine to coarse gravel,(some clay and sand, poorly sorted, very dense, moist, no odor).

11/10/86 (1530)

(Decrease in sand and clay, wet).

Brown, sandy clay, (some silt, hard, wet, no odor).

Light brown, medium sand, (dense, wet, no odor).

Drilled to 25 feet.

02100144

Drilling Log

GROUNDWATER TECHNOLOGY, INC.

Monitoring Well 7

Project Texaco/Livermore Owner Texaco Refining and Marketing
Location Livermore Project Number 203 150 4051
Date Drilled 12/5/89 Total Depth of Hole 25 ft Diameter 10.5 in
Surface Elevation ____ Water Level Initial 13 ft 24-hour ____
Screen: Dia. 4 in Length 20 ft Slot Size 0.020 in
Casing: Dia. 4 in Length 5 ft Type Sch. 40 PVC
Drilling Company Sierra Pacific Drilling Method hollow stem auger
Driller Chris DeSocio Log by Steve Kranyak
Geologist/Engineer RBStorm License No. R64394

Sketch Map

SEE SITE MAP

Notes

Continuously sampled

Depth (Feet)	Well Construction	PID (ppm)	Sample	Graphic Log	Description/Soil Classification (Color, Texture, Structure)
0		0			3 inches asphalt over 2 inches aggregate base
2				CL	Brown gravelly, silty, sandy clay (soft, slightly moist, no product odor)
4		0			
6		0	A		Brown sandy, silty, gravelly clay (stiff, slightly moist, stiff, no product odor)
8				CL	(grades more stiff)
10		0	B		(grades light brown and tan)
12		0	C		
14					▼ Encountered water 12/5/89 (15:30 hours) (grades wet)
16		0	D E		Brown and black mottled sandy, silty, clayey gravel (loose, wet, no product odor)
18		0		GC	
20		0	F		(grades coarser)
22					
24		0			End of drilling, installed monitoring well to 25

Drilling Log

GROUNDWATER TECHNOLOGY, INC.

Monitoring Well 8

Project Texaco/Livermore Owner Texaco Refining and Marketing
Location Livermore Project Number 203 150 4051
Date Drilled 12/6/89 Total Depth of Hole 25 ft Diameter 10.5 in
Surface Elevation ____ Water Level Initial 15 ft 24-hour ____
Screen: Dia. 4 in Length 20 ft Slot Size 0.02 in
Casing: Dia. 4 in Length 5 ft Type ____
Drilling Company ____ Drilling Method hollow stem auger
Driller Chris DeSocio Log by Steve Kranyak
Geologist/Engineer AB Stamm License No. R64394

Sketch Map

SEE SITE MAP

Notes

Continuously sampled

Depth (Feet)	Well Construction	PID (ppm)	Sample	Graphic Log	Description/Soil Classification (Color, Texture, Structure)
0					6 inches grass and roots
2		0		CL	Tan silty clay with trace gravels (stiff, moist, no product odor)
4		0			
6		0	A		(grades with no gravels)
8		0	B		
10		0	C	SM	Brown fine sand with trace clay, wilt and gravel
12					(grades with cobbles)
14		0			▼ Encountered water 12/6/89 (15:00 hours)
16				SC	Tan, silty, clayey sand (medium dense, wet, no product odor)
18		0	D		
20		0	E		
22					
24		0			End of drilling, installed monitoring well

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-9
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	24-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	24-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	523.43 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	523.14 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	5 to 15 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	11.0 ft (24-Jun-09) ▽
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	13.00 ft (23-Jul-09) ▼
REMARKS	Hand cleared to 8 fbg. Log is based on well MW-10.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
				0	ML		**Clayey SILT with gravel:** Dark Brown; damp; moderate plasticity.		Portland Type I/II
								3.0	Bentonite Seal
							Sandy SILT: Light brown; damp; low plasticity.		
				5					
					ML				
				10					Monterey Sand #2/12 4"-diam., 0.010" Slotted Schedule 40 PVC
							▽		
							▼	13.0	
7					SW		**Gravely SAND (F to C):** Dark Grey; wet; non-plastic.		
				15				15.0	Bottom of Boring @ 15 ft

WELL LOG (PID) I:\CHEVRON\0600-\060058~1\0603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-10
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	24-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	24-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	523.21 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	522.76 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	22 to 27 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	15.0 ft (24-Jun-09)
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	12.59 ft (23-Jul-09)
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	DEPTH (ft bgs)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)
					Sandy GRAVEL (Fill): Grey; damp; non-plastic.	
				ML	**SILT with sand (F):** Brown; damp; low plasticity.	3.0
			5		**Clayey SILT:** Brown; damp; moderate plasticity.	5.0
6		MW-10-10.5	10	ML	Grades to sandy silt @ 13 fbg.	
111		MW-10-15.5	15		**Gravelly SAND (M):** Grey; wet; non-plastic.	15.0
12		MW-10-20.5	20	SP		
			25		**SAND (F to M):** Grey; wet; non-plastic.	24.5
8		MW-10-26		SW		27.0

WELL DIAGRAM

- Portland Type I/II
- Bentonite Seal
- Monterey Sand #2/12
- 4"-diam., 0.010" Slotted Schedule 40 PVC

Bottom of Boring @ 27 ft

WELL LOG (PID) I:\CHEVRON\0600-\060058-\10603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-11
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	24-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	24-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	523.81 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	523.25 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	5 to 15 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	14.0 ft (24-Jun-09) ▽
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	13.05 ft (23-Jul-09) ▼
REMARKS	Hand cleared to 8 fbg. Log based on well MW-13		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
							ASPHALT	0.5	Portland Type I/II
					GM		**Sandy silty GRAVEL (Fill):** Dark grey; damp; non-plastic.	1.5	
					CL		**Silty CLAY with gravel:** Grey; damp; low plasticity.	3.0	Bentonite Seal
				5	ML		**Sandy SILT:** Grey; damp; low plasticity.		
				10	SW		**Gravelly SAND (F to C):** Grey; wet; non-plastic. ▼ ▽	9.0	Monterey Sand #2/12 4"-diam., 0.010" Slotted Schedule 40 PVC
				15				15.0	Bottom of Boring @ 15 ft

WELL LOG (PID) I:\CHEVRON\0600-\060058~1\0603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-12
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	25-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	25-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	523.88 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	523.42 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	22 to 27 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	10.0 ft (25-Jun-09)
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	13.03 ft (23-Jul-09)
REMARKS	Hand cleared to 8 fbg. Log based on MW-13.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
					GP		**ASPHALT**	0.5	
							Sandy GRAVEL: Dark grey; damp; non-plastic.	1.5	
					CL		**Silty CLAY with gravel:** Grey; damp; low plasticity.	3.0	
							Sandy SILT with clay: Grey; damp; low plasticity.		
				5	ML				
				10			**Gravelly SAND (F to C):** Grey; wet; non-plastic.	10.0	Portland Type I/II
				15	SW				
				20			**SAND (M):** Grey; wet; non-plastic.	20.0	Bentonite Seal
				25	SP				Monterey Sand #2/12 4"-diam., 0.010" Slotted Schedule 40 PVC
								27.0	Bottom of Boring @ 27 ft

WELL LOG (PID) I:\CHEVRON\0600-\060058-\10603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-13
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	25-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	25-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	523.61 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	523.12 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	32 to 37 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	15.0 ft (25-Jun-09) ▽
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	12.75 ft (23-Jul-09) ▼
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
					GP		**ASPHALT**	0.5	
							Sandy GRAVEL: Dark brown; damp; non-plastic.	1.5	
					CL		**Silty CLAY with gravel:** Dark brown; damp; low plasticity.	3.0	
							Sandy SILT with clay: Brown; damp; low plasticity.		
				5	ML				
				10			**Gravelly SAND (F to C):** Grey; wet; non-plastic.	10.0	
		MW-13-10.5							
69		MW-13-15.5		15	SW				Portland Type I/II
				20			**SAND (M):** Brown; wet; non-plastic.	20.0	
130		MW-13-20.5							
2470		MW-13-25.5		25					
				30	SP				Bentonite Seal
559		MW-13-31							Monterey Sand #2/12 4"-diam.,
				35					

WELL LOG (PID) I:\CHEVRON\0600-\060058~1\0603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-13
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	25-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	25-Jun-09

Continued from Previous Page

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
237		MW-13-36.5					Grades to gravelly sand @ 35 fbg.	37.0	0.010" Slotted Schedule 40 PVC Bottom of Boring @ 37 ft

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-14
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	29-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	29-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	521.20 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	520.88 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	5 to 15 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	13.0 ft (29-Jun-09) ▽
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	10.40 ft (23-Jul-09) ▼
REMARKS	Hand cleared to 8 fbg. Log based on well MW-15.		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
							ASPHALT	0.5	
							Sandy GRAVEL (Fill): Dark grey, damp, non-plastic	1.5	Portland Type I/II Bentonite Seal
							Sandy SILT: Grey, damp, low plasticity.		
				5	ML				
								8.0	
							Silty SAND (M): Dark grey, damp, non-plastic. ▼ ▽		Monterey Sand #2/12 4"-diam., 0.010" Slotted Schedule 40 PVC
				10	SM				
				15				15.0	Bottom of Boring @ 15 ft

WELL LOG (PID) I:\CHEVRON\0600-\060058~1\0603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-15
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	30-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	30-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	521.25 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	520.87 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	41.5 to 46.5 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	14.5 ft (30-Jun-09) ▽
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	10.33 ft (23-Jul-09) ▼
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
					GW		**ASPHALT**	0.5	
					GW		**Sandy GRAVEL (Fill):** Dark grey; damp; non-plastic.	1.5	
							Sandy SILT: Light grey ; damp; low plasticity.		
481				5	ML				
1278									
847									
								8.0	
1505	3 5 6	MW-15-9.5		10	SM		**Silty SAND (F):** Grey; compact; moist; non-plastic.		
490									
								14.5	
756	35 35 50	MW-15-14.5		15	SW		**SAND (F to C):** Dark grey; very dense; wet; non-plastic.		
								19.0	
1185	7 15 18	MW-15-19.5		20	SM		**Silty SAND (F):** Grey; dense; wet; non-plastic.		Portland Type I/II
								24.0	
490	4 9 12	MW-15-24.5		25	ML		**Sandy SILT:** Light grey; very stiff; damp; low plasticity.		
								28.5	
53	4 6 8	MW-15-29.5		30	SM		**Silty SAND (F to C):** Grey; compact; wet; non-plastic.		
	6 8 11			35					

WELL LOG (PID) I:\CHEVRON\0600--\060058~1\10603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-15
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	30-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	30-Jun-09

Continued from Previous Page

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
		MW-15-34.5							
23	14 28 36			40	SW		**Gravely SAND (F to C):** Grey; very dense; wet; non-plastic.	38.5	Bentonite Seal
	8 12 16			45					Monterey Sand #2/12 4"-diam., 0.010" Slotted Schedule 40 PVC
								47.0	
							Flowing sands reduced boring depth and prohibited well placement @ bottom of well.		Bottom of Boring @ 47 ft

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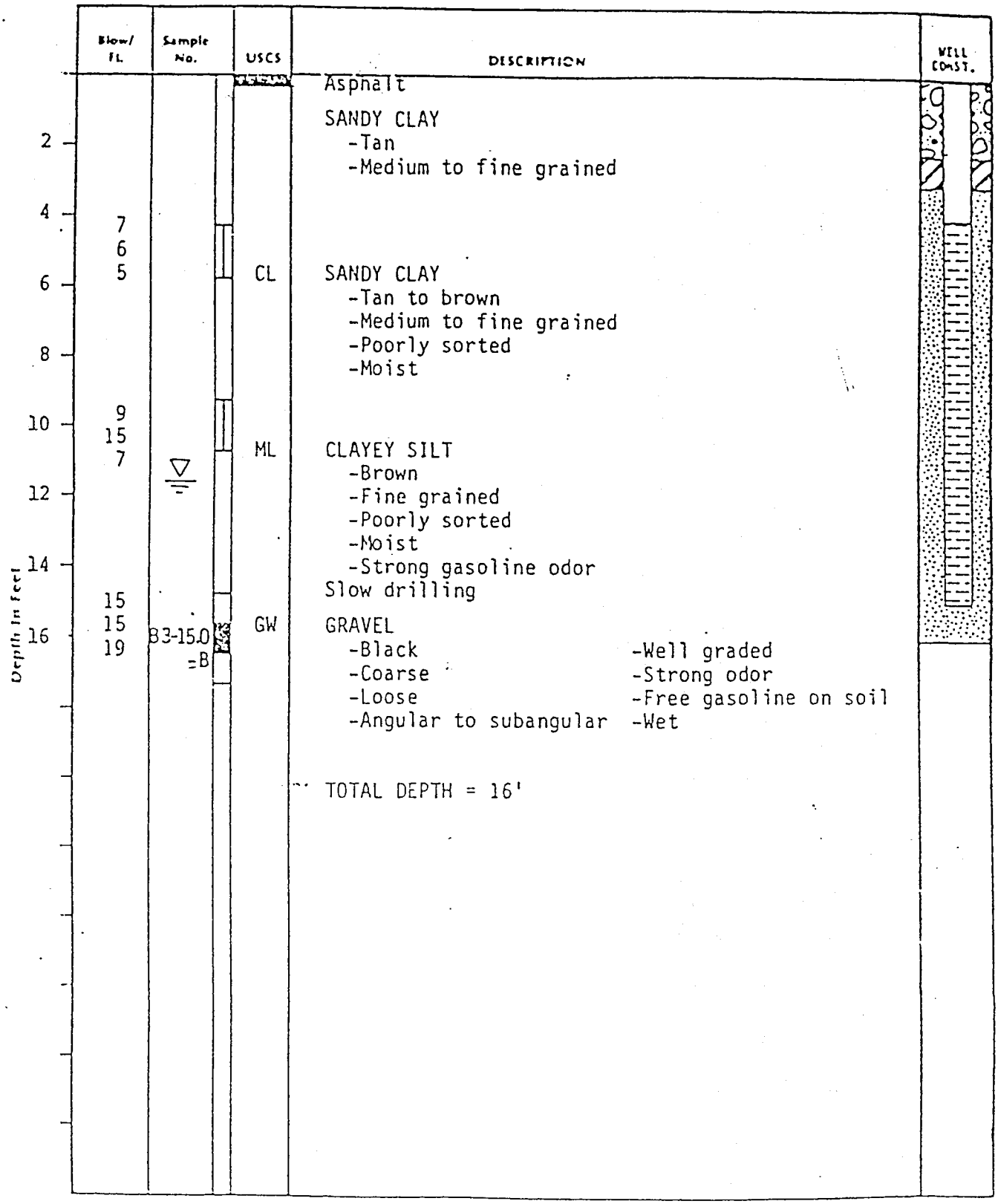
BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	MW-16
JOB/SITE NAME	Former Chevron Station 21-1253	**DRILLING STARTED**	29-Jun-09
LOCATION	930 Springtown Blvd., Livermore, California	**DRILLING COMPLETED**	29-Jun-09
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	23-Jul-09
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	521.08 ft above msl
DRILLING METHOD	Hollow-stem auger	**TOP OF CASING ELEVATION**	520.50 ft above msl
BORING DIAMETER	10-inches	**SCREENED INTERVAL**	25 to 30 ft bgs
LOGGED BY	B.Yifru	**DEPTH TO WATER (First Encountered)**	21.0 ft (29-Jun-09)
REVIEWED BY	Brandon S. Wilken P.G. #7564	**DEPTH TO WATER (Static)**	10.63 ft (23-Jul-09)
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
							ASPHALT	0.5	
							Sandy GRAVEL (Fill): Dark grey; damp; non-plastic.	1.0	
							Silty SAND (M): Brown; damp; non-plastic.		
				5	SM				
								8.0	
							Sandy SILT: Light brown; damp; low plasticity.		
				10					Portland Type I/II
				15	ML				
				20					Bentonite Seal
								23.0	
							Silty SAND (M): Light brown; wet; non-plastic.		
				25	SM				Monterey Sand #2/12 4"-diam., 0.010" Slotted Schedule 40 PVC
								28.5	
					SW		**SAND (F to C):** Grey; wet; non-plastic.		
				30			Grades to gravelly sand @29.5 fbg.	30.0	Bottom of Boring @ 30 ft

WELL LOG (PID) I:\CHEVRON\0600-\060058~1\0603E2~1\060058-BORING LOGS.GPJ DEFAULT.GDT 8/11/09

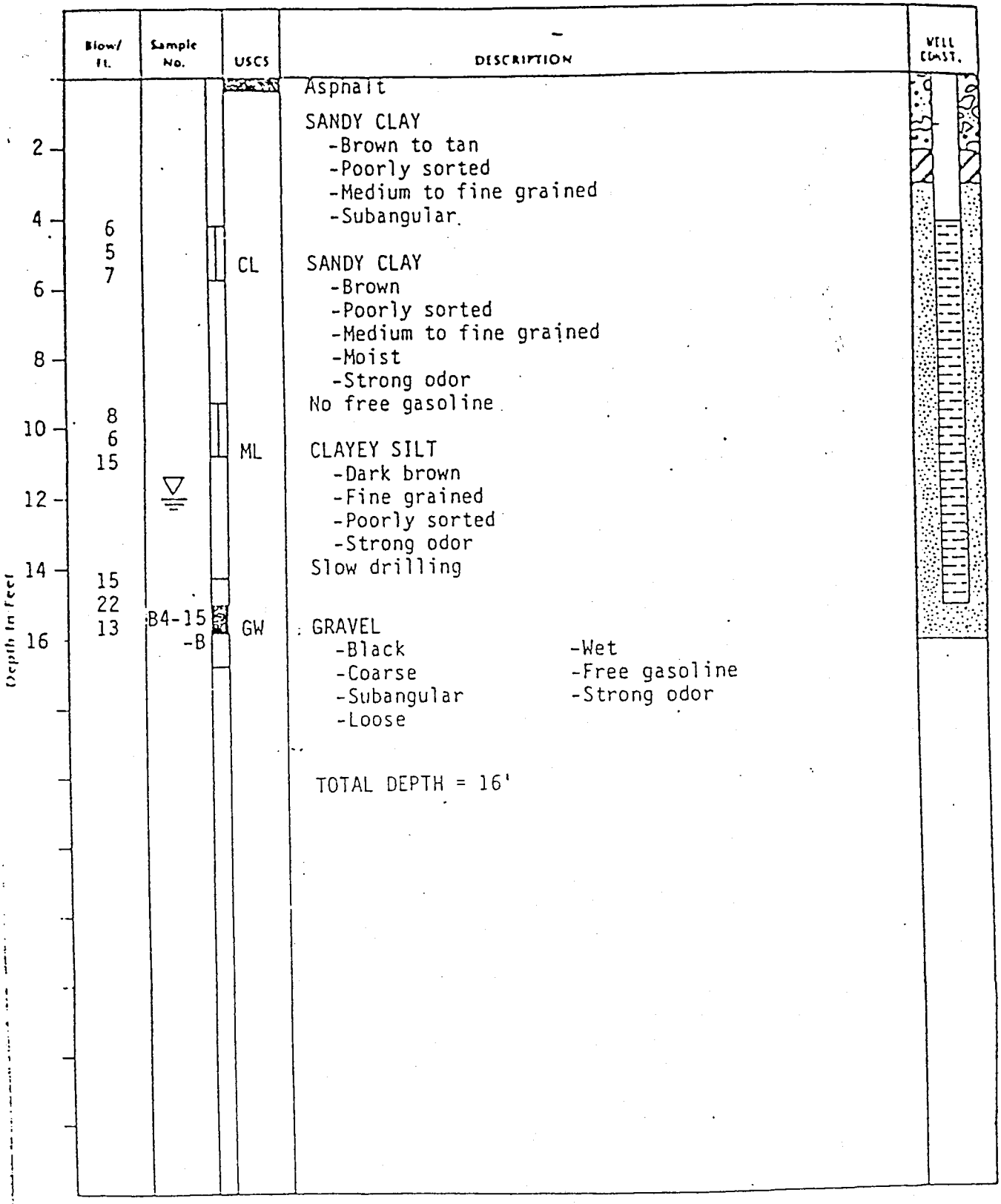


H KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. B-1423-1

PROPOSED 7-11 STORE
SPRINGTOWN BLVD. AND LASSEN RD.
LIVERMORE, CA
LOG OF BORING NO. B-3
(MW-A)

PLATE
3



H KLEINFELDER & ASSOCIATES
GEOTECHNICAL CONSULTANTS • MATERIALS TESTING

PROJECT NO. B-1423-1

PROPOSED 7-11 STORE
SPRINGTOWN BLVD. AND LASSEN RD
LIVERMORE, CA
LOG OF BORING NO. B-4
(MW-B)

PLATE
4

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Fax: 510-420-9170

BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	CPT1
JOB/SITE NAME	Former Texaco Station #211253	**DRILLING STARTED**	21-Nov-07
LOCATION	930 Springtown Boulevard, Livermore, CA	**DRILLING COMPLETED**	21-Nov-07
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hand Auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	3 Inches	**SCREENED INTERVAL**	NA
LOGGED BY	Jeremy Gekov	**DEPTH TO WATER (First Encountered)**	NA ▽
REVIEWED BY	Robert C. Foss, PG#7445	**DEPTH TO WATER (Static)**	NA ▼
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
0		CPT1-5		5	ML		**SILT with clay:** Light brown; loose; 90% silt, 10% clay; moist; moderate plasticity, low estimated permeability. @ 6 fbg asphalt debris	8.0	Portland Type I/II
							(See CPT log for continuation)		Bottom of Boring @ 8 ft

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	CPT2
JOB/SITE NAME	Former Texaco Station #211253	**DRILLING STARTED**	19-Nov-07
LOCATION	930 Springtown Boulevard, Livermore, CA	**DRILLING COMPLETED**	19-Nov-07
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hand Auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	3 Inches	**SCREENED INTERVAL**	NA
LOGGED BY	Jeremy Gekov	**DEPTH TO WATER (First Encountered)**	NA
REVIEWED BY	Robert C. Foss, PG#7445	**DEPTH TO WATER (Static)**	NA
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
0		CPT2-5		5	ML		**SILT with clay and sand:** Light brown; loose; 80% silt, 10% clay, 10% fine grained sand; moist; low plasticity, low estimated permeability.		Portland Type I/II
							@ 6 fbg asphalt with baserock	8.0	
							(See CPT log for continuation)		Bottom of Boring @ 8 ft

WELL LOG (PID) I:\CHEVRON\211253-11BORING-11211253 BORING LOGS.GPJ DEFAULT.GDT 7/15/08

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	CPT3
JOB/SITE NAME	Former Texaco Station #211253	**DRILLING STARTED**	07-Apr-08
LOCATION	930 Springtown Boulevard, Livermore, CA	**DRILLING COMPLETED**	07-Apr-08
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hand Auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	3 Inches	**SCREENED INTERVAL**	NA
LOGGED BY	I. Hull	**DEPTH TO WATER (First Encountered)**	NA
REVIEWED BY	Robert C. Foss, PG#7445	**DEPTH TO WATER (Static)**	NA
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
0					ML		**SILT with clay and sand:** Light brown; firm; damp; 75% silt, 15% clay, 10% medium grained sand; low to moderate plasticity; low estimated permeability.		Portland Type I/II Cement
				5			@5 fbg: one foot thick hard layer		
								8.0	
							(See CPT log for continuation)		Bottom of Boring @ 8 ft

WELL LOG (PID) I:\CHEVRON\211253~1\BORING~1\211253 BORING LOGS.GPJ DEFAULT.GDT 7/15/08

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	CPT4
JOB/SITE NAME	Former Texaco Station #211253	**DRILLING STARTED**	14-Jul-08
LOCATION	930 Springtown Boulevard, Livermore, CA	**DRILLING COMPLETED**	14-Jul-08
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hand Auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	3 Inches	**SCREENED INTERVAL**	NA
LOGGED BY	I. Hull	**DEPTH TO WATER (First Encountered)**	NA ▽
REVIEWED BY	Brandon S. Wilken, PG # 7564	**DEPTH TO WATER (Static)**	NA ▼
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
0					ML		**Sandy SILT:** Light brown; dry; 60% silt, 40% coarse to fine grained sand; low plasticity; medium estimated permeability.		
				5			@ 7 fbg silt increases to 70%; sand decreases to 30%.	8.0	Portland Type I/II
							(See CPT log for continuation)		Bottom of Boring @ 8 ft

WELL LOG (PID) I:\CHEVRON\211253~1\BORING~1\211253 BORING LOGS.GPJ DEFAULT.GDT 7/15/08

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	CPT5
JOB/SITE NAME	Former Texaco Station #211253	**DRILLING STARTED**	08-Apr-08
LOCATION	930 Springtown Boulevard, Livermore, CA	**DRILLING COMPLETED**	08-Apr-08
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hand Auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	3 Inches	**SCREENED INTERVAL**	NA
LOGGED BY	I. Hull	**DEPTH TO WATER (First Encountered)**	NA ▽
REVIEWED BY	Robert C. Foss, PG#7445	**DEPTH TO WATER (Static)**	NA ▼
REMARKS	Hand cleared to 8 fbg		

PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
0					ML		**SILT with clay and sand**:Dark brown; firm; damp; 80% silt, 10% clay, 10% fine grained sand; low plasticity; low estimated permeability. @3 fbg color changes to light brown	8.0	Portland Type I/II Cement
				5			(See CPT log for continuation)		Bottom of Boring @ 8 ft

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BORING/WELL LOG

CLIENT NAME	Chevron Environmental Management Company	**BORING/WELL NAME**	CPT6
JOB/SITE NAME	Former Texaco Station #211253	**DRILLING STARTED**	19-Nov-07
LOCATION	930 Springtown Boulevard, Livermore, CA	**DRILLING COMPLETED**	20-Nov-07
PROJECT NUMBER	060058	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Gregg Drilling & Testing, Inc. (C57 #485165)	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hand Auger	**TOP OF CASING ELEVATION**	NA
BORING DIAMETER	3 Inches	**SCREENED INTERVAL**	NA
LOGGED BY	Jeremy Gekov	**DEPTH TO WATER (First Encountered)**	NA ▽
REVIEWED BY	Robert C. Foss, PG#7445	**DEPTH TO WATER (Static)**	NA ▼
REMARKS	Hand cleared to 8 fbg		

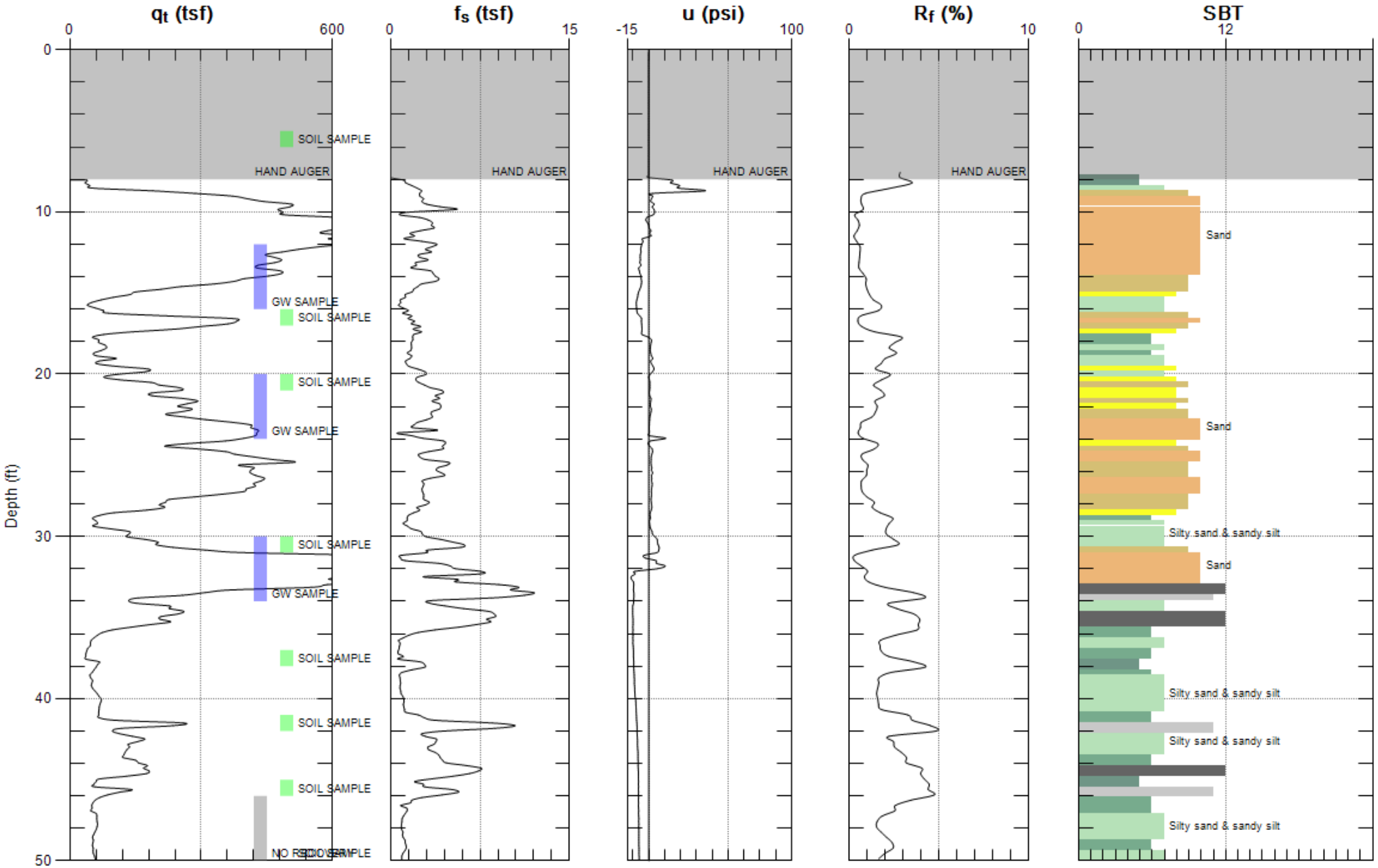
PID (ppm)	BLOW COUNTS	SAMPLE ID	EXTENT	DEPTH (ft bgs)	U.S.C.S.	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (ft bgs)	WELL DIAGRAM
0		CPT6-5		5	ML		**SILT with gravel and sand** Light brown; dry; 80% silt, 10% gravel up to 1/4", 10% fine grained sand; moderate plasticity, low estimated permeability.	8.0	Portland Type I/II
							(See CPT log for continuation)		Bottom of Boring @ 8 ft

GREGG

CRA

Site: 21-1253, 930 SPRINGTWN Engineer: C.EVANS

Sounding: CPT-01 **Date: 11/21/2007 09:23**



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

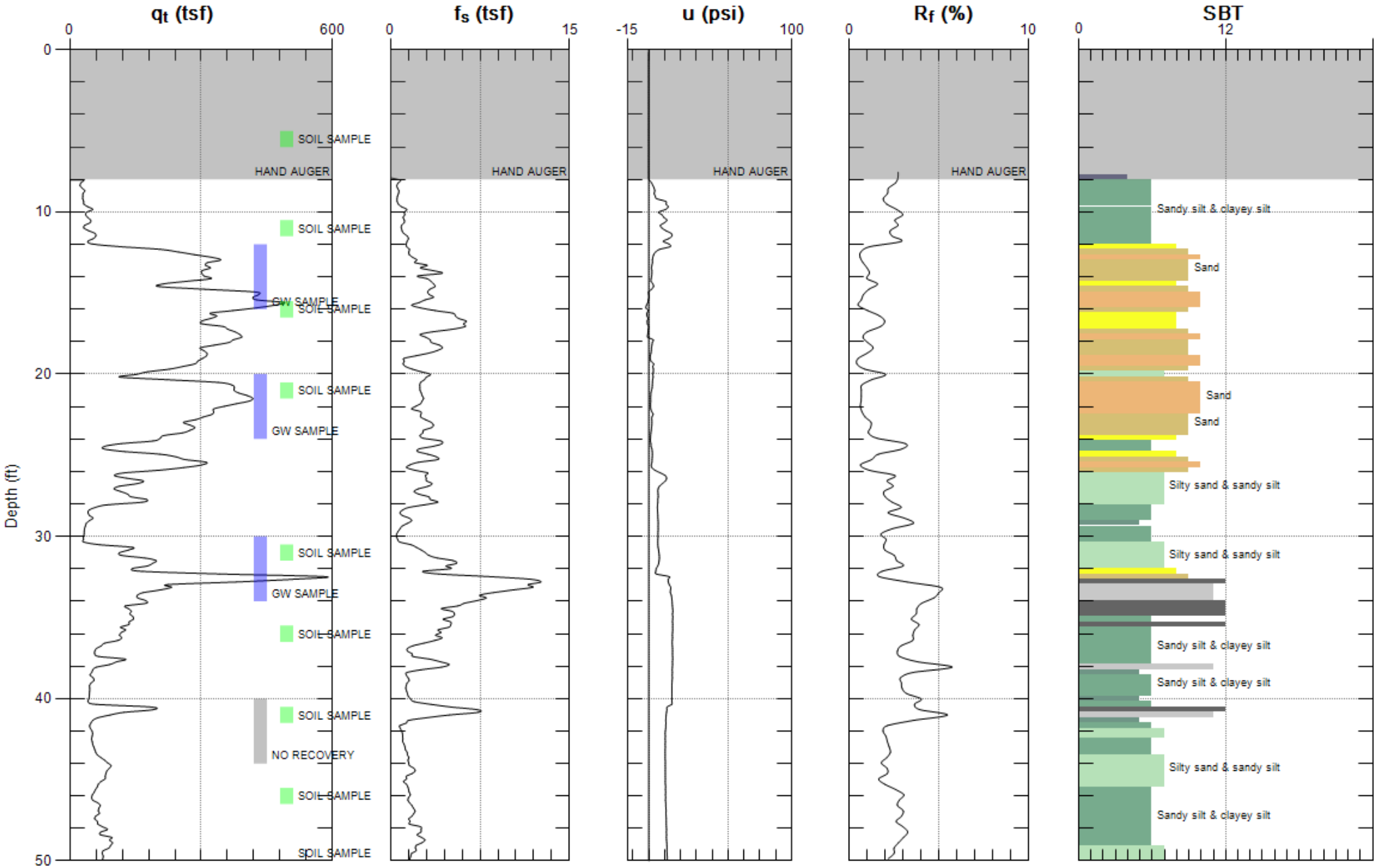
SBT: Soil Behavior Type (Robertson 1990)

GREGG

CRA

Site: 21-1253, 930 SPRINGTOWN Engineer: C.EVANS

Sounding: CPT-02 Date: 11/19/2007 10:26



Max. Depth: 50.197 (ft)

Avg. Interval: 0.328 (ft)

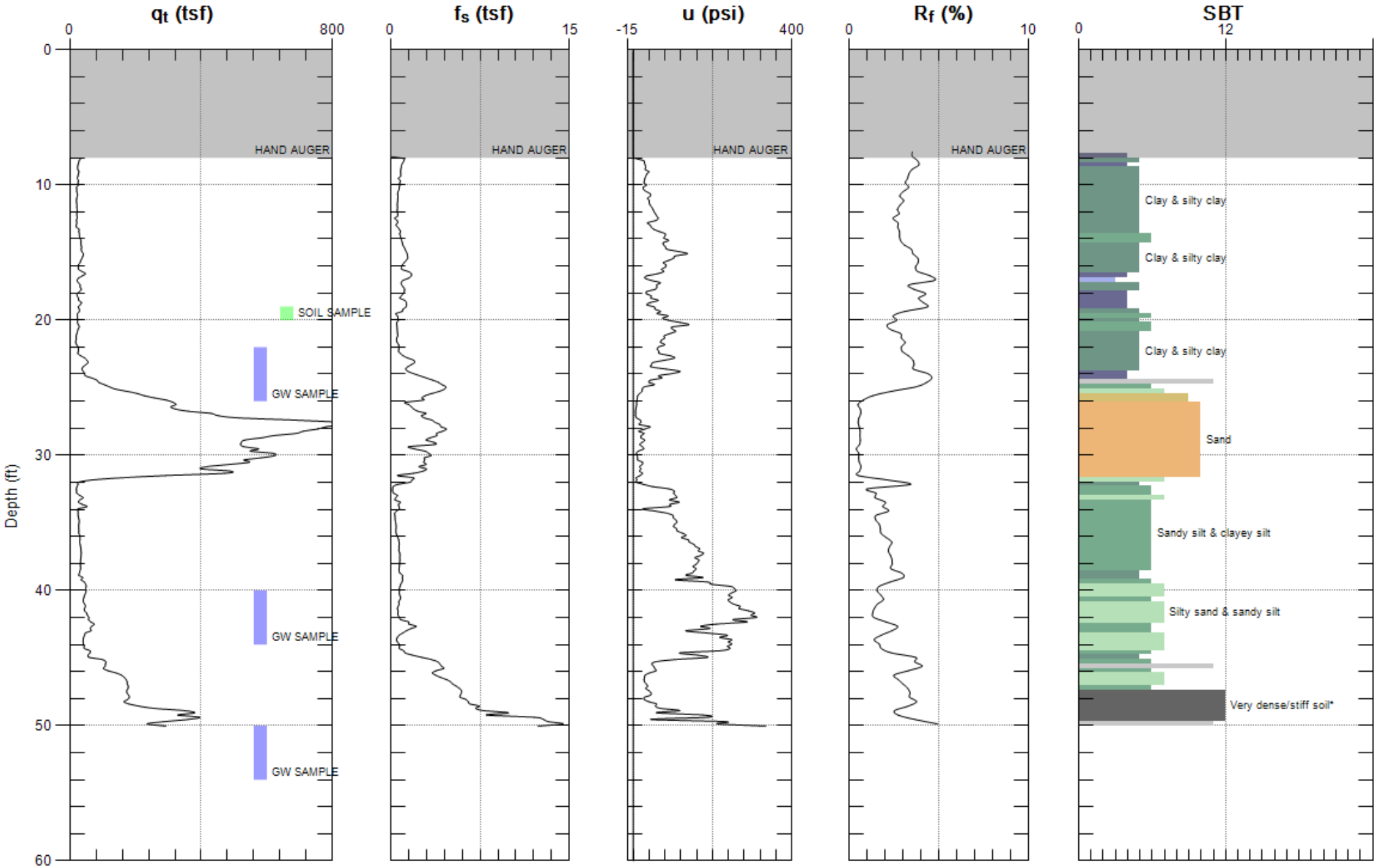
SBT: Soil Behavior Type (Robertson 1990)

GREGG

CRA

Site: FMR TEXACO 21-1253
Sounding: CPT-03

Engineer: C.EVANS
Date: 4/7/2008 08:59



Max. Depth: 50.033 (ft)
Avg. Interval: 0.328 (ft)

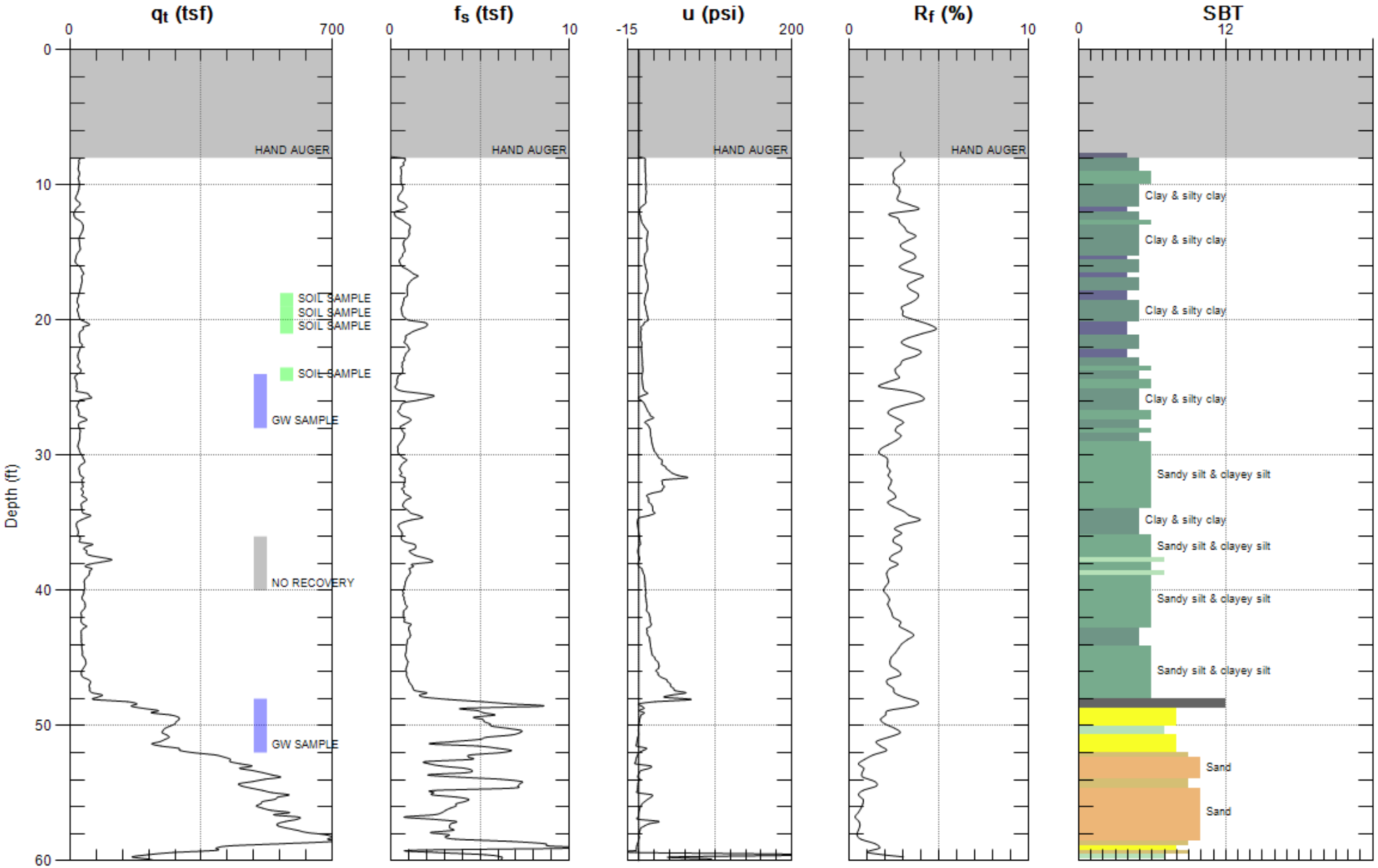
SBT: Soil Behavior Type (Robertson 1990)

GREGG

CRA

Site: LIVERMORE
Sounding: CPT4

Engineer: I.HULL
Date: 7/14/2008 06:41



Max. Depth: 60.039 (ft)
Avg. Interval: 0.328 (ft)

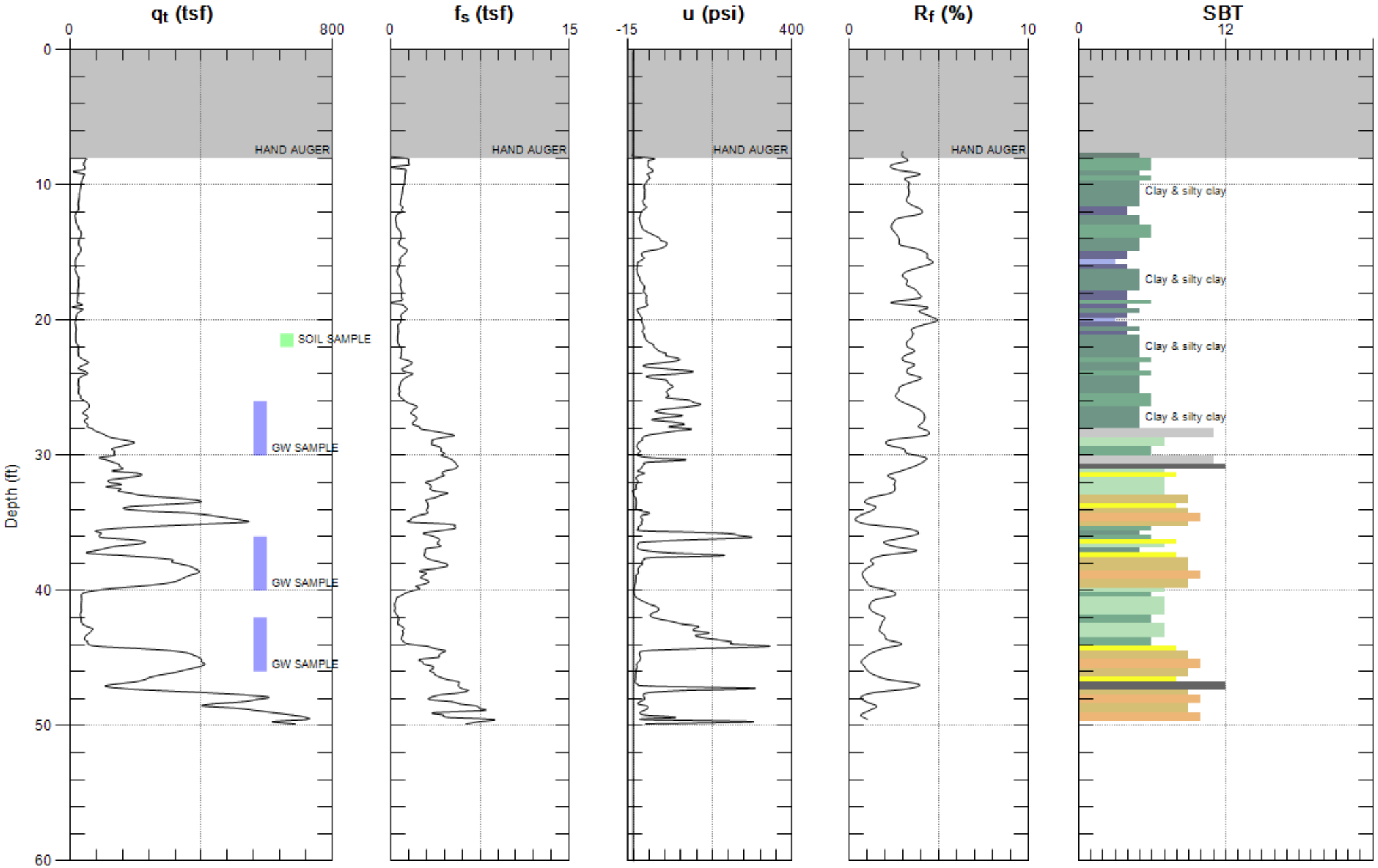
SBT: Soil Behavior Type (Robertson 1990)

GREGG

CRA

Site: FMR TEXACO 21-1253
Sounding: CPT-05

Engineer: C.EVANS
Date: 4/8/2008 01:12



Max. Depth: 49.869 (ft)
Avg. Interval: 0.328 (ft)

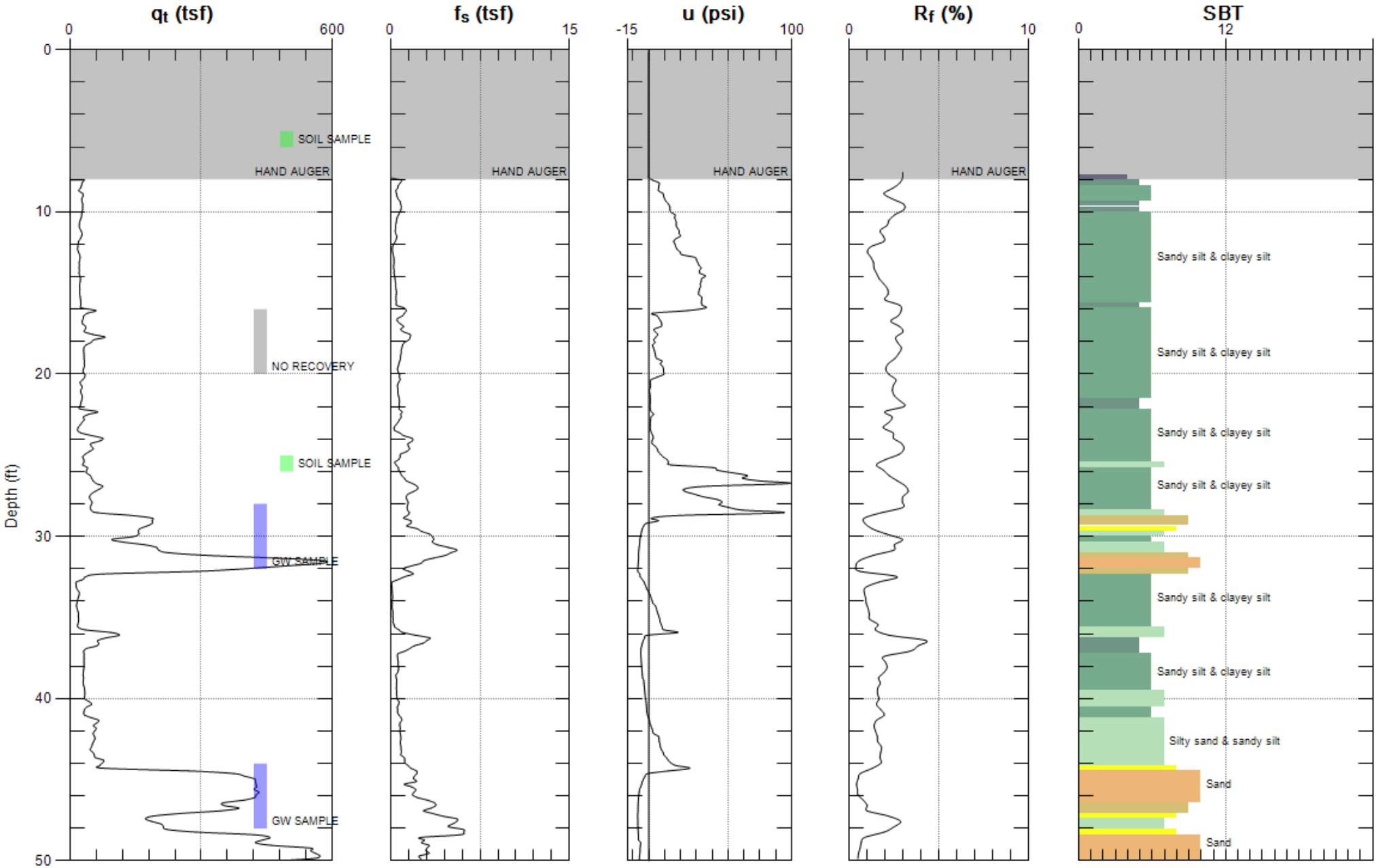
SBT: Soil Behavior Type (Robertson 1990)

GREGG

CRA

Site: 21-1253, 930 SPRINGTOWN Engineer: C.EVANS

Sounding: CPT-06 Date: 11/20/2007 07:49



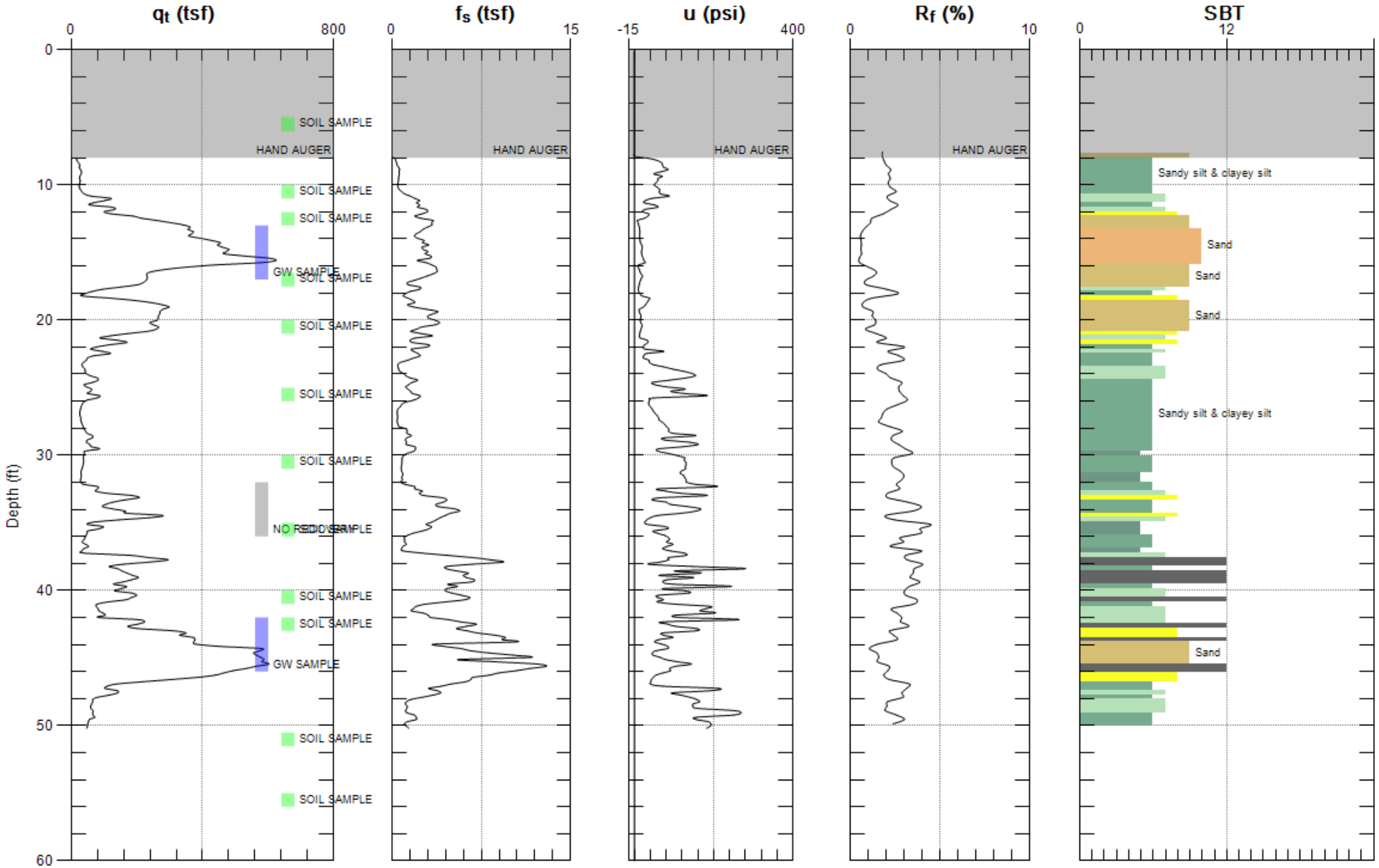
Max. Depth: 50.033 (ft)

Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

CRA

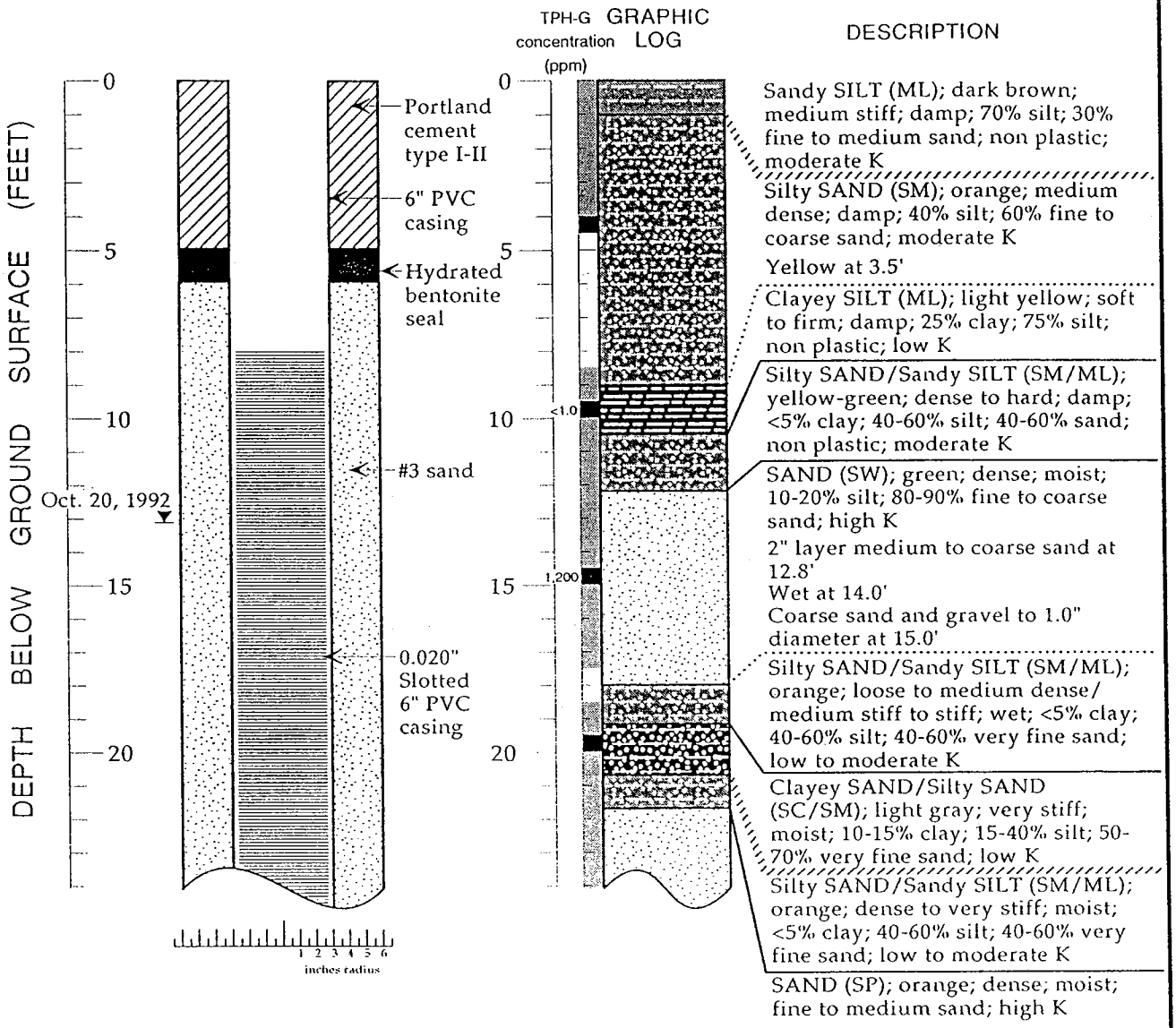
Site: FMR TEXACO 21-1253
Sounding: CPT-07
Engineer: C.EVANS
Date: 4/8/2008 08:01



Max. Depth: 50.197 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

WELL EW-1 (B-1)



EXPLANATION

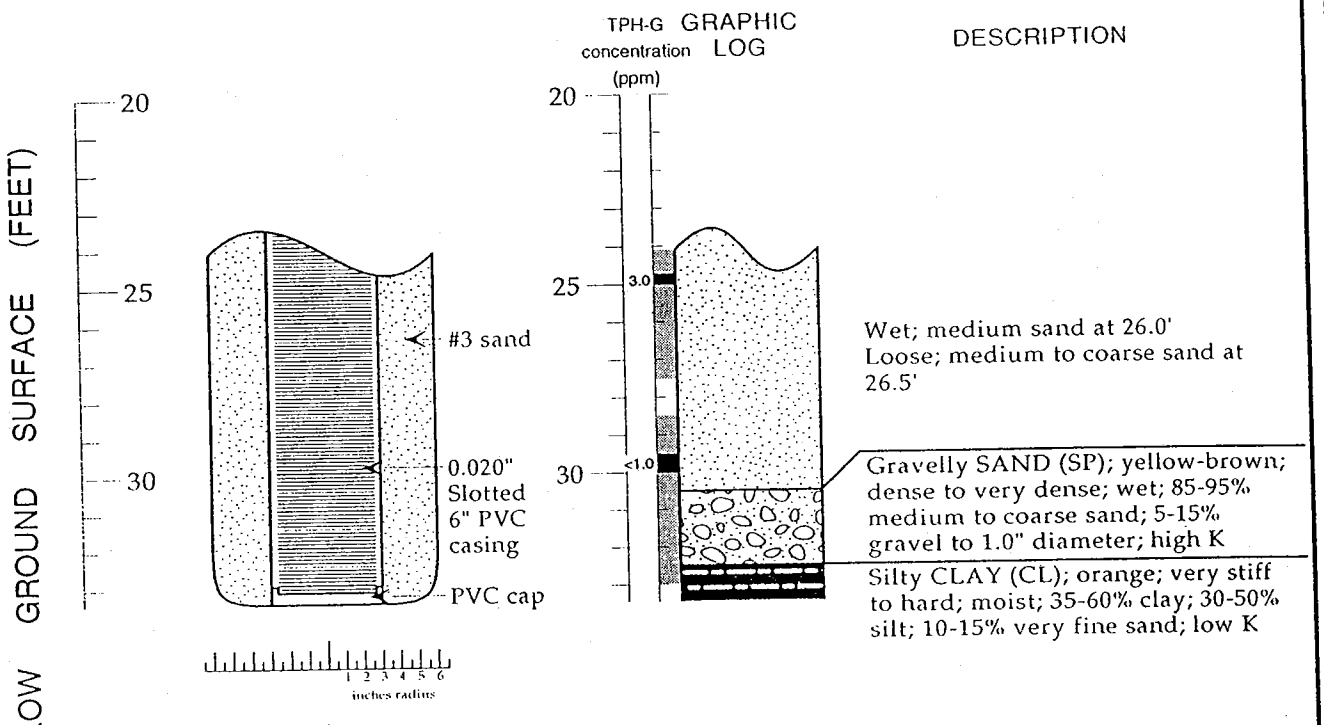
- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Eric Anderson
Supervisor: Joseph P. Theisen; CEG 1645
Drilling Company: HEW Drilling, East Palo Alto, CA
License Number: C57-384167
Driller: Tomas Jaime
Drilling Method: 6" and 12" O.D. hollow-stem auger
Date Drilled: October 19-20, 1992
Well Head Completion: Temporary, traffic-rated vault
Type of Sampler: Split barrel (1.5", 2", 2.5" ID)
Ground Surface Elevation: Approximately 520 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil by EPA Method 5030 with GC/FID

Boring Log and Well Construction Details - Well EW-1 (B-1) - Former Texaco Service Station, 930 Springtown Boulevard, Livermore, California

1/5.93

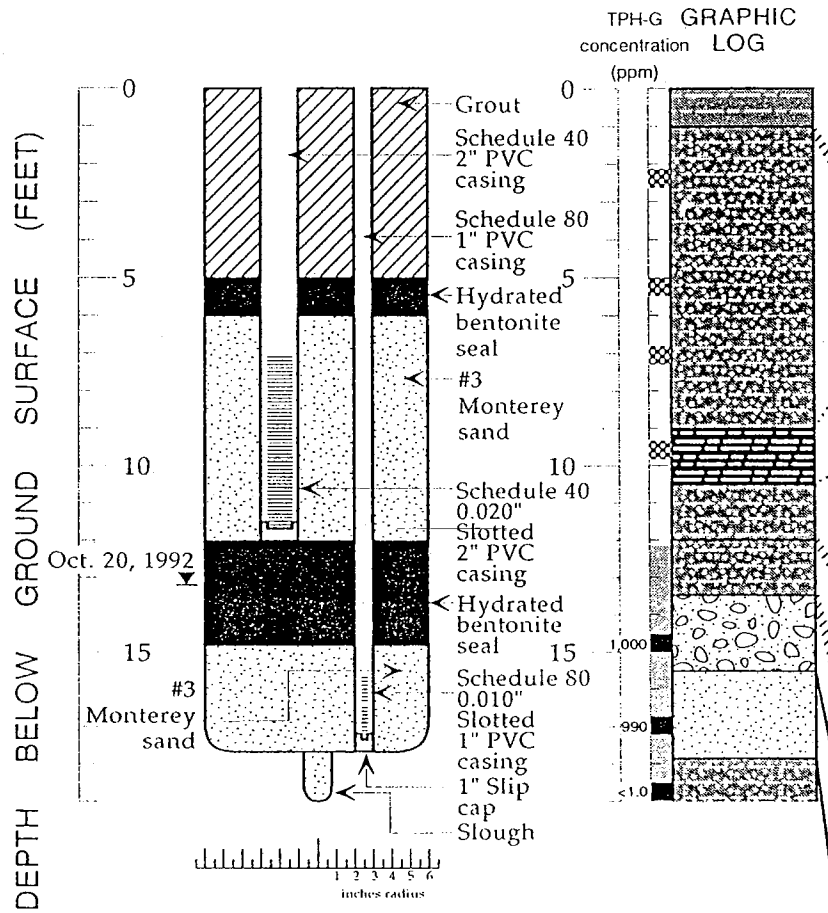
WELL EW-1 (B-1) (cont.)



Boring Log and Well Construction Details - Well EW-1 (B-1) - Former Texaco Service Station, 930 Springtown Boulevard, Livermore, California

1/5-93

WELL VE-1/SP-1 (B-2)



DESCRIPTION

Sandy SILT (ML); dark brown; medium stiff; damp; 70% silt; 30% fine to medium sand; non plastic; moderate K

Silty SAND (SM); orange; medium dense; damp; 40% silt; 60% fine to coarse sand; moderate K
Yellow at 3.5'

Clayey SILT (ML); light yellow; soft to firm; damp; 25% clay; 75% silt; non plastic; low K

Silty SAND/Sandy SILT (SM/ML); yellow-green; medium dense to dense to very stiff; damp; <5% clay; 40-60% silt; 40-60% sand; moderate K

Silty SAND (SM); green; medium dense to dense; moist; 10-20% silt; 80-90% fine sand; moderate to high K
Angular to subangular gravel to 1.0" diameter at 13.0'

Gravelly SAND/Silty SAND (SW); green; medium dense to dense; moist; 15% silt; 75% fine sand; 10% gravel to 0.5" diameter; high K

SAND (SP); green; medium dense to dense; wet; 95% medium sand; 5% gravel to 1" diameter; high K
Subangular to sub rounded gravel to 2.0" diameter at 16.5'
95% coarse sand; very high K at 16.7'

Silty SAND/Clayey SAND (SM/SC); orange;medium dense; damp; 10-15% clay; 15-40% silt; 50-70% very fine sand; low K

EXPLANATION

- Water level during drilling (date)
- Water level (date)
- Contact (dotted where approximate)
- Uncertain contact
- Gradational contact
- Location of recovered drive sample
- Location of drive sample sealed for chemical analysis
- Cutting sample
- K = Estimated hydraulic conductivity

Logged By: Eric Anderson
Supervisor: Joseph P. Theisen; CEG 1645
Drilling Company: HEW Drilling, East Palo Alto, CA
License Number: C57-384157
Driller: Tomas Jaime
Drilling Method: 6" and 12" O.D. hollow-stem auger
Date Drilled: October 20, 1992
Well Head Completion: Temporary, traffic-rated vault
Type of Sampler: Split barrel (1.5", 2", 2.5" ID)
Ground Surface Elevation: Approximately 520 feet above mean sea level
TPH-G: Total petroleum hydrocarbon as gasoline in soil by EPA Method 5030 with GC/FID

Boring Log and Well Construction Details - Well VE-1/SP-1 (B-2) - Former Texaco Service Station, 930 Sprintown Boulevard, Livermore, California

1/5.33

APPENDIX D

GROUNDWATER MONITORING AND SAMPLING DATA

TABLE 1
GROUNDWATER MONITORING AND SAMPLING DATA
FORMER CHEVRON SERVICE STATION 21-1253
930 SPRINGTOWN BLVD, LIVERMORE, CALIFORNIA

							HYDROCARBONS	*PRIMARY VOCS*			
Location	Date	*TOC*	*DTW*	*GWE*	*LNAPLT*	*LNAPL REMOVED*	*TPH-GRO*	*B*	*T*	*E*	*X*
	Units	*ft*	*ft*	*ft-amsl*	*ft*	*ft*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*
MW-9	08/24/2010	523.14	13.58	509.56	-	-	3,500	6	8	180	79
MW-9	**01/31/2011**	**523.14**	**13.31**	**509.83**	**-**	**-**	**68**	**<0.5**	**3**	**<0.5**	**<0.5**
MW-10	08/24/2010	523.25	13.07	510.18	-	-	1,300	<0.5	<0.5	2	<0.5
MW-10	**01/31/2011**	**523.25**	**11.92**	**511.33**	**-**	**-**	**250**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
MW-11	08/24/2010	523.42	13.80	509.62	-	-	2,000	6	2	9	5
MW-11	**01/31/2011**	**523.42**	**12.35**	**511.07**	**-**	**-**	**790**	**1**	**<0.5**	**5**	**3**
MW-12	08/24/2010	523.12	12.84	510.28	-	-	18,000	210	650	330	1,900
MW-12	**01/31/2011**	**523.12**	**12.47**	**510.65**	**-**	**-**	**9,600**	**64**	**180**	**180**	**400**
MW-13	08/24/2010	520.88	13.69	507.19	-	-	13,000	810	710	76	660
MW-13	**01/31/2011**	**520.88**	**12.21**	**508.67**	**-**	**-**	**22,000**	**1600**	**1600**	**270**	**1600**
MW-14	08/24/2010[1**]	520.88	10.36	510.75	0.29	-	-	-	-	-	-
MW-14	**01/31/2011[1**]**	**520.88**	**10.16**	**511.08**	**0.45**	**-**	**-**	**-**	**-**	**-**	**-**
MW-15	08/24/2010	520.87	10.81	510.06	-	-	<50	<0.5	<0.5	<0.5	<0.5
MW-15	**01/31/2011**	**520.87**	**9.86**	**511.01**	**-**	**-**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
MW-16	08/24/2010	520.50	11.07	509.43	-	-	68	<0.5	<0.5	<0.5	<0.5
MW-16	**01/31/2011**	**520.50**	**9.99**	**510.51**	**-**	**-**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
QA	08/24/2010	-	-	-	-	-	<50	<0.5	<0.5	<0.5	<0.5
QA	**01/31/2011**	**-**	**-**	**-**	**-**	**-**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**

TABLE 1
GROUNDWATER MONITORING AND SAMPLING DATA
FORMER CHEVRON SERVICE STATION 21-1253
930 SPRINGTOWN BLVD, LIVERMORE, CALIFORNIA

							HYDROCARBONS	*PRIMARY VOCS*			
Location	Date	*TOC*	*DTW*	*GWE*	*LNAPLT*	*LNAPL REMOVED*	*TPH-GRO*	*B*	*T*	*E*	*X*
	Units	*ft*	*ft*	*ft-amsl*	*ft*	*ft*	*µg/L*	*µg/L*	*µg/L*	*µg/L*	*µg/L*

Abbreviations and Notes:

TOC = Top of Casing

DTW = Depth to Water

GWE = Groundwater elevation

(ft-amsl) = Feet Above Mean sea level

ft = Feet

µg/L = Micrograms per Liter

TPH-GRO = Total Petroleum Hydrocarbons - Gasoline Range Organics

B = Benzene

T = Toluene

E = Ethylbenzene

X = Xylene

-- = Not available / not applicable

<x = Not detected above laboratory method detection limit

* TOC elevations were surveyed on July 22, 2009, by Morrow Surveying. Vertical datum is NAVD 88 from GPS Observations.

** GWE was corrected for the presence of LNAPL; correction factor: [(TOC - DTW) + (LNAPLT x 0.80)].

1 Not sampled due to the presence of LNAPL.

Table 1

Groundwater Monitoring Data and Analytical Results

Former Texaco Service Station #211253

930 Springtown Boulevard

Livermore, California

WELL ID/ DATE	TOC* (ft.)	DTW (ft.)	GWE (msl)	SPHT (ft.)	SPH REMOVED (gallons)	TPH-GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)
MW-9										
07/23/09[1]	523.14	13.00	510.14	0.00	0.00	5,200	4	5	310	100
11/09/09	523.14	12.70	510.44	0.00	0.00	240	4	4	2	5
02/22/10	523.14	11.93	511.21	0.00	0.00	<50	<0.5	<0.5	<0.5	<0.5
05/24/10	**523.14**	**12.22**	**510.92**	**0.00**	**0.00**	**6,200**	**9**	**5**	**470**	**110**
MW-10										
07/23/09[1]	522.76	12.59	510.17	0.00	0.00	16,000	220	440	440	660
11/09/09	522.76	12.30	510.46	0.00	0.00	2,800	1	2[3]	30	30
02/22/10	522.76	11.52	511.24	0.00	0.00	3,600	9	2	61	10
05/24/10	**522.76**	**11.82**	**510.94**	**0.00**	**0.00**	**3,000**	**12**	**3**	**110**	**22**
MW-11										
07/23/09[1]	523.25	13.05	510.20	0.00	0.00	5,400	25	28	62	66
11/09/09	523.25	12.73	510.52	0.00	0.00	1,100	3	0.6[3]	2	2
02/22/10	523.25	11.96	511.29	0.00	0.00	1,400	2	<0.5	5	0.9
05/24/10	**523.25**	**12.27**	**510.98**	**0.00**	**0.00**	**1,700**	**1**	**<0.5**	**10**	**0.6**
MW-12										
07/23/09[1]	523.42	13.03	510.41**	0.02	5.01[2]	48,000	340	3,100	1,300	7,600
11/09/09	523.42	12.78	510.64	0.00	0.00	18,000	290	560	22	3,100
02/22/10	523.42	12.13	511.29	0.00	0.00	14,000	190	590	310	1,400
05/24/10	**523.42**	**12.38**	**511.04**	**0.00**	**0.00**	**17,000**	**150**	**530**	**320**	**1,400**
MW-13										
07/23/09[1]	523.12	12.75	510.37	0.00	0.00	52,000	760	6,200	980	13,000
11/09/09	523.12	12.51	510.61	0.00	0.00	12,000	340	1,300	16	1,700
02/22/10	523.12	11.87	511.25	0.00	0.00	13,000	630	600	22	960
05/24/10	**523.12**	**12.10**	**511.02**	**0.00**	**0.00**	**15,000**	**950**	**670**	**130**	**790**

Table 1

Groundwater Monitoring Data and Analytical Results

Former Texaco Service Station #211253

930 Springtown Boulevard

Livermore, California

WELL ID/ DATE	TOC* (ft.)	DTW (ft.)	GWE (msl)	SPHT (ft.)	SPH REMOVED (gallons)	TPH-GRO (µg/L)	B (µg/L)	T (µg/L)	E (µg/L)	X (µg/L)
MW-14										
07/23/09[1]	520.88	10.40	510.48	0.00	0.00	8,400	230	460	180	670
11/09/09	520.88	10.11	510.77	0.00	0.00	23,000	1,800	1,900	750	2,600
02/22/10	520.88	9.37	511.51	0.00	0.00	48,000	3,600	7,900	2,100	9,400
05/24/10	**520.88**	**9.88**	**511.25****	**0.31**	**0.00**	**NOT SAMPLED DUE TO THE PRESENCE OF SPH**				**--**
MW-15										
07/23/09[1]	520.87	10.33	510.54	0.00	0.00	2,500	6	17	16	320
11/09/09	520.87	10.18	510.69	0.00	0.00	20,000	110	590	370	4,900
02/22/10	520.87	9.48	511.39	0.00	0.00	66	<0.5	3	1	6
05/24/10	**520.87**	**9.83**	**511.04**	**0.00**	**0.00**	**70**	**1**	**8**	**1**	**8**
MW-16										
07/23/09[1]	520.50	10.63	509.87	0.00	0.00	430	0.6	<0.5	<0.5	<0.5
11/09/09	520.50	10.31	510.19	0.00	0.00	180	<0.5	<0.5	<0.5	<0.5
02/22/10	520.50	9.63	510.87	0.00	0.00	<50	<0.5	<0.5	<0.5	<0.5
05/24/10	**520.50**	**9.88**	**510.62**	**0.00**	**0.00**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**
QA										
07/23/09	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5
11/09/09	--	--	--	--	--	<50	<0.5	1[4]	<0.5	<0.5
02/22/10	--	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5
05/24/10	--	--	--	--	--	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**

Table 1

Groundwater Monitoring Data and Analytical Results

Former Texaco Service Station #211253
930 Springtown Boulevard
Livermore, California

EXPLANATIONS:

TOC = Top of Casing
(ft.) = Feet
DTW = Depth to Water
GWE = Groundwater Elevation
SPHT = Separate Phase Hydrocarbon Thickness
(msl) = Mean Sea Level
TPH = Total Petroleum Hydrocarbons
GRO = Gasoline Range Organics
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
-- = Not Measured/Not Analyzed
QA = Quality Assurance/Trip Blank
(µg/L) = Micrograms per liter

* TOC elevations were surveyed on July 22, 2009, by Morrow Surveying. Vertical datum is NAVD 88 from GPS Observations.

** GWE has been corrected due to the presence of SPH; correction factor: [(TOC - DTW) + (SPHT x 0.80)].

ANALYTICAL METHODS:

TPH-GRO analyzed by EPA Method 8015
BTEX analyzed by EPA Method 8260

[1] Well development preformed.

[2] Product + water removed.

[3] The Laboratory report indicates the result reported for toluene in this sample may be attributed to trace amounts of toluene recently found in HCl preserved vials from the manufacturer. The trip blank associated with this sample had a trace toluene detection of 1 ug/l. Please refer to the letter accompanying the lab report for further explanation.

[4] The Laboratory report indicates the result reported for toluene in this trip blank may be attributed to trace amounts of toluene recently found in HCl preserved vials from the manufacturer. Please refer to the letter accompanying the lab report for further explanation.

WELL CONCENTRATIONS
Former Texaco Service Station
930 Springtown Boulevard
Livermore, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-A	07/31/1998	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	520.10	10.04	510.06
MW-A	11/04/1998	15000	86	180	960	1800	<50	<50	520.10	11.09	509.01
MW-A	11/11/1999	1010	4.72	<2.50	26.1	59.9	87.6	<0.500	520.10	11.39	508.71
MW-A	04/03/2000	12800	23.8	54.9	704	1070	242	NA	520.10	10.41	509.69
MW-A	10/16/2000	4810	51.6	<20.0	251	434	108	<10.0	520.10	11.59	508.51
MW-A	06/28/2001	1100	1.2	2.4	51	64	NA	<0.50	520.10	12.13	507.97
MW-A	10/22/2001	15000	24	38	1000	980	NA	<5.0	520.10	12.74	507.36
MW-A	**01/04/2002**	**9100**	**4.1**	**6.5**	**450**	**360**	**NA**	**<20**	**520.10**	**10.83**	**509.27**
MW-B	01/02/1992	NA	NA	NA	NA	NA	NA	NA	518.05	11.27	506.78
MW-B	04/02/1992	1900	ND	39	24	35	NA	NA	518.05	10.18	507.87
MW-B	07/21/1992	16000	180	1600	270	1100	NA	NA	518.05	11.27	506.78
MW-B	10/09/1992	38000	490	8300	1400	5100	NA	NA	518.05	11.64	506.41
MW-B	01/11/1993	NA	NA	NA	NA	NA	NA	NA	518.05	9.65	508.40
MW-B	05/05/1993	NA	NA	NA	NA	NA	NA	NA	518.05	9.28	508.77
MW-B	08/09/1993	NA	NA	NA	NA	NA	NA	NA	518.05	11.02	507.03
MW-B	10/14/1993	NA	NA	NA	NA	NA	NA	NA	518.05	11.34	506.71
MW-B	01/24/1994	23000	110	1700	600	1900	NA	NA	518.05	10.54	507.51
MW-B	05/31/1994	13000	780	310	370	1400	NA	NA	518.05	10.19	507.86
MW-B	08/31/1994	35000	160	2800	1000	4500	NA	NA	518.05	10.98	507.07
MW-B	11/02/1994	2500	170	3200	1100	4700	NA	NA	518.05	10.90	507.15
MW-B	02/20/1995	10000	46	1400	330	1200	NA	NA	518.05	9.47	508.58
MW-B	05/09/1995	4100	9.1	47	26	30	NA	NA	518.05	10.58	507.47
MW-B	08/21/1995	4000	9.6	110	120	270	98	NA	518.05	9.34	508.71
MW-B	10/20/1995	9300	35	1300	370	1300	NA	NA	518.05	9.83	508.22
MW-B	02/07/1996	8900	33	700	110	360	NA	NA	518.05	7.85	510.20
MW-B	04/30/1996	5500	17	460	120	400	NA	NA	518.05	8.02	510.03

WELL CONCENTRATIONS
Former Texaco Service Station
930 Springtown Boulevard
Livermore, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-B	08/14/1996	9000	<5	260	120	320	<300	NA	518.05	8.66	509.39
MW-B	11/22/1996	560000	56	2400	1600	5500	<3000	NA	518.05	8.70	509.35
MW-B	02/14/1997	4600	5.2	110	72	210	<300	NA	518.05	7.75	510.30
MW-B	05/23/1997	34000	75	1700	590	2100	1800	NA	518.05	9.05	509.00
MW-B	07/25/1997	39000	250	5200	1600	5900	<800	NA	518.05	9.37	508.68
MW-B	10/31/1997	36000	130	2600	1200	4800	<800	NA	518.05	9.29	508.76
MW-B	02/06/1998	4800	10	120	72	200	<80	NA	518.05	6.68	511.37
MW-B	05/19/1998	25000	200	900	410	1600	570	NA	518.05	7.57	510.48
MW-B	07/31/1998	580	<0.5	<0.5	<0.5	<0.5	14	NA	518.05	8.03	510.02
MW-B	11/04/1998	24000	150	1400	850	2400	<50	<66	518.05	8.85	509.20
MW-B	11/11/1999	685	7.22	14.7	6.10	17.8	<12.5	NA	518.05	9.03	509.02
MW-B	04/03/2000	9250	106	477	346	1320	231	<1.00a	518.05	8.14	509.91
MW-B	10/16/2000	1280	14.5	13.8	13.3	38.8	26.5	NA	518.05	9.42	508.63
MW-B	06/28/2001	16000	29	550	470	1700	NA	<2.5	518.05	9.81	508.24
MW-B	10/22/2001	7000	20	400	330	1100	NA	<20	518.05	10.44	507.61
MW-B	**01/04/2002**	**10000**	**11**	**240**	**280**	**1100**	**NA**	**<20**	**518.05**	**8.46**	**509.59**
MW-1	01/02/1992	16	6	ND	ND	ND	NA	NA	520.61	14.11	506.50
MW-1	04/02/1992	ND	ND	ND	ND	ND	NA	NA	520.61	12.98	507.63
MW-1	07/21/1992	<50	3.2	<0.5	<0.5	<0.5	NA	NA	520.61	13.92	506.69
MW-1	10/09/1992	<50	8.5	<0.5	<0.5	<0.5	NA	NA	520.61	14.25	506.36
MW-1	01/11/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	12.30	508.31
MW-1	05/05/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	11.88	508.73
MW-1	08/09/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	13.63	506.98
MW-1	10/14/1993	440	16	2.9	2.9	11	NA	NA	520.61	13.91	506.70
MW-1	01/24/1993	NA	NA	NA	NA	NA	NA	NA	520.61	13.12	507.49
MW-1	05/31/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	12.74	507.87

WELL CONCENTRATIONS
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930 Springtown Boulevard
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Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-1	08/31/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	13.68	506.93
MW-1	11/02/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	13.48	507.13
MW-1	02/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	12.02	508.59
MW-1	05/09/1995	450	22	25	23	100	NA	NA	520.61	12.83	507.78
MW-1	08/21/1995	58	<0.5	1.5	1.8	4.5	<10	NA	520.61	11.93	508.68
MW-1	10/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	12.40	508.21
MW-1	02/07/1996	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	520.61	10.42	510.19
MW-1	04/30/1996	NA	NA	NA	NA	NA	NA	NA	520.61	10.48	510.13
MW-1	08/14/1996	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	520.61	11.18	509.43
MW-1	11/22/1996	NA	NA	NA	NA	NA	NA	NA	520.61	11.10	509.51
MW-1	02/14/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	520.61	10.25	510.36
MW-1	05/23/1997	NA	NA	NA	NA	NA	NA	NA	520.61	11.48	509.13
MW-1	07/25/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	520.61	11.99	508.62
MW-1	10/31/1997	NA	NA	NA	NA	NA	NA	NA	520.61	11.74	508.87
MW-1	02/06/1998	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	520.61	9.27	511.34
MW-1	05/19/1998	NA	NA	NA	NA	NA	NA	NA	520.61	10.51	510.10
MW-1	07/31/1998	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	520.61	10.41	510.20
MW-1	11/04/1998	<50	<0.50	<0.50	<0.50	<0.50	<2.5	NA	520.61	11.32	509.29
MW-1	11/11/1999	82.5	6.35	7.08	4.76	10.9	3.13	1.08	520.61	11.54	509.07
MW-1	04/03/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	520.61	10.65	509.96
MW-1	10/16/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	520.61	11.91	508.70
MW-1	06/28/2001	<50	<0.50	<0.50	<0.50	<0.50	NA	0.65	520.61	12.37	508.24
MW-1	10/22/2001	<50	<0.50	<0.50	<0.50	0.55	NA	<5.0	520.61	12.90	507.71
MW-1	**01/04/2002**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**520.61**	**11.02**	**509.59**
MW-2	01/02/1992	ND	ND	ND	ND	ND	NA	NA	518.29	11.96	506.33
MW-2	04/02/1992	ND	ND	ND	ND	ND	NA	NA	518.29	10.89	507.40

WELL CONCENTRATIONS
Former Texaco Service Station
930 Springtown Boulevard
Livermore, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-2	07/21/1992	NA	NA	NA	NA	NA	NA	NA	518.29	11.55	506.74
MW-2	05/31/1994	NA	NA	NA	NA	NA	NA	NA	518.29	10.37	507.92
MW-2	08/31/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.29	11.16	507.13
MW-2	11/02/1994	NA	NA	NA	NA	NA	NA	NA	518.29	11.07	507.22
MW-2	02/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.29	9.66	508.63
MW-2	05/09/1995	NA	NA	NA	NA	NA	NA	NA	518.29	10.14	508.15
MW-2	08/21/1995	<50	<0.5	<0.5	<0.5	<0.5	<10	NA	518.29	9.58	508.71
MW-2	10/20/1995	NA	NA	NA	NA	NA	NA	NA	518.29	9.91	508.38
MW-2	02/07/1996	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.29	8.00	510.29
MW-2	04/30/1996	NA	NA	NA	NA	NA	NA	NA	518.29	8.21	510.08
MW-2	08/14/1996	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	518.29	8.88	509.41
MW-2	11/22/1996	NA	NA	NA	NA	NA	NA	NA	518.29	8.88	509.41
MW-2	02/14/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	518.29	7.92	510.37
MW-2	05/23/1997	NA	NA	NA	NA	NA	NA	NA	518.29	9.25	509.04
MW-2	07/25/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	518.29	9.51	508.78
MW-2	10/31/1997	NA	NA	NA	NA	NA	NA	NA	518.29	9.30	508.99
MW-2	02/06/1998	<50	<0.5	<0.5	<0.5	1.4	<30	NA	518.29	6.88	511.41
MW-2	05/19/1998	NA	NA	NA	NA	NA	NA	NA	518.29	8.35	509.94
MW-2	07/31/1998	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	518.29	8.14	510.15
MW-2	11/04/1998	<50	<0.50	<0.50	<0.50	<0.50	<2.5	NA	518.29	9.00	509.29
MW-2	11/11/1999	65.8	6.34	7.04	4.71	10.8	3.21	1.04	518.29	9.19	509.10
MW-2	04/03/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	518.29	8.31	509.98
MW-2	10/16/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	518.29	9.36	508.93
MW-2	06/28/2001	<50	<0.50	<0.50	<0.50	<0.50	NA	<0.50	518.29	9.88	508.41
MW-2	10/22/2001	<50	<0.50	<0.50	<0.50	<0.50	NA	<5.0	518.29	10.54	507.75
MW-2	**01/04/2002**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**518.29**	**8.63**	**509.66**

WELL CONCENTRATIONS
Former Texaco Service Station
930 Springtown Boulevard
Livermore, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-3	01/02/1992	340	0.4	ND	ND	ND	NA	NA	519.60	12.87	506.73
MW-3	04/02/1992	160	5	ND	0.3	0.5	NA	NA	519.60	11.97	507.63
MW-3	07/21/1992	260	1.7	<0.5	<0.5	<0.5	NA	NA	519.60	12.60	507.00
MW-3	10/09/1992	88	<0.5	<0.5	<0.5	<0.5	NA	NA	519.60	12.93	506.67
MW-3	01/11/1993	130	<0.5	<0.5	<0.5	<0.5	NA	NA	519.60	11.16	508.44
MW-3	05/05/1993	340	1.8	<0.5	1.3	<0.5	NA	NA	519.60	10.72	508.88
MW-3	08/09/1993	610	18	<0.5	2.4	0.9	NA	NA	519.60	12.34	507.26
MW-3	10/14/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	519.60	12.71	506.89
MW-3	01/24/1994	320	3.5	<0.5	<0.5	<0.5	NA	NA	519.60	12.03	507.57
MW-3	05/31/1994	830	11	12	5.0	1.2	NA	NA	519.60	11.54	508.06
MW-3	08/31/1994	660	2	<0.5	1	<0.5	NA	NA	519.60	12.60	507.00
MW-3	11/02/1994	1500	260	36	34	76	NA	NA	519.60	12.16	507.44
MW-3	02/20/1995	410	1.2	1.9	1.4	2.2	NA	NA	519.60	11.05	508.55
MW-3	05/09/1995	730	23	43	21	95	NA	NA	519.60	11.97	507.63
MW-3	08/21/1995	<50	<0.5	<0.5	<0.5	<0.5	<10	NA	519.60	7.60	512.00
MW-3	10/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	519.60	11.46	508.14
MW-3	02/07/1996	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	519.60	9.42	510.18
MW-3	04/30/1996	NA	NA	NA	NA	NA	NA	NA	519.60	9.60	510.00
MW-3	08/14/1996	<50	<0.5	0.60	<0.5	<0.5	<30	NA	519.60	10.24	509.36
MW-3	11/22/1996	NA	NA	NA	NA	NA	NA	NA	519.60	10.34	509.26
MW-3	02/14/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	519.60	9.38	510.22
MW-3	05/23/1997	NA	NA	NA	NA	NA	NA	NA	519.60	10.67	508.93
MW-3	07/25/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	519.60	11.11	508.49
MW-3	10/31/1997	NA	NA	NA	NA	NA	NA	NA	519.60	10.86	508.74
MW-3	02/06/1998	63	1.5	2.8	0.77	8.6	<30	NA	519.60	8.41	511.19
MW-3	05/19/1998	NA	NA	NA	NA	NA	NA	NA	519.60	9.40	510.20
MW-3	07/31/1998	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	519.60	9.04	510.56

WELL CONCENTRATIONS
Former Texaco Service Station
930 Springtown Boulevard
Livermore, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-3	11/04/1998	230	11	7.2	7.6	33	18	14	519.60	10.45	509.15
MW-3	11/11/1999	569	103	47.1	14.1	29.6	521	604	519.60	10.73	508.87
MW-3	04/03/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	519.60	9.78	509.82
MW-3	10/16/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	519.60	10.97	508.63
MW-3	06/28/2001	110	<0.50	<0.50	0.56	1.8	NA	1.8	519.60	11.49	508.11
MW-3	10/22/2001	190	1.4	1.3	1.2	7.7	NA	<5.0	519.60	12.08	507.52
MW-3	**01/04/2002**	**<50**	**<0.50**	**<0.50**	**<0.50**	**<0.50**	**NA**	**<5.0**	**519.60**	**10.18**	**509.42**
MW-4	01/02/1992	ND	ND	ND	ND	ND	NA	NA	518.79	12.22	506.57
MW-4	04/02/1992	ND	ND	ND	ND	ND	NA	NA	518.79	11.03	507.76
MW-4	07/21/1992	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	12.36	506.43
MW-4	10/09/1992	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	12.40	506.39
MW-4	01/11/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	10.72	508.07
MW-4	05/05/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	10.21	508.58
MW-4	08/09/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	12.25	506.54
MW-4	10/14/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	12.58	506.21
MW-4	01/24/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	11.72	507.07
MW-4	05/31/1994	NA	NA	NA	NA	NA	NA	NA	518.79	11.29	507.50
MW-4	08/31/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	12.00	506.79
MW-4	11/02/1994	NA	NA	NA	NA	NA	NA	NA	518.79	11.96	506.83
MW-4	02/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	10.42	508.37
MW-4	05/09/1995	NA	NA	NA	NA	NA	NA	NA	518.79	11.22	507.57
MW-4	08/21/1995	<50	<0.5	<0.5	<0.5	<0.5	<10	NA	518.79	10.51	508.28
MW-4	10/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	10.86	507.93
MW-4	02/07/1996	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	518.79	8.93	509.86
MW-4	04/30/1996	NA	NA	NA	NA	NA	NA	NA	518.79	9.03	509.76
MW-4	08/14/1996	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	518.79	9.84	508.95

WELL CONCENTRATIONS
Former Texaco Service Station
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Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-4	11/22/1996	NA	NA	NA	NA	NA	NA	NA	518.79	9.73	509.06
MW-4	02/14/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	518.79	8.85	509.94
MW-4	05/23/1997	NA	NA	NA	NA	NA	NA	NA	518.79	10.15	508.64
MW-4	07/25/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	518.79	10.61	508.18
MW-4	10/31/1997	NA	NA	NA	NA	NA	NA	NA	518.79	10.36	508.43
MW-4	02/06/1998	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	518.79	7.46	511.33
MW-4	05/19/1998	NA	NA	NA	NA	NA	NA	NA	518.79	8.91	509.88
MW-4	07/31/1998	<50	<0.5	<0.5	<0.5	<0.5	<2.5	NA	518.79	8.99	509.80
MW-4	11/04/1998	<50	<0.50	<0.50	<0.50	<0.50	<2.5	NA	518.79	10.08	508.71
MW-4	11/11/1999	83.6	6.50	7.52	4.31	9.59	<2.50	NA	518.79	9.81	508.98
MW-4	04/03/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	518.79	9.24	509.55
MW-4	10/16/2000	<50.0	<0.500	<0.500	<0.500	<0.500	<2.50	NA	518.79	10.49	508.30
MW-4	06/28/2001	<50	<0.50	<0.50	<0.50	<0.50	NA	<0.50	518.79	10.82	507.97
MW-4	10/22/2001	<50	<0.50	<0.50	<0.50	<0.50	NA	<5.0	518.79	11.45	507.34
MW-4	**01/04/2002**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**	**518.79**	**9.43**	**509.36**
MW-5	01/02/1992	1800	74	41	84	94	NA	NA	521.19	14.56	506.63
MW-5	04/02/1992	ND	ND	ND	ND	ND	NA	NA	521.19	13.58	507.61
MW-5	07/21/1992	1000	69	16	40	31	NA	NA	521.19	13.77	507.42
MW-5	10/09/1992	3400	890	51	110	110	NA	NA	521.19	14.09	507.10
MW-5	01/11/1993	15000	460	110	900	370	NA	NA	521.19	12.24	508.95
MW-5	05/05/1993	4500	160	19	280	110	NA	NA	521.19	11.90	509.29
MW-5	08/09/1993	2300	180	19	130	80	NA	NA	521.19	13.35	507.84
MW-5	10/14/1993	2200	160	27	90	64	NA	NA	521.19	13.89	507.30
MW-5	01/24/1994	2600	69	11	65	25	NA	NA	521.19	13.32	507.87
MW-5	05/31/1994	3100	130	64	140	120	NA	NA	521.19	12.75	508.44
MW-5	08/31/1994	600	20	2.9	14	7.1	NA	NA	521.19	14.34	506.85

WELL CONCENTRATIONS
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Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-5	11/02/1994	2300	68	18	52	54	NA	NA	521.19	14.22	506.97
MW-5	02/20/1995	12000	130	<30	240	138	NA	NA	521.19	12.78	508.41
MW-5	05/09/1995	2500	57	60	54	37	NA	NA	521.19	13.41	507.78
MW-5	08/21/1995	11000	91	28	140	120	<100	<100	521.19	12.32	508.87
MW-5	10/20/1995	2300	38	3.8	28	19	NA	NA	521.19	13.28	507.91
MW-5	02/07/1996	1800	35	8.1	37	20	NA	NA	521.19	11.31	509.88
MW-5	04/30/1996	NA	NA	NA	NA	NA	NA	NA	521.19	11.52	509.67
MW-5	08/14/1996	3500	130	22	170	47	71	NA	521.19	12.03	509.16
MW-5	11/22/1996	3500	160	15	190	28	<200	NA	521.19	12.22	508.97
MW-5	02/14/1997	2900	150	54	330	68	<300	NA	521.19	11.20	509.99
MW-5	05/23/1997	10000	170	98	380	68	<200	NA	521.19	12.55	508.64
MW-5	07/25/1997	2700	110	<0.5	33	<0.5	<30	NA	521.19	12.93	508.26
MW-5	10/31/1997	NA	NA	NA	NA	NA	NA	NA	521.19	12.78	508.41
MW-5	02/06/1998	67	<0.5	<0.5	<0.5	<0.5	<30	NA	521.19	10.26	510.93
MW-5	05/19/1998	4200	120	25	360	76	510	NA	521.19	11.12	510.07
MW-5	07/31/1998	270	<0.5	<0.5	<0.5	<0.5	<2.5	NA	521.19	11.79	509.40
MW-5	11/04/1998	2800	120	14	590	140	<25	<10	521.19	12.33	508.86
MW-5	11/11/1999	1220	40.5	22.8	16.4	6.22	<12.5	NA	521.19	12.64	508.55
MW-5	04/03/2000	5060	130	20.8	281	30.6	74.1	NA	521.19	11.64	509.55
MW-5	10/16/2000	2070	35.4	33.6	114	57.6	50.1	NA	521.19	12.82	508.37
MW-5	06/28/2001	1500	15	2.5	74	5.5	NA	<0.50	521.19	13.40	507.79
MW-5	10/22/2001	2400	37	2.9	75	7.3	NA	<5.0	521.19	13.99	507.20
MW-5	**01/04/2002**	**3400**	**8.9**	**1.2**	**22**	**13**	**NA**	**<5.0**	**521.19**	**12.13**	**509.06**
MW-6	01/02/1992	23	ND	0.3	0.6	3	NA	NA	522.18	16.64	505.54
MW-6	04/02/1991	ND	ND	ND	ND	ND	NA	NA	522.18	15.61	506.57
MW-6	07/21/1992	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	522.18	15.53	506.65

WELL CONCENTRATIONS
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930 Springtown Boulevard
Livermore, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-6	10/09/1992	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	522.18	15.69	506.49
MW-6	08/09/1993	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	522.18	14.50	507.68
MW-6	10/14/1993	NA	NA	NA	NA	NA	NA	NA	522.18	NA	NA
MW-6	01/24/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	522.18	15.09	507.09
MW-6	05/31/1994	NA	NA	NA	NA	NA	NA	NA	522.18	14.64	507.54
MW-6	08/31/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	522.18	15.32	506.86
MW-6	11/02/1994	NA	NA	NA	NA	NA	NA	NA	522.18	15.32	506.86
MW-6	02/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	522.18	14.07	508.11
MW-6	05/09/1995	NA	NA	NA	NA	NA	NA	NA	522.18	14.30	507.88
MW-6	10/20/1995	NA	NA	NA	NA	NA	NA	NA	522.18	14.31	NA
MW-6	07/25/1997	NA	NA	NA	NA	NA	NA	NA	522.18	NA	NA
MW-7	01/02/1992	NA	NA	NA	NA	NA	NA	NA	522.19	11.17	511.02
MW-7	04/02/1992	ND	ND	ND	ND	ND	NA	NA	522.19	10.34	511.85
MW-7	07/21/1992	NA	NA	NA	NA	NA	NA	NA	522.19	9.02	513.17
MW-7	05/31/1994	NA	NA	NA	NA	NA	NA	NA	522.19	9.42	512.77
MW-7	08/31/1994	NA	NA	NA	NA	NA	NA	NA	522.19	6.84	515.35
MW-7	11/02/1994	NA	NA	NA	NA	NA	NA	NA	522.19	6.48	515.71
MW-7	02/20/1995	NA	NA	NA	NA	NA	NA	NA	522.19	7.71	514.48
MW-7	05/09/1995	NA	NA	NA	NA	NA	NA	NA	522.19	7.65	514.54
MW-7	08/21/1995	NA	NA	NA	NA	NA	NA	NA	522.19	7.83	514.36
MW-7	10/20/1995	NA	NA	NA	NA	NA	NA	NA	522.19	8.61	513.58
MW-7	07/25/1997	NA	NA	NA	NA	NA	NA	NA	522.19	NA	NA
MW-8	01/02/1992	12000	32	980	200	760	NA	NA	524.03	18.42	505.61
MW-8	04/02/1992	ND	ND	ND	ND	ND	NA	NA	524.03	17.39	506.64
MW-8	07/21/1992	NA	NA	NA	NA	NA	NA	NA	524.03	14.02	510.01

WELL CONCENTRATIONS
Former Texaco Service Station
930 Springtown Boulevard
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Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)
MW-8	05/31/1994	NA	NA	NA	NA	NA	NA	NA	524.03	19.65	504.38
MW-8	08/31/1994	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	524.03	17.40	506.63
MW-8	11/02/1994	NA	NA	NA	NA	NA	NA	NA	524.03	17.38	506.65
MW-8	02/20/1995	<50	<0.5	<0.5	<0.5	<0.5	NA	NA	524.03	15.99	508.04
MW-8	05/09/1995	NA	NA	NA	NA	NA	NA	NA	524.03	16.54	507.49
MW-8	08/21/1995	<50	<0.5	<0.5	0.67	0.62	<10	NA	524.03	15.77	508.26
MW-8	10/20/1995	NA	NA	NA	NA	NA	NA	NA	524.03	16.24	507.79
MW-8	02/07/1996	<50	7.0	<0.5	<0.5	<0.5	NA	NA	524.03	14.42	509.61
MW-8	04/30/1996	61	9.6	<0.5	<0.5	<0.5	NA	NA	524.03	14.65	509.38
MW-8	08/14/1996	<50	0.73	<0.5	<0.5	<0.5	<30	NA	524.03	15.08	508.95
MW-8	11/22/1996	120	5.9	2.2	2.4	8.3	<30	NA	524.03	15.35	508.68
MW-8	02/14/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	524.03	14.32	509.71
MW-8	05/23/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	524.03	13.35	510.68
MW-8	07/25/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	524.03	16.05	507.98
MW-8	10/31/1997	<50	<0.5	<0.5	<0.5	<0.5	<30	NA	524.03	15.86	508.17
MW-8	02/06/1998	180	17	<0.5	<0.5	6.0	<30	NA	524.03	13.62	510.41
MW-8	05/19/1998	<50	4.9	<0.5	<0.5	<0.5	<2.5	NA	524.03	14.23	509.80
MW-8	07/31/1998	140	<0.5	<0.5	<0.5	<0.5	<2.5	NA	524.03	14.95	509.08
MW-8	11/04/1998	<50	1.2	100	1.9	7.8	<2.5	NA	524.03	15.42	508.61
MW-8	11/11/1999	<50.0	<0.500	<0.500	<0.500	<0.500	3.70	<0.500	524.03	15.74	508.29
MW-8	04/03/2000	87.7	10.8	<0.500	<0.500	<0.500	<2.50	NA	524.03	14.76	509.27
MW-8	10/16/2000	237	11.3	<0.500	<0.500	0.544	7.93	NA	524.03	15.91	508.12
MW-8	06/26/2001	<50	<0.50	<0.50	<0.50	<0.50	NA	29	524.03	16.49	507.54
MW-8	10/22/2001	<50	<0.50	<0.50	<0.50	2.0	NA	<5.0	524.03	16.98	507.05
MW-8	**01/04/2002**	**290**	**1.3**	**<0.50**	**<0.50**	**<0.50**	**NA**	**<5.0**	**524.03**	**15.29**	**508.74**

WELL CONCENTRATIONS
Former Texaco Service Station
930 Springtown Boulevard
Livermore, CA

Well ID	Date	TPPH (ug/L)	B (ug/L)	T (ug/L)	E (ug/L)	X (ug/L)	MTBE 8020 (ug/L)	MTBE 8260 (ug/L)	TOC (MSL)	Depth to Water (ft.)	GW Elevation (MSL)

Abbreviations:

TPPH = Total petroleum hydrocarbons as gasoline by EPA Method 8260B; prior to June 28, 2001, analyzed by EPA Method 8015.

BTEX = benzene, toluene, ethylbenzene, xylenes by EPA Method 8260B; prior to June 28, 2001, analyzed by EPA Method 8020.

MTBE = Methyl-tertiary-butyl ether

TOC = Top of Casing Elevation

GW = Groundwater

ug/L = Parts per billion

msl = Mean sea level

ft = Feet

<n = Below detection limit

(D) = Duplicate sample

NA = Not applicable

ND = Not detected at or above the minimum quantitation limits.

Notes:

a = Sample analyzed outside of EPA recommended holding time.

For the event on April 3, 2000, the lab confirmed MTBE by 8260 for well MW-B instead of well MW-A.

KIFF ANALYTICAL LLC

Report Number : 24208
Date : 1/14/2002

Nick Sudano
Blaine Tech Services
1680 Rogers Avenue
San Jose, CA 95112-1105

Subject : 5 Water Samples
Project Name : 930 Springtown Boulevard, Livermore
Project Number : 020104-DA2
P.O. Number : 91995053

Dear Mr. Sudano,

Chemical analysis of the samples referenced above has been completed. Summaries of the data are contained on the following pages. Sample(s) were received under documented chain-of-custody. US EPA protocols for sample storage and preservation were followed.

Kiff Analytical is certified by the State of California (# 2236). If you have any questions regarding procedures or results, please call me at 530-297-4800.

Sincerely,

Joel Kiff

Joel Kiff

KIFF ANALYTICAL LLC

Report Number : 24208
Date : 1/14/2002

Project Name : **930 Springtown Boulevard, Livermore**
Project Number : **020104-DA2**

Sample : **MW-A** Matrix : Water Lab Number : 24208-01
Sample Date :1/4/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**4.1**	2.0	ug/L	EPA 8260B	1/9/2002
Toluene	**6.5**	2.0	ug/L	EPA 8260B	1/9/2002
Ethylbenzene	**450**	2.0	ug/L	EPA 8260B	1/9/2002
Total Xylenes	**360**	2.0	ug/L	EPA 8260B	1/9/2002
Methyl-t-butyl ether (MTBE)	**< 20**	20	ug/L	EPA 8260B	1/9/2002
TPH as Gasoline	**9100**	200	ug/L	EPA 8260B	1/9/2002
Toluene - d8 (Surr)	102		% Recovery	EPA 8260B	1/9/2002
4-Bromofluorobenzene (Surr)	107		% Recovery	EPA 8260B	1/9/2002

Sample : **MW-B** Matrix : Water Lab Number : 24208-02
Sample Date :1/4/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**11**	2.0	ug/L	EPA 8260B	1/9/2002
Toluene	**240**	2.0	ug/L	EPA 8260B	1/9/2002
Ethylbenzene	**280**	2.0	ug/L	EPA 8260B	1/9/2002
Total Xylenes	**1100**	2.0	ug/L	EPA 8260B	1/9/2002
Methyl-t-butyl ether (MTBE)	**< 20**	20	ug/L	EPA 8260B	1/9/2002
TPH as Gasoline	**10000**	200	ug/L	EPA 8260B	1/9/2002
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	1/9/2002
4-Bromofluorobenzene (Surr)	110		% Recovery	EPA 8260B	1/9/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

KIFF ANALYTICAL LLC

Report Number : 24208
Date : 1/14/2002

Project Name : **930 Springtown Boulevard, Livermore**
Project Number : **020104-DA2**

Sample : **MW-3** Matrix : Water Lab Number : 24208-03
Sample Date :1/4/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**< 0.50**	0.50	ug/L	EPA 8260B	1/9/2002
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	1/9/2002
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	1/9/2002
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	1/9/2002
Methyl-t-butyl ether (MTBE)	**< 5.0**	5.0	ug/L	EPA 8260B	1/9/2002
TPH as Gasoline	**< 50**	50	ug/L	EPA 8260B	1/9/2002
Toluene - d8 (Surr)	99.6		% Recovery	EPA 8260B	1/9/2002
4-Bromofluorobenzene (Surr)	102		% Recovery	EPA 8260B	1/9/2002

Sample : **MW-5** Matrix : Water Lab Number : 24208-04
Sample Date :1/4/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**8.9**	0.50	ug/L	EPA 8260B	1/9/2002
Toluene	**1.2**	0.50	ug/L	EPA 8260B	1/9/2002
Ethylbenzene	**22**	0.50	ug/L	EPA 8260B	1/9/2002
Total Xylenes	**13**	0.50	ug/L	EPA 8260B	1/9/2002
Methyl-t-butyl ether (MTBE)	**< 5.0**	5.0	ug/L	EPA 8260B	1/9/2002
TPH as Gasoline	**3400**	250	ug/L	EPA 8260B	1/10/2002
Toluene - d8 (Surr)	96.5		% Recovery	EPA 8260B	1/9/2002
4-Bromofluorobenzene (Surr)	101		% Recovery	EPA 8260B	1/9/2002

Approved By: Joel Kiff

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KIFF ANALYTICAL LLC

Report Number : 24208
Date : 1/14/2002

Project Name : **930 Springtown Boulevard, Livermore**
Project Number : **020104-DA2**

Sample : **MW-8** Matrix : Water Lab Number : 24208-05
Sample Date :1/4/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	**1.3**	0.50	ug/L	EPA 8260B	1/9/2002
Toluene	**< 0.50**	0.50	ug/L	EPA 8260B	1/9/2002
Ethylbenzene	**< 0.50**	0.50	ug/L	EPA 8260B	1/9/2002
Total Xylenes	**< 0.50**	0.50	ug/L	EPA 8260B	1/9/2002
Methyl-t-butyl ether (MTBE)	**< 5.0**	5.0	ug/L	EPA 8260B	1/9/2002
TPH as Gasoline	**290**	50	ug/L	EPA 8260B	1/10/2002
Toluene - d8 (Surr)	101		% Recovery	EPA 8260B	1/9/2002
4-Bromofluorobenzene (Surr)	99.9		% Recovery	EPA 8260B	1/9/2002

Approved By: Joel Kiff

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

Report Number : 24208

Date : 1/14/2002

QC Report : Method Blank Data

Project Name : **930 Springtown Boulevard, Livermore**

Project Number : **020104-DA2**

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed
Benzene	< 0.50	0.50	ug/L	EPA 8260B	1/9/2002
Toluene	< 0.50	0.50	ug/L	EPA 8260B	1/9/2002
Ethylbenzene	< 0.50	0.50	ug/L	EPA 8260B	1/9/2002
Total Xylenes	< 0.50	0.50	ug/L	EPA 8260B	1/9/2002
Methyl-t-butyl ether (MTBE)	< 5.0	5.0	ug/L	EPA 8260B	1/9/2002
TPH as Gasoline	< 50	50	ug/L	EPA 8260B	1/9/2002
Toluene - d8 (Surr)	103		%	EPA 8260B	1/9/2002
4-Bromofluorobenzene (Surr)	114		%	EPA 8260B	1/9/2002

Parameter	Measured Value	Method Reporting Limit	Units	Analysis Method	Date Analyzed

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC

720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

QC Report : Matrix Spike/ Matrix Spike Duplicate

Report Number : 24208

Date : 1/14/2002

Project Name : **930 Springtown**

Project Number : **020104-DA2**

Parameter	Spiked Sample	Sample Value	Spike Level	Spike Dup. Level	Spiked Sample Value	Duplicate Spiked Sample Value	Units	Analysis Method	Date Analyzed	Spiked Sample Percent Recov.	Duplicate Spiked Sample Percent Recov.	Relative Percent Diff.	Spiked Sample Percent Recov. Limit	Relative Percent Diff. Limit
Benzene	24206-03	<0.50	18.5	19.5	18.6	19.4	ug/L	EPA 8260B	1/9/2002	101	99.4	1.20	70-130	25
Toluene	24206-03	<0.50	18.5	19.5	18.1	19.1	ug/L	EPA 8260B	1/9/2002	97.8	98.0	0.281	70-130	25
Tert-Butanol	24206-03	<5.0	92.5	97.4	84.2	92.3	ug/L	EPA 8260B	1/9/2002	91.0	94.8	4.06	70-130	25
Methyl-t-Butyl Ether	24206-03	1.4	18.5	19.5	18.4	16.1	ug/L	EPA 8260B	1/9/2002	92.1	75.5	19.7	70-130	25

Approved By: Joel Kiff

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QC Report : Laboratory Control Sample (LCS)

Report Number : 24208
Date : 1/14/2002

Project Name : **930 Springtown**
Project Number : **020104-DA2**

Parameter	Spike Level	Units	Analysis Method	Date Analyzed	LCS Percent Recov.	LCS Percent Recov. Limit
Benzene	19.1	ug/L	EPA 8260B	1/8/2002	100	70-130
Toluene	19.1	ug/L	EPA 8260B	1/8/2002	99.4	70-130
Tert-Butanol	95.6	ug/L	EPA 8260B	1/8/2002	91.6	70-130
Methyl-t-Butyl Ether	19.1	ug/L	EPA 8260B	1/8/2002	85.9	70-130

Approved By: Joel Kiff

KIFF ANALYTICAL, LLC
720 Olive Drive, Suite D Davis, CA 95616 530-297-4800

L: Kiff

Lab Identification (if necessary):

Address:

City, State, Zip:

EQUIVA Services LLC Chain Of Custody Record

Equiva Project Manager to be invoiced:

☑ SCIENCE & ENGINEERING ☐ TECHNICAL SERVICES ☐ CRMT HOUSTON

Karen Petryna

24208

INCIDENT NUMBER (S&E ONLY): 9 1 9 9 5 0 5 3

SAP or CRMT NUMBER (TS/CRMT):

DATE: 1/4/02

PAGE: 1 of 1

SAMPLING COMPANY:	LOG CODE:	SITE ADDRESS (Street and City):	GLOBAL ID NO.:
Blaine Tech Services	BTSS	930 Springtown Boulevard, Livermore	T0600101353

ADDRESS:			
1680 Rogers Avenue, San Jose, CA 95112			
PROJECT CONTACT (Hardcopy or PDF Report to):	EDF DELIVERABLE TO (Responsible Party or Designee):	PHONE NO.:	E-MAIL:
Nick Sudano	Janet Yantis	408-224-4724	jyantis@khm1.com
TELEPHONE: / FAX: / E-MAIL:	SAMPLER NAME(S) (Print):		CONSULTANT PROJECT NO.:
408-573-0555 / 408-573-7771 / nsudano@blainetech.com	David A.		BTS # 020104-DA2

LAB USE ONLY

TURNAROUND TIME (BUSINESS DAYS):

☒ 10 DAYS ☐ 5 DAYS ☐ 72 HOURS ☐ 48 HOURS ☐ 24 HOURS ☐ LESS THAN 24 HOURS

☐ LA - RWQCB REPORT FORMAT ☐ UST AGENCY: _____

GC/MS MTBE CONFIRMATION: HIGHEST _____ HIGHEST per BORING _____ ALL _____

SPECIAL INSTRUCTIONS OR NOTES: TEMPERATURE ON RECEIPT C°

REQUESTED ANALYSIS

LAB USE ONLY	Field Sample Identification	SAMPLING DATE	SAMPLING TIME	MATRIX	NO. OF CONT.	TPH - Gas, Purgeable	BTEX	MTBE (8021B - 5ppb RL)	MTBE (8260B - 0.5ppb RL)	Oxygenates (5) by (8260B)	Ethanol (8260B)	Methanol	1,2-DCA (8260B)	EDB (8260B)	TPH - Diesel, Extractable (8015m)	MTBE (8260B) Confirmation, See Note	FIELD NOTES: Container/Preservative or PID Readings or Laboratory Notes
	MW-A	1/4/02	1445	W	3	X	X	X									-01
	MW-B		1415			X	X	X									-02
	MW-3		1508			X	X	X									-03
	MW-5		1343			X	X	X									-04
	MW-8	↓	1248	↓	↓	X	X	X									-05

Relinquished by: (Signature)	Received by: (Signature)	Date:	Time
David Allbaugh			
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time
Relinquished by: (Signature)	Received by: (Signature)	Date:	Time
	John Cutler / Kiff Analytical	010702	1158

Q&O Graphic (714) 898-9702

WELL GAUGING DATA

Project # 020104-DA2 Date 1/4/02 Client Equiva

Site 930 Springtown Blvd. Livermore

Well ID	Well Size (in.)	Sheen / Odor	Depth to Immiscible Liquid (ft.)	Thickness of Immiscible Liquid (ft.)	Volume of Immiscibles Removed (ml)	Depth to water (ft.)	Depth to well bottom (ft.)	Survey Point: TOB or (TOC)	G/S
* MW-A	2					10.83 ~~11.02~~	16.35		S
MW-B	2					8.46	22.20		S
MW-1	4					11.02	25.40		G
MW-2	4					8.63	22.48		G
MW-3	3-4					10.18	24.52 ~~24.85~~		S
MW-4	3					9.43	24.85		G
MW-5	2					12.13	22.00		S
MW-8	4					15.29	24.20	↓	S
* Bent casing, used disposable bailer									

EQUIVA WELL MONITORING DATA SHEET

BTS #: 020104-DA2	Site: 930 Springtown Blvd. Livermore
Sampler: DA	Date: 1/4/02
Well I.D.: MW-A	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 16.35	Depth to Water: 10.83
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method:
(Bailer)
Disposable Bailer
Middleburg
Electric Submersible
Waterra
Peristaltic
Extraction Pump
Other_____

Sampling Method: (Bailer)
Disposable Bailer
Extraction Port
Dedicated Tubing
Other: _____

0.9 (Gals.) X 3 = 2.7 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
(2")	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1434	64.1	7.2	1920	196	0.9	cloudy, tan, light sheen, odor
1438	64.1	7.1	1824	>200	1.8	"
1442	64.8	7.1	1737	>200	2.7	"

Did well dewater? Yes (No) Gallons actually evacuated: 2.7

Sampling Time: 1445 Sampling Date: 1/4/02

Sample I.D.: MW-A Laboratory: Sequoia Columbia Other Kiff

Analyzed for: (TPH-G BTEX MTBE) TPH-D Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

EQUIVA WELL MONITORING DATA SHEET

BTS #: 020104-DA2	Site: 930 Springtown Blvd. Livermore
Sampler: DA	Date: 1/4/02
Well I.D.: MW-B	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 22.20	Depth to Water: 8.46
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method: (Bailer) Waterra
Disposable Bailer Peristaltic
Middleburg Extraction Pump
Electric Submersible Other_____

Sampling Method: (Bailer)
Disposable Bailer
Extraction Port
Dedicated Tubing
Other:

2.2 (Gals.) X 3 = 6.6 Gals.
1 Case Volume Specified Volumes Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
(2")	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1404	63.4	7.5	1733	135	2.2	light sheen
1409	63.2	7.5	1750	157	4.4	cloudy, turning gray
1412	63.7	7.6	1760	192	6.6	"

Did well dewater? Yes (No) Gallons actually evacuated: 6.6

Sampling Time: 1415 Sampling Date: 1/4/02

Sample I.D.: MW-B Laboratory: (Kiff) Sequoia Other_____

Analyzed for: (TPH-G BTEX MTBE) TPH-D Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

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EQUIVA WELL MONITORING DATA SHEET

BTS #: 020104-DA2	Site: 930 Springtown Blvd. Livermore
Sampler: DA	Date: 1/4/02
Well I.D.: ~~MW-2~~ MW-3	Well Diameter: 2 3 (4) 6 8 ___
Total Well Depth: ~~25.40~~ ~~22.48~~ 24.52	Depth to Water: ~~11.02~~ 10.18
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method:
- Bailer
- Disposable Bailer
- Middleburg
- (Electric Submersible)
- Waterra
- Peristaltic
- Extraction Pump
- Other_____

Sampling Method: (Bailer)
- Disposable Bailer
- Extraction Port
- Dedicated Tubing
- Other: _____

9.3 (Gals.) X 3 = 27.9 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1310	62.7	7.3	1851	146	9.3	cloudy
	dewatered after 9.3g. dtw = 22.45					
1455	Returned. Recharged 80%.				18.6 ↓	dtw = 10.97
~~1501~~ 1501	60.9	7.4	2004	100	27.9 ↓	
1505	61.9	7.4	1933	.62		

Did well dewater? (Yes) No — Gallons actually evacuated: 27.9

Sampling Time: 1508 — Sampling Date: 1/4/02

Sample I.D.: MW-3 — Laboratory: Sequoia Columbia Other Kiff

Analyzed for: (TPH-G) (BTEX) (MTBE) TPH-D Other:

EB I.D. (if applicable): @ Time — Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

EQUIVA WELL MONITORING DATA SHEET

BTS #: 020104-DA2	Site: 930 Springtown Blvd. Livermore
Sampler: DA	Date: 1/4/02
Well I.D.: MW-5	Well Diameter: (2) 3 4 6 8 ___
Total Well Depth: 22.00	Depth to Water: 12.13
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method:
(Bailer)
Disposable Bailer
Middleburg
Electric Submersible
Waterra
Peristaltic
Extraction Pump
Other_____

Sampling Method: (Bailer)
Disposable Bailer
Extraction Port
Dedicated Tubing
Other: _____

1 Case Volume		Specified Volumes		Calculated Volume	
~~9.9~~ 1.6	(Gals.) X	3	=	~~29.7~~ 4.8	Gals.

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	4"	0.65
(2")	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1332	65.2	7.1	1288	7200	1.6	light grey
1336	65.8	7.1	1352	7200	3.2	darker grey
1340	66.6	7.2	1481	7200	4.8	"

Did well dewater? Yes (No) Gallons actually evacuated: 4.8

Sampling Time: 1343 Sampling Date: 1/4/02

Sample I.D.: MW-5 Laboratory: Sequoia Columbia Other Kiff

Analyzed for: ~~TPH-G BTEX MTBE~~ TPH-D Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

$50

EQUIVA WELL MONITORING DA . SHEET

BTS #: 020104-DA2	Site: 930 Springtown Blvd. Livermore
Sampler: DA	Date: 1/4/02
Well I.D.: MW-8	Well Diameter: 2 3 (4) 6 8
Total Well Depth: 24.20	Depth to Water: 15.29
Depth to Free Product:	Thickness of Free Product (feet):
Referenced to: (PVC) Grade	D.O. Meter (if req'd): YSI HACH

Purge Method:
Bailer
Disposable Bailer
Middleburg
(Electric Submersible)
Waterra
Peristaltic
Extraction Pump
Other

Sampling Method: (Bailer)
Disposable Bailer
Extraction Port
Dedicated Tubing
Other:

5.8 (Gals.) X 3 = 17.4 Gals.
1 Case Volume | Specified Volumes | Calculated Volume

Well Diameter	Multiplier	Well Diameter	Multiplier
1"	0.04	(4")	0.65
2"	0.16	6"	1.47
3"	0.37	Other	radius² * 0.163

Time	Temp (°F)	pH	Cond.	Turbidity	Gals. Removed	Observations
1242	60.2	7.2	1683	86	5.8	
1244	61.6	7.0	1444	50	11.6	
1245	61.7	7.1	1431	50	17.4	

Did well dewater? Yes (No) Gallons actually evacuated: 17.4

Sampling Time: 1248 Sampling Date: 1/4/02

Sample I.D.: MW-8 Laboratory: Sequoia Columbia Other Kiff

Analyzed for: (TPH-G BTEX MTBE) TPH-D Other:

EB I.D. (if applicable): @ Time Duplicate I.D. (if applicable):

Analyzed for: TPH-G BTEX MTBE TPH-D Other:

D.O. (if req'd):	Pre-purge:	mg/L	Post-purge:	mg/L
O.R.P. (if req'd):	Pre-purge:	mV	Post-purge:	mV

APPENDIX E

TREND GRAPHS AND DEGRADATION CALCULATIONS

Table A - Summary of Degradation Rate Calculations

Former Texaco Service Station 21-1253, 930 Springtown Boulevard, Livermore, California

Well		Analyte	Maximum Concentration (ug/L)	Current or Last Concentration (ug/L)	Half-Life (years)	Date to Reach ESL	Years to Reach ESL
MW-A		TPPH	1,400,000	9,100	3.29	May 2016	5
		Benzene	6,900	4	1.39	Jun 2004	Below ESL
MW-B		TPPH	560,000	10,000	1.76	Nov 2010	Below ESL
		Benzene	780	11	3.80	Oct 2016	6
MW-5		TPPH	15,000	3,400	7.69	Oct 2032	22
		Benzene	890	9	2.49	Jul 2011	Near ESL
MW-9		TPHg	6,200	68	0.63	Dec 2011	1
		Benzene	9	< 0.5	0.91	Jun 2011	Near ESL
MW-10		TPHg	16,000	250	0.30	Aug 2011	Near ESL
		Benzene	220	< 0.5	0.22	Sep 2010	Below ESL
MW-11		TPHg	5,400	790	0.89	Nov 2013	3
		Benzene	25	1	0.47	Jan 2011	Near ESL
MW-12		TPHg	48,000	9,600	0.88	Nov 2016	6
		Benzene	340	64	0.72	Aug 2015	4
MW-13		TPHg	52,000	22,000	1.98	Feb 2025	14
		Benzene	1,600	1,600	NA	Increasing	NA
MW-14		TPHg	48,000	LNAPL	NA	NA	NA
		Benzene	3,600	LNAPL	NA	NA	NA
MW-15		TPHg	20,000	< 50	0.18	Aug 2010	Below ESL
		Benzene	110	< 0.5	0.20	Jul 2010	Below ESL
MW-16		TPHg	430	< 50	0.53	Mar 2010	Below ESL
		Benzene	0.6	< 0.5	7.95	Sep 2002	Below ESL

Notes and Abbreviations:

a	=	Maximum concentration is reported as the highest reported value above any detection limit
TPPH	=	Total Purgeable Petroleum Hydrocarbons
TPHg	=	Total petroleum hydrocarbons as gasoline
LNAPL	=	Not sampled due to the presence of light non-aqueous phase liquid (LNAPL)
ug/L	=	Micrograms per liter
ESL	=	Environmental Screening Level
NA	=	Not applicable

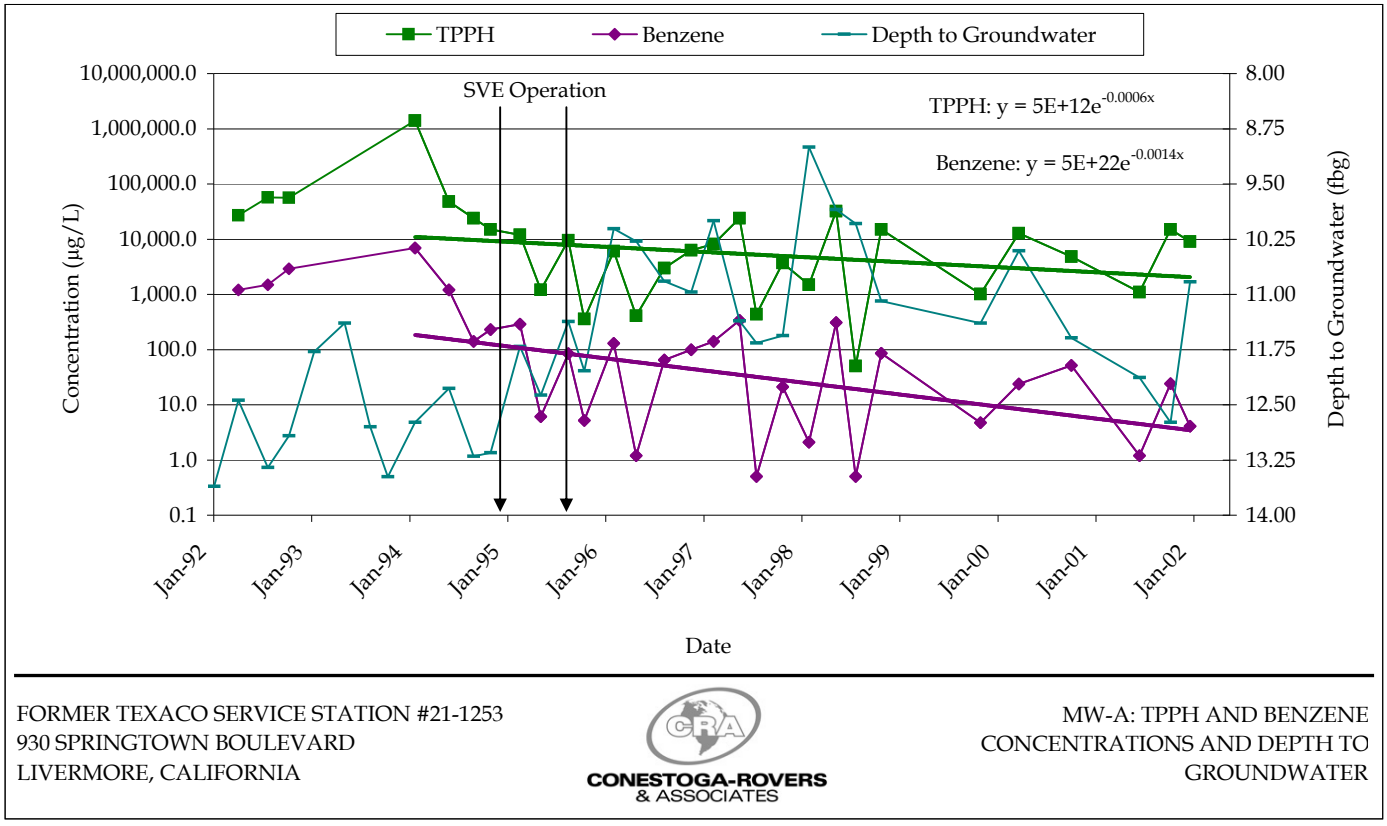
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-A

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L, a = decay constant
b = concentration at time (x), x = time (x) in days

	Constituent	Total Purgeable Petroleum Hydrocarbons (TPPH)	Benzene
Given			
ESL :	y	100	1
Constant:	b	4.53E+12	4.82E+22
Constant:	a	-5.77E-04	-1.37E-03
Starting date for current trend:		1/24/1994	1/24/1994
Calculate			
Attenuation Half Life (years):	(-ln(2)/a)/365.25	3.29	1.39
Estimated Date to Reach ESL:	(x = ln(y/b) / a)	May 2016	Jun 2004



FORMER TEXACO SERVICE STATION #21-1253
930 SPRINGTOWN BOULEVARD
LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-A: TPPH AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

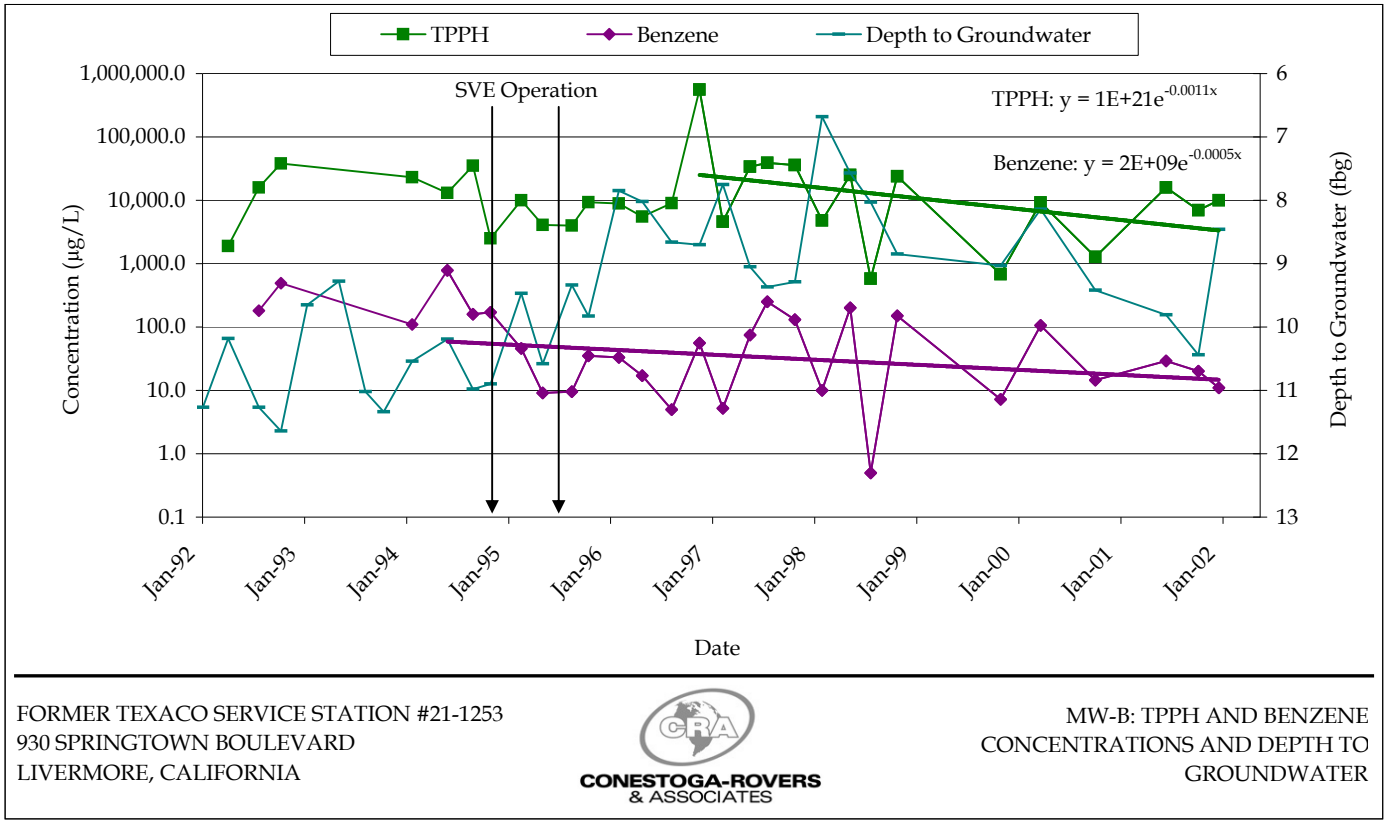
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-B

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

		Constituent	Total Purgeable Petroleum Hydrocarbons (TPPH)	Benzene
Given				
ESL :		y	100	1
Constant:		b	1.04E+21	1.78E+09
Constant:		a	-1.08E-03	-5.00E-04
Starting date for current trend:			11/22/1996	5/31/1994
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		1.76	3.80
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Nov 2010	Oct 2016



FORMER TEXACO SERVICE STATION #21-1253
930 SPRINGTOWN BOULEVARD
LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-B: TPPH AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

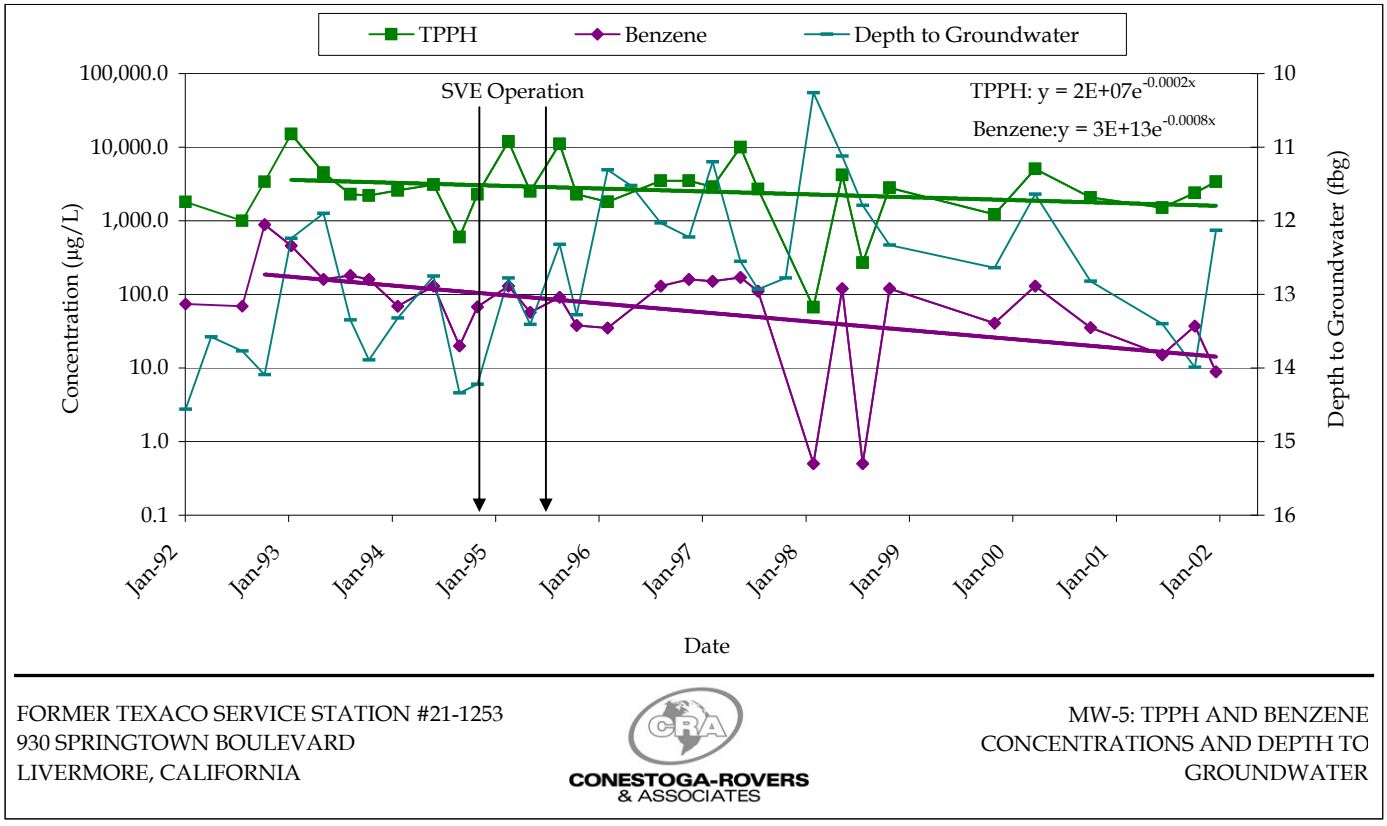
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-5

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

		Constituent	Total Purgeable Petroleum Hydrocarbons (TPPH)	Benzene
Given				
ESL :		y	100	1
Constant:		b	1.57E+07	3.00E+13
Constant:		a	-2.47E-04	-7.62E-04
Starting date for current trend:			1/11/1993	10/9/1992
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		7.69	2.49
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Oct 2032	Jul 2011



FORMER TEXACO SERVICE STATION #21-1253
930 SPRINGTOWN BOULEVARD
LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-5: TPPH AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

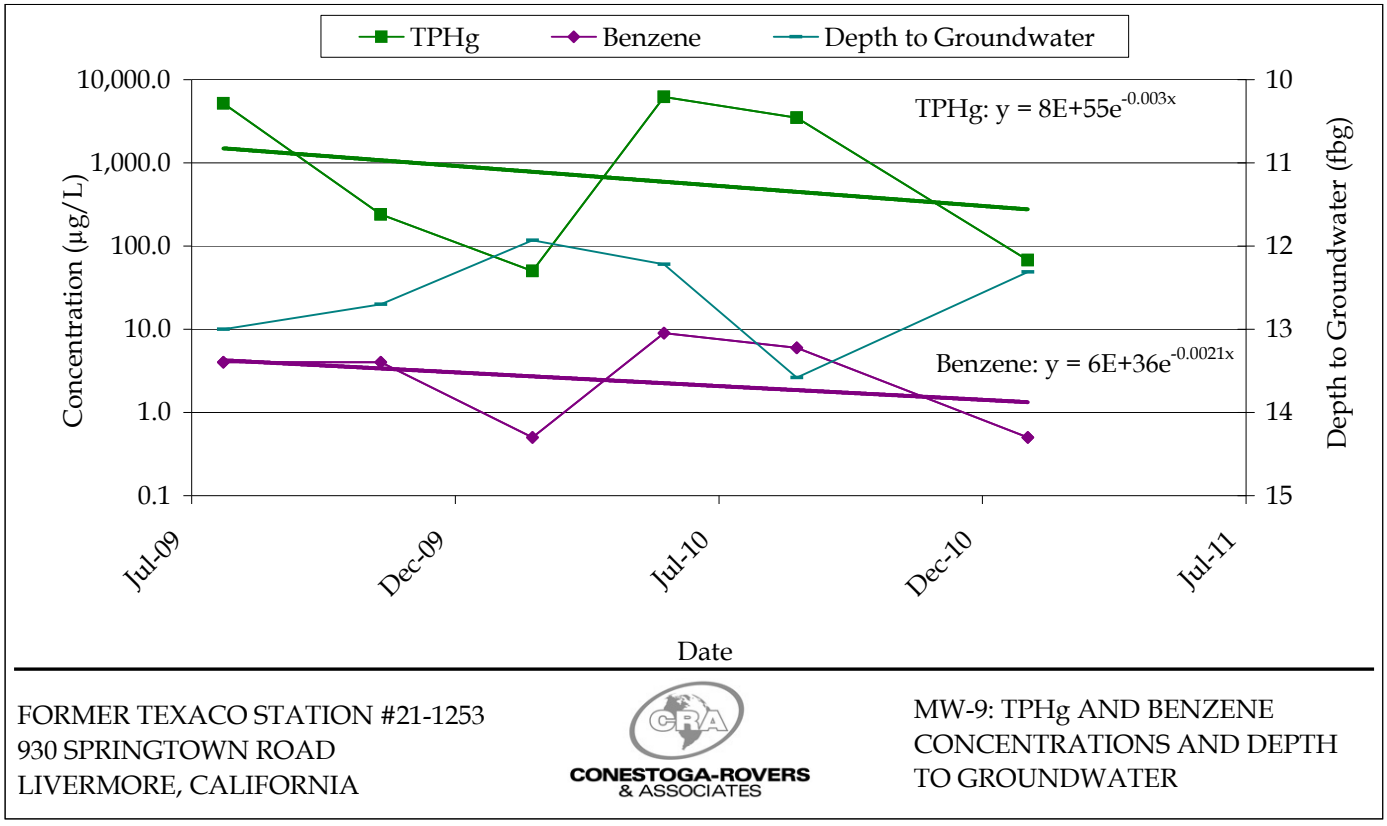
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-9

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given				
Environmental Screening Levels (ESL) :		y	100	1
Constant:		b	8.19E+55	6.11E+36
Constant:		a	-3.03E-03	-2.08E-03
Starting date for current trend:			7/23/2009	7/23/2009
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		0.63	0.91
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Dec 2011	Jun 2011



FORMER TEXACO STATION #21-1253
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LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-9: TPHg AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

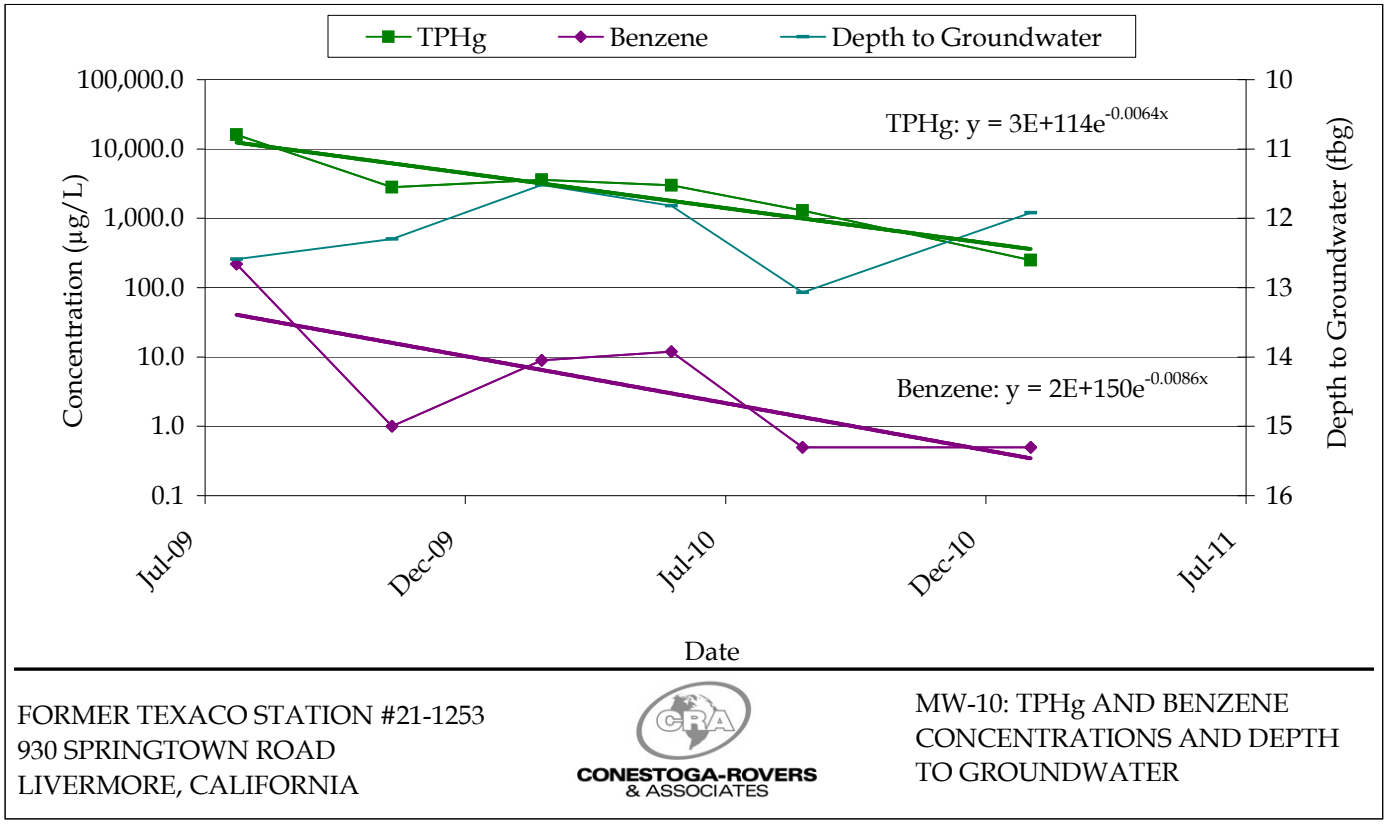
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-10

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given				
Environmental Screening Levels (ESL) :		y	100	1
Constant:		b	3.46E+114	2.35E+150
Constant:		a	-6.36E-03	-8.56E-03
Starting date for current trend:			7/23/2009	7/23/2009
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		0.30	0.22
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Aug 2011	Sep 2010



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CONESTOGA-ROVERS & ASSOCIATES

MW-10: TPHg AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

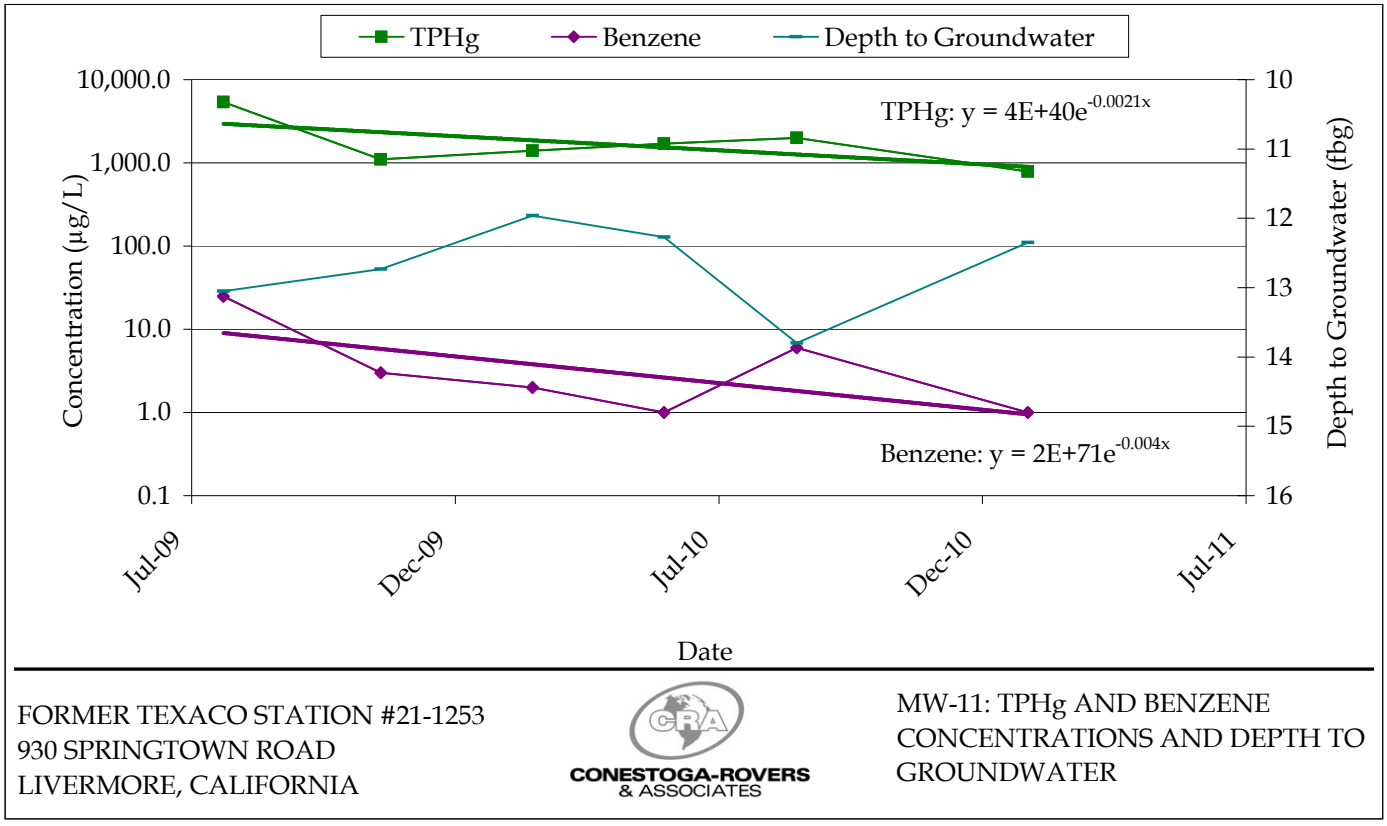
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-11

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given				
Environmental Screening Levels (ESL) :		y	100	1
Constant:		b	4.42E+40	1.57E+71
Constant:		a	-2.14E-03	-4.04E-03
Starting date for current trend:			7/23/2009	7/23/2009
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		0.89	0.47
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Nov 2013	Jan 2011



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CONESTOGA-ROVERS & ASSOCIATES

MW-11: TPHg AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

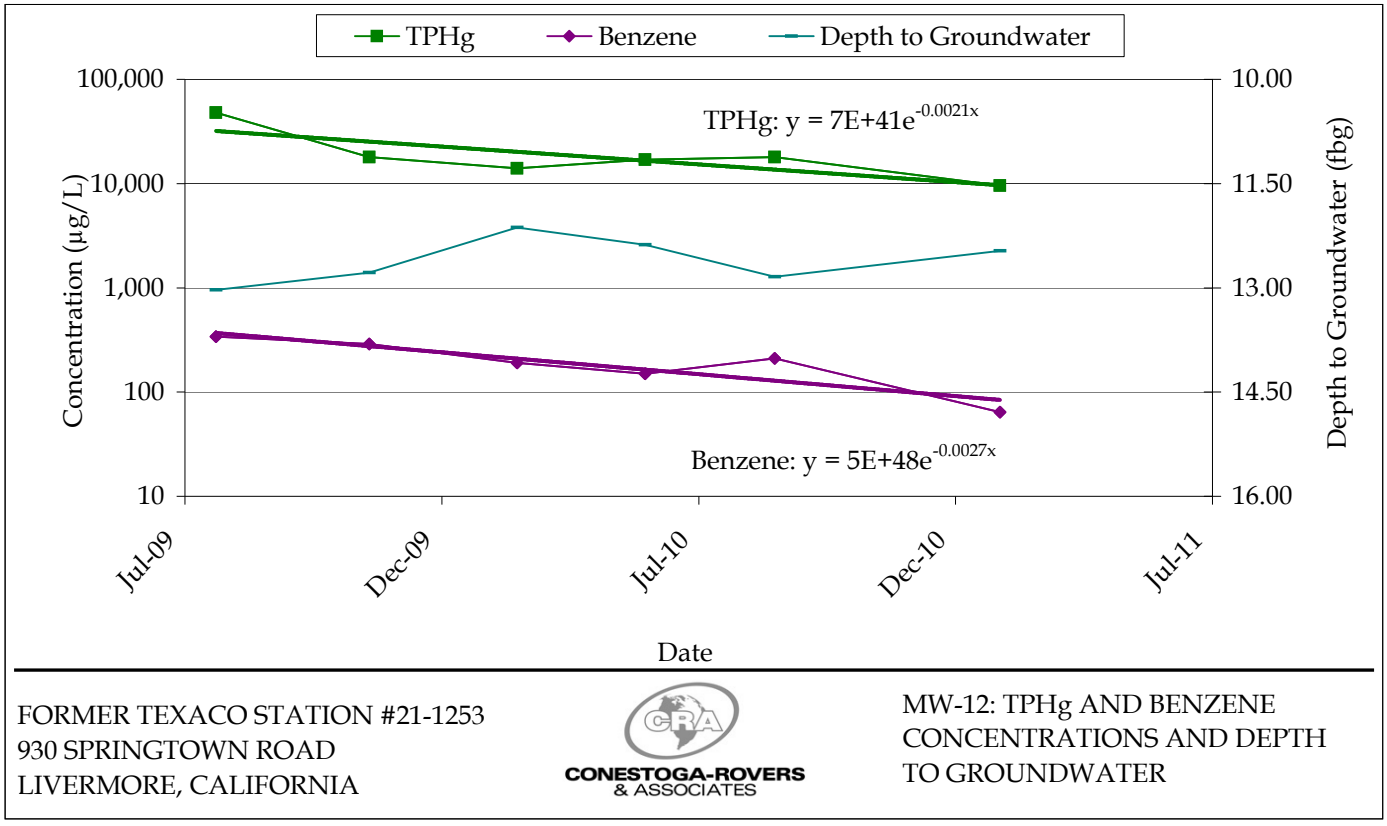
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-12

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

	Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given			
Environmental Screening Levels (ESL) :	y	100	1
Constant:	b	7.11E+41	4.75E+48
Constant:	a	-2.15E-03	-2.65E-03
Starting date for current trend:		7/23/2009	7/23/2009
Calculate			
Attenuation Half Life (years):	(-ln(2)/a)/365.25	0.88	0.72
Estimated Date to Reach ESL:	(x = ln(y/b) / a)	Nov 2016	Aug 2015



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LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-12: TPHg AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

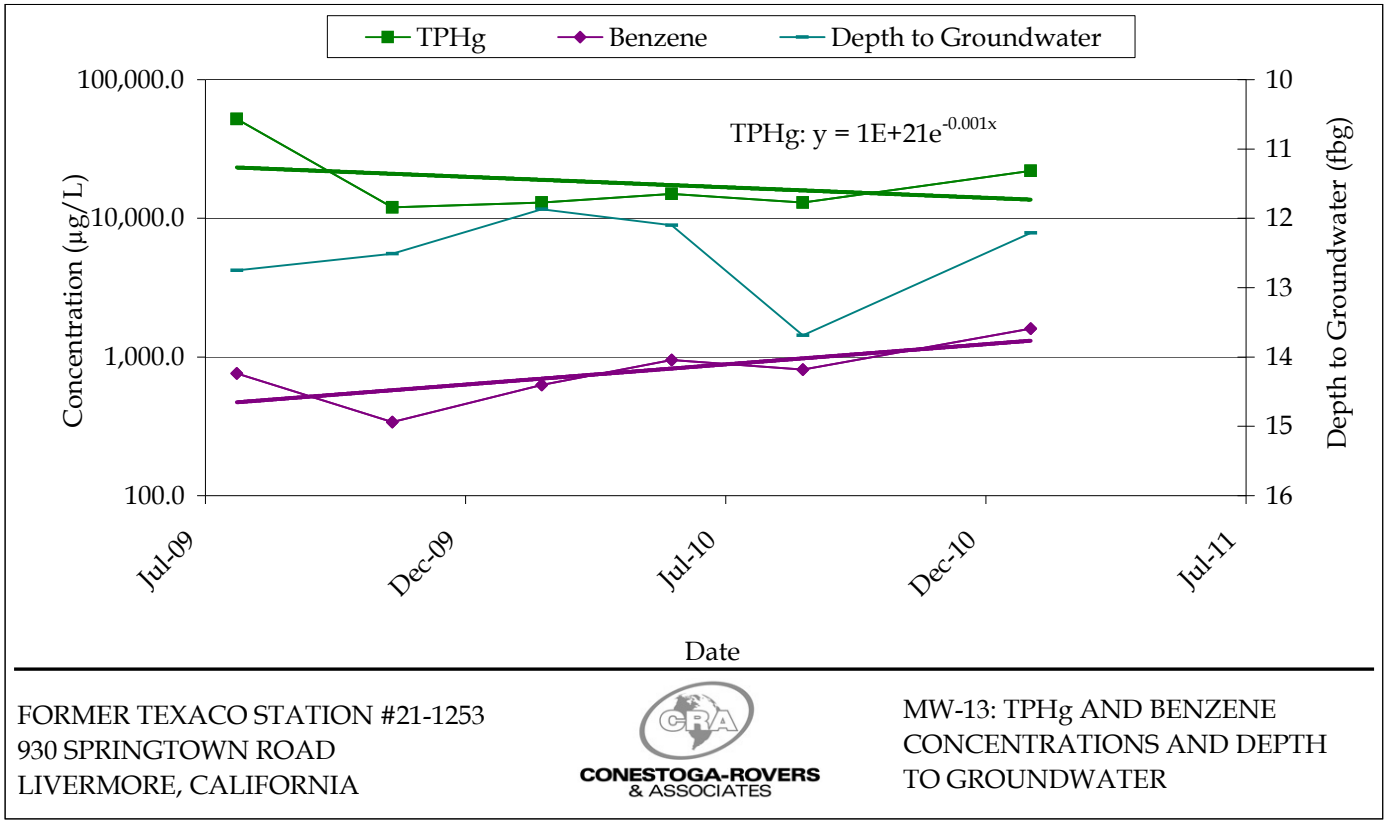
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-13

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given				
Environmental Screening Levels (ESL) :		y	100	1
Constant:		b	1.02E+21	Increasing
Constant:		a	-9.58E-04	Increasing
Starting date for current trend:			7/23/2009	7/23/2009
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		1.98	NA
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Feb 2025	Increasing



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LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-13: TPHg AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

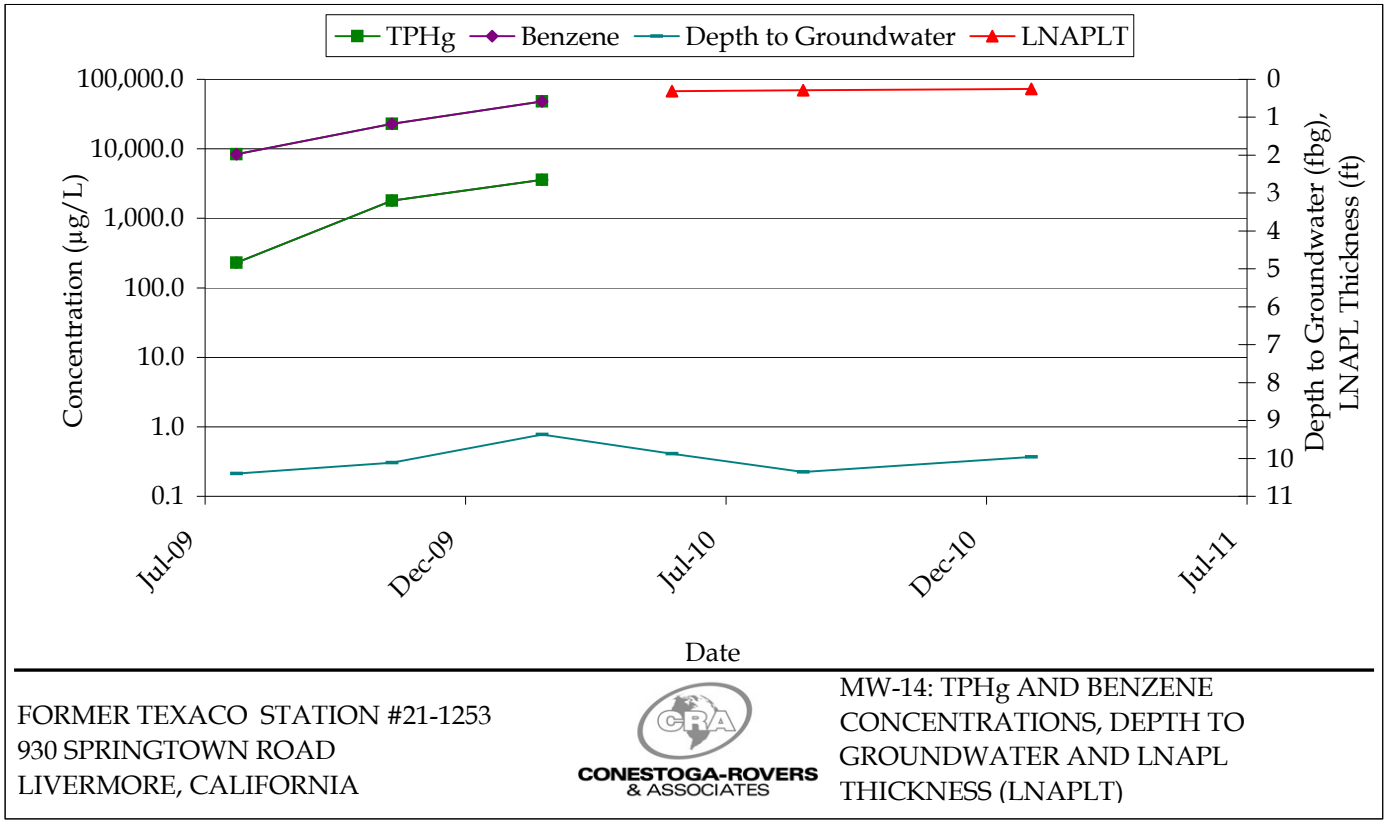
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-14

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L; a = decay constant
b = concentration at time (x); x = time (x) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given				
Environmental Screening Levels (ESL) :		y	100	1
Constant:		b	3.17E+191	2.73E+167
Constant:		a	-1.08E-02	-9.55E-03
Starting date for current trend:			11/9/2009	11/9/2009
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		0.18	0.20
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Aug 2010	Jul 2010



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LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-14: TPHg AND BENZENE CONCENTRATIONS, DEPTH TO GROUNDWATER AND LNAPL THICKNESS (LNAPLT)

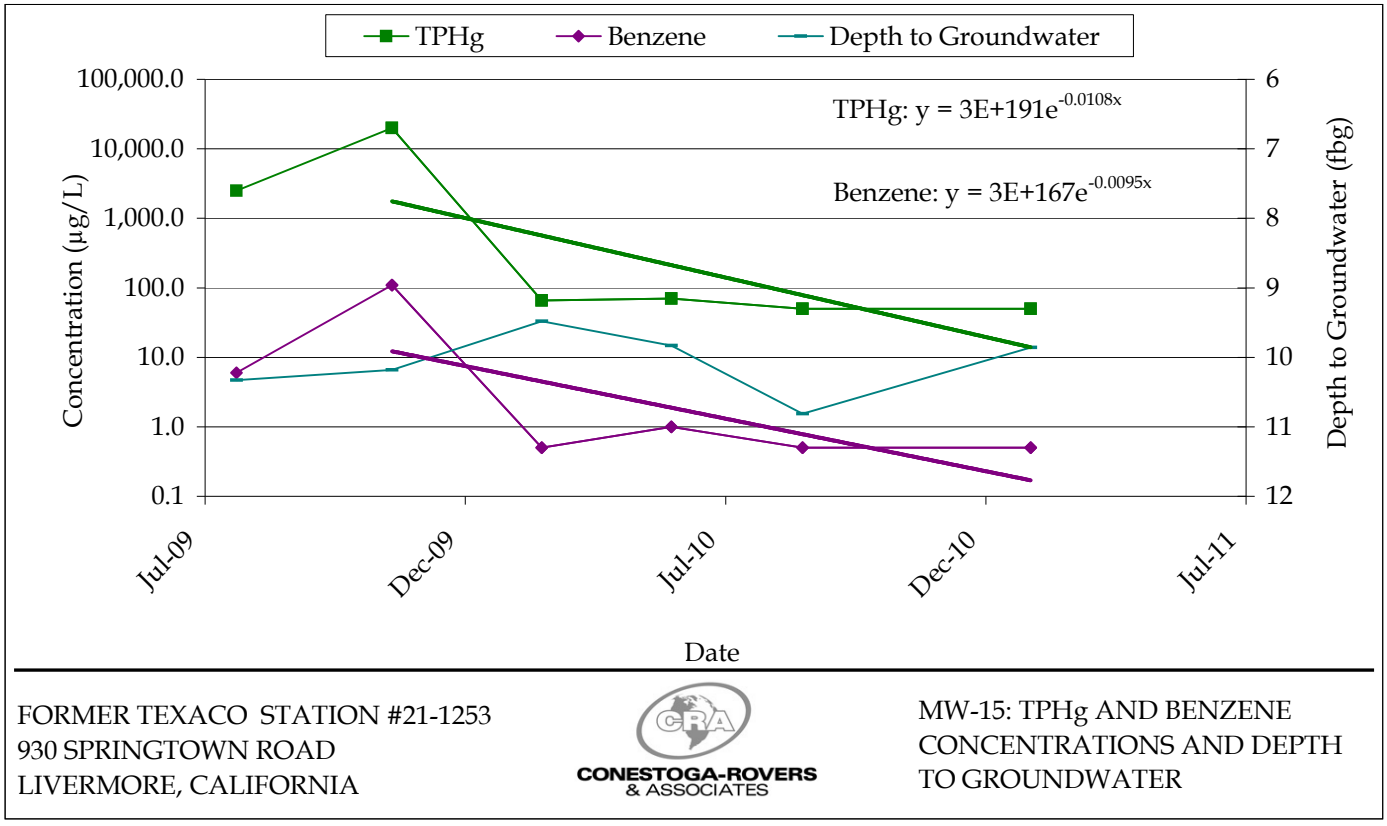
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-15

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L, a = decay constant
b = concentration at time (x), x = time (x) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given				
Environmental Screening Levels (ESL) :		y	100	1
Constant:		b	3.17E+191	2.73E+167
Constant:		a	-1.08E-02	-9.55E-03
Starting date for current trend:			11/9/2009	11/9/2009
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		0.18	0.20
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Aug 2010	Jul 2010



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LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-15: TPHg AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

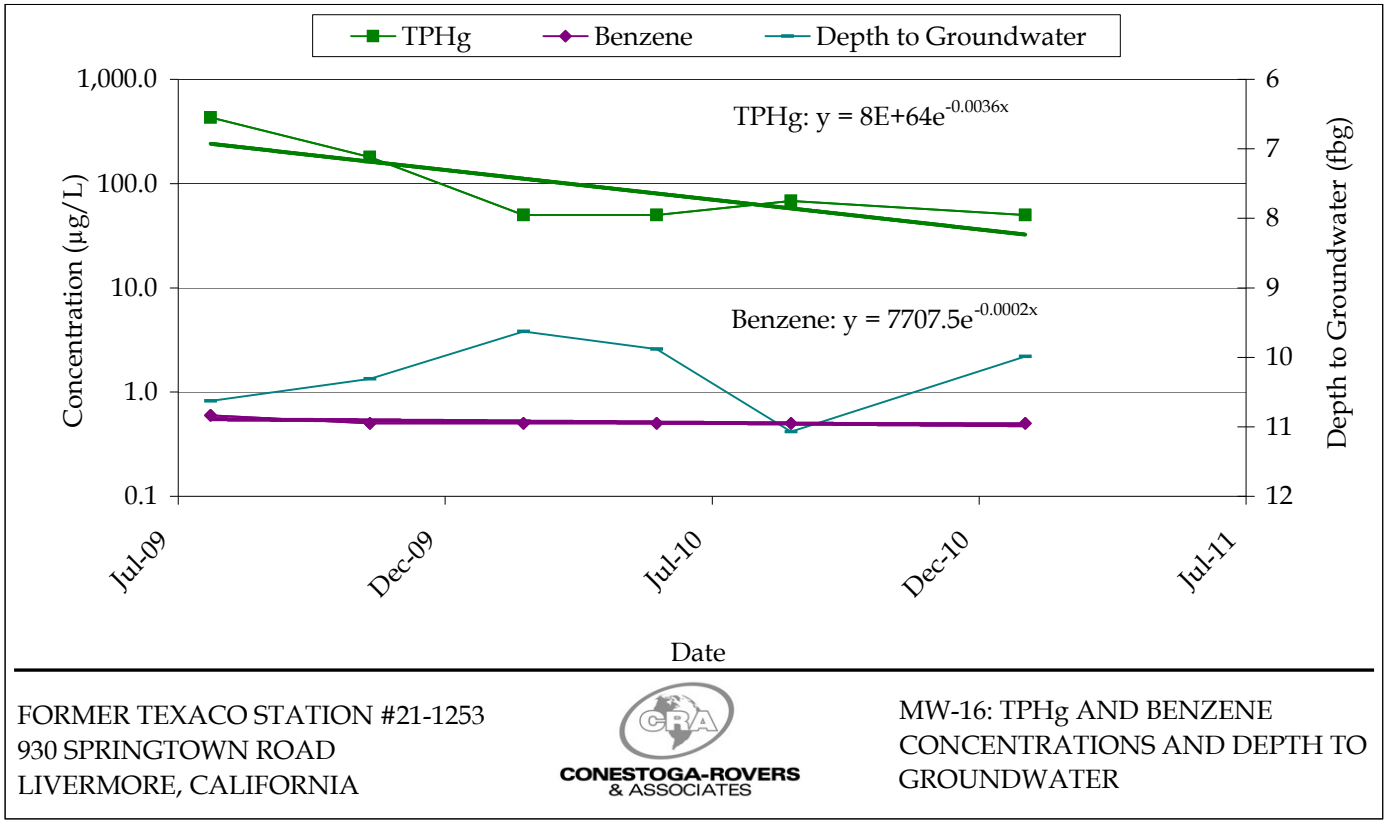
Predicted Time to Reach Environmental Screening Levels (ESL) in Well MW-16

Former Texaco Service Station #21-1253, 930 Springtown Road, Livermore, California

$y = b\,e^{ax}$ **===>** $x = \ln(y/b) / a$

where: y = concentration in µg/L, a = decay constant
b = concentration at time (x), x = time (x) in days

		Constituent	Total Petroleum Hydrocarbons as Gasoline (TPHg)	Benzene
Given				
Environmental Screening Levels (ESL) :		y	100	1
Constant:		b	7.67E+64	7.71E+03
Constant:		a	-3.60E-03	-2.39E-04
Starting date for current trend:			7/23/2009	7/23/2009
Calculate				
Attenuation Half Life (years):	(-ln(2)/a)/365.25		0.53	7.95
Estimated Date to Reach ESL:	(x = ln(y/b) / a)		Mar 2010	Sep 2002



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LIVERMORE, CALIFORNIA

CONESTOGA-ROVERS & ASSOCIATES

MW-16: TPHg AND BENZENE CONCENTRATIONS AND DEPTH TO GROUNDWATER

APPENDIX F

STANDARD FIELD PROCEDURES FOR SOIL BORING AND MONITORING WELL INSTALLATION

STANDARD FIELD PROCEDURES FOR SOIL BORING AND MONITORING WELL INSTALLATION

This document presents standard field methods for drilling and sampling soil borings and installing, developing and sampling groundwater monitoring wells. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

SOIL BORINGS

Objectives
Soil samples are collected to characterize subsurface lithology, assess whether the soils exhibit obvious hydrocarbon or other compound vapor or staining, and to collect samples for analysis at a State-certified laboratory. All borings are logged using the ASTM D2488-06 Unified Soil Classification System by a trained geologist working under the supervision of a California Professional Geologist (PG).

Soil Boring and Sampling
Prior to drilling, the first 8 feet of the boring are cleared using an air or water knife and vacuum extraction or hand auger. This minimizes the potential for impacting utilities. Soil borings are typically drilled using hollow-stem augers or direct-push technologies such as the Geoprobe®. Soil samples are collected at least every five ft to characterize the subsurface sediments and for possible chemical analysis. 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 at the bottom of the borehole.

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 Analysis
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 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
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 volatile vapor analyzer measures volatile hydrocarbon vapor concentrations in the tube headspace, extracting the vapor through a slit in the cap. Volatile vapor analyzer measurements are used along with the field observations, odors, stratigraphy and groundwater 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 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. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may 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.

MONITORING WELL INSTALLATION, DEVELOPMENT AND SAMPLING

Well Construction and Surveying
Groundwater monitoring wells are installed to monitor groundwater quality and determine the groundwater elevation, flow direction and gradient. Well depths and screen lengths are based on groundwater depth, occurrence of hydrocarbons or other compounds in the borehole, stratigraphy and State and local regulatory guidelines. Well screens typically extend 10 to 15 feet below and 5 feet above the static water level at the time of drilling. However, the well screen will generally not extend into or through a clay layer that is at least three feet thick.

Well casing and screen are flush-threaded, Schedule 40 PVC. Screen slot size varies according to the sediments screened, but slots are generally 0.010 or 0.020 inches wide. A rinsed and graded sand occupies the annular space between the boring and the well screen to about one to two feet above the well screen. A two feet thick hydrated bentonite seal separates the sand from the overlying sanitary surface seal composed of Portland type I, II cement.

Well-heads are secured by locking well-caps inside traffic-rated vaults finished flush with the ground surface. A stovepipe may be installed between the well-head and the vault cap for additional security.

The well top-of-casing elevation is surveyed with respect to mean sea level and the well is surveyed for horizontal location with respect to an onsite or nearby offsite landmark.

Well Development

Wells are generally developed using a combination of groundwater surging and extraction. Surging agitates the groundwater and dislodges fine sediments from the sand pack. After about ten minutes of surging, groundwater is extracted from the well using bailing, pumping and/or reverse air-lifting through an eductor pipe to remove the sediments from the well. Surging and extraction continue until at least ten well-casing volumes of groundwater are extracted and the sediment volume in the groundwater is negligible. This process usually occurs prior to installing the sanitary surface seal to ensure sand pack stabilization. If development occurs after surface seal installation, then development occurs 24 to 72 hours after seal installation to ensure that the Portland cement has set up correctly.

All equipment is steam-cleaned prior to use and air used for air-lifting is filtered to prevent oil entrained in the compressed air from entering the well. Wells that are developed using air-lift evacuation are not sampled until at least 24 hours after they are developed.

Groundwater Sampling

Depending on local regulatory guidelines, three to four well-casing volumes of groundwater are purged prior to sampling. Purging continues until groundwater pH, conductivity, and temperature have stabilized. Groundwater samples are collected using bailers or pumps and 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. Laboratory-supplied trip blanks accompany the samples and are analyzed to check for cross-contamination. An equipment blank may be analyzed if non-dedicated sampling equipment is used.

Waste Handling and Disposal

Soil cuttings from drilling activities are usually stockpiled onsite and covered by plastic sheeting. At least three individual soil samples are collected from the stockpiles and composited at the analytic laboratory. The composite sample is analyzed for the same constituents analyzed in the borehole samples in addition to any analytes required by the receiving disposal facility. Soil cuttings are transported by licensed waste haulers and disposed in secure, licensed facilities based on the composite analytic results.

Groundwater removed during development and sampling is typically 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. Upon receipt of analytic results, 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.