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December 31, 2008
(date)

Alameda County Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502-6577

Re: Chevron Facility # 9-7127

Address: Grant Line Road and Interstate 580, Tracy, California

I have reviewed the attached report titled *Corrective Action Plan Addendum and Proposed Feasibility Study* and dated December 31, 2008.

I agree with the conclusions and recommendations presented in the referenced report. The information in this report is accurate to the best of my knowledge and all local Agency/Regional Board guidelines have been followed. This report was prepared by 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.

Sincerely,

SHFrerichs

Stacie H. Frerichs
Project Manager

Enclosure: Report

CORRECTIVE ACTION PLAN ADDENDUM AND PROPOSED FEASIBILITY STUDY

FORMER CHEVRON SERVICE STATION NO. 9-7127
GRANT LINE ROAD AND INTERSTATE 580
TRACY, CALIFORNIA
LOCAL OVERSIGHT PROGRAM CASE RO0000185

Prepared For:

Mr. Steven Plunkett
Alameda County Environmental Health

Prepared by:
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DECEMBER 2008
REF. NO. 631656(1)

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1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has prepared this *Corrective Action Plan Addendum and Proposed Feasibility Study* on behalf of Chevron Environmental Management Company (Chevron) to address residual light non-aqueous phase liquid (LNAPL) at former Chevron Service Station No. 9-7127 located at Grant Line Road and Interstate 580 in Tracy, California (Figure 1). CRA previously prepared and submitted a *Corrective Action Plan* (CAP) dated May 15, 2007, that proposed the injection of surfactant followed by groundwater extraction for LNAPL removal. In a letter dated August 22, 2007, Alameda County Environmental Health (ACEH) provided several technical comments regarding the proposed remedial action. CRA subsequently prepared and submitted *Additional Assessment and Revised Interim Remedial Action Plan* (IRAP) (dated October 19, 2007) that proposed additional investigation to further evaluate the potential effectiveness of surfactant injection. In a letter dated August 20, 2008 (Appendix A), ACEH did not concur with the proposed surfactant injection prior to the performance of a bench-scale treatability study, and requested a bench-scale study and revised CAP. After further evaluation of the site conditions, CRA no longer recommends surfactant injection as a remedial alternative at the site, and alternatively proposes a groundwater pump test to evaluate the hydrogeologic characteristics and behavior of groundwater beneath the site. The information provided from the pump test will be used to further define the necessary scope of remediation and to further evaluate available remedial options at the site.

1.1 SITE DESCRIPTION AND BACKGROUND

The site is a vacant lot located on the east side of Grant Line Road, south of Interstate 580 (Figure 1). The elevation of the site is approximately 320 feet above mean sea level. Site topography slopes toward the southeast. The site is bounded by Interstate 580 to the north, Grant Line Road to the west, and ranch property to the south and east. Chevron operated a service station at the site until April 1991 when all underground storage tanks (USTs), dispenser islands, and associated piping were removed and the station building was demolished. Previous station facilities included two 10,000-gallon and one 6,000-gallon gasoline USTs, one 1,000-gallon used-oil tank, one 750-gallon heating oil tank, two dispenser islands, and a station building (Figure 2). The site has since remained vacant land. Environmental investigation has been performed at the site since 1987. A summary of the environmental work performed at the site to date is presented in Appendix B. Historical soil vapor, soil, and grab-groundwater sample analytical results are presented in Tables 1 through 3, respectively.

1.2 REGIONAL AND LOCAL GEOLOGY

The San Joaquin Valley lies within the southernmost part of the Great Valley Geomorphic Province of California. The Great Valley is characterized by a large elongate northwest-trending structural trough which is bounded by the Sierra Nevada to the east and the Coast Ranges to the west. Regional subsurface materials are dominated by unconsolidated to semi-consolidated continental deposits of Late Tertiary to Quaternary age. Deposits in this region include the Tulare Formation, Older Alluvium, Flood Basin Deposits, and Younger Alluvium. The cumulative thickness of these deposits ranges from a few hundred feet on the west near the Coast Range foothills to approximately 3,000 feet on the east[1]. The Midway Fault, an approximate north-south trending normal fault, is located approximately 300 feet east of the site.

Boring logs from previous site investigations indicate that soil beneath the site consists primarily of fill (combinations of sand, silt and clay), silty clay, clayey sand, silty sand and gravel to a maximum depth of approximately 19 feet below grade (fbg). Site soils are underlain by sandstone that extends to the maximum explored depth of 40 fbg. Geologic cross-sections are provided as Figures 3 and 4. Historical boring logs are presented in Appendix C.

1.3 REGIONAL AND LOCAL HYDROGEOLOGY

The site lies within the Tracy Subbasin, which is located adjacent to the Eastern San Joaquin Subbasin to the east and the Delta-Mendota Subbasin to the south within the larger San Joaquin Valley Groundwater Basin. The Tracy Subbasin lies south of the Sacramento Valley Groundwater Basin, Solano Subbasin and is bounded by the Mokelumne and San Joaquin Rivers to the north, the San Joaquin-Stanislaus County line to the south, the San Joaquin River to the east, and the Diablo Range to the west. The Tracy Subbasin is drained by the San Joaquin River and is one of its major westside tributaries[2].

Groundwater has been monitored quarterly since 1994 and semi-annually since 1999. Historical groundwater data indicate that the measured depth-to-groundwater has fluctuated from approximately 23 to 31 fbg onsite and 9 to 14 fbg offsite. Groundwater flow is generally to the north with a gradient of 0.005 to 0.08.

[1] California Department of Water Resources, October 2003. California's Groundwater, Bulletin 118.
[2] California Department of Water Resources, October 2003. California's Groundwater, Bulletin 118.

2.0 PREVIOUS REMEDIAL ACTIONS

The following sections briefly describe the remedial actions that have been performed at the site to date.

2.1 SOIL EXCAVATION AND AERATION

In April 1991, following removal of the USTs and associated product piping, additional excavation of the UST and dispenser island areas was performed to remove impacted soil. The soil was aerated onsite until detected total petroleum hydrocarbons as gasoline (TPHg) concentrations did not exceed 10 milligrams per kilogram (mg/kg). The aerated soil was subsequently used to backfill the excavation areas.

2.2 BIOREMEDIATION

In August 1998, Oxygen Releasing Compound® (ORC) socks were installed in wells MW-1, MW-2 and MW-4 to attempt to reduce hydrocarbon concentrations via enhanced biodegradation. In July 2001, the ORC sock in MW-1 was removed so that a passive product skimmer could be installed (see Section 2.4). No data is available as to when the ORC socks in the remaining two wells were removed.

2.3 HYDROGEN PEROXIDE INJECTION

In December 1999, Cambria Environmental Technology, Inc. (Cambria; now CRA) injected hydrogen peroxide into wells MW-1 and MW-3 to attempt to reduce hydrocarbon concentrations in groundwater beneath the site. Various concentrations of hydrogen peroxide were injected in the wells. Details of the work were documented in Cambria's March 30, 2000 *Hydrogen Peroxide Injection* report.

2.4 LNAPL REMOVAL

In 1993, weekly bailing of well MW-1 to remove LNAPL was performed by Pacific Environmental Group (PEG); a passive skimmer was also installed in the well. As of March 1993, approximately 2 gallons of product had been removed. The bailing frequency was then reduced to monthly.

In July 2001, a passive product skimmer was again installed in MW-1 to attempt to remove LNAPL from this well and seven groundwater vacuum extraction events were conducted from July 2001 through April 2002. Approximately 8,300 gallons of groundwater and 2.19 gallons of LNAPL were extracted from MW-1 during this time. In July 2002, vacuum extraction of impacted groundwater from MW-3 was initiated. Due to an increase in LNAPL thickness in MW-1, vacuum extractions from MW-1 and MW-3 were terminated in October 2002.

In March and April 2007, three additional batch groundwater extraction events were conducted in well MW-1, and a total of approximately 5,100 gallons of groundwater were extracted. The LNAPL thickness in MW-1 was measured prior to each batch extraction event; the results were 0.5 feet, 0.36 feet and 0.39 feet.

3.0 HYDROCARBON DISTRIBUTION AND GROUNDWATER FLOW

3.1 HYDROCARBON DISTRIBUTION IN SOIL

The hydrocarbon source area appears to be in the vicinity of the former USTs and dispenser islands. The highest TPHg and benzene concentrations detected in soil during the UST, dispenser and product piping excavations were 5,700 mg/kg and 30 mg/kg, respectively, in the gasoline UST pit at 14 to 15 fbg. These samples were collected just above the bedrock interface. Various concentrations of TPHg and benzene, toluene, ethylbenzene, and xylenes (BTEX) have been detected in soil samples collected from borings B-3, B-4, and MW-1. The highest TPHg and benzene concentrations detected in soil during subsurface investigations were 8,100 mg/kg and 21 mg/kg, respectively, in the soil sample collected at 29 fbg from boring MW-1. None of the soil samples collected to date were analyzed for methyl tertiary butyl ether (MTBE).

Based on the historic LNAPL observed in MW-1, the elevated hydrocarbons in the soil samples collected from boring MW-1 are more likely LNAPL concentrations and not true hydrocarbons adsorbed to soil. The soil samples collected from boring MW-1 at 19 and 30.5 fbg did not contain TPHg above the laboratory reporting limit of 1.0 mg/kg. However, TPHg was detected at 2,600 mg/kg in the sample collected at 24 fbg and 8,100 mg/kg in the sample collected at 29 fbg. The absence of TPHg between the source area above and the elevated concentrations below is not typical of soil impacts below a former UST pit. The abrupt decrease in soil concentrations from 29 to 30.5 fbg suggests the hydrocarbon source is in the groundwater and not soil.

3.2 HYDROCARBON DISTRIBUTION IN GROUNDWATER

3.2.1 TPH AND BTEX DISTRIBUTION

Historically, the highest concentrations of TPHg and BTEX have been detected in MW-1 at concentrations ranging from 520 to 180,000 micrograms per liter (µg/L), 48 to 25,000 µg/L, 71 to 25 µg/L, 790 to 2,000 µg/L, and 27 to 13,000 µg/L, respectively. Well MW-1 has not been sampled during quarterly monitoring events since November 1998 due to the continued presence of LNAPL. LNAPL has historically been measured in well MW-1 at thicknesses ranging from less than 0.2 to 1.67 feet. In April 2008, the measured thickness was 0.83 feet. Elevated concentrations of TPHg and BTEX have also been detected in well MW-3. During the most recent quarterly event (April 2008), TPHg and BTEX were detected in MW-3 at concentrations of 19,000 µg/L, 8,300 µg/L, 440 µg/L, 510 µg/L, and 620 µg/L, respectively. Well MW-4 contained the lowest

concentrations of TPHg and BTEX during the most recent event. The groundwater sample from MW-4 contained concentrations of 73 µg/L TPHg, 15 µg/L benzene, 0.6 µg/L toluene, 0.7 µg/L ethylbenzene, and 0.9 µg/L xylenes. TPHg and BTEX have not been detected in wells MW-2, MW-5, and MW-7 since July 2002, in well MW-6 since May 2001, in well MW-8 since May 1998, and in the onsite supply well since April 1993.

TPHg and benzene groundwater isoconcentration maps for the April 30, 2008 semi-annual monitoring and sampling event are presented on Figures 5 and 6, respectively. The lateral extent of TPHg and benzene in groundwater is defined downgradient (MW-6) and crossgradient (MW-2, MW-5, MW-7, and MW-8), and relatively well-defined upgradient (MW-4). The elongated north-south orientation of the plume combined with the narrow lateral distribution of hydrocarbons suggests possible groundwater flow within fractures of the bedrock.

3.2.2 MTBE DISTRIBUTION

MTBE has not been detected in wells MW-2, MW-5 and the onsite supply well since November 1995, in well MW-4 since November 2001, in well MW-3 since May 2005, in well MW-6 since May 2001 and in wells MW-7 and MW-8 since February 1996.

3.3 GROUNDWATER FLOW

A copy of a map (Geologic Map; Figure 3) included in a May 13, 1999 report entitled *Regulatory Response* prepared by RRM, Inc. (RRM) is presented in Appendix D. The map is a portion of the United States Geologic Survey (USGS) 1980 geologic map of the Midway Quadrangle. Field data of the bedrock bedding collected by RRM shows strike orientation of the sandstone bedding is approximately north-south to the west of the Midway Fault, which is located approximately 300 feet east of the site, and approximately northwest-southeast to the east of the fault.

During CRA's evaluation of the hydrocarbon distribution, a north-south linear appearance is apparent. There appears to be a correlation between the strike of the bedrock, the groundwater flow direction at the site, and the narrow distribution of hydrocarbons at the site in that they all appear oriented north-south. If the fractures observed during installation of several site wells are also oriented in the same north-south direction, groundwater beneath the site may be flowing within these fractures, resulting in the narrow, elongated distribution of hydrocarbons in groundwater (Figures 5 and 6). CRA proposes a groundwater pump test at the site to determine if

groundwater flow is primarily within the fractures of the sandstone. Details of the pump test are provided in the following section.

4.0 PROPOSED GROUNDWATER PUMP TEST

After further evaluation of the site conditions, CRA no longer recommends surfactant injection as the preferred remedial method at the site. Based on the narrow distribution of hydrocarbons north of MW-1 to MW-3, CRA proposes a pump test to evaluate the hydrogeologic characteristics and behavior of groundwater beneath the site. The information provided from the pump test will be used to further define the necessary scope of remediation and to further evaluate available remedial options at the site. A pump will be temporarily installed in MW-1, and transducers will be placed in MW-1 and surrounding wells to measure drawdown. Groundwater will be pumped into a holding tank with a capacity between 8,000 to 10,000 gallons. The test will end once the holding tank is at or near capacity. Water samples for chemical analysis will be collected throughout the pump test to evaluate potential hydrocarbon mass removal from groundwater. Upon ACEH approval, CRA will submit a work plan and provide further details of the proposed pump test. Following completion of the pump test, CRA will prepare a report documenting the activities.

5.0 CONCLUSION AND RECOMMENDATIONS

After further evaluation of the previously proposed surfactant injection and the distribution of hydrocarbons in groundwater, CRA rescinds our recommendation for surfactant injection as the preferred remedial alternative at the site. Alternatively, CRA proposes the performance of a pump test to further evaluate the characteristics of groundwater beneath the site. The information provided from the pump test will be used to further define the necessary scope of remediation and to further evaluate available remedial options at the site. Accordingly, the three monitoring wells originally proposed in the IRAP associated with the surfactant injection are no longer necessary. They were originally proposed as groundwater extraction points following the surfactant injection.

Once the proposed pump test is completed, CRA will re-evaluate the hydrogeologic conditions as they relate to hydrocarbon mass, contaminant transport and lateral distribution, and will prepare a report documenting the activities and will provide recommendations for future activities at the site. The report will include estimates of the residual hydrocarbon mass remaining at the site.

Should you have any questions concerning the information provided herein, please contact James Kiernan of CRA at (916) 677-3407.

Sincerely,

CONESTOGA-ROVERS & ASSOCIATES

Dayna Cordano

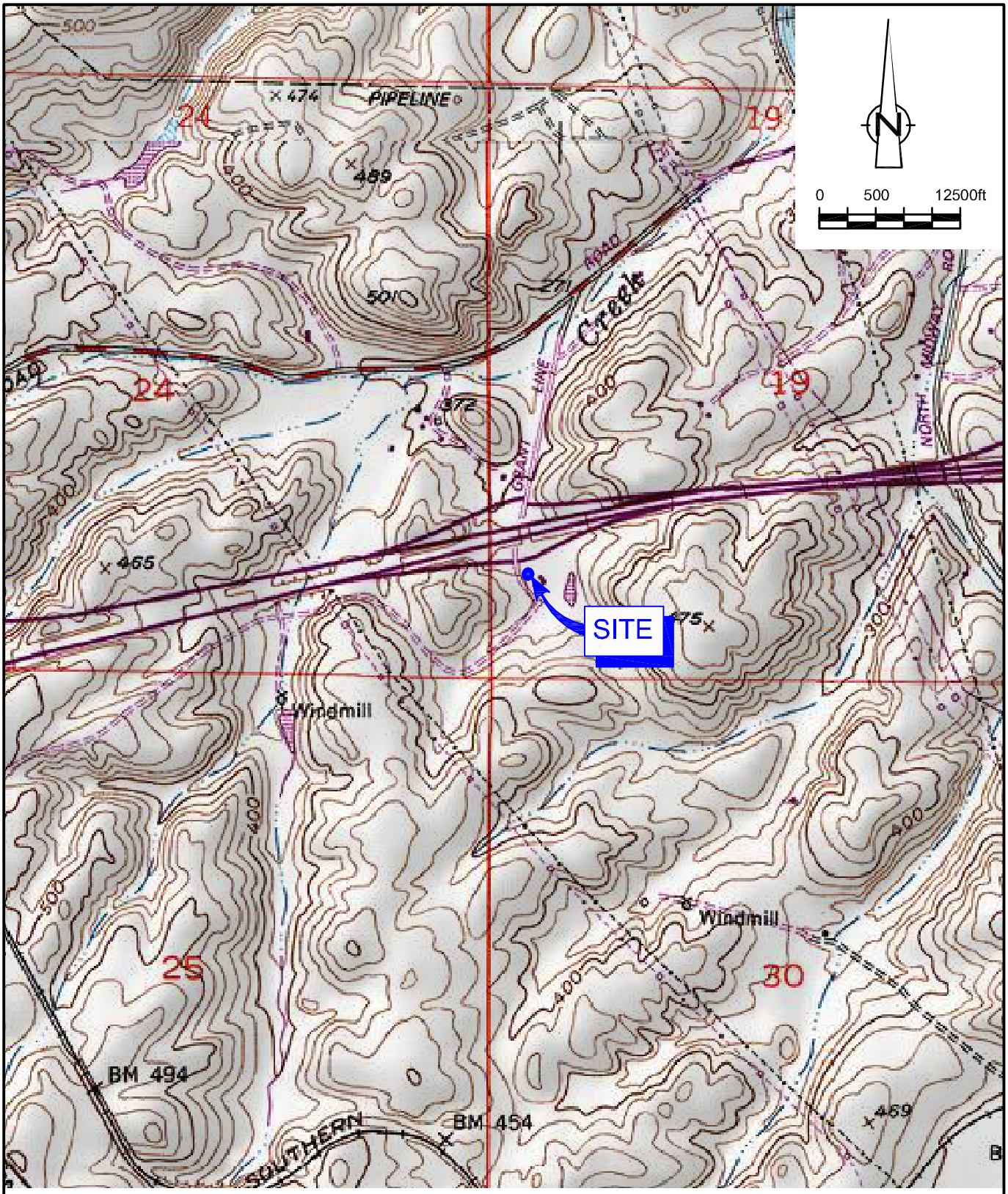
For Brian P. Carey, P.G.

James P. Kiernan, P.E. #C68498

BC/DC/kw/1

REGISTERED PROFESSIONAL ENGINEER
JAMES P. KIERNAN
No. 68498
Exp. 9/30/09
CIVIL
STATE OF CALIFORNIA

jpk
12/31/08



SOURCE: TOPO! MAPS.

figure 1

VICINITY MAP
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580
Tracy, California

631656-601(PRES001)GN-WA001 OCT 18/2007

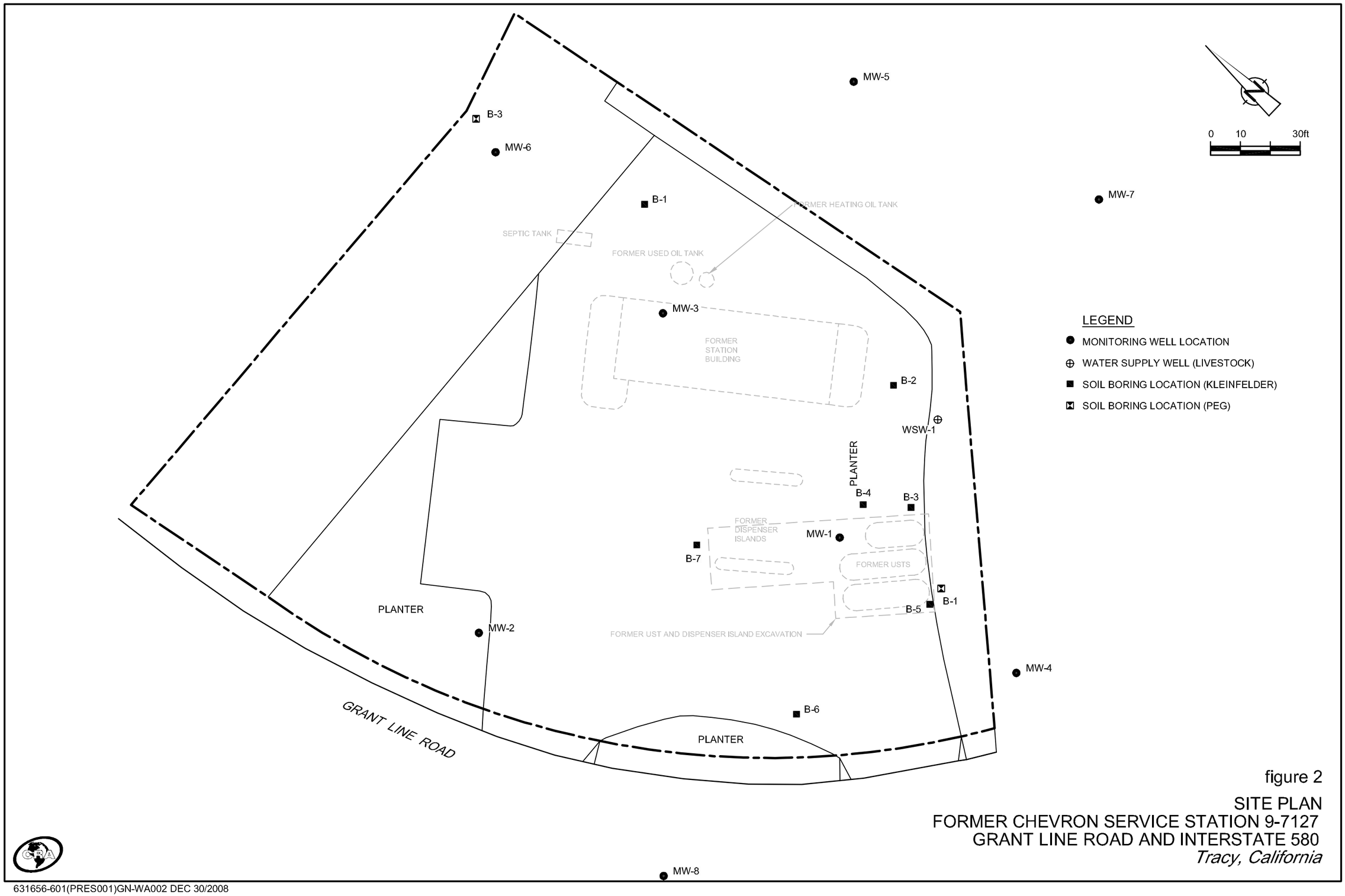
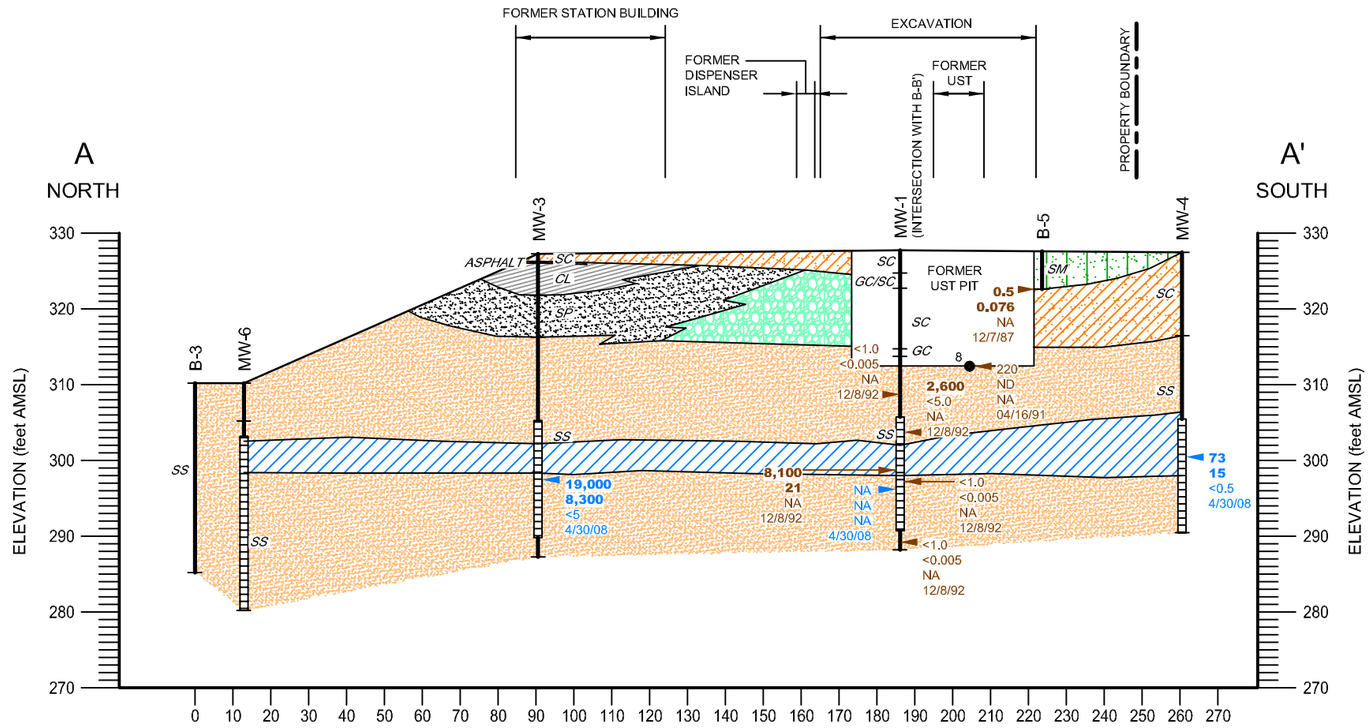


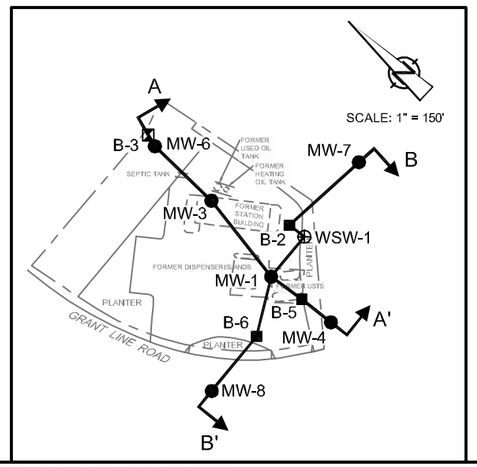
figure 2

SITE PLAN
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580
Tracy, California

631656-601(PRES001)GN-WA002 DEC 30/2008



SCALE: HORZ. 1" = 40'
VERT. 1" = 20'



LEGEND

MW-6 — WELL DESIGNATION
GROUND SURFACE
OBSERVATION WELL INSTALLATION
STRATIGRAPHIC BOUNDARY
CL — TYPICAL SOIL CLASSIFICATION
SCREENED INTERVAL
BOTTOM OF BORING

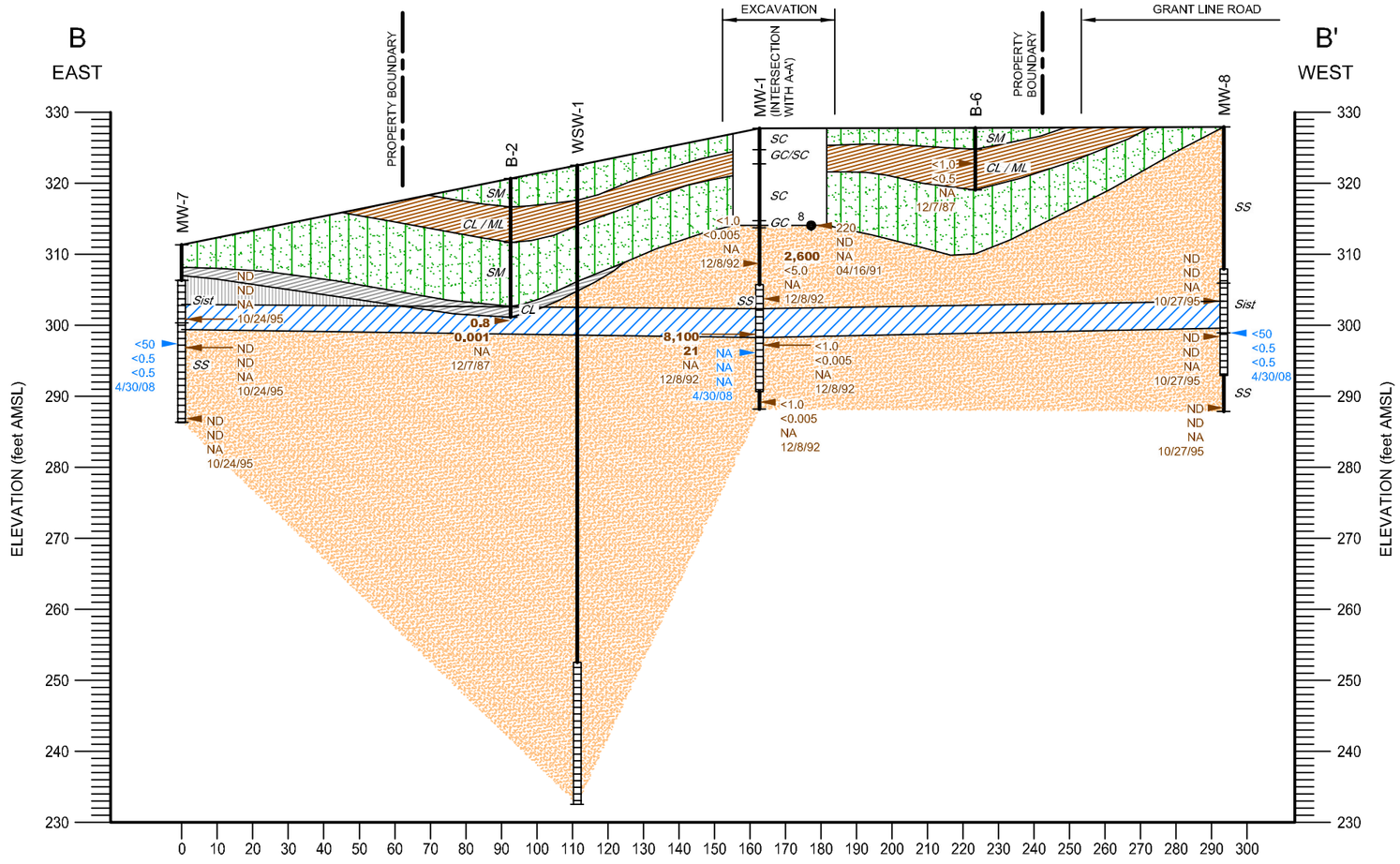
TPHg
BENZENE
MTBE
DATE
APPROXIMATE SAMPLE LOCATION
HYDROCARBON CONCENTRATIONS IN SOIL (mg/kg)

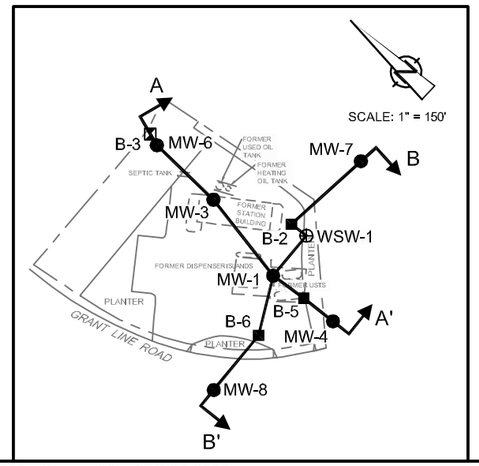
TPHg
BENZENE
MTBE
DATE
APPROXIMATE GROUNDWATER SAMPLE LOCATION
HYDROCARBON CONCENTRATIONS IN GROUNDWATER (µg/L)

ASPHALT
SS - SANDSTONE
SC - CLAYEY SANDS, SAND-CLAY MIXTURES
CL - INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
SP - POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
GC/SC - CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES AND CLAYEY SANDS, SAND-CLAY MIXTURES
SM - SILTY SANDS, SAND-SILT MIXTURES
HISTORICAL RANGE OF GROUNDWATER ELEVATIONS
NA NOT ANALYZED

figure 3

CROSS SECTION A-A'
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580
Tracy, California





LEGEND

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

SCALE: HORZ. 1" = 40'
VERT. 1" = 20'

- *Sist* - SILTY SANDSTONE
- *SS* - SANDSTONE
- *CL* - INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
- *CL/ML* - FINE GRAINED CLAYS AND SILTS
- *SM* - SILTY SANDS, SAND-SILT MIXTURES
- HISTORICAL RANGE OF GROUNDWATER ELEVATIONS

NA NOT ANALYZED
ND NON DETECT

figure 4

CROSS SECTION B-B'
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580
Tracy, California

631656-201(001)GN-WA001 DEC 30/2008

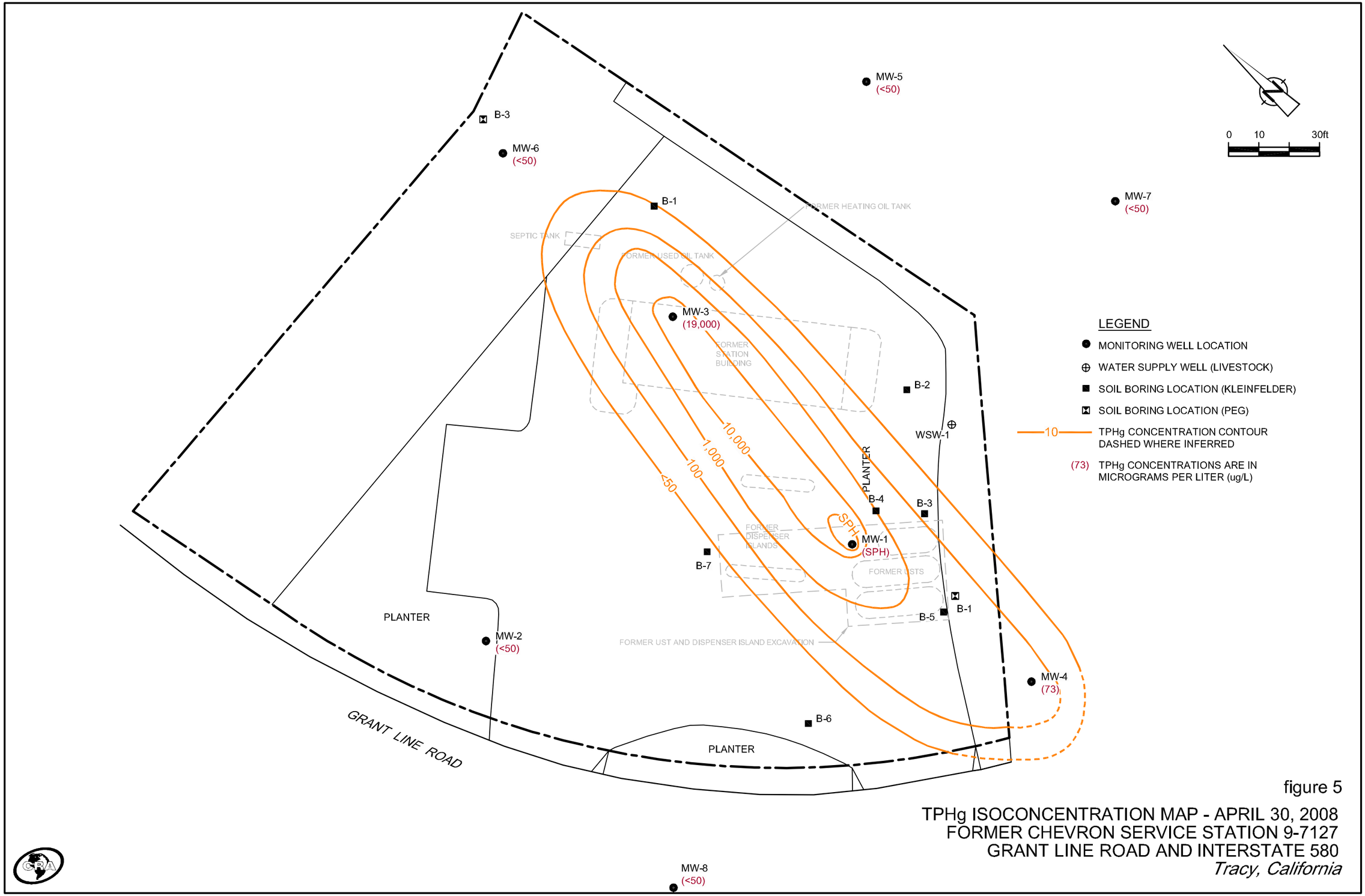


figure 5

TPHg ISOCONCENTRATION MAP - APRIL 30, 2008
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580
Tracy, California

631656-201(001)GN-WA002 DEC 30/2008

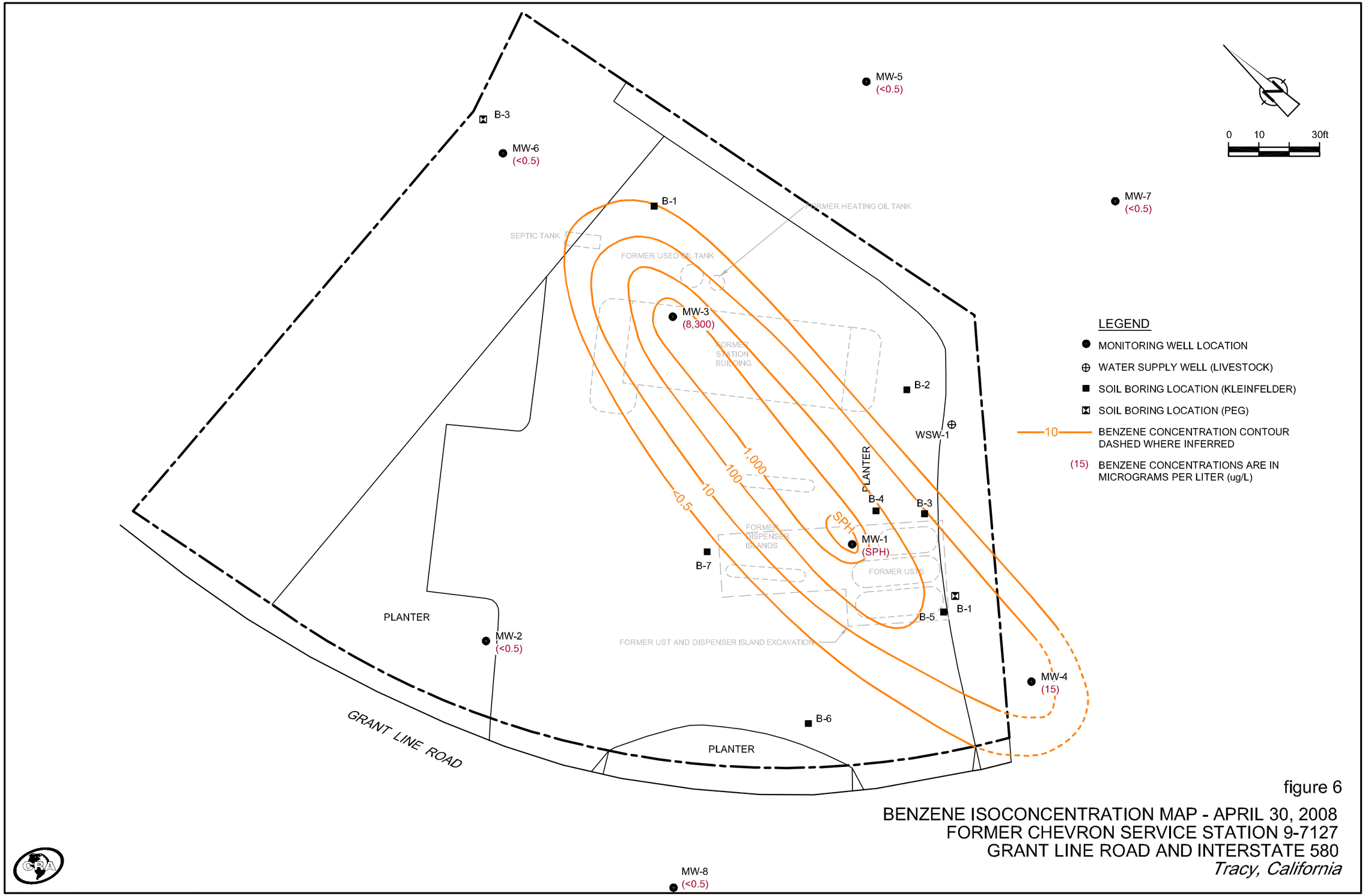


figure 6

BENZENE ISOCONCENTRATION MAP - APRIL 30, 2008
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580
Tracy, California

631656-201(001)GN-WA003 DEC 30/2008

TABLE 1

HISTORICAL SOIL VAPOR ANALYTICAL DATA
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580, TRACY, CALIFORNIA

Sample ID	*Date*	*Depth (fbg)*	*Benzene*	*Toluene*	*Detected Hydrocarbons*
			reported in parts per million by volume (ppmv)		
V1	10/27/1987	3	<1	<1	<5
V1/B	10/27/1987	5	**650**	**3,200**	**7,500**
V1/C	10/27/1987	8	**600**	**2,800**	**20,000**
V2	10/27/1987	5	<5.0	**30**	**160**
V3	10/27/1987	3	**5.0**	**10**	**30**
V3/B	10/27/1987	5	**1.0**	**10**	**15**
V4	10/27/1987	3	**3,200**	**5,200**	**28,500**
V4/B	10/27/1987	5	**130**	**1,900**	**2,000**
V5	10/27/1987	5	<1	<5	<5
V5/B	10/27/1987	7	**40**	<1	**750**
V6	10/27/1987	5	**540**	**160**	**7,300**
V7	10/27/1987	5	<5	<5	**1,400**
V8	10/27/1987	3	<1	<1	<1
V8/B	10/27/1987	8	<1	<1	<1
V9	10/27/1987	8	<1	<10	10
V10	10/27/1987	8	<1	<1	<1
V11	10/27/1987	5	<1	<1	<1
V12	10/27/1987	8	<1	<1	<1
V13	10/27/1987	12	<1	<1	**25**
V14	10/27/1987	8	<1	<1	<1
V15	10/27/1987	12	<1	<1	<1

Notes:

fbg feet below grade

<x not detected at or above reporting limit x

TABLE 2

HISTORICAL SOIL ANALYTICAL DATA
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580, TRACY, CALIFORNIA

Boring/Sample ID	*Date*	*Investigation Type*	*Depth (fbg)*	*TOG*	*TPHd*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*TPPHg*	*Lead*[1]
				← *reported in milligrams per kilogram (mg/kg)* →								
B-1	12/7/1987	Subsurface Investigation	10	--	--	ND	ND	ND	ND	ND	--	--
B-2	12/7/1987	Subsurface Investigation	20	--	--	**0.8**	**0.001**	ND	**0.003**	**0.004**	--	--
B-3	12/7/1987	Subsurface Investigation	14	--	--	**76**	**1.2**	**0.68**	**0.80**	**2.0**	--	--
B-4	12/7/1987	Subsurface Investigation	15	--	--	**2,300**	**19**	**85**	**28**	**140**	--	--
B-5	12/7/1987	Subsurface Investigation	5	--	--	**0.50**	**0.076**	**0.007**	**0.002**	**0.03**	--	--
B-6	12/7/1987	Subsurface Investigation	5	--	--	ND	ND	ND	ND	ND	--	--
B-7	12/7/1987	Subsurface Investigation	5	--	--	**0.70**	**0.022**	**0.003**	**0.024**	**0.046**	--	--
B-1	12/9/1992	Subsurface Investigation	7	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	--	--
B-1	12/9/1992	Subsurface Investigation	12.5	--	--	**4**	<0.005	<0.005	<0.005	**0.015**	--	--
B-1	12/9/1992	Subsurface Investigation	17.5	--	--	<1.0	<0.005	**0.014**	<0.005	**0.025**	--	--
B-1	12/9/1992	Subsurface Investigation	21.5	--	--	<1.0	<0.005	**0.013**	<0.005	**0.018**	--	--
AF	4/4/1991	UST Removal	14	--	--	**4,000**	<13	**41**	**66**	**310**	--	**13**
Aop	4/4/1991	UST Removal	13.5	--	--	**1.0**	**0.0070**	<0.0050	**0.005**	**0.03**	--	**9.1**
BF	4/4/1991	UST Removal	14	--	--	**5,700**	**20**	**220**	**110**	**560**	--	**80**
Bop	4/4/1991	UST Removal	14	--	--	ND	**0.0070**	**0.016**	**0.012**	**0.03**	--	**7.7**
CF	4/4/1991	UST Removal	12.5	--	--	**2.1**	**0.018**	**0.013**	**0.014**	**0.046**	--	**6.9**
Cop	4/4/1991	UST Removal	15	--	--	**2,900**	**30**	**180**	**60**	**350**	--	**14**
Cop	4/16/1991	UST Removal	13	--	--	**16**	**0.0090**	**0.014**	**0.021**	**0.17**	--	**3.6**
Cop	4/16/1991	UST Removal	15	--	--	**710**	**0.013**	**0.063**	**0.096**	**0.41**	--	**8.1**
#1	4/4/1991	Product Line/Dispenser Island Removal	2.5	--	--	**1,200**	**3.3**	**17**	**17**	**86**	--	**17**

TABLE 2

HISTORICAL SOIL ANALYTICAL DATA
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580, TRACY, CALIFORNIA

Boring/Sample ID	*Date*	*Investigation Type*	*Depth (fbg)*	*TOG*	*TPHd*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*TPPHg*	*Lead*[1]
				← *reported in milligrams per kilogram (mg/kg)* →								
#10	4/4/1991	Product Line/Dispenser Island Removal	4	--	--	**3.3**	**0.20**	**0.043**	**0.06**	**0.16**	--	**7.7**
#11	4/4/1991	Product Line/Dispenser Island Removal	4	--	--	**750**	**12**	**33**	**19**	**110**	--	**9.5**
#12	4/4/1991	Product Line/Dispenser Island Removal	4	--	--	**15**	**0.23**	**0.19**	**0.26**	**1.3**	--	**6.9**
#5	4/16/1991	Product Line/Dispenser Island Removal	13	--	--	**220**	<0.25	**0.80**	**1.7**	**10**	--	**2.6**
#8	4/16/1991	Product Line/Dispenser Island Removal	14	--	--	**33**	**0.085**	**0.24**	**0.27**	**1.5**	--	**6.1**
#13	4/16/1991	Product Line/Dispenser Island Removal	15	--	--	**11**	<0.025	**0.047**	**0.044**	**0.31**	--	**6.1**
#14	4/16/1991	Product Line/Dispenser Island Removal	13	--	--	**9.2**	**0.0050**	**0.0060**	**0.03**	**0.13**	--	**3.6**
WoM	4/4/1991	Used-Oil Tank Removal	11	<30	<1.0	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	**3.3**
FoM	4/4/1991	Heating-Oil Tank Removal	11	<30	<1.0	**170**	<0.50	<0.50	<0.50	**2.7**	--	**1.7**
MW-1	12/8/1992	Monitoring Well Installation	19	--	--	<1.0	<0.005	**0.0056**	<0.005	**0.0079**	--	--
MW-1	12/8/1992	Monitoring Well Installation	24	--	--	**2,600**	<5.0	**79**	**30**	**200**	--	--
MW-1	12/8/1992	Monitoring Well Installation	29	--	--	**8,100**	**21**	**560**	**150**	**840**	--	--
MW-1	12/8/1992	Monitoring Well Installation	30.5	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	--	--
MW-1	12/8/1992	Monitoring Well Installation	38.5	--	--	<1.0	<0.005	**0.013**	<0.005	**0.024**	--	--
MW-5/B-4	5/25/1993	Monitoring Well Installation	10	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	--	--
MW-5/B-4	5/25/1993	Monitoring Well Installation	15	--	--	<1.0	<0.005	<0.005	<0.005	<0.005	--	--

TABLE 2

HISTORICAL SOIL ANALYTICAL DATA
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580, TRACY, CALIFORNIA

Boring/Sample ID	*Date*	*Investigation Type*	*Depth (fbg)*	*TOG*	*TPHd*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*	*TPPHg*	*Lead*[1]
				← *reported in milligrams per kilogram (mg/kg)* →								
MW-6	10/27/1995	Monitoring Well Installation	9.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-6	10/27/1995	Monitoring Well Installation	14.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-6	10/27/1995	Monitoring Well Installation	29.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-7	10/24/1995	Monitoring Well Installation	10.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-7	10/24/1995	Monitoring Well Installation	14.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-7	10/24/1995	Monitoring Well Installation	24.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-8	10/25/1995	Monitoring Well Installation	24.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-8	10/25/1995	Monitoring Well Installation	29.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--
MW-8	10/25/1995	Monitoring Well Installation	39.5	--	--	<1.0	<0.0050	<0.0050	<0.0050	<0.0050	--	--

Notes:

fbg	feet below grade
TOG	total oil and grease
TPHd	total petroleum hydrocarbons as diesel
TPHg	total petroleum hydrocarbons as gasoline
TPPHg	total purgeable petroleum hydrocarbons as gasoline
<x	not detected above laboratory reporting limit x
--	not analyzed for specific parameter
ND	not detected; reporting limits vary

TABLE 2.1

ADDITIONAL SOIL ANALYTICAL RESULTS FOR METALS AND VOCs

Sample ID	*Date*	*Depth*	*Cadmium*	*Chromium*	*Zinc*	*Nickel*	*Halogenated VOCs*
WoM	4/4/1991	11	**4.8**	**7.9**	**23**	**10**	ND
FoM	4/4/1991	11	**2.2**	**4.4**	**13**	**8.5**	ND

TABLE 3

HISTORICAL GRAB GROUNDWATER SAMPLE ANALYTICAL DATA
FORMER CHEVRON SERVICE STATION 9-7127
GRANT LINE ROAD AND INTERSTATE 580, TRACY, CALIFORNIA

Sample ID	*Date*	*TPHg*	*Benzene*	*Toluene*	*Ethyl-benzene*	*Total Xylenes*
		← *reported in micrograms per liter (µg/L)* →				
MW-2	12/28/1992	<50	<0.4	<0.3	<0.3	**0.6**
MW-3	12/28/1992	**19,000**	**8,900**	**660**	**380**	**720**
MW-4/B-2	5/21/1993	<50	**12**	**2.0**	<0.50	**1.0**
B-3	5/21/1993	**96**	**1.0**	**0.50**	<0.50	<0.50
MW-5/B-4	5/25/1993	<50	<0.50	<0.50	<0.50	**0.9**
MW-6	11/22/1995	<50	<0.50	<0.50	<0.50	<0.50
MW-7	11/22/1995	<50	<0.50	<0.50	<0.50	<0.50
MW-8	11/22/1995	<50	<0.50	<0.50	<0.50	<0.50

Notes:

TPHg total petroleum hydrocarbons as gasoline

<x not detected at or above laboratory reporting limit x

APPENDIX A

REGULATORY CORRESPONDENCE

ALAMEDA COUNTY
HEALTH CARE SERVICES
AGENCY
DAVID J. KEARS, Agency Director

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

August 20, 2008

Mr. Ian Robb
6001 Bollinger Canyon Road K2256 B
PO Box 6012
San Ramon, CA 94583-2324

Mr. Onsori Ardavan
9310 Union City Blvd.
Union City, CA 94587

Mr. Ahmad Mostofi
37 Victoria Drive
Atherton, CA 94027-4122

Subject: Fuel Leak Case No. RO0000185 (Global ID #T0600102298), Chevron #9-7127, I 580 and Grant Line Road, Tracy, CA

Dear Mr. Robb:

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the above referenced site and the documents entitled "Additional Assessment and Revised Interim Remedial Action Plan (IRAP)" dated October 19, 2007, and prepared by Conestoga Rovers Associates (CRA). Due to the presence of residual separate phase petroleum hydrocarbon contamination in soil and groundwater beneath the site, CRA and Chevron have recommended remediation using surfactant injection into an existing monitoring well. In addition, several remediation options have been implemented at the site, thus far these remedial options have had limited success.

Furthermore, in previous correspondence from ACEH dated April 2007, we expressed several concerns regarding the use of surfactant, including the Central Valley Water Quality Control Board's requirement for Chevron to perform a bench scale treatability study prior to approval. ACEH does not concur with the proposed use of surfactant injection as interim remediation prior to the completion of a treatability study.

Based on ACEH staff review of the case file, we request that you address the following technical comments and send us the reports described below. Please provide 72-hour advance written notification to this office (e-mail preferred to mailto:steven.plunkett@acgov.org) prior to the start of field activities.

TECHNICAL COMMENTS

1. **Source Area Evaluation.** Recent monitoring data indicate that approximately 1.7 feet of free product remains in monitoring well MW-1, which is located in the source area. In addition, benzene concentrations of 9,200 parts per billion (ppb) were detected in groundwater from MW-3 located near the former dispenser island. It appears that a residual source of contamination is continuing to add mass to the hydrocarbon plume beneath the site. Furthermore, your consultants evaluation of analytical data have not determined the quantity of residual mass of petroleum hydrocarbon that remains in the source area. Therefore, we request that you quantify the residual mass of contamination remaining in the source are and present your conclusions and recommendations in the Draft CAP (revised) report requested below.

2. **Bench Scale Treatability Study**. ACEH is concerned that Chevron has not considered the potential negative implications of surfactant injection in an active drinking water basin. Therefore, you are required to perform a bench scale treatability study to evaluate the use of surfactant as a remedial alternative. Please present the results from the treatability study in the report requested below.

3. **Site Geology and Hydrogeology**. No evaluation of site lithology has been conducted to determine applicability of surfactant injection. Furthermore, fluid flow through a fractured media beneath the site could act as a preferential pathway for the distribution of hydrocarbon contaminated surfactant. It is unlikely that your proposed hydraulic controls using vacuum extraction from MW-1 and MW-9 will be successful in removing all surfactant or remobilized, sorbed phase petroleum hydrocarbon product. In addition, vacuum extraction could result with additional contamination distribution throughout the well screen. Our review of the case studies you provided indicate that surfactant was allowed to equilibrate for at least 72 hours prior to removal. It is unclear how CRA determined that a 1 hour equilibration of surfactant will result in the solubilization of residual sorbed phase contamination. Additionally, case studies are not a viable substitute for a bench scale treatability study that includes site specific information regarding lithology, hydrogeology, and contamination fate and transport, etc.

4. **Corrective Action Plan.** CRA asserts that the remediation using surfactant and batch extraction will accelerate remediation of soil and groundwater, leading to expedited site closure. Interim remedial measures are intended to control plume migration and mitigate residual separate phase contamination, interim remediation is not intended as the final remedial action at this site. ACEH does not agree with the use of surfactant as a remedial option for the mitigation of hydrocarbon contamination. Interim remediation must be completed within the corrective action process.

   The CAP should include contamination cleanup levels and cleanup goals for all COCs and for the appropriate groundwater designation. Soil cleanup levels should ultimately (within a reasonable timeframe) achieve water quality objectives (cleanup goals) for groundwater in accordance with San Francisco Regional Water Quality Control Board Basin Plan. Please propose appropriate cleanup levels and cleanup goals in accordance with 23 CCR Section 2725, 2726, and 2727 in the FS/CAP. Please include your anticipated time frame for meeting the cleanup levels and goal.

   Public participation is a requirement for the Corrective Action Plan (CAP) process. Therefore, upon approval of a CAP, but before implementation, ACEH will notify potentially affected members of the public and concerned citizens who live or own property in the surrounding area of the proposed remediation described in the CAP. Public comments on the proposed remediation will be accepted for a 30-day period. We request that you perform the proposed work and send us the reports described below.

TECHNICAL REPORT REQUEST

Please submit technical reports to Alameda County Environmental Health (Attention: Mr. Steven Plunkett), according to the following schedule:

- **October 30, 2008 –** Corrective Action Plan (Revised)
- **November 30, 2008 –** Surfactant Bench Scale Treatability Study

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.

If you have any questions, please call me at (510) 383-1761 or send me an electronic mail message at steven.plunkett@acgov.org.

Sincerely,

Steven Plunkett
Hazardous Materials Specialist

Donna Drogos, PE
Supervising Hazardous Materials Specialist

cc: Mark Miller
CRA
2000 Opportunity Drive, Suite 110
Roseville, CA 95678

Donna Drogos, ACEH Steven Plunkett ACEH, File

APPENDIX B

SUMMARY OF PREVIOUS ENVIRONMENTAL WORK

SUMMARY OF PREVIOUS ENVIRONMENTAL WORK

October 1987 Soil Vapor Investigation: In October 1987, EA Engineering, Science, and Technology, Inc. (EA) conducted a soil vapor investigation at the site. Soil vapor samples were collected from 13 onsite and two offsite locations at depths ranging from 3 to 12 fbg. Hydrocarbons were detected in several of the samples at concentrations ranging from 10 to 28,500 parts per million (ppm). Benzene was detected in several of the samples at concentrations ranging from 1.0 to 3,200 ppm. Toluene was detected in several of the samples at concentrations ranging from 10 to 5,200 ppm. Based on the results of the investigation, it was concluded that LNAPL may be present in the area of the tank field and pump island. Details of this investigation were presented in EA's November 13, 1987 *Report of Investigation.*

December 1987 Subsurface Investigation: In December 1987, Kleinfelder, Inc. (Kleinfelder) advanced seven onsite soil borings (B-1 through B-7). One soil sample was collected from each boring (depths ranging from 5 to 20 fbg) and analyzed for total petroleum hydrocarbons as gasoline (TPHg), benzene, toluene, ethylbenzene and xylenes (BTEX). Low concentrations of TPHg (up to 76 milligrams per kilogram [mg/kg]) and BTEX (up to 2.0 mg/kg) were detected in the samples collected from borings B-2, B-3, B-5, and B-7. Elevated concentrations of TPHg (2,300 mg/kg) and BTEX (up to 140 mg/kg) were detected in the sample collected from boring B-4. Water samples were also collected from taps supplied by an onsite water well in December 1987 and January 1988. The samples were analyzed for purgeable aromatics; which were not detected with the exception of benzene at 2 micrograms per liter (µg/L) and 4 µg/L. Details of this investigation were presented in Kleinfelder's January 6, 1988 *Final Report: Subsurface Environmental Investigation at Chevron Service Station #7127.*

January 1988 through March 1991 Domestic Well Monitoring: In January 1988, groundwater samples were collected from a tap and the onsite water supply well; benzene was detected in the tap samples at 1.0 and 1.1 µg/L. Benzene was not detected in the well sample. In February 1989, samples collected from a tap and the well did not contain TPH or BTEX. Benzene concentrations detected in tap and well samples collected in March and April 1989 ranged from 1.4 to 7 µg/L. In May 1989, Gettler-Ryan Inc. (G-R) installed a carbon adsorption treatment system on the wellhead and began weekly sampling. Samples collected from the well and treatment system influent, mid, and effluent samples in August 1989 did not contain TPH or BTEX. From August 1989 to March 1991, 26 samples were collected from the well. TPHg and benzene generally were not detected in the samples with the exception of TPHg in one sample at 320 µg/L and benzene in one sample at 0.07 µg/L. Details of this work were presented in Kleinfelder's March 8, 1988 *Summary of Domestic Water Sampling Activities and Analytical Results* and August 2, 1989 *Domestic Water Contaminant Source Evaluation,* and Pacific Environmental Group's (PEG's) March 22, 1993 untitled report

April 1991 Tank, Product Piping, and Dispenser Island Removal: In April 1991, the station was demolished and all aboveground and underground facilities were removed. Blaine Tech Services Inc. (Blaine) supervised the removal of two 10,000 gallon and one 6,000-gallon gasoline underground storage tanks (USTs), one 1,000-gallon used-oil UST, one 750-gallon heating oil UST. two dispenser islands, and associated product piping. No holes were observed in the fiberglass tanks upon removal. Ten soil samples were collected from the gasoline UST excavation (12.5 to 15 fbg) and beneath the product piping and the dispenser island (2.5 to 4 fbg); several of the samples contained elevated concentrations of TPHg (up to 5,700 mg/kg), benzene (up to 30 mg/kg), and lead (up to 80 mg/kg). Therefore, over-excavation of the gasoline UST pit and product piping trenches was conducted. The final confirmation soil samples contained TPHg and benzene up to 710 mg/kg 0.085 mg/kg, respectively. Soil samples were also collected at 11 fbg beneath the used-oil and heating oil USTs. TPHg, BTEX, TPH as diesel (TPHd), total oil and grease (TOG), and volatile organic compounds (VOCs) were not detected in the sample collected beneath the used-oil UST; the detected metals concentrations were consistent with background levels. Only low concentrations of TPHg (170 mg/kg) and xylenes (2.7 mg/kg) were detected in the sample collected beneath the heating oil UST; the detected metals concentrations were consistent with background levels. The excavated soil was aerated onsite until detected TPHg concentrations did not exceed 10 mg/kg; the soil was then used to backfill the excavations. Details of this investigation were presented in Blaine's June 24, 1991 *Multiple Event Sampling Report.*

December 1992 Monitoring Well Installation and January through March 1993 Water-Supply Well Sampling: In December 1992, PEG advanced soil boring B-1 and installed monitoring wells MW-1 through MW-3. The borings were advanced to total depths ranging from 22 to 40 fbg. The wells were screened at intervals ranging from 22 to 37 fbg (MW-1), 21 to 36 fbg (MW-2), and 22 to 37.5 fbg (MW-3). A total of nine soil samples were collected at various depths from borings B-1 and MW-1 and analyzed for TPHg and BTEX. TPHg was detected in three samples at concentrations of 4.0 mg/kg (B-1 at 12.5 fbg), 2,600 mg/kg (MW-1 at 24 fbg), and 8,100 mg/kg (MW-1 at 29 fbg). Benzene was only detected in boring MW-1 at 29 fbg (21 mg/kg). Toluene (up to 560 mg/kg), ethylbenzene (up to 150 mg/kg), and xylenes (up to 840 mg/kg) were also detected in several of the samples. Groundwater samples were collected from MW-2 and MW-3 and analyzed for TPHg and BTEX. TPHg and BTEX were detected in MW-3 at concentrations of 19,000 µg/L, 8,900 µg/L, 660 µg/L, 380 µg/L, and 720 µg/L, respectively. Xylenes was the only analyte detected in MW-2 (0.6 µg/L). MW-1 was not sampled due to the presence of light non-aqueous phase liquid (LNAPL). PEG performed weekly sampling of the water-supply well from January through March 1993. TPHg and BTEX generally were not detected in the samples with the exception of low concentrations of toluene (3 µg/L) and xylenes (2 µg/L) in January 1993. Details of this work were presented in PEG's March 22, 1993 untitled report.

May 1993 Monitoring Well Installation: In May 1993, PEG advanced soil borings B-2 through B-4 to investigate groundwater conditions upgradient, crossgradient, and downgradient of the site. Borings B-2 and B-4 were converted to monitoring wells MW-4 and MW-5 and were screened at depths of 22 to 36.5 fbg and 5 to 24.5 fbg, respectively. Soil samples were collected at 10 and 15 fbg from boring B-4 and analyzed for TPHg and BTEX; which were not detected. A grab-groundwater samples was collected from boring B-3 and analyzed for TPHg and BTEX; TPHg, benzene, and toluene were detected at 96 µg/L, 1 µg/L, and 0.5 µg/L, respectively. The initial groundwater sample collected from well MW-4 contained TPHg and benzene 300 µg/L and 56 µg/L, respectively. TPHg and BTEX were not detected in the initial groundwater sample collected from well MW-5. Details of this investigation were presented in PEG's December 3, 1993 untitled report.

October 1994 Comprehensive Site Evaluation: In October 1994, Weiss Associates (WA) conducted a comprehensive site evaluation. Based on historical soil and groundwater data, WA concluded that the hydrocarbon source areas had been removed from the site and that the plume was primarily contained onsite. However, to determine the full extent of the hydrocarbon plume beneath the site, WA recommended the installation of an additional offsite monitoring well north of the site. Details of this investigation were presented in WA's October 13, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan.*

October 1995 Monitoring Well Installation: In October 1995, PEG installed monitoring wells MW-6 through MW-8 to further delineate the offsite extent of dissolved hydrocarbons in groundwater. Wells MW-6, MW-7, and MW-8 were screened at intervals of 6.5 to 30 fbg, 4.5 to 25 fbg, and 20 to 40 fbg, respectively. A total of nine soil samples were collected at various depths from the well borings and analyzed for TPHg and BTEX; which were not detected in any of the soil samples. TPHg and BTEX were not detected in the initial groundwater samples collected from the wells. Details of this investigation were presented in PEG's January 25, 1996 *Groundwater Investigation Report.*

June 1997 Risk-Based Assessment: In June 1997, a Risk Based Corrective Action (RBCA) Tier 2 Assessment was completed for the site. Results of the assessment indicate that groundwater ingestion could pose a risk to human health due to the elevated TPHg and benzene concentrations in MW-1, MW-3, and MW-4. The assessment also indicated that the onsite water supply well was a potential receptor for residual concentrations of petroleum hydrocarbons in the subsurface. Details of this investigation were presented in PEG's June 27, 1997 *Risk-Based Corrective Action-Tier 2* report.

May 2001 Corrective Action Plan: In May 2001, Delta Environmental Consultants, Inc. (Delta) submitted an Interim Corrective Action Plan. Delta recommended that the onsite supply well be destroyed and that LNAPL be hand bailed from MW-1 on a monthly basis for two quarters,

after which the thickness of the LNAPL would be re-evaluated. Details of this investigation were presented in Delta's May 7, 2001 *Interim Corrective Action Plan.*

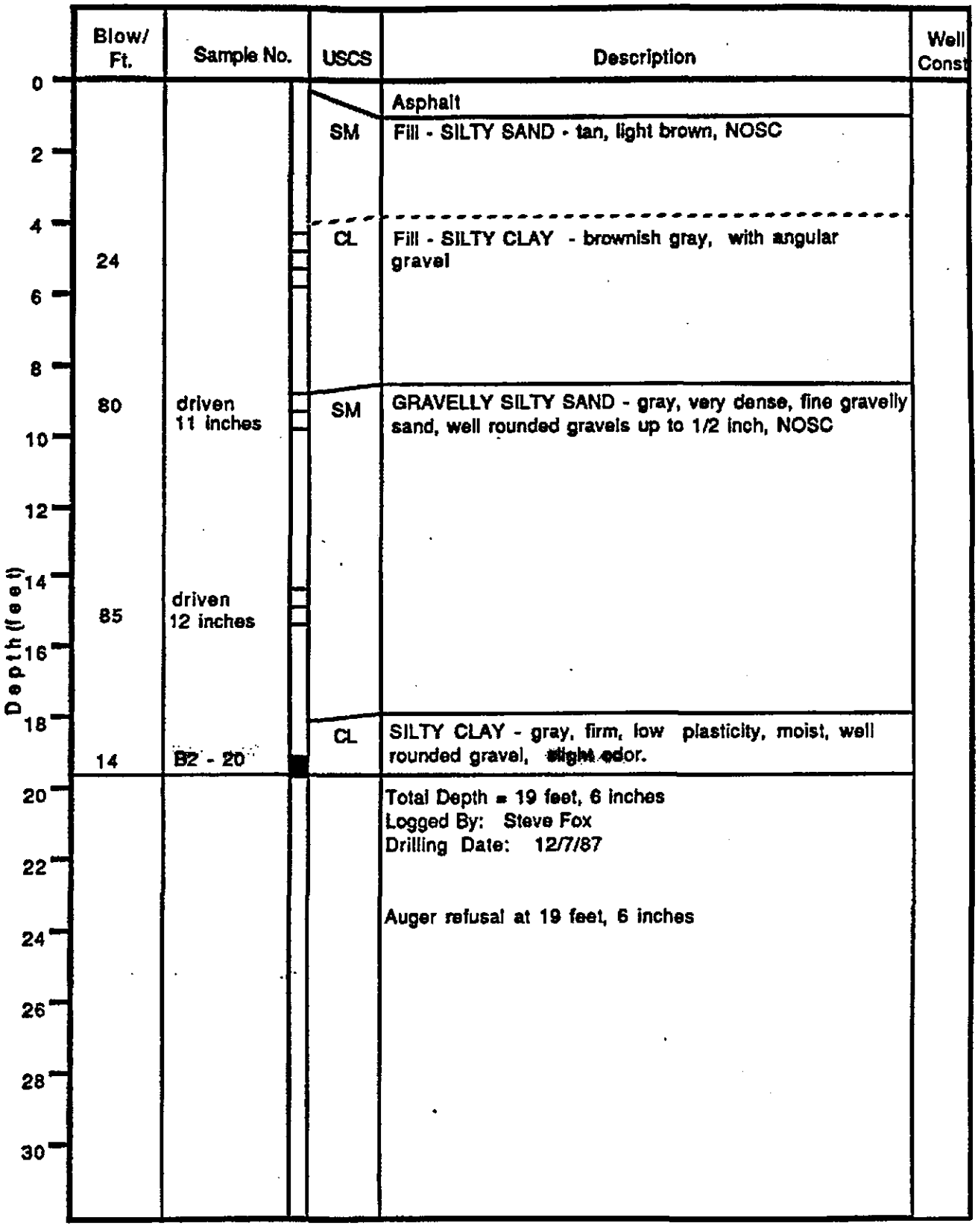
April 2003 Remedial Action Plan and Feasibility Study: In April 2003, Delta submitted a remedial action plan (RAP) and feasibility study for the site. Data from the study indicated that the groundwater beneath the site is in a perched zone at approximately 10 to 40 fbg, with underlying confining bedrock. The impacted soil appeared to be confined to just above the groundwater table, within the capillary fringe approximately 25 to 30 fbg, in the vicinity of the former USTs. Remedial technologies evaluated included soil excavation, soil vapor extraction (SVE), groundwater extraction and natural attenuation. Due to the depth of the source and site lithology, soil excavation and SVE were not considered viable options for the site. Delta recommended removal of LNAPL from MW-1 using an active mechanical oil skimmer in conjunction with natural attenuation as the most feasible remedial options for the site. Details of this investigation were presented in Delta's April 30, 2003 *Remedial Action Plan and Feasibility Study.*

May 2007 Corrective Action Plan: In May, 2007, Conestoga-Rovers & Associates (CRA) submitted a CAP which evaluated three remedial alternatives: oxygen injection, batch groundwater extraction, and surfactant injection. The report recommended surfactant injection followed by groundwater extraction as the remedial alternative. Details were presented in CRA's May 15, 2007 *Corrective Action Plan.*

October 2007 Interim Remedial Action Plan (IRAP): In October 2007, CRA submitted a revised IRAP. CRA proposed the installation of three additional groundwater monitoring wells around MW-1 to better evaluate hydrocarbon distribution, hydrogeologic characteristics, and potentially facilitate the remediation of groundwater and vapors from fractures in the bedrock beneath the site. In addition, CRA proposed injection of a surfactant solution to emulsify LNAPL found in formation pore spaces. Emulsification of the LNAPL would increase the ability to remove it using enhanced vacuum fluid recovery (EVFR). Details were presented in CRA's October 19, 2007 *Additional Assessment and Revised Interim Remedial Action Plan.*

APPENDIX C

HISTORICAL BORING LOGS



B - 2

KLEINFELDER

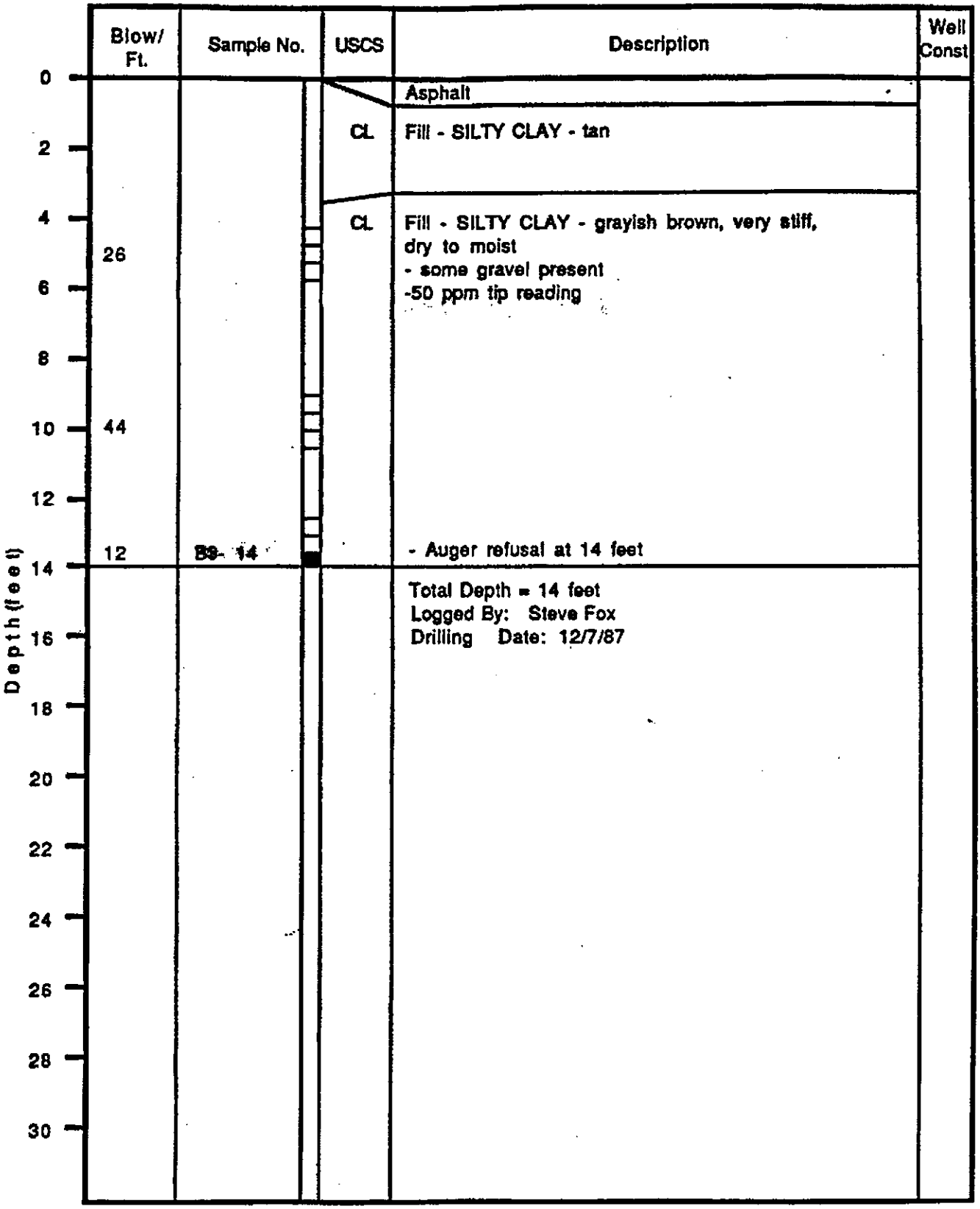
PROJECT NO. 10-1782-01

CHEVRON, USA - STATION 7127
GRANT LINE ROAD
TRACY, CALIFORNIA

BORING LOG ~~B-2~~

PLATE

A3



B-3

KLEINFELDER

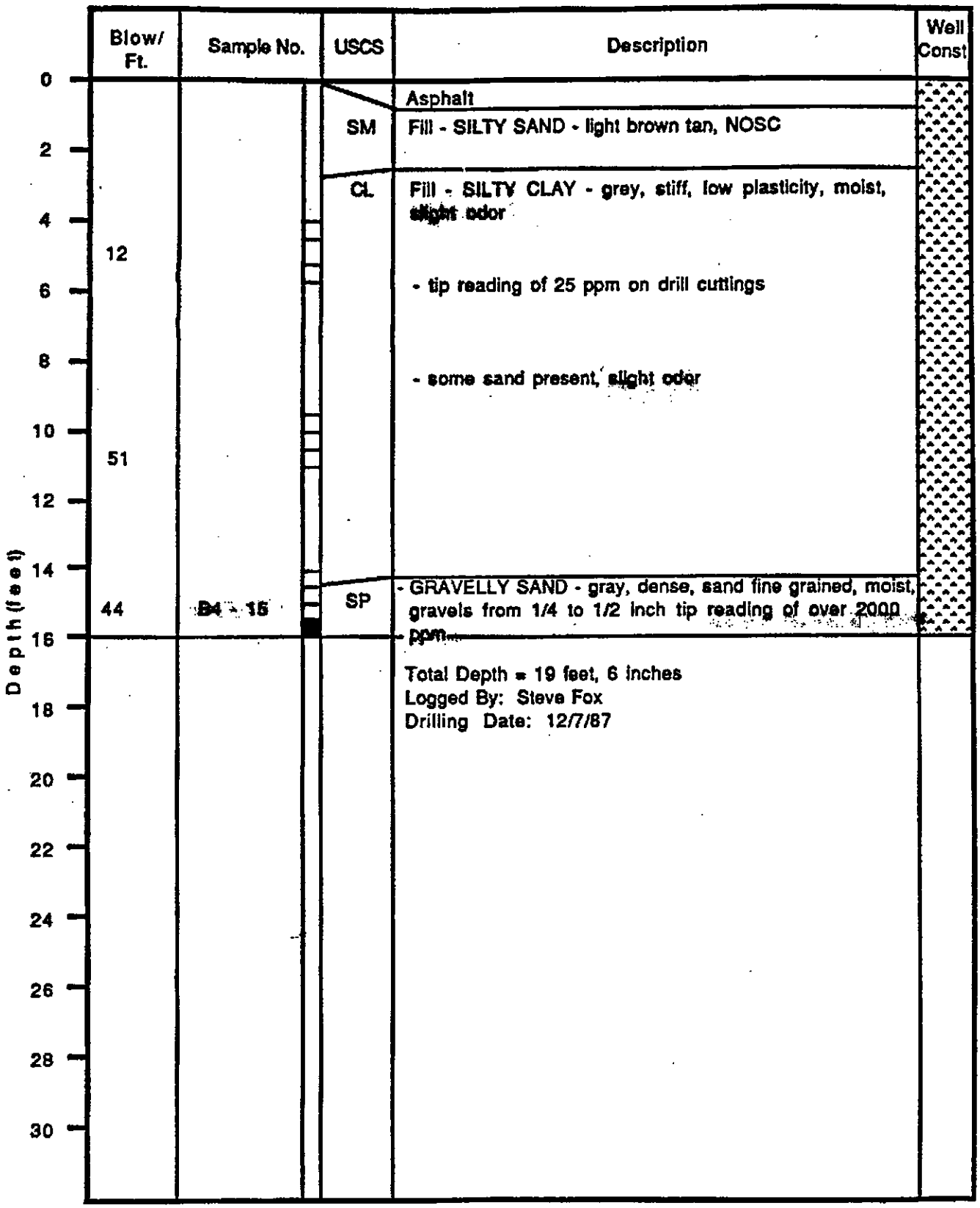
PROJECT NO. 10-1782-01

CHEVRON, USA - STATION 7127
GRANT LINE ROAD
TRACY, CALIFORNIA

BORING LOG B-3

PLATE

A4



B - 4

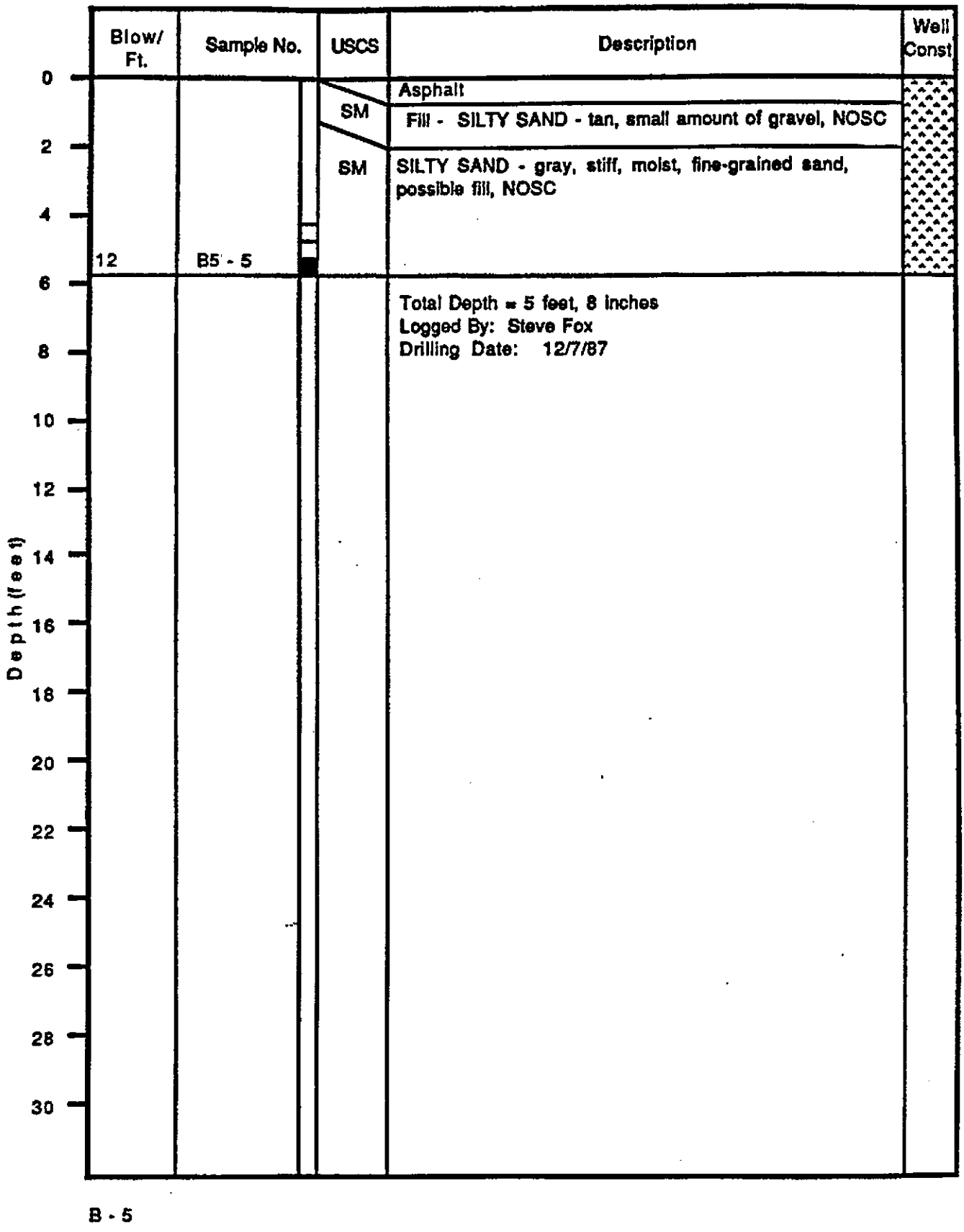
KLEINFELDER

PROJECT NO. 10-1782-01

CHEVRON, USA - STATION 7127
GRANT LINE ROAD
TRACY, CALIFORNIA

BORING LOG B-4

PLATE
A5



B - 5

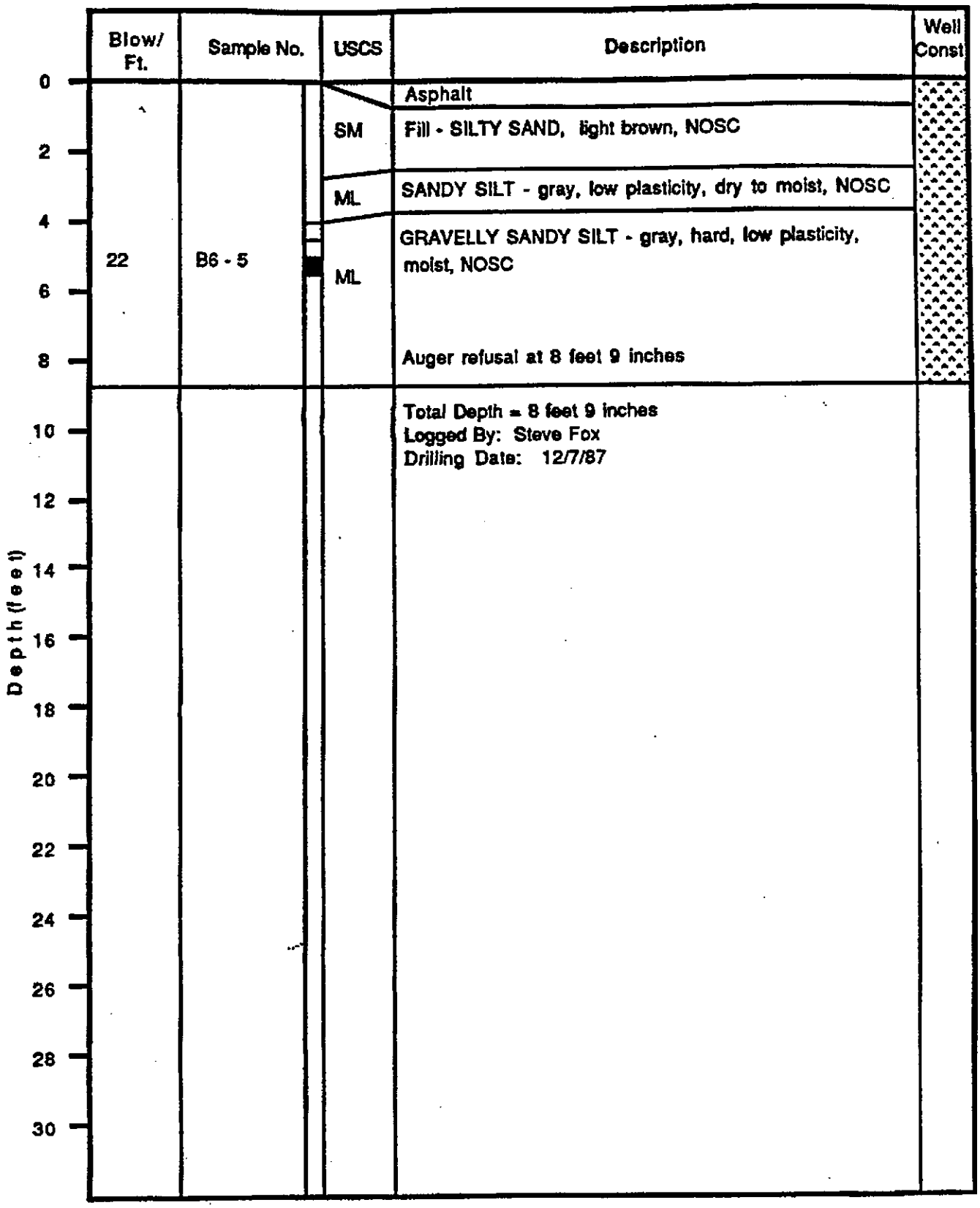
KLEINFELDER

PROJECT NO. 10-1782-01

CHEVRON, USA - STATION 7127
GRANT LINE ROAD
TRACY, CALIFORNIA

BORING LOG B-5

PLATE
A6



B - 6

KLEINFELDER

PROJECT NO. 10-1782-01

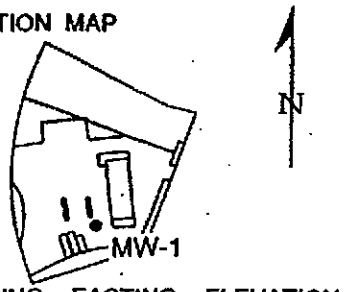
CHEVRON, USA - STATION 7127
GRANT LINE ROAD
TRACY, CALIFORNIA

BORING LOG B-6

PLATE

A7

LOCATION MAP



NORTHING	EASTING	ELEVATION
154.6	172.9	29.18

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. [redacted]-1

PROJECT NO. 325-04.01
LOGGED BY: RWNT
DRILLER: GREAT SIERRA
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD: DRY CORE
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: #2-/16 Lonestar

CLIENT: CHEVRON
DATE DRILLED: 12-8-92
LOCATION: Grant Line Road
HOLE DIAMETER: 10"
HOLE DEPTH: 39.5'
WELL DIAMETER: 4"
WELL DEPTH: 38'
CASING STICKUP: ~2.3

WELL COMPLETION	CORE BOX	RUN	MOISTURE CONTENT	PID	ROD (%)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT	1	1	Dp	0	0	1–3				SC	CLAYEY SAND - FILL: dark grayish brown; low to moderate plasticy; 40% clay; 15% silt; 45% fine to medium sand; weak subangular blocky; minor angular gravel fragments; loose; no product odor.
						3–5				GC-SC	CLAYEY GRAVEL to CLAYEY SAND - FILL: dark gray; 60% clay; 10% silt; 30% medium to coarse sand with 1" angular gravel fragments throughout; minor iron oxide staining and caliche; medium dense; weak product odor.
		2		16		5–7					
					0	7–9				SC	CLAYEY SAND: dark greenish gray; low to medium plasticity; 50% clay; 15% silt; 35% medium to coarse sand; granular; loose texture; paleosol odor; no product odor.
		3			12	9–13					
				1		13–14				GC	SILTY GRAVEL: silica cemented 1/4 - 1 1/4" diameter rounded quartz pebbles; poor core recovery.
BENTONITE						14–15				SS	SANDSTONE - (Neroly Formation): very dark greenish brown; 80-90% medium quartz, feldspar and mafic mineral grains subrounded with 10-20% coarse rounded 1/4 - 1" diameter conglomeratic pebbles; minor mica; local 1/4" bandof white altered feldspar rich zone perpendicular TCA; sandstone is granular; poorly sorted and is derived from intermediate volcanic rocks (andesite); low hardness; no product odor.
		4	Dry		16	15–18					
				3		18–19					@19': weak product odor increasing to strong product odor at 23'.
SAND		5			32	19–22					

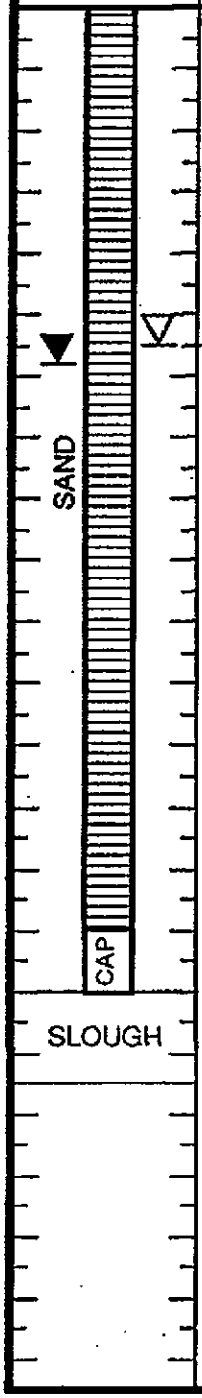
See Page One

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL MW-1
PAGE 2 OF 2

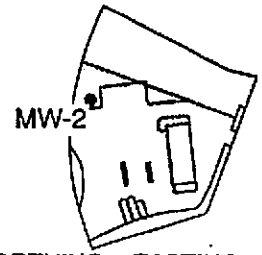
PROJECT NO. 325-04.01
LOGGED BY:
DRILLER:
DRILLING METHOD:
SAMPLING METHOD:
CASING TYPE:
SLOT SIZE:
GRAVEL PACK:

CLIENT:
DATE DRILLED:
LOCATION:
HOLE DIAMETER:
HOLE DEPTH:
WELL DIAMETER:
WELL DEPTH:
CASING STICKUP:



CORE BOX	RUN	MOISTURE CONTENT	PID	RQD (%)	DEPTH (FEET)	RECOVERY	SAMPLE ANALYZED	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
					23				SS	SANDSTONE (Neroly Formation): continued
	5	Dp-Mst	>200		24					@23': 1/2" altered epidotized vein at 35° TCA, horizontal parting common; very strong product odor at 25' and continues with depth.
					25					
	6			22	26					
					27					
2					28					
		Dp	>220		29					@29': bedding at 80° TCA.
	7	Dp		53	30					
					31					@31': moderate product odor; equigranular sandstone.
					32					@32': poor core recovery due to saturation of sandstone; weak product odor.
	8	Wt		0	33					
			70		34					
					35					
					36					
	9	Wt		12	37					
		Dp			38					@38': 5" bed of subrounded conglomerate pebbles from 1/4" to 2" diameter; no product odor.
			6		39					@39': 1mm wide chlorite veinlets at 12° TCA.
					40					BOTTOM OF BORING AT 39.5'
					41					
					42					
					43					
					44					

LOCATION MAP



NORTHING 270.1 EASTING 131.9 ELEVATION 27.22

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-2
PAGE 1 OF 2

PROJECT NO. 325-04.01
LOGGED BY: RWNT
DRILLER: GREAT SIERRA
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD: DRY CORE
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: #2-/16 Lonestar

CLIENT: CHEVRON
DATE DRILLED: 12-10-92
LOCATION: Grant Line Road
HOLE DIAMETER: 8"
HOLE DEPTH: 37'
WELL DIAMETER: 2"
WELL DEPTH: 36'
CASING STICKUP: ~2.1

WELL COMPLETION	CORE BOX	RUN	MOISTURE CONTENT	PID	ROD (%)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT			Dp			1				SC	CLAYEY SAND - FILL: brown to dark brown; low plasticity; 25% clay; 15% silt; 60% medium sand; abundant subangular lithic fragments throughout; loose; no product odor.
						2					
						3				SS	SANDSTONE (Neroly Formation): >90% fine to medium sand as subangular quartz and mafic mineral grains and weakly altered feldspar; sucrosic texture; weak alteration; moderate to hard; no product odor.
		1				4					@2-5.5': moderate alteration evident as iron oxide surrounding up to 10% rounded 1/4 - 1" conglomeratic pebbles; 50% pebbles from 2-3'.
					16	5					
						6					@5': bedding attitude at 55° TCA.
	1					7					
				0		8					
						9					
						10					
		2	Dp			11					
					8	12					
				0		13					
						14					@14-19': loose; unconslidated sandstone; no core recovery.
						15					
		3	Mst			16					
					0	17					
						18					
						19					
				0		20					@20': pebbles; brown to dark brown; matrix is >90% quartz and altered chloritic minerals; ~5-20% intergranular porosity; angular grains; pebbles are subangular, 1/4 - 1" diameter pebbles weathered by iron oxide and manganese oxide; hard; no product odor.
		4				21					
SAND	2				100	22					
BENTONITE											

PACIFIC ENVIRONMENTAL GROUP, INC.

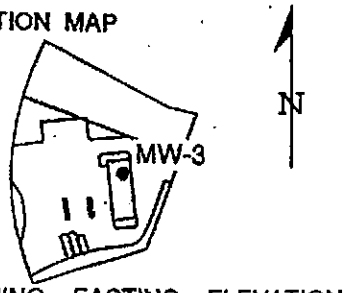
See Page One

PROJECT NO. 325-04.01
LOGGED BY:
DRILLER:
DRILLING METHOD:
SAMPLING METHOD:
CASING TYPE:
SLOT SIZE:
GRAVEL PACK:

CLIENT:
DATE DRILLED:
LOCATION:
HOLE DIAMETER:
HOLE DEPTH:
WELL DIAMETER:
WELL DEPTH:
CASING STICKUP:

WELL COMPLETION	CORE BOX	RUN	MOISTURE CONTENT	PID	RQD (%)	DEPTH (FEET)	RECOVERY	SAMPLE ANALYZED	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
SAND						23				SS	SANDSTONE (Neroly Formation): continued
				0		24					
		5				25					@25-26': sandy claystone; brown to dark brown; fine sandy texture; horizontal platy fracturing; rare mineral grain solution cavities; moderate hardness; no product odor.
	2		Dp-Mst		6	26					
						27					@27.5': parting common at 80° TCA.
						28					@28.5-29.3': sandy claystone; brown to dark brown; fine sandy texture; horizontal platy fracturing; rare mineral grain solution cavities; moderate hardness; no product odor.
			Wt	0		29					
						30					
	3	6	Mst		0	31					@31.5': bedding at 75° TCA.
						32					
						33					@33.3-34': brecciated claystone as described above; rare biotite; moderate hardness; crushed fracturing; no product oodor.
			Wt	0		34					@34-36': Neroly Formation; intense parting at 76° TCA.
		7				35					
			Dp		0	36					@36-36.2': brecciated claystone as described above; rare biotite; moderate hardness; crushed fracturing; no product oodor.
CAP			Wt	1		37					BOTTOM OF BORING AT 37'
						38					
						39					
						40					
						41					
						42					
						43					
						44					

LOCATION MAP



NORTHING	EASTING	ELEVATION
220.3	242.3	29.26

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-3

PROJECT NO. 325-04.01
LOGGED BY: RWNT
DRILLER: GREAT SIERRA
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD: DRY CORE
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: #2-/16 Lonestar

CLIENT: CHEVRON
DATE DRILLED: 12-10-92
LOCATION: Grant Line Road
HOLE DIAMETER: 8"
HOLE DEPTH: 40'
WELL DIAMETER: 2"
WELL DEPTH: 37.5'
CASING STICKUP: ~2.3

WELL COMPLETION	CORE BOX	RUN	MOISTURE CONTENT	PID	RQD (%)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT		1	Dp			1				SC	CLAYEY SAND - FILL: moderate plasticity; 50% clay; 10% silt; 40% fine to medium sand; occasional to 3" angular lithic fragments throughout; minor roots; soft; no product odor.
						2				CL	@1': 3-4" asphalt layer
						3					SANDY CLAY - FILL: yellowish brown; medium plasticity; 65% clay; 10% silt; 25% fine to medium sand; subangular blocky peds; calcium carbonate and iron oxide blebs and fracture fills; in part lithified with low hardness; minor rounded to 1" pebbles; rare manganese oxide; stiff; no product odor.
						4					
						5					
						6					
		2			0	7				SP	SAND (Neroly Formation): black; <15% fines; 85% fine to medium, subangular, volcanically derived sand; poorly graded; massive; weathered feldspar grains; weakly oxidized; poor recovery; loose; no product odor.
			Mst	0		8					
						9					
						10					
		3			0	11					
	1					12					
						13					
						14					
		4		3		15				SS	CONGLOMERATIC SANDSTONE (Neroly Formation): matrix as sand above, but lithified in part; subrounded pebbles to 2" diameter; minor calcium carbonate and iron oxide around pebble edges; intense fracturing; as strong iron oxide alteration throughout matrix from 16-17' and 20-21'.
			Dp		0	16					
						17					
		5			0	18					
			Wt			19					
				0		20					@17-18': rounded 2" diameter pebbles recovered; no sand matrix.
						21					@21': see next page.
SAND		6			24	22					

BENTONITE

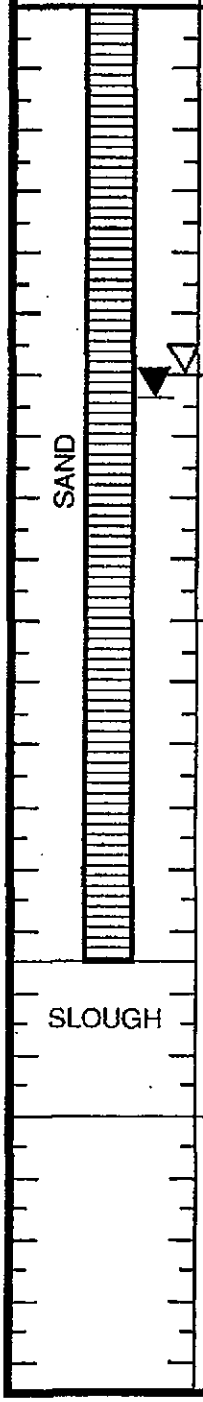
See Page One

PACIFIC ENVIRONMENTAL GROUP, INC.

WELL MW-3
PAGE 2 OF 2

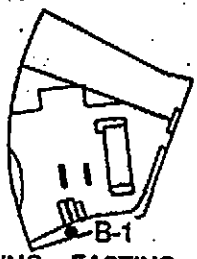
PROJECT NO. 325-04.01
LOGGED BY:
DRILLER:
DRILLING METHOD:
SAMPLING METHOD:
CASING TYPE:
SLOT SIZE:
GRAVEL PACK:

CLIENT:
DATE DRILLED:
LOCATION:
HOLE DIAMETER:
HOLE DEPTH:
WELL DIAMETER:
WELL DEPTH:
CASING STICKUP:



CORE BOX	RUN	MOISTURE CONTENT	PID	RQD (%)	DEPTH (FEET)	RECOVERY/ SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
			16		23			SS	SANDSTONE (Neroly Formation): black; 90% subangular quartz and weathered mafic minerals; minor feldspar grains fine to medium grained; 10% fines; sucrosic texture; homogeneous; moderate to intense fracturing; weakly weathered; low hardness; no product odor.
					24				@22-24': slight clay enriched zone; brittle subhorizontal parting.
					25				
2		Dp			26				@23.5': bedding at 62° TCA with perpendicular fracture running at 77° TCA.
	7				27				
				6	28				@28': bedding at 77° TCA with similar high angle fracture perpendicular to bedding at 25° TCA; increased hardness due to cementation; parting common along bedding planes at 75° and 83° TCA.
		Dp	1		29				
					30				@30': slight product odor.
					31				
	8			0	32				
					33				
					34				
			0		35				
3					36				@36': bedding at 55° TCA.
					37				
	9	Mst-Dp		0	38				@38': high angle fractures at 30° TCA and 11° TCA.
					39				
			2		40				BOTTOM OF BORING AT 40'
					41				
					42				
					43				
					44				

LOCATION MAP



NORTHING 154.6 EASTING 172.9 ELEVATION 29.18

PACIFIC ENVIRONMENTAL GROUP, INC.

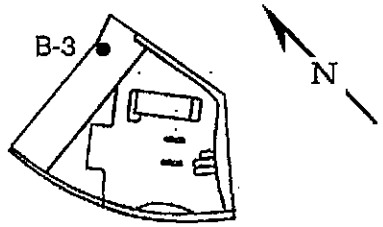
BORING NO. B-1
PAGE 1 OF 1

PROJECT NO. 325-04.01
LOGGED BY: RWNT
DRILLER: GREAT SIERRA
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD: DRY CORE
CASING TYPE: NA
SLOT SIZE: NA
GRAVEL PACK: NA

CLIENT: CHEVRON
DATE DRILLED: 12-9-92
LOCATION: Grant Line Road
HOLE DIAMETER: 6"
HOLE DEPTH: 22'
WELL DIAMETER: NA
WELL DEPTH: NA
CASING STICKUP: NA

WELL COMPLETION	CORE BOX	RUN	MOISTURE CONTENT	PID	ROD (%)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
Back Filled With Grout			Mst			1				SP	SAND - FILL: variable color from yellow to dark yellowish brown; no plasticity; 15% clay; 15% silt; 70% fine to medium sand; subrounded; minor wood fragments; local rooted peds of gray clay; loose; no product odor.
			Dp			2				SM	SILTY SAND - FILL: brown; low plasticity; 15% clay; 25% silt; 60% fine to medium sand; loose; subrounded gravel to 1/2" diameter; no product odor.
				0		3					
	1	1	Mst			4					
				0		5				SC	CLAYEY SAND - FILL: low plasticity; dark grayish brown; 30% clay; 15-20% silt 50-55% fine to medium sand; abundant angular to 1-1/2" diameter gravel fragments; no product odor.
						6					
			Mst			7				CL	CLAY - FILL: very dark greyish brown; low plasticity; subangular conglomeratic pebbles in dark gray sandy clay matrix; 60% clay; 20% silt; 20% fine to coarse sand; silty texture; angular coarse sand fragments throughout; rare iron oxide blebs; soft; no product odor.
		2				8					
						9					
						10					
						11					
			Mst-Wt	2		12					
				11		13				SM	SILTY SAND - FILL: grayish green; no to low plasticity; 15% silt;10% clay; 75% medium to coarse sand; subrounded coarse sand pebbles; loose; slight product odor.
		3				14					
						15					SANDSTONE (Neroly Formation): variable color from white to very dark gray brown; 10% clay;10% silt; 80% medium quartz and weathered matic minerals and iron oxide altered feldspars, subangular; abundant to 1/2" clastic fragments; weak fracturing; intragranular porosity; hard; no to weak product odor.
						16					
				15		17				SS	
		4				18					@19': very dark gray; 10% fines; 90% fine to medium sand; subangualr granular sucrosic texture; weak fracturing and alteration; dense; no to weak product odor.
						19					
			Dp		26	20					@20': bedding at 77° TCA.
						21					~~@22': moderate product odor.~~
				>200		22					BOTTOM OF BORING AT 22'

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

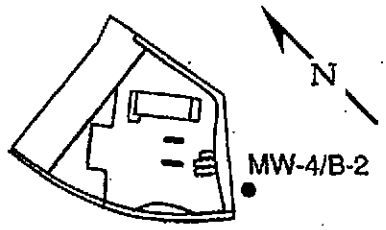
BORING NO. B-3
PAGE 1 OF 1

PROJECT NO. 325-04.04
LOGGED BY: CJM
DRILLER: Great Sierra
DRILLING METHOD: AIR
SAMPLING METHOD: CORE
CASING TYPE: NA
SLOT SIZE: NA
GRAVEL PACK: NA

CLIENT: Chevron
DATE DRILLED: 5-21-93
LOCATION: Grant Line Road
HOLE DIAMETER: 94 mm
HOLE DEPTH: 25'
WELL DIAMETER: NA
WELL DEPTH: NA
CASING STICKUP: NA

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
Backfilled With Cement	Mst	0		2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24			SS	SANDSTONE (Neroly Formation): green; >85% coarse sand; subangular; lithic fragments; moderate to hard no product odor.
	Dp	0		16				@15': bluish/green; 90% medium to fine sand; quartz; no lithic fragments; moderate to hard, no product odor.
				26, 28, 30, 32, 34, 36, 38, 40, 42, 44				BOTTOM OF BORING 25'

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

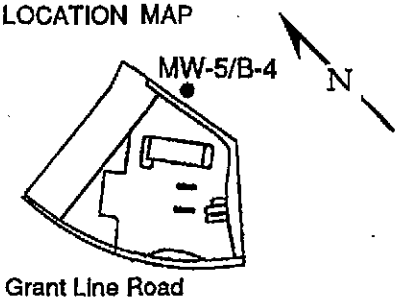
WELL NO. MW-4/B-2
PAGE 1 OF 1

PROJECT NO. 325-04.04
LOGGED BY: AFW
DRILLER: Great Sierra
DRILLING METHOD: AIR
SAMPLING METHOD: CORE
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 X 12 Sand

CLIENT: Chevron
DATE DRILLED: 5-21-93
LOCATION: Grant Line Road
HOLE DIAMETER: 8 7/8"
HOLE DEPTH: 37'
WELL DIAMETER: 2"
WELL DEPTH: 37"
CASING STICKUP: 3'

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				2			SC	CLAYEY SAND - FILL: dark brown; 30-40% fines; abundant lithic fragments; loose; no product odor.
	Dp	0	push	6				
	Dp	0.1		10			SS	SANDSTONE (Neroly Formation): olive green >90% fine to medium sand; subangular quartz, lithic fragments, and weakly altered feldspar; faint product odor.
BENTONITE				12				
SAND				16				
				20				
				22				
				24				
				26				
				28				
	Wt	2.0		30				@30': as above; no product odor.
				32				
				34				
				36				
				38				
				40				
				42				
				44				

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

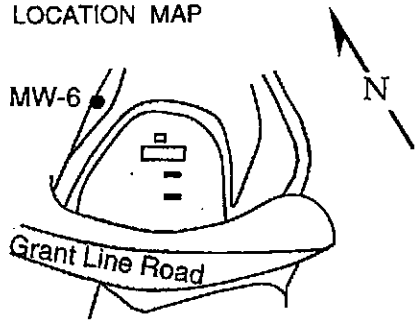
WELL NO. MW-5/B-4
PAGE 1 OF 1

PROJECT NO. 325-04.04
LOGGED BY: CJM
DRILLER: Great Sierra
DRILLING METHOD: AIR
SAMPLING METHOD: CORE
CASING TYPE: Sch 40 PVC
SLOT SIZE: 0.020"
GRAVEL PACK: 2 X 12 SAND

CLIENT: Chevron
DATE DRILLED: 5-25-93
LOCATION: Grant Line Road
HOLE DIAMETER: 8 7/8"
HOLE DEPTH: 25'
WELL DIAMETER: 2"
WELL DEPTH: 25'
CASING STICKUP: 3'

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT, BENTONITE, SAND	Mst	0		2–24				SS	SANDSTONE: greenish brown; 90% coarse sand; lithic fragments; no product odor.
				10					@10': grayish brown; 90% coarse to medium sand; subrounded to subangular; lithic fragments; hard to very hard; no product odor.
	Wt	0		16					
				26					BOTTOM OF BORING 25'
				28–44					

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

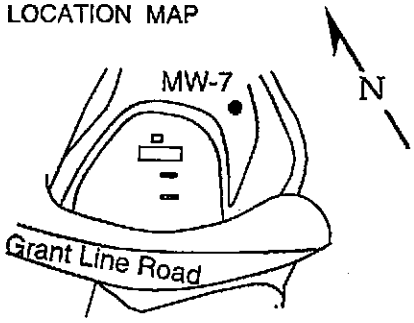
WELL NO. MW-6
PAGE 1 OF 1

PROJECT NO. 325-004.1B
LOGGED BY: MOTO
DRILLER: ALL TERRAIN
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD: CORE
CASING TYPE: SCH 40 PVC
SLOT SIZE: 0.020"
SAND PACK: 2 X 12 SAND

CLIENT: CHEVRON
DATE DRILLED: 10-27-95
LOCATION: Grant Line Road
HOLE DIAMETER: 6.5"
HOLE DEPTH: 30'
WELL DIAMETER: 2"
WELL DEPTH: 30'
CASING STICKUP: NA

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY / SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				2				TOPSOIL
				4				
	Dp	0		6			SS	SANDSTONE (Neroly Formation): gray; 15% fines; 45% fine to coarse sand; 40% subangular to subrounded gravel to 1" diameter; hard; no product odor.
				8				@8-12': alternating 1" beds of sandstone and conglomeratic lenses; scour marks; no product odor.
	Mst	0		10				
BENTONITE				12				
	Wt	0		14				@13-14': coarsens downward.
SAND				16				
				18				@18-26': dark gray; 15% fines; 85% fine to medium sand; subangular quartz and weathered mafics; alternating crossbeds of medium sand and coarse sand; no product odor.
	Wt	0		20				
				22				
	Wt	0		24				
				26				@26-30': predominately fine to medium.grained sand; no product odor.
				28				
	Wt	0		30				
				32				BOTTOM OF BORING AT 30'
				34				
				36				
				38				
				40				
				42				
				44				

LOCATION MAP



PACIFIC ENVIRONMENTAL GROUP, INC.

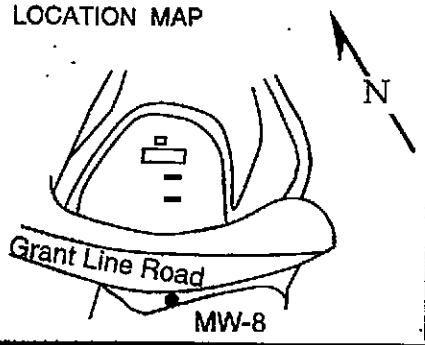
WELL NO. MW-7
PAGE 1 OF 1

PROJECT NO. 325-004.1B
LOGGED BY: MOTO
DRILLER: ALL TERRAIN
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD: CORE
CASING TYPE: SCH 40 PVC
SLOT SIZE: 0.020"
SAND PACK: 2 X 12 SAND

CLIENT: CHEVRON
DATE DRILLED: 10-24-95
LOCATION: Grant Line Road
HOLE DIAMETER: 6.5"
HOLE DEPTH: 25'
WELL DIAMETER: 2"
WELL DEPTH: 25'
CASING STICKUP: NA

WELL COMPLETION	MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
GROUT				2				ALLUVIUM: topsoil
				4				
	Dp	0		6			Slst	SANDY SILTSTONE (Neroly Formation): olive; strongly weathered; vertical root holes to 1 cm common; no product odor.
				8				
BENTONITE	Dp	0		10				
	Dp	0		12			SS	SANDSTONE (Neroly Formation): light gray to olive; 85% fine to medium grained sand; 15% coarse sand; very hard; no product odor.
SAND	Wt	0		14				@11': verticalar calcite veins to 1/2" diameter common; no product odor.
				16			SS	CONGLOMERATIC SANDSTONE (Neroly Formation): matrix as above; matrix is partially lithified subrounded pebbles to 2" diameter; very hard; no product odor.
				18				
	Wt	0		20				
				22				
	Wt	0		24			SS	SANDSTONE (Neroly Formation): gray; 10% fines; 80% medium sand; 10% coarse sand common; scour marks; 1/4" thick lenses of coarse grained sand; well lithified; no product odor.
				26				
				28				BOTTOM OF BORING AT 25'
				30				
				32				
				34				
				36				
				38				
				40				
				42				
				44				

LOCATION MAP

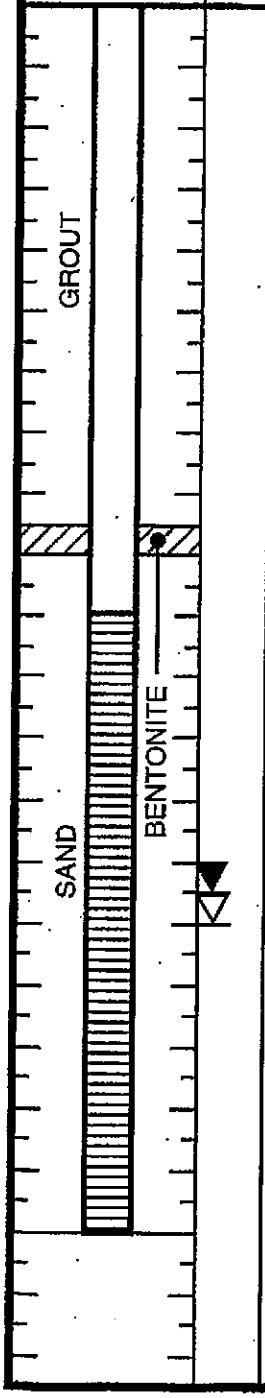


PACIFIC ENVIRONMENTAL GROUP, INC.

WELL NO. MW-8
PAGE 1 OF 1

PROJECT NO. 325-004.1B
LOGGED BY: MOTO
DRILLER: ALL TERRAIN
DRILLING METHOD: AIR ROTARY
SAMPLING METHOD: CALMOD/CORE
CASING TYPE: SCH 40 PVC
SLOT SIZE: 0.020"
SAND PACK: 2 X 12 SAND

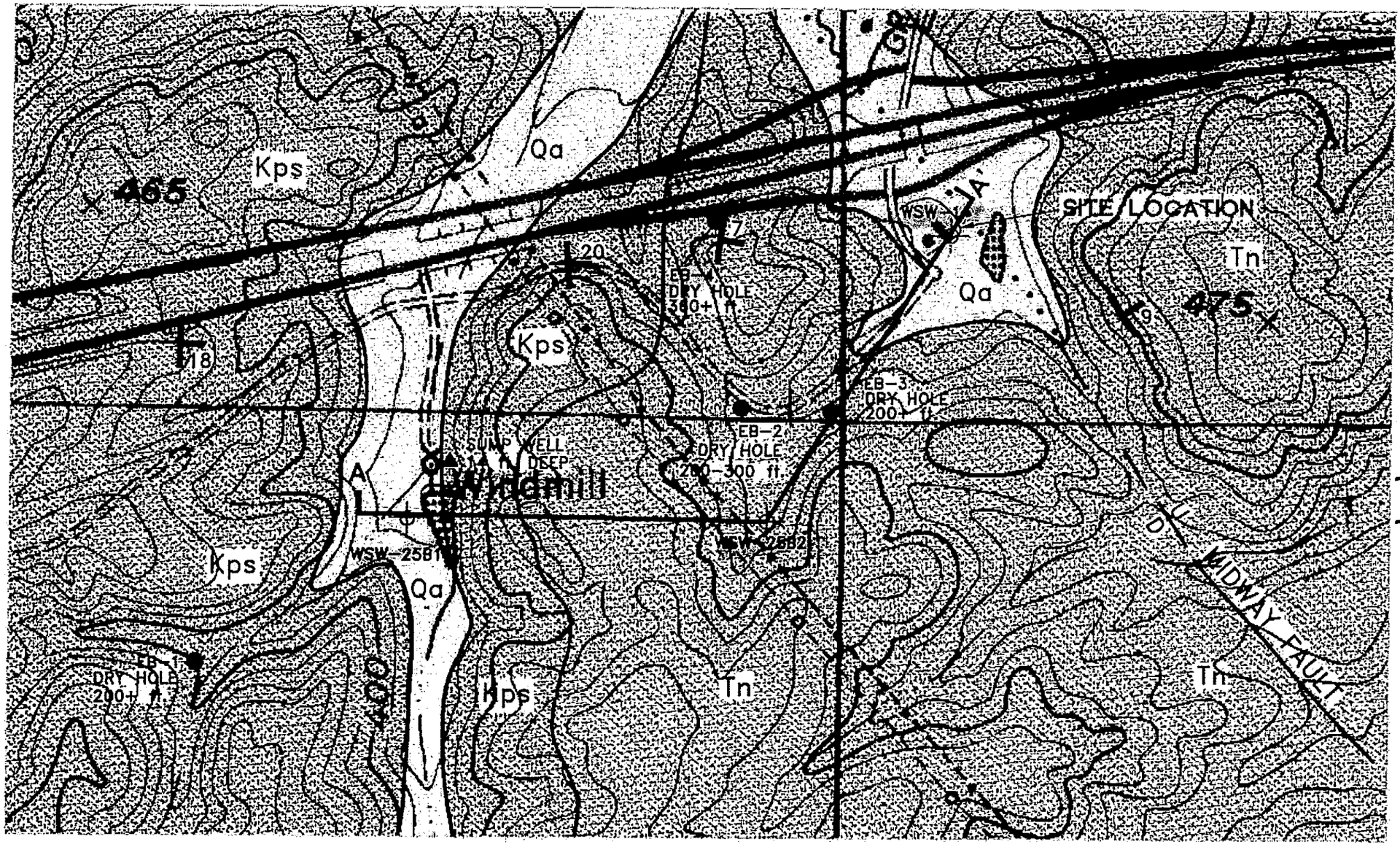
CLIENT: CHEVRON
DATE DRILLED: 10-24, 25, 27-95
LOCATION: Grant Line Road
HOLE DIAMETER: 6.5"
HOLE DEPTH: 40'
WELL DIAMETER: 2"
WELL DEPTH: 40'
CASING STICKUP: NA



MOISTURE CONTENT	PID	PENETRATION (BLOWS/FT)	DEPTH (FEET)	RECOVERY	SAMPLE INTERVAL	GRAPHIC	SOIL TYPE	LITHOLOGY / REMARKS
			2				SS	SANDSTONE (Neroly Formation): dark gray; 15% fines; 85% fine to medium subangular sand; weathered feldspars; massive; weakly oxidized; well sorted; no product odor.
			4					
Dp	0		6					
			8					
Dp	0		10					@10': dark bluish gray to black; no product odor.
			12					
			14					
Dp	0		16					
			18					@17': light gray; 85% fine to medium sand; 15% coarse sand; subrounded to subangular; weakly altered feldspars; massive; very hard; no product odor.
Dp	0		20					
			22				Slst	SANDY SILTSTONE: pinkish gray to brown; fine sandy texture; occasional mineral grain solution cavities; massive; manganese oxide common; moderate hardness; no product odor.
Mst	0		24					
			26					
			28					
Wt	0		30				SS	CONGLOMERATIC SANDSTONE (Neroly Formation): grayish brown; 10% fines; 15% fine to medium sand; 75% rounded pebbles to 2" diameter; minor iron oxide staining around pebble edges; hard; no product odor.
			32					
Wt	0		34					@30-33': rounded pebbles to 2" diameter recovered; no sand matrix.
			36					@33-40': conglomeratic sandstone; 10% fines; 15% medium sand; 75% rounded pebbles to 4" diameter; pebbles as volcanics and andesite common; matrix is strongly oxidized; hard; no product odor.
			38					
			40					BOTTOM OF BORING AT 40'
			42					
			44					

APPENDIX D

RRM GEOLOGIC MAP



Ref. AA51/GEOLOGY.DWG
Topo: USGS 7.5 Minute Quadrangle Map Thiele: Midway, 1980
Geology: USGS open file report 80-535 by Thomas W. Dibblee Jr., 1980

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RRM
engineering contracting firm

GEOLOGIC MAP

FORMER CHEVRON STATION 9-7127
Grant Line Road at Interstate 580
Tracy, California

FIGURE: 3
PROJECT: AA51