Chevron

Thomas K. Bauhs
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January 11, 2008
(date)

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

Re: Chevron Facility # 9-6991

Address: 2920 Castro Valley Boulevard, Castro Valley, California

I have reviewed the attached report titled Site Conceptual Model and Investigation Work Plan and dated January 11, 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,

Thomas K. Bauhs
Project Manager

Enclosure: Report

CONESTOGA-ROVERS
& ASSOCIATES

2000 Opportunity Dr, Suite 110, Roseville, California 95678
Telephone: 916-677-3407, ext. 100 Facsimile: 916-677-3687
www.CRAworld.com

January 11, 2008

Ms. Donna Drogos
Alameda County Health Care Services Agency (ACHCSA)
Department of Environmental Health
1131 Harbor Bay Parkway, Suite 250
Alameda, California 94502

Re: **Site Conceptual Model and Investigation Work Plan**
Chevron Station #9-6991
2920 Castro Valley Blvd
Castro Valley, California

Dear Ms. Drogos:

On behalf of Chevron Environmental Management Company (Chevron), Conestoga-Rovers and Associates (CRA) has prepared this Site Conceptual Model (SCM) and investigation work plan for the site referenced above. In a letter dated August 8, 2006, The ACHCSA provided technical comments based on their file review of the site. This SCM was proposed in Cambria Environmental Technology's (Cambria) September 8, 2006, *Response to Technical Comments*. This SCM and work plan propose advancing two soil borings and installing one monitoring well offsite to delineate the lateral extent of the dissolved-phase hydrocarbon plume. CRA presents details of the site background, discussions of hydrocarbon distribution, and CRA's recommendations below.

SITE DESCRIPTION AND BACKGROUND

The site is located at the northeast corner of Castro Valley Boulevard and Anita Avenue in a commercial area of Castro Valley, California (Figures 1 and 2). The site elevation is approximately 170 feet (ft) above mean sea level and the topography slopes gently southward toward South Reservoir, a distance of approximately 3,500 ft. The nearest surface water is an unnamed intermittent creek approximately 1,100 ft west of the site. The underground storage tanks (USTs) were replaced in 1983, when Chevron also discontinued diesel fuel sales at the site. The service station was remodeled into its current configuration in 1990.

The site is located within the Castro Valley groundwater basin in a valley between ridges of the Diablo Range. The unconfined water-bearing zone lies within unconsolidated alluvial sediments and exhibits a generally southwestward flow direction toward San Francisco Bay. These water-bearing sediments overlie the sedimentary Chico Formation, considered a non-water-producing formation based on its historically poor groundwater yields.

Current site features consist of a station building, three 10,000-gallon double-walled fiberglass USTs, two dispenser islands, and associated piping (Figure 2). The former used-oil UST was located northwest of the current station building and the former gasoline UST was located at the northern end of the same excavation as the existing USTs. The former dispenser islands were located south of the station building.

PREVIOUS ENVIRONMENTAL ACTIVITIES

1983, UST Replacement: According to Chevron records, all USTs were replaced in 1983, when storage and retail of diesel fuel was also terminated. No environmental assessment was conducted.

1990, Tank Removal/Station Remodel: In September 1990, Groundwater Technology, Inc. (GTI) observed the removal of one 1,000-gallon used-oil UST and one 6,000-gallon unleaded gasoline UST from the site. The three remaining USTs were left in place. Product piping was also removed and replaced. Chevron records indicate that approximately 700 cubic yards of impacted soil were excavated during tank removal. Soil samples collected beneath the product lines and USTs contained 63 milligrams per kilogram (mg/kg) total petroleum hydrocarbons as gasoline (TPHg), 140 mg/kg TPH as diesel (TPHd), and 12 mg/kg total oil and grease (TOG). Grab water samples collected from the used oil and fuel UST excavations contained up to 54,000 micrograms per liter (µg/l) TPHg and 6,200 µg/l benzene. Groundwater from the used-oil UST excavation contained 1,400 µg/l TPHg. Details are available GTI's December 1990 *Summary Tank Excavation Report.*

1991, Well Installation: In September 1991, Groundwater Technology Inc. (GTI) installed ¾-inch diameter wells MW-1, MW-2, and MW-3. No TPHg was detected in the soil samples. Initial groundwater samples contained TPHg concentrations ranging from 81 to 230 µg/l and benzene from 1.9 to 45 µg/l. Details are available in GTI's December 1992 *Environmental Assessment Report.* A summary of soil boring and well construction details is provided in Table 1.

1992, Well Installation: In September and October 1992, GTI installed 2-inch diameter wells MW-4, MW-5, and MW-6 to further define the extent of hydrocarbons in soil and groundwater beneath the site. No TPHg, benzene, or ethylbenzene were detected in the soil samples. TPHd was detected at 5.0 mg/kg in MW-6 at 5.0 fbg. MW-6 was installed across Castro Valley Boulevard and downgradient of the site approximately 180 feet away. Initial groundwater samples contained maximum concentrations of 600 µg/l TPHg and 22 µg/l benzene in MW-6. Based on this data, it was concluded that impacted groundwater in the vicinity of MW-6 may have been from an offsite source as concentrations in this well were higher than all onsite wells at the time. Details are available GTI's December 1992 *Environmental Assessment Report.*

1993, Offsite Source Investigation: In March 1993 GTI reviewed public project files of the RWQCB and Alameda County Health Agency (ACHA) and reviewed Castro Valley Sanitary District maps to determine possible sources of hydrocarbons detected in offsite well MW-6. The former service station site at 2896 Castro Valley Boulevard was determined to be a possible source, as was the 36-inch diameter storm drain located adjacent to MW-6. Details are available in Weiss's December 20, 1994 *Comprehensive Site Evaluation and Proposed Future Action Plan* report.

1995, Well Installation: Well MW-7 was installed in August 1995 to further assess soil and groundwater conditions adjacent to the former pump islands and existing USTs. Soil samples collected from MW-7 contained 3.7 mg/kg TPHg at approximately 12 fbg. No benzene was detected in soil. Initial groundwater samples collected from MW-7 contained 220 µg/l TPHg, 1,400 µg/l TPHd, and 0.79 µg/l benzene. Details are available Gettler-Ryan, Inc.'s (G-R) October 1995 *Well Installation Report.*

2002, Utility Trench Investigation: In March 2002, Delta Environmental Consultants, Inc. (Delta) hand augured soil borings SB-1 through SB-6, which were advanced onsite and offsite in the vicinity of adjacent utility trenches. This investigation was requested by the ACHA to determine if utility trenches were providing conduits for hydrocarbon migration. Soil samples collected from SB-5 contained 250 mg/kg TPHg and 53 mg/kg TPHd, and no benzene was detected. No hydrocarbons were detected in soil samples collected from the other borings. Grab-groundwater samples were collected from SB2, SB-3, and SB-6. SB-3, located immediately downgradient of the source area, contained 990 µg/l TPHg, 0.59 µg/l benzene, and 960 µg/l TPHd. SB-2 contained 200 µg/l TPHg and SB-6 contained 8.5 µg/l MTBE. Groundwater was not collected from SB-5 due to the presence of NAPL. However, Delta's boring log for SB-5 indicated only a sheen was present on soil collected at approximately 13 fbg within the saturated zone. The investigation concluded that utility trenches might be creating a barrier for dissolved hydrocarbon migration south and west of the site, resulting in elevated concentrations in the southwest corner of the property near soil borings SB-3 and SB-5. Details are available Delta's April 2002 *Soil Boring And Utility Trench Investigation Report.*

2003, Site Assessment: On July 29, 2003, Cambria Environmental Technology, Inc. (Cambria) advanced soil boring SB-7 to approximately 20 fbg to investigate hydrocarbons in soil and groundwater observed in boring SB-5. Maximum concentrations of 430 mg/kg TPHg (13 fbg) and 110 mg/kg TPHd (11.5 fbg) were detected in soil. No TPHg and TPHd were detected in soil samples collected at depth (19.5 fbg). A grab-groundwater sample collected from the boring contained 0.9 µg/l MTBE, and did not contain TPHg, TPHd, or benzene.

REMEDIAL ACTIONS PERFORMED

Soil Excavation: In September 1990, GTI observed the removal of one 1,000-gallon used-oil UST and one 6,000-gallon unleaded gasoline UST from the site. The three remaining USTs were left in place. All product piping at the site was removed and replaced. Records indicate that approximately 700 cubic yards of impacted soil was excavated.

GEOLOGY AND HYDROGEOLOGY

The site is located within the Castro Valley groundwater basin in a valley between ridges of the Diablo Range. The unconfined water-bearing zone lies within unconsolidated alluvial sediments and exhibits a generally southwestward flow direction toward San Francisco Bay. These water-bearing sediments overlie the sedimentary Chico Formation, considered a non-water-producing formation based on its historically poor groundwater yields.

Sediments encountered during boring advancement and monitoring well installation included clay, silt, clayey sand, silty sand, and poorly graded gravels and sands. Depth to groundwater has ranged from 8 to 11 fbg. Groundwater flow direction is toward the southwest at gradients between 0.007 and 0.02 feet per foot. Cross sections provided as Figures 3 and 4 illustrate the geology beneath the site, the historic range of groundwater elevations, and soil and groundwater concentrations in select borings and monitoring wells. Historic boring logs are provided in Attachment B.

HYDROCARBON DISTRIBUTION IN SOIL

The lateral extent of TPHd, TPHg, benzene, and MTBE in soil has been defined to the north (waste oil UST pit), south (SB-1 through SB-3), east (MW-4), and west (MW-5). Hydrocarbons in soil are predominantly detected between 10 and 12 fbg, as shown in SB-5 and MW-7. A summary of historic soil sample analytical data is provided in Table 2.

The vertical extent of hydrocarbons is defined adjacent to the USTs and former dispenser islands, as shown by the soil samples collected from MW-2 at 10 fbg, MW-7 at 21 fbg, and MW-4 at 20 fbg. Soil samples collected from SB-5 at 10 fbg contained 53 mg/kg TPHd and 250 mg/kg TPHg. These concentrations have likely attenuated since the borings were advanced in 2002.

HYDROCARBON DISTRIBUTION IN GROUNDWATER

Groundwater beneath the site has been monitored on a quarterly basis since 1991. Groundwater analytical tables are included in Attachment C. The current monitoring network consists of wells MW-1, MW-2, MW-4, MW-6, and MW-7. Groundwater samples are analyzed for TPHd; TPHg; benzene, toluene, ethylbenzene, and total xylenes (BTEX); and MTBE. The lateral extent of TPHg, benzene, and MTBE in groundwater is defined to the north (MW-1), west (SB-6), and east/southeast (SB-1 and SB-2). The lateral extent of benzene is also defined downgradient to the southwest. The lateral extent of TPHd is defined to the west (SB-6) and southeast (SB-1), but not to the north (MW-1), south (SB-2), or southwest (MW-6). A summary of historic grab-groundwater sample analytical data is provided in Table 3. CRA proposes advancing two soil borings and installing one monitoring well south and southwest of the site to investigate the downgradient extent of TPHd, TPHg, and MTBE. Details of the proposed investigation are provided below.

The dissolved hydrocarbon plume extends downgradient to the southwest and MW-6, as shown in the isoconcentration maps provided as Figures 5 through 8. Hydrocarbons have been detected in MW-2 since monitoring began in 1992. Since 2000, maximum concentrations of 300 µg/L TPHd, 320 µg/L TPHg, and 18 µg/L MTBE have been reported in MW-2. Table A summarizes recent 2007 concentrations of the constituents of concern.

Table A
Hydrocarbons in Groundwater
September 26, 2007

Well ID and date	TPHd	TPHg	Benzene	MTBE
	(µg/L)			
MW-1 (3/26/07)	**730**	<50	**0.6**	<0.5
MW-2 (9/26/07)	**140**	<50	<0.5	**69**
MW-4 (9/26/07)	<50	<50	<0.5	**0.8**
MW-6 (9/26/07)	**84**	**180**	<0.5	**6**
MW-7 (9/26/07)	**2,200**	**670**	<0.5	**420**

Separate-Phase Hydrocarbons

Separate-phase hydrocarbons (SPH) were reported in soil and groundwater samples collected from boring SB-5 in 2002. Soil boring SB-7 was advanced in a subsequent investigation in 2003 to confirm or refute the findings in SB-5. SPH were not observed in soil and groundwater samples collected from SB-7.

Groundwater Concentration Trends

The highest hydrocarbon concentrations have historically been detected in near-source well MW-7. The highest concentrations historically detected in groundwater beneath the site were 13,000 µg/L TPHd (MW-7 in 2002), 3,200 µg/L TPHg (MW-7 in 2002), 750 µg/L benzene (MW-7 in 2000), and 20,000 µg/L MTBE (MW-2 in 1996). Currently, elevated TPHd concentrations are detected in MW-1 and MW-7, with elevated TPHg concentrations also reported in MW-7. Overall, hydrocarbon concentrations are declining over time. Trend graphs illustrating declining concentrations in the wells with notable hydrocarbon concentrations are included as Attachment D.

In MW-3, located cross-gradient of the UST pit, TPHg has decreased to concentrations below the laboratory detection limits. MTBE concentrations have decreased from over 3,000 ug/L in 2001 to 530 ug/L in 2005. The TPHg trends are similar in MW-6, where MTBE remains below 10 ug/L. Although the trend graph for MW-6 shows TPHd concentrations increasing, the trend is affected by one elevated concentration of 300 ug/L in December 2006. TPHd concentrations are stable in MW-6.

WATER SUPPLY WELL SURVEY

CRA researched Department of Water Resources (DWR) records for a water supply well survey. CRA identified five water supply wells within a 2,000-foot radius of the site. According to the DWR well logs, three wells are located at Eden Hospital approximately 2,000 feet northwest of the site, and one well is located at a private residence approximately 1,500 feet southwest of the site. A fifth well was identified to likely be within the 2,000-foot radius but the exact location could not be determined. Figure 9 illustrates the locations of four of the five wells within 2,000 feet of the site.

OFFSITE ASSESSMENT WORKPLAN

CRA recommends advancing two soil borings and installing one monitoring well to investigate the southern and southwestern lateral extent of hydrocarbons dissolved in groundwater downgradient of the site. In addition, CRA recommends destroying monitoring well MW-6, which is located in Castro Valley Boulevard and is considered unsafe to monitor and sample. Soil and groundwater samples will be collected from each boring and analyzed for COCs.

PROPOSED SCOPE OF WORK

CRA proposes properly destroying offsite monitoring well MW-6, installing one monitoring well downgradient of MW-6, and advancing two offsite soil borings. Soil and groundwater samples collected during installation of the new well and soil borings will investigate the lateral extent of hydrocarbons in groundwater southwest and south of the site. Standard operating procedures for monitoring well installations and destructions are presented in Attachment E. Details of the proposed work are discussed below.

Permits and Access Agreements: CRA will obtain well installation permits from Alameda County Public Works Agency (ACPWA) prior to the beginning of any field operations. In addition, CRA will obtain access agreements from offsite property owners whose lots are proposed for well and boring installation. If offsite access agreements cannot be secured, CRA will obtain encroachment permits from the City of Castro Valley for work within the city right-of-way. CRA will notify ACPWA at least 48 hours prior to the start of work.

Site Health and Safety Plan: CRA will prepare a site safety plan to protect onsite workers. The plan will be kept onsite at all times and signed by all site workers and visitors each day.

Underground Utility Location: CRA will notify Underground Service Alert prior to drilling to clear monitoring well and soil boring locations with utility companies. Additionally, CRA will contract a private utility line locator to ensure no utilities are in conflict with the proposed boring locations. All boring locations will be cleared to 8 fbg using an airknife vacuum truck or hand auger prior to drilling.

Soil Borings: After clearing to 8 fbg, CRA proposes advancing two soil borings and one monitoring well using an 8-inch hollow-stem auger to approximately 25 fbg and completing the borings as 2-inch groundwater monitoring wells. Actual boring and well locations may be adjusted based upon underground utility locations. Grab-groundwater samples will be collected at first encountered groundwater, expected at approximately 10 fbg, and 15 feet below first encountered groundwater. CRA's standard operating procedures for soil boring and monitoring well installation are presented in Attachment E.

Well Installation: The well will be screened from approximately 5 to 20 fbg. The actual screen interval may be modified based on the depth at which water bearing units are encountered. The wells will be constructed using 2-inch diameter, 0.010 slotted screen, schedule 40 PVC casing with #2/16 Monterey Sand filter pack. The sand will be placed to approximately one foot above the top of well screen, and a one-foot thick bentonite seal will be placed on top of the sand. Cement grout will be placed from the top of bentonite to ground surface for the well seal.

Chemical Analyses: Selected soil and groundwater samples will be analyzed at a standard turn around time for:

- Gasoline-range organics (GRO) and diesel-range organics (GRO) by EPA method 8015 modified; and,

- Benzene, toluene, ethylbenzene, total xylenes (BTEX), MTBE, tert-butyl alcohol (TBA), di-isopropyl ether (DIPE), ethyl tert-butyl ether (ETBE), and tert-amyl methyl ether (TAME) by EPA Method 8260B.

Well Destruction: Monitoring well MW-6 will be properly destroyed by pressure grouting Portland I/II cement into the well casing. CRA's standard operating procedures for well destruction are presented as Attachment E.

Well Development and Sampling: The wells will be developed using agitation and evacuation after the well has been installed. Gettler-Ryan Inc. of Dublin, California will develop and sample the wells no sooner than 72 hours after installation.

Well Elevation Survey: The well locations and top of casing will be surveyed to mean sea level by a California-licensed land surveyor.

Soil and Water Disposal/Recycling: Soil and water produced during field activities will be temporarily stored onsite. Soil cuttings will either be stockpiled on plastic and covered with plastic or placed in 55-gallon drums and stored onsite. Rinseate and development water will be stored in drums. Following review of laboratory analytical results, the soil and water will be transported to a Chevron-approved facility for disposal/recycling.

GeoTracker Upload: Once all of the necessary data is received, the data will be uploaded to the State Water Resources Control Board GeoTracker databases as required in sections 2729 and 2729.1 of the California Code of Regulations for USTs.

Reporting: After all analytical results are received; Cambria will prepare a subsurface investigation report that, at a minimum, will contain:

- A summary of the site background and history,
- Descriptions of the monitoring well installation, destruction, and soil and groundwater sampling methods,
- Boring logs,

- DWR well completion reports,
- Tabulated soil analytical results,
- A figure illustrating well and boring locations,
- Analytical reports and chain-of-custody forms,
- Soil and groundwater disposal methods,
- A discussion of the hydrocarbons in soil and groundwater, and
- CRA's conclusions and recommendations.

CONCLUSIONS AND RECOMMENDATIONS

The lateral extent of hydrocarbons in soil has been defined surrounding the site. The lateral extent of hydrocarbons in groundwater is defined to the north, west, east, and southeast. The lateral extent of TPHd. TPHg, and MTBE is not defined to the south and southwest. The hydrocarbon plume remains stable beneath the site. Quarterly groundwater monitoring and sampling is ongoing in wells MW-2, MW-4, MW-6 and MW-7. MW-1 is sampled annually.

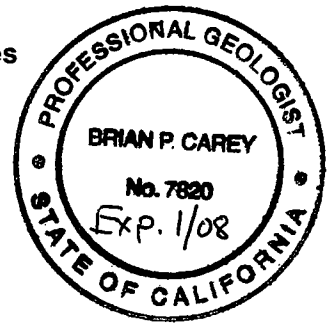
An assessment of subsurface utilities in adjacent roadways indicates that these utility trenches may be acting as preferential pathways for the transport of dissolved hydrocarbons. Figure 2 illustrates the aerial location of the utilities. The cross sections in Figures 3 and 4 illustrate the depth of utilities in relation to historic groundwater elevations.

CRA recommends advancing two soil borings and one monitoring well to investigate the southern and southwestern lateral extent of hydrocarbons dissolved in groundwater downgradient of the site. CRA also proposes destroying well MW-6, which is currently unsafe to monitor and sample. Low concentrations of TPHd, TPHg, and MTBE are consistently detected in MW-6, the well farthest downgradient. Soil and groundwater samples will be collected from each boring and analyzed for COCs. Upon concurrence from the ACHCSA, or 60 days following submittal of this report, CRA will begin work on the proposed soil borings and monitoring well replacement.

CLOSING

If you have any questions or comments, please contact Brian Carey at (916) 677-3407 extension 106, or at bcarey@craworld.com.

Sincerely,
Conestoga-Rovers & Associates



Brian P. Carey, P.G.
Senior Project Geologist

Figures:
1 - Vicinity Map
2 - Site Plan
3 – Geologic Cross Section A-A'
4 – Geologic Cross Section B-B'
5 – TPHd Isoconcentration Map – September 26, 2007
6 – TPHg Isoconcentration Map – September 26, 2007
7 – Benzene Isoconcentration Map – September 26, 2007
8 – MTBE Isoconcentration Map – September 26, 2007
9 – Well Survey Location Map

Tables:
1 – Well Construction Details
2 – Soil Analytical Data
3 – Grab-Groundwater Analytical Data

Attachments:
A – Regulatory Correspondence
B – Historical Boring Logs
C – Historical Groundwater Analytical Data
D – Hydrocarbon Concentration Trend Graphs
E – CRA's Standard Operating Procedures

cc: Ms. Stacie Hartung-Frerichs, Chevron Environmental Management Company, 6001 Bollinger Canyon Road, San Ramon, CA 94583

Conestoga-Rovers & Associates file copy

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SOURCE: TOPO! MAPS.

figure 1

VICINITY MAP
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

CRA

LEGEND

MW-2 ● MONITORING WELL LOCATION
SB-5 ■ SOIL BORING LOCATION
STM STORM DRAIN
W WATER LINE
SAN SANITARY SEWER
PROPOSED SOIL BORING
PROPOSED MONITORING WELL LOCATION

FORMER SERVICE
STATION SITE
2896 CASTRO VALLEY BLVD.

N

0 10 30ft

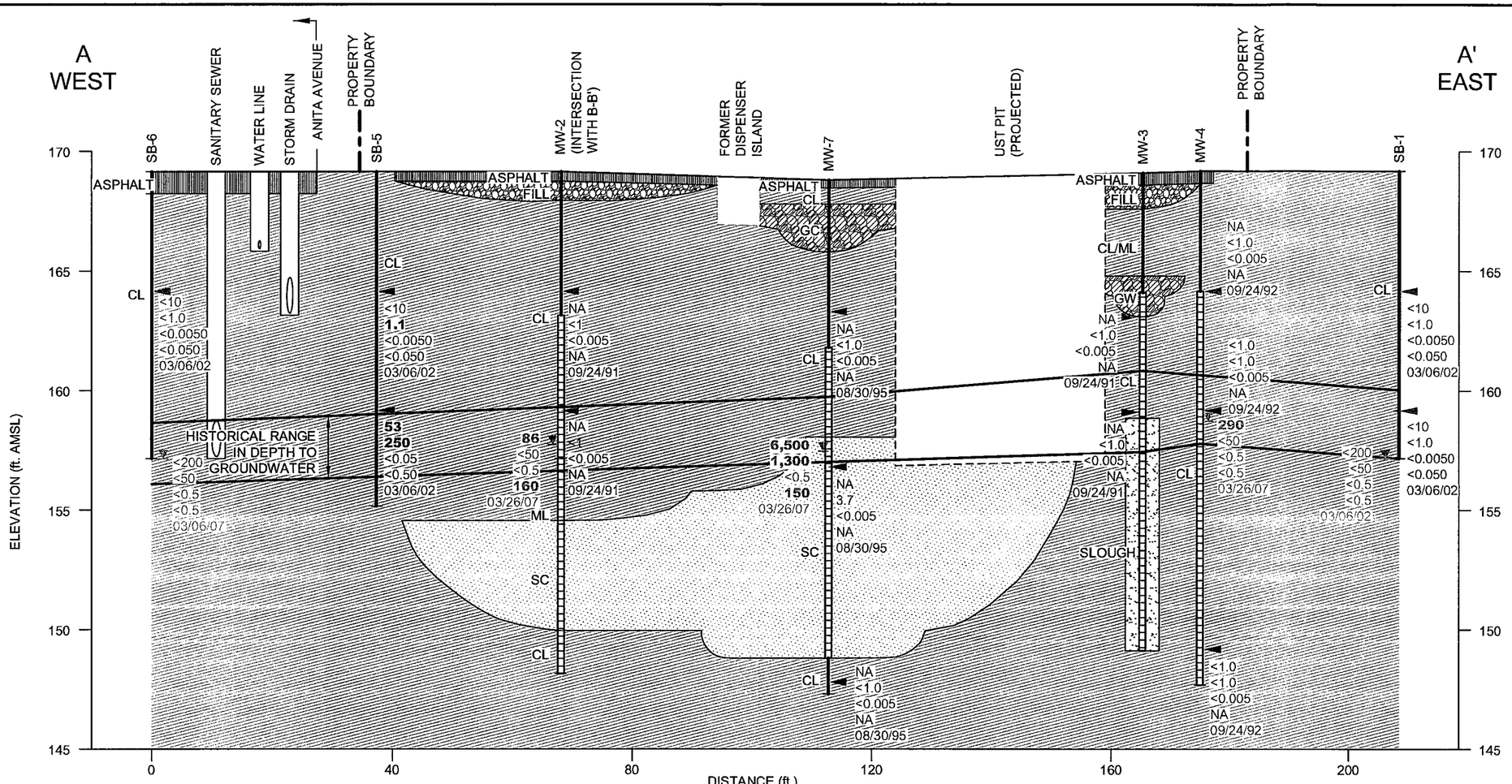
PLANTER
FORMER
W/O TANK
MW-1
MW-5
ANITA AVENUE
SIDEWALK
DISPENSER
ISLAND
BUILDING
DISPENSER
ISLAND
MW-2
FORMER
DISPENSER
ISLANDS
UST
PAD
SB-6
SB-5
SB-7
PLANTER
MW-7
MW-4
MW-3
PLANTER
SB-3
SIDEWALK
SB-1
CASTRO VALLEY BOULEVARD
MEDIAN
SB-4
MEDIAN
SB-2
MW-6
SIDEWALK
PARKING LOT
BUILDING

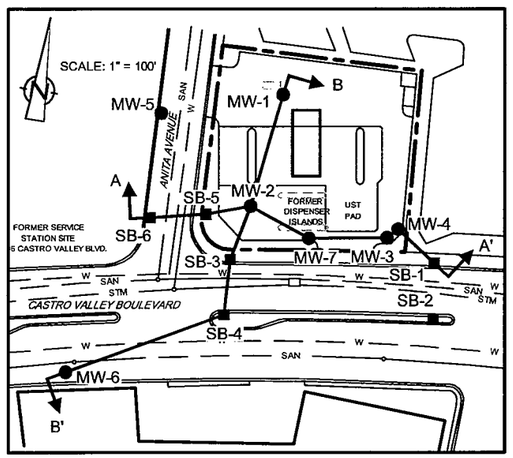
CRA MW-7

figure 2

SITE PLAN
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

611633-204(PRES001)GN-WA002 JAN 07/2008





LEGEND

- WELL DESIGNATION
- GROUND SURFACE
- OBSERVATION WELL INSTALLATION
- STRATIGRAPHIC BOUNDARY
- CL — TYPICAL SOIL CLASSIFICATION
- SCREENED INTERVAL
- BOTTOM OF BORING
- TPHd / TPHg / BENZENE / MTBE / DATE — APPROXIMATE SAMPLE LOCATION
- HYDROCARBON CONCENTRATIONS IN SOIL, IN PARTS PER MILLION
- DEPTH OF GROUNDWATER - 03/26/07
- HYDROCARBON CONCENTRATIONS IN GROUNDWATER, IN PARTS PER BILLION

SCALE: HORZ. 1"=20'
VERT. 1"=5'

- *SP* - POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
- *CL/ML* - FINE GRAINED CLAYS AND SILTS
- *AS* - ASPHALT
- *FILL*
- *GC/GW* - CLAYEY GRAVELS, WELL GRADED GRAVELS
- *SC* - CLAYEY SAND

figure 3

GEOLOGIC CROSS-SECTION A-A'
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

B NORTH

B NORTH

MW-1 | DISPENSER ISLAND | MW-2 | PROPERTY BOUNDARY | SB-3 | CASTRO VALLEY BLVD. | WATER LINE | SANITARY SEWER | STORM DRAIN | MEDIAN | SB-4 | MEDIAN | WATER LINE | SANITARY SEWER | MW-6

ELEVATION (ft. AMSL)

170 165 160 155 150 145 140

ASPHALT
GC
SC
NA
<1.0
SP <0.005
NA
09/24/91
730
<50
0.6
GP <0.5
03/26/07
CL
GC
CL
GC
CL

ASPHALT
FILL
CL
NA
<1.0
<0.005
NA
09/24/91
SS
<50
<0.5
160
03/26/07
ML
SC
CL

CL
<10
<1.0
<0.005
<0.05
03/06/02
NA
<1.0
<0.005
NA
09/24/91

CONC
ASPHALT
CONC
CL

HISTORICAL RANGE IN DEPTH TO GROUNDWATER

<1.0
5
<0.005
NA
09/24/92
CL
<1.0
<1.0
<0.005
NA
09/24/92

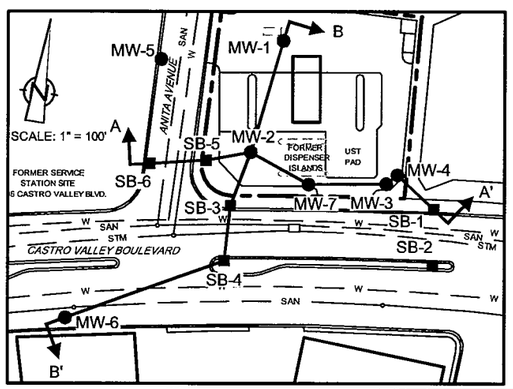
<1.0
300
260
<0.5
3
12/28/06

SM
CL
SC

0

DISTANCE (ft.)

SCALE: HORZ. 1"=20'
VERT. 1"=5'



LEGEND

MW-2 — WELL DESIGNATION
GROUND SURFACE
OBSERVATION WELL INSTALLATION
STRATIGRAPHIC BOUNDARY
CL — TYPICAL SOIL CLASSIFICATION
SCREENED INTERVAL
BOTTOM OF BORING

TPHd
TPHg
BENZENE
MTBE
DATE — APPROXIMATE SAMPLE LOCATION
HYDROCARBON CONCENTRATIONS IN SOIL, IN PARTS PER MILLION

TPHd
TPHg
BENZENE
MTBE
DATE — DEPTH OF GROUNDWATER - 03/26/07
HYDROCARBON CONCENTRATIONS IN GROUNDWATER, IN PARTS PER BILLION

SP - POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
CL/ML - FINE GRAINED CLAYS AND SILTS
AS - ASPHALT
FILL
SM/SC - SILTY SANDS, CLAYEY SANDS
GC/GP - CLAYEY GRAVELS, POORLY GRADED GRAVELS

figure 4

GEOLOGIC CROSS-SECTION B-B'
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

611633-204(PRES001)GN-WA007 JAN 07/2008

LEGEND

MW-2 ● MONITORING WELL LOCATION

SB-5 ■ SOIL BORING LOCATION

STORM DRAIN

WATER LINE

SANITARY SEWER

◉ PROPOSED SOIL BORING

◉ PROPOSED MONITORING WELL LOCATION

(730) TPHd CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)

100 TPHd CONCENTRATION CONTOUR, DASHED WHERE INFERRED

(NM) NOT MEASURED

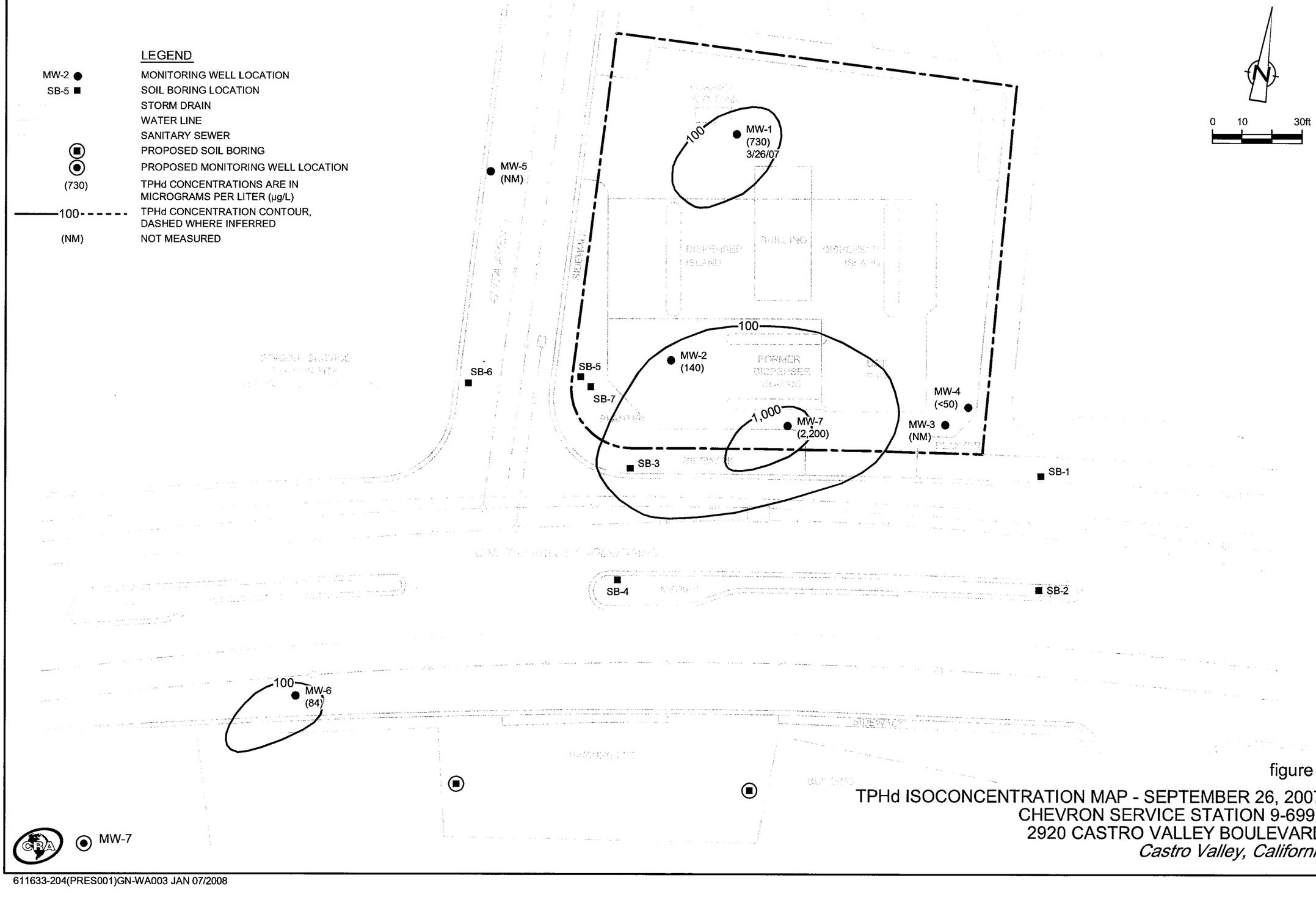


figure 5

TPHd ISOCONCENTRATION MAP - SEPTEMBER 26, 2007
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

611633-204(PRES001)GN-WA003 JAN 07/2008

LEGEND

MW-2 ●	MONITORING WELL LOCATION
SB-5 ■	SOIL BORING LOCATION
	STORM DRAIN
	WATER LINE
	SANITARY SEWER
◉	PROPOSED SOIL BORING
◉	PROPOSED MONITORING WELL LOCATION
(1,300)	TPHg CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)
100	TPHg CONCENTRATION CONTOUR, DASHED WHERE INFERRED
(NM)	NOT MEASURED

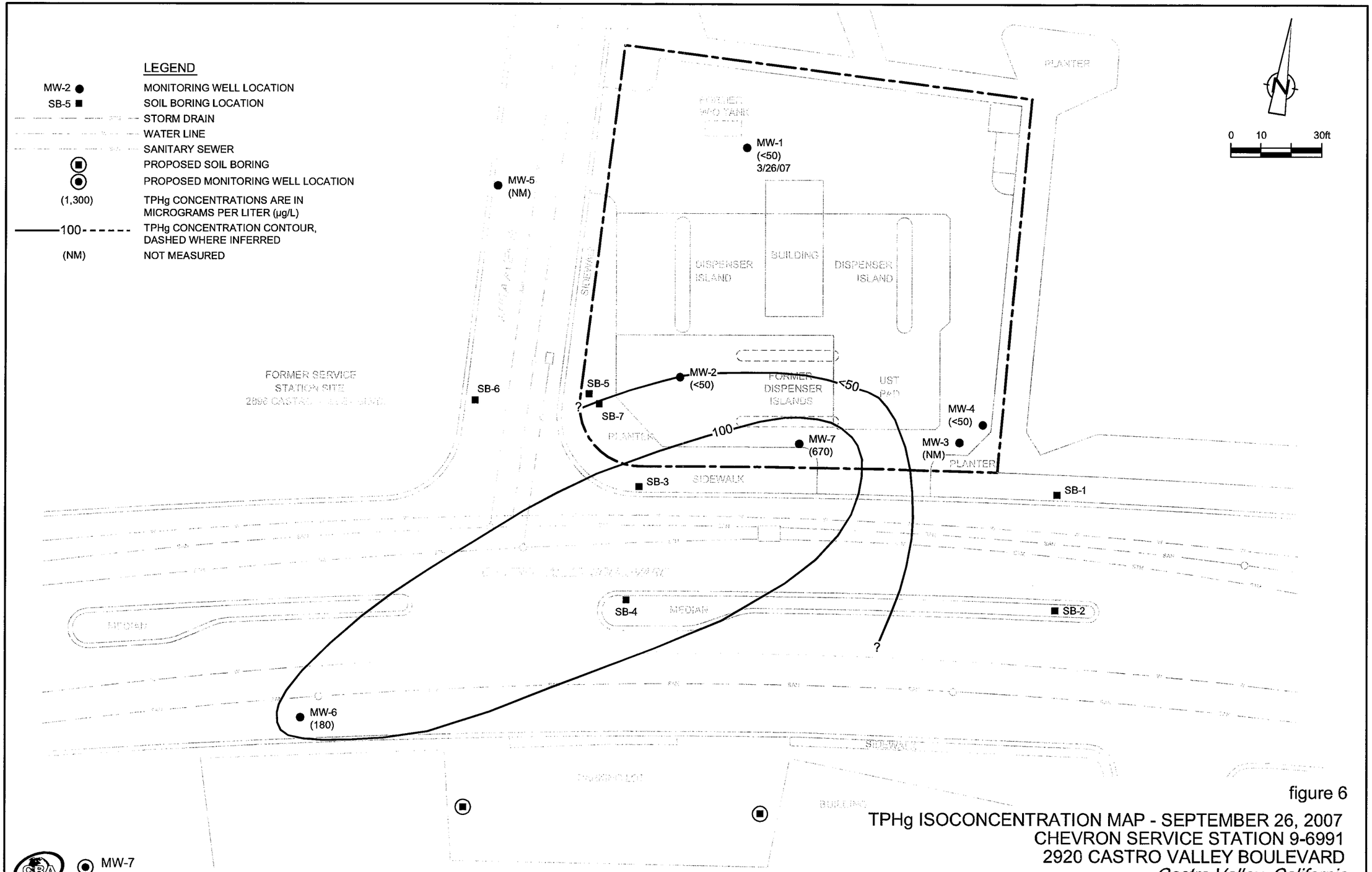


figure 6

TPHg ISOCONCENTRATION MAP - SEPTEMBER 26, 2007
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

611633-204(PRES001)GN-WA004 JAN 07/2008

LEGEND

MW-2 ● MONITORING WELL LOCATION

SB-5 ■ SOIL BORING LOCATION

STORM DRAIN

WATER LINE

SANITARY SEWER

PROPOSED SOIL BORING

PROPOSED MONITORING WELL LOCATION

(0.6) BENZENE CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)

(NM) NOT MEASURED

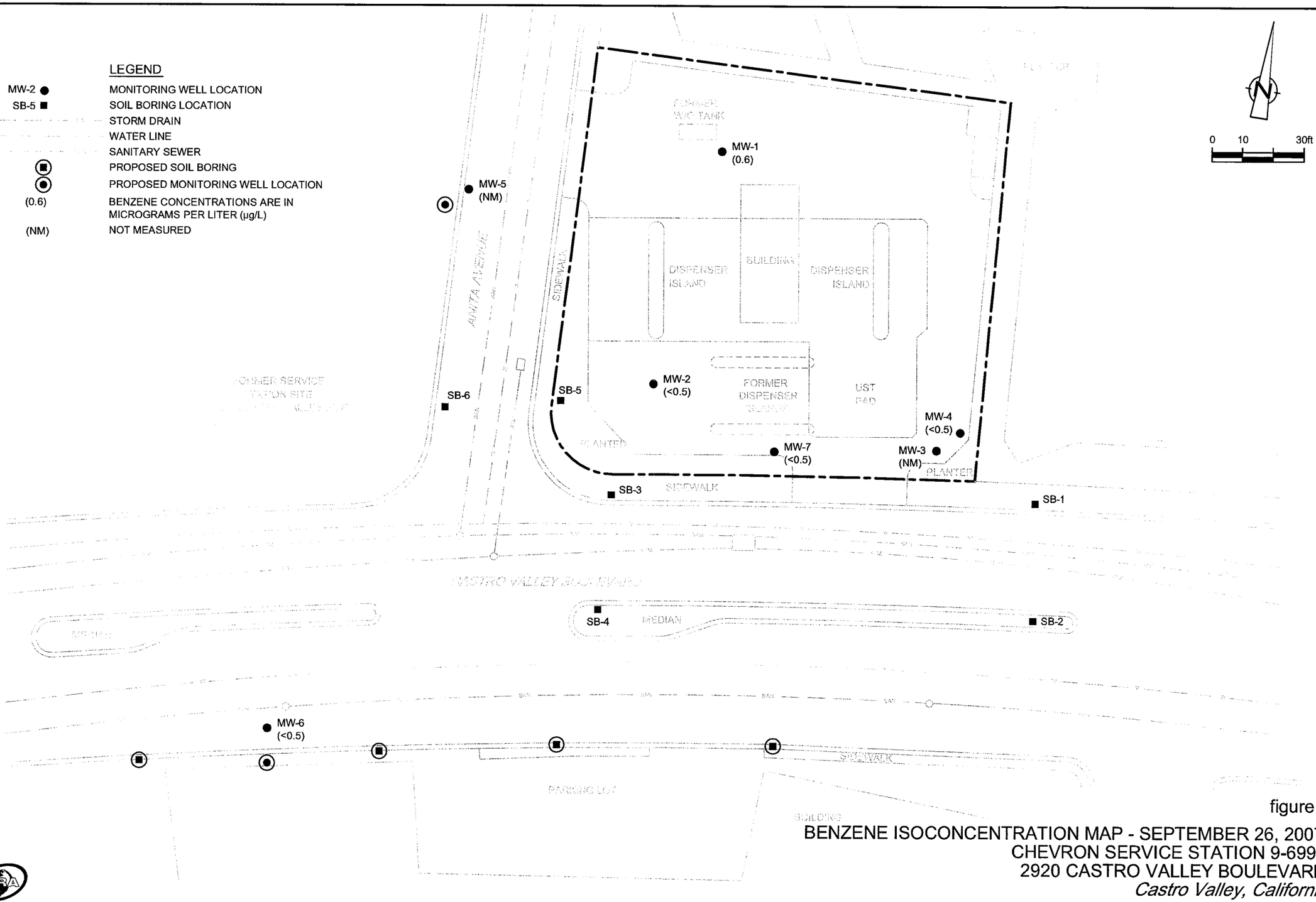


figure 7

BENZENE ISOCONCENTRATION MAP - SEPTEMBER 26, 2007
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

LEGEND

MW-2 ● MONITORING WELL LOCATION

SB-5 ■ SOIL BORING LOCATION

STORM DRAIN

WATER LINE

SANITARY SEWER

PROPOSED SOIL BORING

PROPOSED MONITORING WELL LOCATION

(160) MTBE CONCENTRATIONS ARE IN MICROGRAMS PER LITER (µg/L)

100 MTBE CONCENTRATION CONTOUR, DASHED WHERE INFERRED

(NM) NOT MEASURED

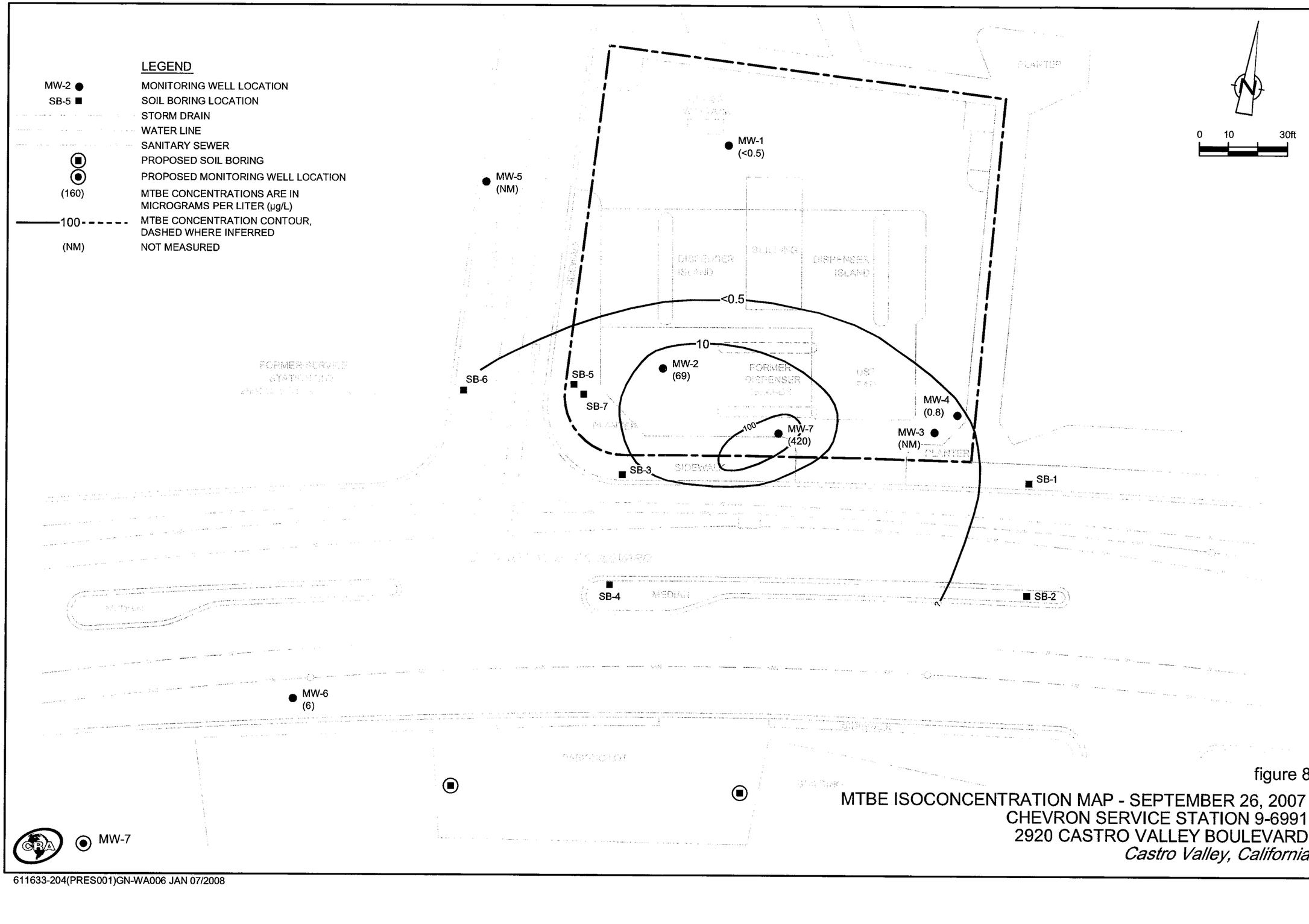
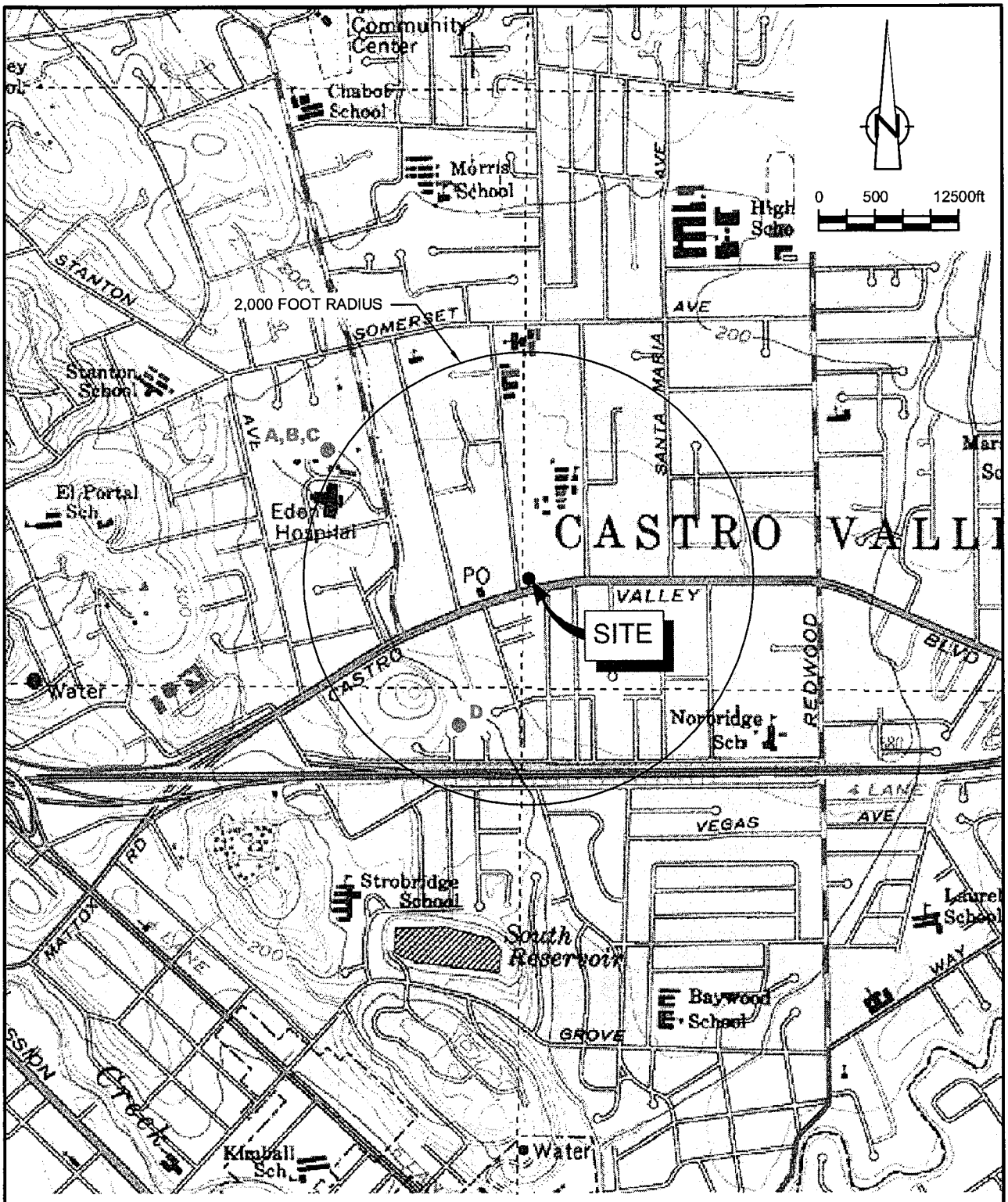


figure 8

MTBE ISOCONCENTRATION MAP - SEPTEMBER 26, 2007
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

CRA ◉ MW-7

611633-204(PRES001)GN-WA006 JAN 07/2008



SOURCE: TOPO! MAPS.

figure 9

LEGEND

● SENSITIVE RECEPTOR

SENSITIVE RECEPTOR SURVEY MAP
CHEVRON SERVICE STATION 9-6991
2920 CASTRO VALLEY BOULEVARD
Castro Valley, California

CRA

611633-204(PRES001)GN-WA008 JAN 09/2008

Table 1

Well Construction Details

Chevron Station #9-6991, 2920 Castro Valley Boulevard, Castro Valley, CA

Boring ID	Drill Date	Well Depth (fbg)	Well Diameter (inches)	Screen Top (fbg)	Screen Bottom (fbg)	Screen Length (feet)	Comments
Soil Borings							
SB-1	03/06/02	12	--	--	--	--	
SB-2	03/06/02	16	--	--	--	--	
SB-3	03/06/02	6	--	--	--	--	
SB-4	03/06/02	3.5	--	--	--	--	
SB-5	03/06/02	14	--	--	--	--	
SB-6	03/06/02	12	--	--	--	--	
SB-7	07/29/03	20	--	--	--	--	
Monitoring Wells							
MW-1	09/24/91	21	3/4	3	18	15	
MW-2	09/24/91	21	3/4	6	21	15	
MW-3	09/24/91	20	3/4	5	20	15	
MW-4	09/25/92	21.5	2	5	20	15	
MW-5	09/25/92	21.5	2	5	20	15	
MW-6	09/25/92	26.5	2	9	24	15	
MW-7	08/30/95	20	2	?	?	?	

fbg = feet below grade

Table 2

Soil Analytical Data

Chevron Station #9-6991, 2920 Castro Valley Blvd., Castro Valley, CA

Sample ID	Sample Depth (ft)	Sample Date	TPHd	TPHg	Benzene	Toluene	Ethylenzene	Xylene	MTBE	TOG
			Concentrations reported in milligrams per kilogram mg/kg = parts per million							
Waste Oil UST										
WOM	11	09/11/90	--	**15**	**26**	**7.5**	**6.4**	**22**	--	**2,000**
WOW15	15	09/18/90	<1	**26**	<0.005	<0.005	<0.005	<0.015	--	**780**
WOE15	15	09/18/90	ND	ND	<0.005	<0.005	<0.005	<0.015	--	**160**
WOM15	15	09/18/90	ND	**13**	<0.005	<0.005	<0.005	<0.015	--	**480**
AW	8	09/11/90	--	--	--	--	--	--	--	**830**
AE	8	09/11/90	--	--	--	--	--	--	--	**1,400**
UST										
A-1	12	09/20/90	--	--	--	--	--	--	--	**710**
2A	12	09/20/90	--	--	--	--	--	--	--	**1,500**
3A	12	09/20/90	--	--	--	--	--	--	--	**510**
6A	12	09/20/90	--	--	--	--	--	--	--	**3,200**
4A	12	09/20/90	--	--	--	--	--	--	--	**39**
5A	12	09/20/90	--	--	--	--	--	--	--	**68**
PH1-6	6	09/20/90	--	--	--	--	--	--	--	**42**
PH1-10	10	09/20/90	--	--	--	--	--	--	--	**480**
PH2-6	6	09/20/90	--	--	--	--	--	--	--	**58**
PH2-10	10	09/20/90	--	--	--	--	--	--	--	**38**
PH3-6	6	09/20/90	--	--	--	--	--	--	--	**22**
PH3-10	10	09/20/90	--	--	--	--	--	--	--	**35**
E-1-10	10	09/21/90	<0.005	--	<0.005	<0.005	<0.005	<0.015	--	**11**
E-2-10	10	09/21/90	<0.005	--	<0.005	<0.005	<0.005	<0.015	--	**19**
E-3-1-10	10	09/21/90	<0.005	--	<0.005	<0.005	<0.005	<0.015	--	**14**
E-3-2-10	10	09/21/90	<0.005	--	<0.005	<0.005	<0.005	<0.015	--	**12**
E-4-10	10	09/21/90	<0.005	--	<0.005	<0.005	<0.005	<0.015	--	**14**
E-5-10	10	09/21/90	ND	<0.005	<0.005	<0.005	<0.005	<0.015	--	**6**
E-6-10	10	09/21/90	ND	<0.005	<0.005	<0.005	<0.005	<0.015	--	**19**
PITW	11	09/11/90	--	ND	<0.005	<0.005	<0.005	<0.005	--	--
PITNC	9	09/11/90	--	**63**	**0.05**	**0.01**	**0.52**	**2**	--	--
PITE	11	09/11/90	--	**1**	<0.005	<0.005	<0.005	<0.005	--	--

Table 2

Soil Analytical Data

Chevron Station #9-6991, 2920 Castro Valley Blvd., Castro Valley, CA

Sample ID	Sample Depth (ft)	Sample Date	TPHd	TPHg	Benzene	Toluene	Ethylenzene	Xylene	MTBE	TOG
			Concentrations reported in milligrams per kilogram mg/kg = parts per million							
Dipsensers and Product Lines										
TNW	3	09/11/90	--	**5**	**0.24**	<0.005	**0.09**	**0.24**	--	--
TSW	3	09/11/90	--	**52**	**0.16**	<0.005	**0.57**	**0.53**	--	--
TNE	3	09/11/90	ND	--	--	--	--	--	--	--
TSE	3	09/11/90	**1,000**	--	--	--	--	--	--	--
TE	5	09/18/90	**150**	--	**0.01**	**0.01**	**0.01**	**0.02**	--	--
TW	5	09/18/90	--	**21**	**0.1**	**0.01**	**0.02**	**0.1**	--	--
PT-N7	7	09/21/00	**140**	<0.005	<0.005	<0.005	<0.005	<0.015	--	--
PT-S7	7	09/21/00	**58**	<0.005	<0.005	<0.005	<0.005	<0.015	--	--
PTS-1-7	7	09/21/00	ND	<0.005	<0.005	<0.005	<0.005	<0.015	--	--
PTS-2-7	7	09/21/00	ND	<0.005	<0.005	<0.005	<0.005	<0.015	--	--
Soil Borings										
SB-1	5	03/06/02	<10.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<0.050	--
	10	03/06/02	<10.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<0.050	--
SB-2	5.5	03/06/02	<10.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<0.050	--
SB-3	5.5	03/06/02	<10.0	<1.0	<0.0050	<0.0050	<0.0050	<0.015	<0.050	--
SB-5	5	03/06/02	<10.0	**1.1**	<0.0050	<0.0050	<0.0050	<0.015	<0.050	--
	10	03/06/02	**53**	**250**	<0.05	<0.20	<0.50	**0.99**	<0.50	--
SB-6	5	03/06/02	<1.0	<10.0	<0.0050	<0.0050	<0.0050	<0.015	<0.050	--
SB-7	8	07/29/03	**36**	**25**	<0.001	<0.001	<0.001	<0.001	<0.001	--
	11.5	07/29/03	**110**	**180**	<0.001	<0.001	**0.018**	**0.001**	<0.001	--
	13	07/29/03	**60**	**430**	<0.005	<0.005	**0.044**	**0.005**	<0.005	--
	15.5	07/29/03	<10	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001	--
	17	07/29/03	<10	<1.0	<0.001	<0.001	<0.001	<0.001	<0.001	--
	19.5	07/29/03	<10	<1.0	<0.001	<0.001	<0.001	<0.001	**0.001**	--

Table 2

Soil Analytical Data

Chevron Station #9-6991, 2920 Castro Valley Blvd., Castro Valley, CA

Sample ID	Sample Depth (ft)	Sample Date	TPHd	TPHg	Benzene	Toluene	Ethylenzene	Xylene	MTBE	TOG
			Concentrations reported in milligrams per kilogram mg/kg = parts per million							
Monitoring Wells										
MW-1A	9	09/24/91	--	<1	<0.005	<0.005	<0.005	<0.005	--	--
MW-2A	5	09/24/91	--	<1	<0.005	**0.005**	**0.006**	**0.014**	--	--
MW-2B	10	09/24/91	--	<1	<0.005	<0.005	<0.005	<0.005	--	--
MW-3A	6	09/30/91	--	<1	<0.005	<0.005	<0.005	<0.005	--	--
MW-3C	10	09/30/91	--	<1	<0.005	<0.005	<0.005	<0.005	--	--
MW-4	5	09/25/92	<1	<1	<0.005	**0.03**	<0.005	<0.005	--	--
	10	09/25/92	<1	<1	<0.005	**0.042**	<0.005	<0.005	--	--
	20	09/25/92	<1	<1	<0.005	**0.03**	<0.005	<0.005	--	--
MW-5	5	09/25/92	<1	<1	<0.005	**0.052**	<0.005	<0.005	--	--
	10	09/25/92	<1	<1	<0.005	**0.067**	<0.005	<0.005	--	--
MW-6	5	09/25/92	<1	**5**	<0.005	**0.26**	<0.005	**0.011**	--	--
	10	09/25/92	<1	<1	<0.005	**0.021**	<0.005	<0.008	--	--
MW-7	5.5	08/30/95	--	<1.0	<0.005	<0.005	<0.005	<0.015	--	--
	12	08/30/95	--	**3.7**	<0.005	**0.009**	**0.006**	<0.015	--	--
	21	08/30/95	--	<1.0	<0.005	<0.005	<0.005	<0.015	--	--

Abbreviations/Notes:

TPHd = Total petroleum hydrocarbons as diesel

TPHg = Total petroleum hydrocarbons as gasoline

MTBE = Methyl-tertiary-butyl ether

TOG = Total oil and grease

<x = Not detected above method detection limit

-- = Not analyzed

Table 3

Grab-Groundwater Sample Analytical Data

Chevron Station #9-6991 2920 Castro Valley Blvd., Castro Valley, CA

Sample ID	Sample Depth (ft)	Sample Date	TPHd	TPHg	Benzene	Toluene	Ethylbenzene	Xylene	MTBE	TBA	ETBE	DIPE	TAME
			Concentrations reported in micrograms per liter (ug/L)										
Excavation Water Samples													
PITWTR1		09/11/90	--	**51,000**	**5,800**	**9,600**	**960**	**13,000**	--	--	--	--	--
PITWTR2		09/11/90	--	**54,000**	**6,200**	**10,000**	**1,100**	**14,000**	--	--	--	--	--
WOWAT1		09/18/90	--	**1,400**	--	--	--	--	--	--	--	--	--
WOWAT2		09/18/90	--	**510**	--	--	--	--	--	--	--	--	--
Ground Water													
SB1-W		03/06/02	<200.	<50.0	<0.50	<0.50	<0.50	<1.5	<0.5	<5.0	<0.5	<0.5	<0.5
SB2-W		03/06/02	**200**	<50.0	<0.50	<0.50	<0.50	<1.5	<0.5	<5.0	<0.5	<0.5	<0.5
SB3-W		03/06/02	**960**	**990**	**0.59**	**0.7**	**1.4**	<1.5	8	<5.0	<0.5	<0.5	<0.5
SB6-W		03/06/02	<200.0	<50.0	<0.50	<0.50	<0.50	<1.5	<0.5	<5.0	<0.5	<0.5	<0.5
SB7-W		07/29/03	<10	<1.0	<0.50	<0.50	<0.50	<0.50	**0.9**	<5.0	<0.5	<0.5	<0.5

Abbreviations/Notes:

TPHd = Total petroleum hydrocarbons as diesel

TPHg = Total petroleum hydrocarbons as gasoline

MTBE = Methyl tertiary butyl ether

TBA = Tert-butyl alcohol

ETBE = Ethyl-tert-butyl ether

DIPE = Diisopropyl ether

TAME = Tert-amyl methyl ether

<x = Not detected above method detection limit

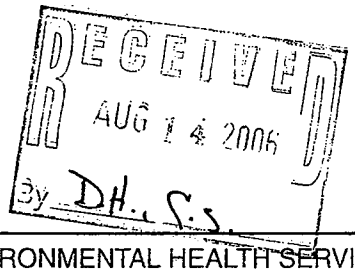
-- = Not analyzed

CONESTOGA-ROVERS
& ASSOCIATES

ATTACHMENT 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 8, 2006

Mr. Dana Thurman
Chevron
6001 Bollinger Canyon Rd., K2236
P.O. Box 6012
San Ramon, CA 94583-2324

Dear Mr. Thurman:

Subject: Fuel Leak Case RO0000475, Chevron Station # 9-6991, 2920 Castro Valley Blvd., Castro Valley, CA 94546

Alameda County Environmental Health (ACEH) staff has reviewed the case file for the subject site including the May 9, 2006 Workplan for Remedial Pilot Test by Cambria. The work plan proposes performing a surfactant pilot test in monitoring well MW-7. The assumption is that residual contamination is located in this area and once removed, groundwater concentrations will decline. As you are aware, the County concerns are the effectiveness of the surfactant/vacuum recovery process, the radius of influence of the treatment and determining a way to monitor the treatment process. A site conceptual model has not been submitted, though it appears that there is the assumption that contamination is localized. Historical data indicates that "old" releases came from the form waste oil tank, from the UST pit and the southern dispenser island area. Elevated MTBE has been detected in groundwater samples from wells MW-2, MW-7 and MW-3, therefore the residual plume could extend this length. The persistent petroleum concentration detected in MW-7 may indicate that residual source remains in the tank pit or dispenser area, some of which was not sampled during the initial tank removal. Although the calculated volume of surfactant will be that which should reach a radius of at least 10' from the test well, there is no way proposed to verify this will be the case.

Please address the following technical comments prior to performing the proposed work.

TECHNICAL COMMENTS

1. Residual contamination from within the existing tank pit should be evaluated. This can be done by installing and sampling from an observation well within the tank pit.
2. The down-gradient extent of the plume should be better characterized. The temporary soil and groundwater results and the existing off-site well data should be evaluated to determine if additional off-site sampling is necessary to evaluate the size and strength of the contaminant plume.
3. The likelihood of a MTBE release migrating beyond the monitoring network should be examined. We request that you re-evaluate or perform an additional conduit study that details the potential migration pathways and potential conduits (utilities, storm drains, etc.) that may be present in the vicinity of the site. Provide a map showing the location and depth of all utility lines and trenches including sewers and storm drains within and near the plume area. The previous 4/2002 Soil Boring Utility Trench Investigation Report results were inconclusive.

The conduit study shall also include a detailed well survey of all wells (monitoring and production wells: active, inactive, standby, destroyed (sealed with concrete), abandoned (improperly destroyed); and dewatering, drainage, and cathodic protection wells) within a 1/4 mile radius of the subject site.

4. The area near former boring SB-5 should be investigated. Separate phase hydrocarbon was detected in the boring during the 4/2002 investigation and a monitoring well was proposed just south of this boring location by Delta Environmental.
5. Although we do not disapprove of the proposed surfactant remediation pilot test, in order to be appropriate remediation we believe it must be shown that the area of proposed treatment is the sole source area. Please provide your explanation and site conceptual model that supports that MW-7 is the sole source area.

TECHNICAL REPORT REQUEST

Please provide the technical report requested according to the following schedule:

- September 8, 2006- response to technical comments

ELECTRONIC SUBMITTAL OF REPORTS

ACEH's Environmental Cleanup Oversight Programs (LOP and SLIC) now request submission of reports in electronic form. The electronic copy is intended to replace the need for a paper copy and is expected to be used for all public information requests, regulatory review, and compliance/enforcement activities. In September 2004, the SWRCB adopted regulations that require electronic submittal of information for 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, electronic submittal of a complete copy of all reports is required in Geotracker (in PDF format). Please visit the State Water Resources Control Board for more information on these requirements (http://www.swrcb.ca.gov/ust/cleanup/electronic_reporting).

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.

If you have any questions, please call me at (510) 567-6765.

Sincerely,

Barney M. Chan

Barney M. Chan
Hazardous Materials Specialist

cc: files, D. Drogos
Mr. David Herzog, Cambria Environmental, 2000 Opportunity Drive, Ste. 110.
Roseville, CA 95678

8_8_06 2920 Castro Valley Blvd

CONESTOGA-ROVERS
& ASSOCIATES

ATTACHMENT B

HISTORICAL BORING LOGS

Gettler-Ryan, Inc.

Log of Boring SB1

PROJECT: *Chevron Service Station No. 9-6991*	LOCATION: *2920 Castro Valley Blvd., Castro Valley, CA*
GR PROJECT NO. : *DG969916.4CT1*	SURFACE ELEVATION:
DATE STARTED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *3 1/4 in. Hand Auger*	TOTAL DEPTH: *12 feet*
DRILLING COMPANY: *Gettler-Ryan, Inc.*	GEOLOGIST: *Tony Mikacich*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
3				CL	CLAY WITH SAND (CL) – dark brown (10YR 3/3), moist; 80% clay, 20% fine sand.	Boring backfilled with excavated soil to surface grade.
6	SB1-5				CLAY (CL) – dark brown (10YR 3/3), moist; 90% clay, 10% fine sand, trace organic matter.	
9	SB1-10				Becomes wet.	
12	SB1-W				SANDY CLAY (CL) – brown (10YR 5/3), wet; 70% clay, 30% fine to medium sand.	Grab groundwater sample SB1-W collected at 12 feet.
15					Bottom of boring at 12 feet bgs.	
18						
21						

JOB NUMBER: *DG969916.4CT1*

Gettler-Ryan, Inc.

Log of Boring SB2

PROJECT: *Chevron Service Station No. 9-6991*	LOCATION: *2920 Castro Valley Blvd., Castro Valley, CA*
GR PROJECT NO.: *DG969916.4CT1*	SURFACE ELEVATION:
DATE STARTED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *3 1/4 in. Hand Auger*	TOTAL DEPTH: *16 feet*
DRILLING COMPANY: *Gettler-Ryan, Inc.*	GEOLOGIST: *Tony Mikacich*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Concrete and base rock – 9 inches thick.	Boring backfilled with excavated soil to 6 inches bgs. Concrete used to surface grade.
					Asphalt – 6 inches thick.	
					Concrete and base rock – 12 inches thick.	
3				CL	CLAY (CL) – greenish gray (5G 5/1), moist; 90% clay, 10% fine sand.	
	SB2-5.5					
6						
9						
12						
				SC	CLAYEY SAND (SC) – brown (10YR 5/3), wet; 70% fine to medium sand, 30% clay.	
15	SB2-W				Bottom of boring at 16 feet bgs.	Grab groundwater sample SB2-W collected at 16 feet.
18						
21						

JOB NUMBER: *DG969916.4CT1*

Gettler-Ryan, Inc.

Log of Boring SB3

PROJECT: *Chevron Service Station No. 9-6991*	LOCATION: *2920 Castro Valley Blvd., Castro Valley, CA*
GR PROJECT NO.: *DG96991G.4CT1*	SURFACE ELEVATION:
DATE STARTED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *3 1/4 in. Hand Auger*	TOTAL DEPTH: *6 feet*
DRILLING COMPANY: *Gettler-Ryan, Inc.*	GEOLOGIST: *Tony Mikacich*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
3				CL	CLAY WITH SAND (CL) – black (7.5YR 2/0), moist; 80% clay, 20% fine to medium sand.	Boring backfilled with excavated soil to surface grade.
6	SB3-5.5 SB3-W				CLAY (CL) – dark brown (10YR 3/3), wet; 90% clay, 10% fine sand. Bottom of boring at 6 feet bgs.	Grab groundwater sample SB3-W collected at 6 feet.
9						
12						
15						
18						
21						

Gettler-Ryan, Inc.

Log of Boring SB4

PROJECT: *Chevron Service Station No. 9-6991*	LOCATION: *2920 Castro Valley Blvd., Castro Valley, CA*
GR PROJECT NO.: *DG96991G.4CT1*	SURFACE ELEVATION:
DATE STARTED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *3 1/4 in. Hand Auger*	TOTAL DEPTH: *3.5 feet*
DRILLING COMPANY: *Gettler-Ryan, Inc.*	GEOLOGIST: *Tony Mikacich*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Concrete and base rock – 9 inches thick.	Boring backfilled with excavated soil to 6 inches bgs. Concrete used to surface grade.
					Asphalt – 4 inches thick.	
					Concrete and base rock – 12 inches thick.	
				CL	SANDY CLAY (CL) – brown (10YR 5/3), moist; 70% clay, 30% sand.	
3					Bottom of boring at 3.5 feet bgs.	
6						
9						
12						
15						
18						
21						

Gettler-Ryan, Inc.

Log of Boring SB5

PROJECT: *Chevron Service Station No. 9-6991*	LOCATION: *2920 Castro Valley Blvd., Castro Valley, CA*
GR PROJECT NO.: *DG96991G.4CT1*	SURFACE ELEVATION:
DATE STARTED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *3 1/4 in. Hand Auger*	TOTAL DEPTH: *14 feet*
DRILLING COMPANY: *Gettler-Ryan, Inc.*	GEOLOGIST: *Tony Mikacich*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
0				CL	CLAY (CL) - black (7.5YR 2/0), moist; 90% clay, 10% fine sand, trace organic matter and odor.	Boring backfilled with excavated soil to surface grade.
3	SB5-5					
6						
9	SB5-10				Includes hydrocarbon odor.	
12					At approximately 13 feet Becomes saturated; includes hydrocarbon sheen.	
					Bottom of boring at 14 feet bgs.	
15						
18						
21						

JOB NUMBER: *DG96991G.4CT1*

Gettler-Ryan, Inc.

Log of Boring SB6

PROJECT: *Chevron Service Station No. 9-6991*	LOCATION: *2920 Castro Valley Blvd., Castro Valley, CA*
GR PROJECT NO.: *DG96991G.4CT1*	SURFACE ELEVATION:
DATE STARTED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DATE FINISHED: *03/06/02*	WL (ft. bgs): DATE: TIME:
DRILLING METHOD: *3 1/4 in. Hand Auger*	TOTAL DEPTH: *12 feet*
DRILLING COMPANY: *Gettler-Ryan, Inc.*	GEOLOGIST: *Tony Mikacich*

DEPTH (feet)	SAMPLE NUMBER	SAMPLE INT.	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION	REMARKS
					Asphalt and base rock – 11 inches thick.	Boring backfilled with excavated soil to 6 inches bgs. Asphalt used to surface grade.
				CL	CLAY (CL) – brown (10YR 5/3), moist; 90% clay, 10% fine to medium sand.	
3						
	SB6-5					
6						
9						
					SANDY CLAY (CL) – brown (10YR 5/3), saturated; 70% clay, 30% fine to medium sand.	
12	SB6-W				Bottom of boring at 12 feet bgs.	Grab groundwater sample SB6-W collected at 12 feet.
15						
18						
21						

JOB NUMBER: *DG96991G.4CT1*

Cambria Environmental Technology, Inc.
5900 Hollis Street, Suite A
Emeryville, California 94608
Telephone: (510) 420-0700
Fax: (510) 420-9170

BORING/WELL LOG

CLIENT NAME	Chevron Products Company	**BORING/WELL NAME**	SB-7
JOB/SITE NAME	Chevron Service Station 9-6991	**DRILLING STARTED**	29-Jul-03
LOCATION	2920 Castro Valley Blvd., Castro Valley, CA	**DRILLING COMPLETED**	29-Jul-03
PROJECT NUMBER	41D-1633	**WELL DEVELOPMENT DATE (YIELD)**	NA
DRILLER	Woodward Drilling	**GROUND SURFACE ELEVATION**	Not Surveyed
DRILLING METHOD	Hydraulic push	**TOP OF CASING ELEVATION**	Not Surveyed
BORING DIAMETER	2"	**SCREENED INTERVAL**	NA
LOGGED BY	I. Robb	**DEPTH TO WATER (First Encountered)**	14.0 fbg (29-Jul-03) ▽
REVIEWED BY	B. Foss, RG# 7445	**DEPTH TO WATER (Static)**	NA ▼
REMARKS			

TPHg (mg/kg)	BLOW COUNTS	SAMPLE ID	DEPTH (fbg)	U.S.C.S.	LITHOLOGIC DESCRIPTION	CONTACT DEPTH (fbg)
			5		Large gravel with fines (Fill)	8.0
25	NA	SB-7@8'	10	ML	**Clayey SILT**: Greenish Gray; dry; 60% silt, 40% clay; high plasticity; low estimated permeability.	
180	NA	SB-7@11.5'				
430	NA	SB-7@13'			▽	14.0
			15	ML	**Clayey SILT**: Greenish Gray; moist; 80% silt, 20% clay; moderate plasticity; low estimated permeability.	
<1.0	NA	SB-7@15.5'				16.5
<1.0	NA	SB-7@17'		ML	**Sandy SILT**: Bown; moist; 60% silt, 20% sand, 10% clay, 10% gravel; low plasticity; medium estimated permeability.	18.0
				ML	**Sandy SILT**: Light Brown; moist; 50% silt, 40% sand, 10% clay; low plasticity; medium estimated permeability.	19.0
<1.0	NA	SB-7@19.5'	20	ML	**Sandy SILT**: Bown; moist; 60% silt, 20% sand, 10% clay, 10%gravel; low plasticity; medium estimated permeability.	20.0

WELL DIAGRAM: Portland Type I/II; Bottom of Boring @ 20 fbg

WELL LOG (TPH-G) I:\9-6991 CASTRO VALLEY\9-6991 ADD'L INVESTIGATION FOR DIVESMENT\9-6991.2003.GPJ DEFAULT.GDT 9/16/03

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well MW-1

Project CHV/2920 Castro Valley Blvd. Owner Chevron U.S.A. Inc.

Location Castro Valley, CA Project Number 020301038

Date Drilled 9/24/91 Total Depth of Hole 21.0 ft. Diameter 2 in.

Top of Casing ____ Water Level Initial 11 ft. Static ____

Screen: Dia .75 in. Length 15 ft. Slot Size .020 in.

Casing: Dia .75 in. Length 3.0 ft. Type SCH 80 PVC

Filter Pack Material No 2/12 Labis Lustre Rig/Core Type ____

Drilling Company Power Core Dril./Mon. Method Percussion Hammer / PID

Driller Michael Nosewicz Log By Glen Mitchell

Geologist/Engineer David Kleesattel License No 5136

See Site Map For Boring Location

NOTES:

Depth (feet)	Well Completion	PID (ppm)	Sample ID	Graphic Log	Soil Class	Description (Color, Texture, Structure)
0		PID				Six inches ASPHALT
					GC	light gray clayey GRAVEL (loose, dry)
2						Brown clayey SAND (loose, dry)
					SC	
4						Tan gravelly SAND (loose, moist)
6		0				
8					SP	
			A			
10		0				
						Encountered water 9/24/91 (09:32 hours)
12						*Tan sandy gravel (loose, saturated)*
					GP	
14					CL	*Mottled tan and dark brown silty CLAY (soft, saturated)*
						Tan clayey GRAVEL (loose, saturated)
16					GC	
						Dark brown silty CLAY (soft, saturated)
18					CL	*Tan clayey GRAVEL (loose, saturated)*
					GC	
20					CL	*Mottled tan and gray silty CLAY (firm, moist)*
22						*End of boring at 21.0 feet. Constructed monitoring well.*
24						
26						

11/11/1991 gtbasic oct

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well MW-2

Project CHV/2920 Castro Valley Blvd. Owner Chevron U.S.A. Inc.

Location Castro Valley, CA Project Number 020301038

Date Drilled 9/24/91 Total Depth of Hole 21.0 ft. Diameter 2 in.

Top of Casing ____ Water Level Initial 11 ft. Static ____

Screen: Dia .75 in. Length 15 ft. Slot Size .020 in.

Casing: Dia .75 in. Length 6.0 ft. Type SCH 80 PVC

Filter Pack Material No 2/12 Labis Lustre Rig/Core Type ____

Drilling Company Power Core Dril./Mon. Method Percussion Hammer / PID

Driller Michael Nosewicz Log By Glen Mitchell

Geologist/Engineer David Kleesattel License No 5136

See Site Map For Boring Location

NOTES:

Depth (feet)	Well Completion	PID (ppm)	Sample ID	Graphic Log	Soil Class	Description (Color, Texture, Structure)
0		PID				ASPHALT
						gravel FILL
2		8				Gray brown silty CLAY (firm, moist)
4						Dark gray silty CLAY (firm, moist)
			A			
6		4.4			CL	
8						Mottled gray and tan silty CLAY (firm, moist) Grades with minor gravel
		1.0 .4				
10			B			
						Encountered water 9/24/91 (12:00 hours)i
12		89.0				Gray brown clayey SILT with fine sand (firm, moist)
14					ML	
						Tan silty SAND (hard, saturated)
16						
						Gray clayey fine SAND (hard, saturated)
18					SC	
						Gray and rusty sandy CLAY (saturated.)
20						Gray silty CLAY (saturated)
					CL	
22						End of boring at 21.0 feet. Constructed groundwater monitoring well.
24						
26						

Drilling Log

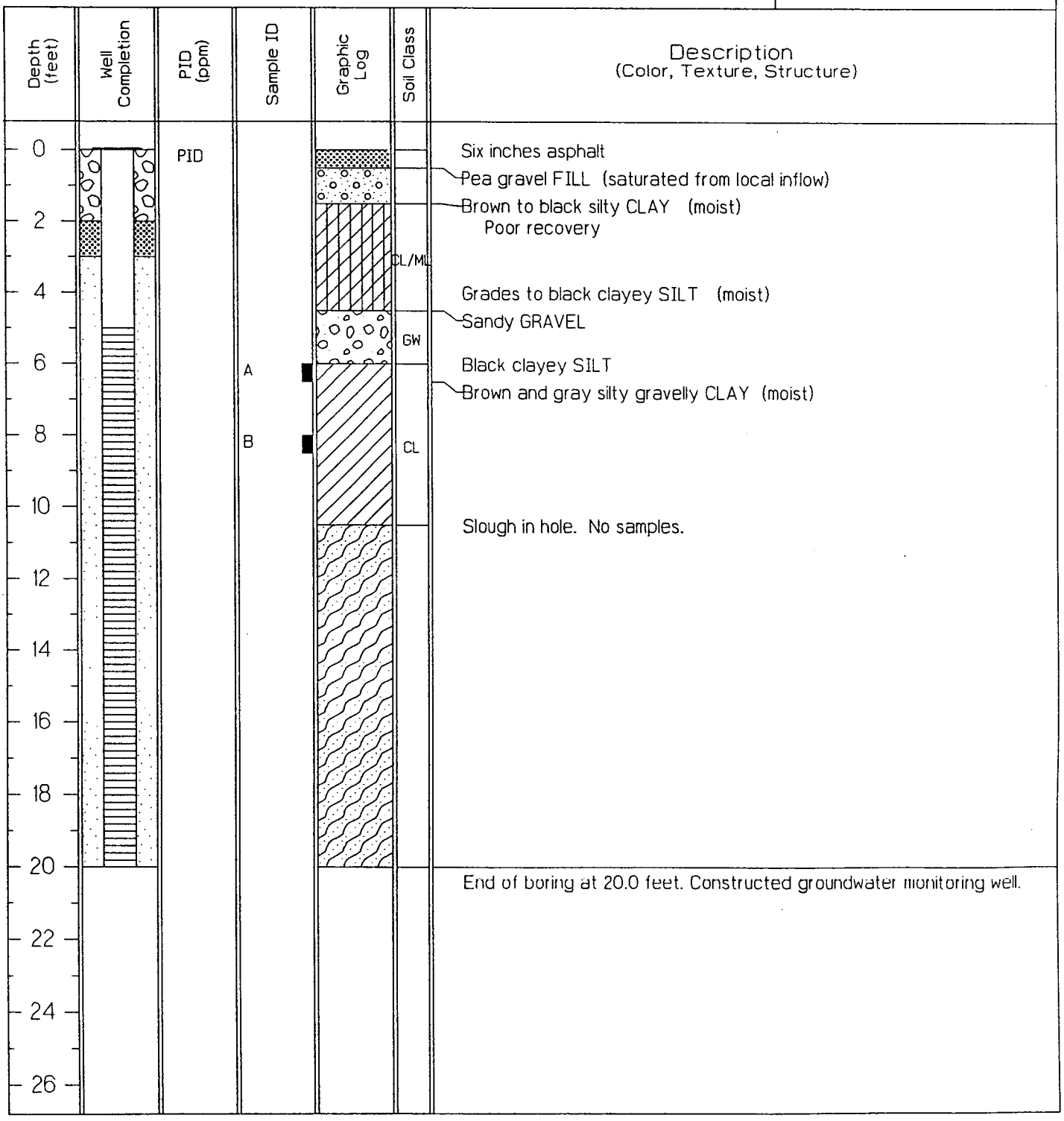
GROUNDWATER TECHNOLOGY

Monitoring Well MW-3

Project CHV/2920 Castro Valley Blvd. Owner Chevron U.S.A. Inc.
Location Castro Valley, CA Project Number 020301038
Date Drilled 9/30/91 Total Depth of Hole 20.0 ft. Diameter 2 in.
Top of Casing ____ Water Level Initial ____ Static ____
Screen: Dia .75 in. Length 15 ft. Slot Size .020 in.
Casing: Dia .75 in. Length 5.0 ft. Type SCH 80 PVC
Filter Pack Material No 2/12 Labis Lustre Rig/Core Type ____
Drilling Company Power Core Dril./Mon. Method Percussion Hammer / PID
Driller Michael Nosewicz Log By Greg Mischel
Geologist/Engineer David Kleesattel License No RG 5136

See Site Map For Boring Location

NOTES:



Description (Color, Texture, Structure)

Six inches asphalt
Pea gravel FILL (saturated from local inflow)
Brown to black silty CLAY (moist)
Poor recovery
Grades to black clayey SILT (moist)
Sandy GRAVEL
Black clayey SILT
Brown and gray silty gravelly CLAY (moist)
Slough in hole. No samples.
End of boring at 20.0 feet. Constructed groundwater monitoring well.

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well **MW-4**

Project *CHV/2920 Castro Valley Blvd.* Owner *Chevron U.S.A. Products Co.*
Location *Castro Valley, CA* Project No. *02020 2778* Date drilled *09/25/92*
Surface Elev. *169.43 ft.* Total Hole Depth *21.5 ft.* Diameter *8 inches*
Top of Casing *169.18 ft.* Water Level Initial *14 ft.* Static *10/27/92 11.39 ft.*
Screen: Dia *2 in.* Length *15 ft.* Type/Size *0.020 in.*
Casing: Dia *2 in.* Length *5 ft.* Type *SCH 40 PVC*
Filter Pack Material *Lapis Lustre #3* Rig/Core Type *Mobile B-53/Split Spoon*
Drilling Company *Kvilhaug Well Drilling* Method *Hollow Stem Auger* Permit # *92365*
Driller *Joel Visil* Log By *Jason Fedota*
Checked By *David Kleesattel* License No. *RG# 5136* David Kleesattel

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						
2						
4						
6		0	9 11 13			Orange mottled brown CLAY (stiff and moist)
8						
10		0	7 11 16		CL	Orange mottled brown silty CLAY (stiff and moist)
12						
14						*Encountered groundwater at 14 feet on 09/25/92.*
16		0	4 6 10			Orange mottled brown silty CLAY (saturated).
18						
20			10 11 12			Orange mottled brown silty CLAY (saturated).
22						End of boring at 21.5 feet. Installed groundwater monitoring well.
24						

GROUNDWATER TECHNOLOGY

Drilling Log

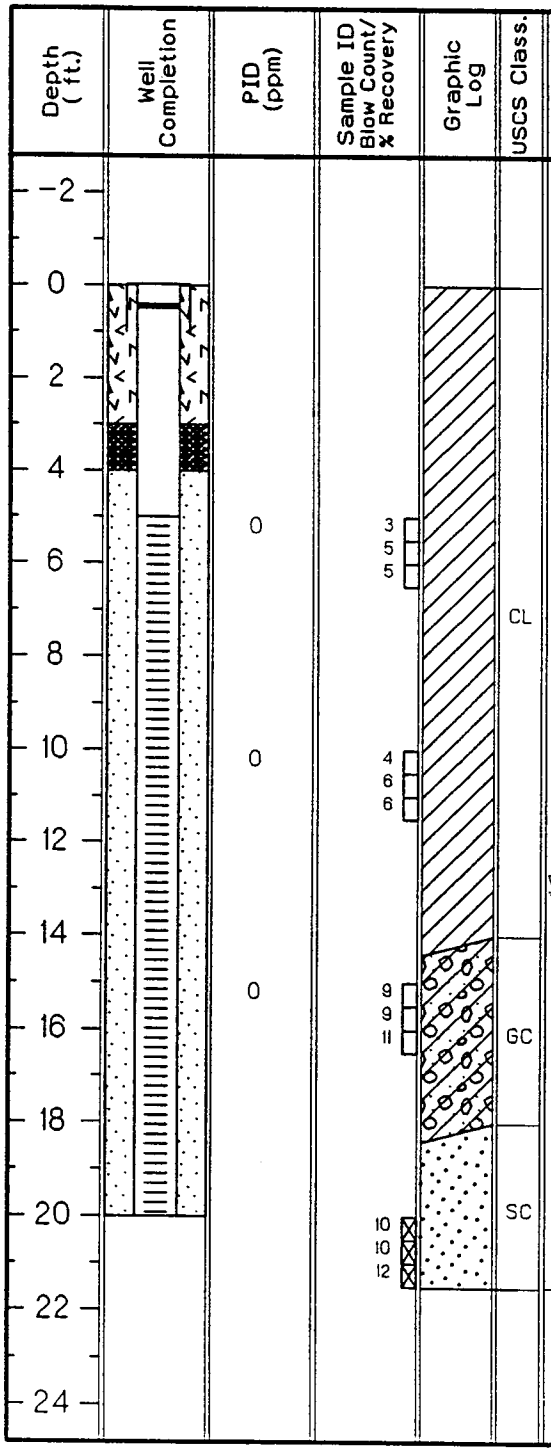
Monitoring Well **MW-5**

Project CHV/2920 Castro Valley Blvd. Owner Chevron U.S.A. Products Co.
Location Castro Valley, CA Project No. 02020 2778 Date drilled 10/08/92
Surface Elev. 168.0 ft. Total Hole Depth 21.5 ft. Diameter 8 inches
Top of Casing 167.41 ft. Water Level Initial 13 ft. Static 10/27/92 9.95 ft.
Screen: Dia 2 in. Length 15 ft. Type/Size 0.020 in.
Casing: Dia 2 in. Length 5 ft. Type SCH 40 PVC
Filter Pack Material Lapis Lustre #3 Rig/Core Type Mobile B-53/Split Spoon
Drilling Company Kvilhaug Well Drilling Method Hollow Stem Auger Permit # 92365
Driller Joel Visil Log By Jason Fedota
Checked By David Kleesattel License No. RG# 5136 David Kleesattel

See Site Map For Boring Location

COMMENTS:

Orginal soilboring for MW-5 was abandoned on September 25, 1992, because flowing sands obstructed installation of the well. The second boring for MW-5 was relocated approximately 5 feet from the orginal boring on October 10, 1992.



Description

(Color, Texture, Structure)
Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%

Dark brown CLAY (soft and moist)
(abundant roots)

Orange mottled brown silty CLAY (soft and moist)

Encountered groundwater at 13 feet on 09/25/92.

Brown clayey sandy GRAVEL (loose and saturated).

Brown gravelly clayey fine SAND (loose and saturated).

End of boring at 21.5 feet. Installed groundwater monitoring well.

Drilling Log

GROUNDWATER TECHNOLOGY

Monitoring Well **MW-6**

Project *CHV/2920 Castro Valley Blvd.* Owner *Chevron U.S.A. Products Co.*
Location *Castro Valley, CA* Project No. *02020 2778* Date drilled *09/25/92*
Surface Elev. *166.68 ft.* Total Hole Depth *26.5 ft.* Diameter *8 inches*
Top of Casing *166.46 ft.* Water Level Initial *15 ft.* Static *10/27/92 12.54 ft.*
Screen: Dia *2 in.* Length *15 ft.* Type/Size *0.020 in.*
Casing: Dia *2 in.* Length *9 ft.* Type *SCH 40 PVC*
Filter Pack Material *Lapis Lustre #3* Rig/Core Type *Mobile B-53/Split Spoon*
Drilling Company *Kvilhaug Well Drilling* Method *Hollow Stem Auger* Permit # *92365*
Driller *Joel Visil* Log By *Jason Fedota*
Checked By *David Kleesattel* License No. *RG# 5136* *David F. Kleesattel*

See Site Map For Boring Location

COMMENTS:

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
-2						
0						
2						
4		0	4 5 8			Black CLAY (soft and moist)
6						
8						
10		0	4 8 7		CL	Brown sandy silty CLAY (soft and moist)
12						
14						
16		0	9 9 12			▽ *Encountered groundwater at 15 feet on 09/25/92 (0925).*
18						Brown gravelly silty fine to medium SAND (saturated)
20		0	7 10 11		SM	
22						Orange mottled brown sandy silty CLAY (stiff and saturated)
24					CL	

GROUNDWATER TECHNOLOGY

Drilling Log

Monitoring Well **MW-6**

Project *CHV/2920 Castro Valley Blvd.* Owner *Chevron U.S.A. Products Co.*
Location *Castro Valley, CA* Project No. *02020 2778* Date drilled *09/25/92*

Depth (ft.)	Well Completion	PID (ppm)	Sample ID Blow Count/ % Recovery	Graphic Log	USCS Class.	Description (Color, Texture, Structure) Trace < 10%, Little 10% to 20%, Some 20% to 35%, And 35% to 50%
24					CL	Brown silty clayey SAND (firm and saturated)
26		0	8 27 40		SC	
						End of boring at 26.5 feet. Installed groundwater monitoring well.
28						
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						
50						
52						
54						
56						

CONESTOGA-ROVERS
& ASSOCIATES

ATTACHMENT C

HISTORICAL GROUNDWATER ANALYTICAL DATA

Table 1

Groundwater Monitoring Data and Analytical Results

Chevron Service Station #9-6991

2920 Castro Valley Boulevard

Castro Valley, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-1												
10/08/91	169.30	158.20	11.10	--	230	45	<0.5	0.9	9.1	--	<5,000	--
11/04/91	169.30	158.27	11.03	--	340	120	<0.5	<0.5	6.1	--	--	--
12/04/91	169.30	158.25	11.05	170	<50	3.9	<0.5	<0.5	<0.5	--	<5,000	--
06/05/92	169.30	158.26	11.04	<50	100	26	0.6	0.5	1.0	--	--	--
10/27/92	169.30	158.20	11.10	54	<50	11	<0.5	<0.5	<0.5	--	--	--
12/30/92	169.30	--	--	170	<50	24	<0.5	<0.5	<0.5	--	--	--
01/27/93	169.30	158.67	10.63	--	--	--	--	--	--	--	--	--
03/05/93	169.30	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/17/93	169.30	158.59	10.71	--	--	--	--	--	--	--	--	--
06/18/93	169.30	158.29	11.01	<50	<50	0.6	<0.5	<0.5	<1.5	--	--	--
09/28/93	169.30	157.35	11.95	<50	<50	0.8	<0.5	<0.5	<1.5	--	--	--
12/30/93	169.30	158.34	10.96	<50	<50	8.5	<0.5	<0.5	<0.5	--	--	--
04/07/94	169.30	158.49	10.81	<10	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
05/31/94	169.30	158.38	10.92	<50	<50	1.0	<0.5	<0.5	<0.5	--	--	--
09/23/94	169.30	158.40	10.90	<50	<50	1.3	<0.5	<0.5	<0.5	--	--	--
11/30/94	169.30	158.76	10.54	570[2]	<50	8.9	<0.5	<0.5	<0.5	--	--	--
03/30/95	169.30	158.60	10.70	110[1]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/06/95	169.30	158.38	10.92	570[1]	61	15	<0.5	<0.5	<0.5	--	--	--
09/25/95	169.30	158.30	11.00	550[1]	<50	4.7	<0.5	<0.5	<0.5	--	--	--
12/28/95	169.30	158.50	10.80	330[1]	72	9.1	0.65	<0.5	<0.5	6.0	--	--
03/05/96	169.30	159.20	10.10	780[1]	<50	7.8	<0.5	<0.5	<0.5	<2.5	--	--
09/13/96	169.30	158.28	11.02	SAMPLED ANNUALLY		--	--	--	--	--	--	--
12/19/96	169.30	158.08	11.22	--	--	--	--	--	--	--	--	--
03/20/97	169.30	158.40	10.90	350[1]	<50	2.2	<0.5	<0.5	<0.5	<2.5	--	--
06/27/97	169.30	158.27	11.03	--	--	--	--	--	--	--	--	--
09/19/97	169.30	158.34	10.96	--	--	--	--	--	--	--	--	--
12/05/97	169.30	158.62	10.68	--	--	--	--	--	--	--	--	--
03/31/98	169.30	158.67	10.63	760[1]	<50	6.7	<0.5	<0.5	<0.5	<2.5	--	--
06/19/98	169.30	159.62	9.68	--	--	--	--	--	--	--	--	--
08/13/98	169.30	157.67	11.63	--	--	--	--	--	--	--	--	--
12/17/98	169.30	158.25	11.05	--	--	--	--	--	--	--	--	--
03/19/99	169.30	158.35	10.95	890[1]	124	14.8	<0.5	<0.5	<0.5	6.49/<2.5[13]	--	--
06/23/99	169.30	158.23	11.07	--	--	--	--	--	--	--	--	--
09/16/99	169.30	158.41	10.89	--	--	--	--	--	--	--	--	--
12/16/99	169.30	158.46	10.84	--	--	--	--	--	--	--	--	--
03/02/00	169.30	158.83	10.47	2,300[1]	155	10.4	<0.5	<0.5	<0.5	10.3	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Chevron Service Station #9-6991

2920 Castro Valley Boulevard

Castro Valley, California

WELL ID/ DATE		TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-1 (cont)													
06/30/00		169.30	159.04	10.26	--	--	--	--	--	--	--	--	--
09/30/00	NP	169.30	158.30	11.00	--	--	--	--	--	--	--	--	--
12/19/00		169.30	158.44	10.86	--	--	--	--	--	--	--	--	--
03/13/01	NP	169.30	158.45	10.85	--[14]	50.4	4.50	0.553	0.522	2.10	1.65	--	--
06/12/01		169.30	158.28	11.02	SAMPLED ANNUALLY		--	--	--	--	--	--	--
09/18/01		169.30	158.23	11.07	SAMPLED ANNUALLY		--	--	--	--	--	--	--
12/17/01		169.30	158.59	10.71	SAMPLED ANNUALLY		--	--	--	--	--	--	--
03/21/02		169.30	158.54	10.76	--[14]	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
06/08/02		169.30	158.33	10.97	SAMPLED ANNUALLY		--	--	--	--	--	--	--
09/13/02		169.30	158.28	11.02	SAMPLED ANNUALLY		--	--	--	--	--	--	--
12/13/02		169.30	158.47	10.83	SAMPLED ANNUALLY		--	--	--	--	--	--	--
03/17/03		169.30	158.60	10.70	250	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
06/16/03		169.30	158.34	10.96	SAMPLED ANNUALLY		--	--	--	--	--	--	--
09/15/03		169.30	158.28	11.02	SAMPLED ANNUALLY		--	--	--	--	--	--	--
12/15/03		169.30	158.71	10.59	SAMPLED ANNUALLY		--	--	--	--	--	--	--
03/01/04		169.30	158.78	10.52	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
06/28/04		169.30	158.27	11.03	SAMPLED ANNUALLY		--	--	--	--	--	--	--
09/13/04		169.30	156.96	12.34	SAMPLED ANNUALLY		--	--	--	--	--	--	--
12/22/04		169.30	158.38	10.92	SAMPLED ANNUALLY		--	--	--	--	--	--	--
03/04/05		169.30	158.81	10.49	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
06/30/05		169.30	158.54	10.76	SAMPLED ANNUALLY		--	--	--	--	--	--	--
09/16/05		169.30	158.33	10.97	SAMPLED ANNUALLY		--	--	--	--	--	--	--
12/21/05		169.30	158.70	10.60	--	--	--	--	--	--	--	--	--
03/21/06[16]		169.30	158.93	10.37	1,100	<50	0.6	<0.5	<0.5	<0.5	1	--	<50
06/21/06		169.30	158.37	10.93	SAMPLED ANNUALLY		--	--	--	--	--	--	--
09/05/06		169.30	158.32	10.98	SAMPLED ANNUALLY		--	--	--	--	--	--	--
12/28/06		169.30	157.52	11.78	SAMPLED ANNUALLY		--	--	--	--	--	--	--
03/26/07[16]		169.30	158.39	10.91	730	<50	0.6	<0.5	<0.5	<0.5	<0.5	--	<50
06/26/07		**169.30**	**158.30**	**11.00**	**SAMPLED ANNUALLY**		--	--	--	--	--	--	--
09/26/07		**169.30**	**158.26**	**11.04**	**SAMPLED ANNUALLY**		--	--	--	--	--	--	--
MW-2													
10/08/91		169.15	157.20	11.95	--	110	5.1	1.1	0.8	26	--	--	--
11/19/91		169.15	157.40	11.75	--	120	11	1.1	<0.5	17	--	--	--
12/04/91		169.15	157.35	11.80	130	440	30	2.5	<0.5	52	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Chevron Service Station #9-6991

2920 Castro Valley Boulevard

Castro Valley, California

WELL ID/ DATE		TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-2 (cont)													
06/05/92		169.15	157.35	11.80	130	80	13	<0.5	<0.5	1.0	--	--	--
10/27/92		169.15	157.15	12.00	110	54	13	<0.5	<0.5	<0.5	--	--	--
12/30/92		169.15	--	--	92	180	30	<0.5	<0.5	1.0	--	--	--
01/27/93		169.15	158.24	10.91	--	--	--	--	--	--	--	--	--
03/05/93		169.15	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/17/93		169.15	158.26	10.89	--	--	--	--	--	--	--	--	--
06/18/93		169.15	157.41	11.74	<50	<50	1.4	<0.5	<0.5	<1.5	--	--	--
09/28/93		169.15	157.97	11.18	<50	<50	0.6	<0.5	<0.5	<1.5	--	--	--
12/30/93		169.15	158.34	21.00	<50	<50	0.9	<0.5	<0.5	<0.5	--	--	--
04/07/94		169.15	158.40	10.75	<10	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
05/31/94		169.15	158.35	10.80	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/23/94		169.15	157.50	11.65	120	<50	0.7	<0.5	<0.5	<0.5	--	--	--
11/30/94		169.15	158.41	10.74	570[4]	55	2.9	<0.5	1.4	0.94	--	--	--
03/30/95		169.15	158.25	10.90	430[1]	91	4.5	<0.5	3.8	<0.5	--	--	--
06/06/95		169.15	157.73	11.42	410[1]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/25/95		169.15	157.52	11.63	220[1]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/28/95		169.15	157.98	11.17	120[1]	<2,000	<20	<20	<20	<20	5,000	--	--
03/05/96		169.15	159.09	10.06	860[1]	<2,000	<20	<20	<20	<20	10,000	--	--
09/13/96		169.15	157.37	11.78	1,300	1,100	25	<10	<10	<10	20,000	--	--
12/19/96		169.15	158.30	10.85	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
03/20/97		169.15	157.75	11.40	190[1]	2400	<10	<10	46	<10	6,200	--	--
06/27/97		169.15	157.35	11.80	--	--	--	--	--	--	--	--	--
09/19/97		169.15	157.43	11.72	60[1]	<50	<0.5	<0.5	<0.5	<0.5	280	--	--
12/08/97		169.15	158.27	10.88	--	--	--	--	--	--	--	--	--
03/31/98		169.15	158.46	10.69	220[1]	110	30	0.74	0.74	0.59	1,000	--	--
06/19/98		169.15	159.31	9.84	--	--	--	--	--	--	--	--	--
08/31/98		169.15	157.43	11.72	380[1]	<100	3.4	<1.0	<1.0	<1.0	980	--	--
12/17/98		169.15	157.60	11.55	--	--	--	--	--	--	480	--	--
03/19/99		169.15	158.63	10.52	107[4]	<250	12.7	<2.5	<2.5	<2.5	1,040/819[13]	--	--
06/23/99		169.15	159.61	9.54	--	--	--	--	--	--	--	--	--
09/16/99		169.15	157.54	11.61	84.9	<100	<1.0	<1.0	<1.0	<1.0	216	--	--
12/16/99		169.15	157.86	11.29	--	--	--	--	--	--	--	--	--
03/02/00		169.15	158.70	10.45	<50	84.8	21.5	<0.5	<0.5	0.636	413	--	--
06/30/00		169.15	159.08	10.07	--	--	--	--	--	--	--	--	--
09/30/00	NP	169.15	157.54	11.61	100[11]	<50	<0.50	0.57	<0.50	1.0	2,800	--	--
12/19/00		169.15	158.04	11.11	--	--	--	--	--	--	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Chevron Service Station #9-6991
2920 Castro Valley Boulevard
Castro Valley, California

WELL ID/ DATE		TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-2 (cont)													
03/13/01	NP	169.15	158.22	10.93	--[14]	179	11.6	2.01	0.856	3.66	1,290	--	--
06/12/01		169.15	157.52	11.63	--	--	--	--	--	--	--	--	--
09/18/01	NP	169.15	157.37	11.78	100	<50	<0.50	<0.50	<0.50	<1.5	670	--	--
12/17/01		169.15	158.29	10.86	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
03/21/02		169.15	158.16	10.99	--[14]	<50	<0.50	<0.50	<0.50	<1.5	350	--	--
06/08/02		169.15	157.52	11.63	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
09/13/02		169.15	157.50	11.65	200	<50	<0.50	<0.50	<0.50	<1.5	260	--	--
12/13/02		169.15	158.07	11.08	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
03/17/03		169.15	158.38	10.77	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
06/16/03		169.15	157.77	11.38	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
09/15/03[16,17]		169.15	157.55	11.60	110	<50	<0.5	<0.5	<0.5	0.6	400	--	--
12/15/03		169.15	158.40	10.75	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
03/01/04		169.15	158.49	10.66	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
06/28/04		169.15	157.63	11.52	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
09/13/04		169.15	156.27	12.88	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
12/22/04		169.15	157.93	11.22	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
03/04/05		169.15	158.58	10.57	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
06/30/05		169.15	158.08	11.07	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
09/16/05[16]	NP	169.15	156.64	12.51	130	<50	<0.5	<0.5	<0.5	<0.5	140	--	<50
12/21/05		169.15	158.41	10.74	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
03/21/06[16]		169.15	158.74	10.41	72	<50	<0.5	<0.5	<0.5	<0.5	530	--	<50
06/21/06		169.15	157.64	11.51	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
09/05/06[16]		169.15	157.51	11.64	620	<50	<0.5	<0.5	<0.5	<0.5	150	--	<50
12/28/06		169.15	158.19	10.96	SAMPLED SEMI-ANNUALLY			--	--	--	--	--	--
03/26/07[16]		169.15	157.74	11.41	86	<50	<0.5	<0.5	<0.5	<0.5	160	--	<50
06/26/07		**169.15**	**157.60**	**11.55**	**SAMPLED SEMI-ANNUALLY**			--	--	--	--	--	--
09/26/07[16]		**169.15**	**157.52**	**11.63**	**140**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**69**	--	**<50**
MW-3													
10/08/91		169.11	160.84	8.27	--	81	1.9	0.7	0.8	2.4	--	--	--
11/04/91		169.11	158.26	10.85	--	60	<0.5	<0.5	<0.5	<0.5	--	--	--
12/04/91		169.11	158.06	11.05	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/05/92		169.11	157.96	11.15	170	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
10/27/92		169.11	157.51	11.60	120	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/30/92		169.11	--	--	170	<50	<0.5	<0.5	<0.5	<0.5	--	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

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2920 Castro Valley Boulevard

Castro Valley, California

WELL ID/ DATE		TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-3 (cont)													
01/27/93		169.11	160.00	9.11	--	--	--	--	--	--	--	--	--
03/05/93		169.11	--	--	--	--	--	--	--	--	--	--	--
03/17/93		169.11	159.16	9.95	--	--	--	--	--	--	--	--	--
06/18/93		169.11	158.22	10.89	<50	<50	<0.5	<0.5	<0.5	<1.5	--	--	--
09/28/93		169.11	159.49	9.62	<50	<50	<0.5	<0.5	<0.5	<1.5	--	--	--
12/30/93		169.11	159.80	9.31	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
04/07/94		169.11	160.30	8.81	<10	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
05/31/94		169.11	160.21	8.90	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/23/94		169.11	158.48	10.63	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
11/30/94		169.11	160.19	8.92	--	--	--	--	--	--	--	--	--
03/30/95		169.11	160.01	9.10	290[1]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/06/95		169.11	158.79	10.32	150[1]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/25/95		169.11	158.11	11.00	260[1]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/28/95		169.11	158.96	10.15	200[1]	<250	<2.5	<2.5	<2.5	<2.5	1,400	--	--
12/17/98		169.11	158.86	10.25	130[1]	<250	<2.5	<2.5	<2.5	<2.5	62,000	--	--
03/19/99		169.11	159.37	9.74	139[1]	<1,000	<10	<10	<10	<10	5,650/5,850[13]	--	--
06/23/99		169.11	158.40	10.71	61.6[1]	<2,000	<20	<20	<20	<20	6,700	--	--
09/16/99		169.11	157.44	11.67	122	<1,000	<10	<10	<10	<10	1,910	--	--
12/16/99		169.11	158.79	10.32	--	--	--	--	--	--	5,850	--	--
12/20/00		169.11	158.91	10.20	96.8[1]	65.2	<0.5	<0.5	<0.5	<0.5	1,790	--	--
03/02/00		169.11	160.26	8.85	<50	<50	<0.5	<0.5	<0.5	<0.5	5,600	--	--
06/30/00		169.11	158.81	10.30	<50	360[5]	<0.50	<0.50	<0.50	<0.50	1,300	--	--
09/30/00	NP	169.11	158.07	11.04	--	150[9]	75	<1.3	<1.3	<1.3	8,200	--	--
12/19/00	NP	169.11	159.06	10.05	--[14]	<1,000	<10	<10	<10	<10	4,600	--	--
03/13/01	NP	169.11	159.76	9.35	--[14]	284	0.601	1.00	<0.500	1.27	3,670	--	--
06/12/01	NP	169.11	158.08	11.03	<50	140[9]	67	<0.50	<0.50	<0.50	2,600	--	--
09/18/01	NP	169.11	157.96	11.15	100	240	<0.50	<0.50	<0.50	<1.5	3,200	--	--
12/17/01		169.11	159.22	9.89	270	55	<0.50	<0.50	<0.50	<1.5	930	--	--
03/21/02		169.11	159.38	9.73	290	190	<0.50	<0.50	<0.50	<1.5	2,600	--	--
06/08/02		169.11	158.21	10.90	110	110	<0.50	<0.50	<0.50	<1.5	2,200	--	--
09/13/02		169.11	158.26	10.85	<50	<50	<0.50	<0.50	<0.50	<1.5	650	--	--
12/13/02		169.11	159.11	10.00	120	<50	<0.50	<0.50	<0.50	<1.5	450	--	--
03/17/03		169.11	159.66	9.45	370	80	<0.50	<0.50	<0.50	<1.5	1,600	--	--
06/16/03		169.11	158.98	10.13	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
09/15/03		169.11	157.85	11.26	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
12/15/03[16]		169.11	159.78	9.33	--[14]	<50	<0.5	3	0.6	4	220	--	<50

Table 1

Groundwater Monitoring Data and Analytical Results

Chevron Service Station #9-6991

2920 Castro Valley Boulevard

Castro Valley, California

WELL ID/ DATE		TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-3 (cont)													
03/01/04		169.11	159.22	9.89	NOT SAMPLED DUE TO INSUFFICIENT WATER				--	--	--	--	--
06/28/04[16]		169.11	158.26	10.85	95	<50	<0.5	<0.5	<0.5	<0.5	980	--	--
09/13/04		169.11	DRY AT 12.96 FEET		--	--	--	--	--	--	--	--	--
12/22/04[16]	NP	169.11	159.14	9.97	--[14]	53	<0.5	<0.5	<0.5	<0.5	110	--	<50
03/04/05[16]	NP	169.11	159.68	9.43	<50	<50	<0.5	<0.5	<0.5	<0.5	460	--	<50
06/30/05[16]	NP	169.11	158.66	10.45	58[17]	<50	<0.5	<0.5	<0.5	<0.5	600	--	<50
09/16/05[16]	NP	169.11	158.26	10.85	--[14]	<50	<0.5	<0.5	<0.5	<0.5	530	--	<50
NOT MONITORED/SAMPLED													
MW-4													
10/27/92		169.18	157.79	11.39	<50	<50	<0.5	0.6	0.5	4.3	--	--	--
12/30/92		169.18	159.05	10.13	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
01/27/93		169.18	160.09	9.09	--	--	--	--	--	--	--	--	--
03/05/93		169.18	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/17/93		169.18	159.28	9.90	--	--	--	--	--	--	--	--	--
06/18/93		169.18	158.50	10.68	<50	<50	<0.5	<0.5	<0.5	<1.5	--	--	--
09/28/93		169.18	159.82	9.36	<50	<50	<0.5	<0.5	<0.5	<1.5	--	--	--
12/30/93		169.18	159.91	9.27	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
04/07/94		169.18	160.37	8.81	<10	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
05/31/94		169.18	160.27	8.91	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/23/94		169.18	158.79	10.39	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
11/30/94		169.18	160.08	9.10	58[2]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/30/95		169.18	160.66	8.52	61[1]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/06/95		169.18	158.70	10.48	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/25/95		169.18	158.38	10.80	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/28/95		169.18	159.23	9.95	<50	<50	<0.5	<0.5	<0.5	<0.5	9.9	--	--
12/21/05[16]		169.18	159.65	9.53	76[18]	<50	<0.5	<0.5	<0.5	<0.5	0.7	--	<50
03/21/06[16]		169.18	160.35	8.83	<50	<50	<0.5	<0.5	<0.5	<0.5	0.5	--	<50
06/21/06[16]		169.18	158.55	10.63	<50	<50	<0.5	<0.5	<0.5	<0.5	0.8	--	<50
09/05/06[16]		169.18	158.24	10.94	170	<50	<0.5	<0.5	<0.5	<0.5	1	--	<50
12/28/06[16]		169.18	159.06	10.12	120	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	<50
03/26/07[16]		169.18	158.73	10.45	290	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	<50
06/26/07[16]		**169.18**	**158.22**	**10.96**	**<50**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**1**	--	**<50**
09/26/07[16]		**169.18**	**157.98**	**11.20**	**<50**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**0.8**	--	**<50**

Table 1

Groundwater Monitoring Data and Analytical Results

Chevron Service Station #9-6991

2920 Castro Valley Boulevard

Castro Valley, California

WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-5												
10/27/92	167.41	157.46	9.95	<50	74	<0.5	<0.5	0.6	7.1	--	--	--
12/30/92	167.41	158.21	9.20	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
01/27/93	167.41	157.80	9.61	--	--	--	--	--	--	--	--	--
03/05/93	167.41	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/17/93	167.41	157.90	9.51	--	--	--	--	--	--	--	--	--
06/18/93	167.41	157.56	9.85	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/28/93	167.41	157.55	9.86	<50	<50	<0.5	<0.5	<0.5	<1.5	--	--	--
12/30/93	167.41	157.08	10.33	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
04/07/94	167.41	157.69	9.72	<10	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
05/31/94	167.41	157.68	9.73	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/23/94	167.41	157.56	9.85	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
11/30/94	167.41	157.73	9.68	79[2]	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/30/95	167.41	157.79	9.62	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/06/95	167.41	157.55	9.86	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/25/95	167.41	157.56	9.85	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/28/95	167.41	157.67	9.74	<50	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
NOT MONITORED/SAMPLED												
MW-6												
10/27/92	166.46	153.92	12.54	<50	600	22	22	24	130	--	--	--
12/30/92	166.46	156.26	10.20	470	1,700	170	16	46	160	--	--	--
01/27/93	166.46	156.44	10.02	--	--	--	--	--	--	--	--	--
03/05/93	166.46	--	--	150	480	76	0.9	3.1	7.1	--	--	--
03/17/93	166.46	155.79	10.67	--	--	--	--	--	--	--	--	--
06/18/93	166.46	154.63	11.83	51	240	37	3.4	2.9	18	--	--	--
09/28/93	166.46	154.90	11.56	120	150	11	1.2	1.3	4.3	--	--	--
12/30/93	166.46	154.81	11.65	290	680	77	5.1	5.5	13	--	--	--
04/07/94	166.46	155.34	11.12	<10	190	24	2.9	1.9	8.0	--	--	--
05/31/94	166.46	--	--	--	--	--	--	--	--	--	--	--
09/23/94	166.46	155.05	11.41	--	--	--	--	--	--	--	--	--
11/30/94	166.46	156.58	9.88	150[2]	320	49	0.58	1.4	1.2	--	--	--
12/15/03[16]	166.46	156.60	9.86	71	210	0.5	0.9	0.7	2	14	--	<50
03/01/04[16,21]	166.46	157.16	9.30	<250	150	<0.5	4	3	18	10	--	<50
06/28/04[16,21]	166.46	155.13	11.33	66	100	<0.5	<0.5	<0.5	<0.5	18	--	--
09/13/04[16,21]	166.46	154.88	11.58	<50	<50	<0.5	<0.5	<0.5	<0.5	17	--	<50
12/22/04[16,21]	166.46	155.75	10.71	300	440	1	1	2	3	10	--	<50

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Castro Valley, California

WELL ID/ DATE		TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
MW-6 (cont)													
03/04/05[16,21]		166.46	157.25	9.21	75	65	<0.5	<0.5	<0.5	1	8	--	<50
06/30/05[16,21]		166.46	155.49	10.97	73	<50	<0.5	<0.5	<0.5	<0.5	7	--	<50
09/16/05[16,21]		166.46	155.02	11.44	58[17]	<50	<0.5	<0.5	<0.5	<0.5	13	--	<50
12/21/05[16,21]		166.46	156.66	9.80	120[19]	140	<0.5	<0.5	<0.5	1	8	--	<50
03/21/06[16,21]		166.46	157.54	8.92	75	52	<0.5	<0.5	0.9	3	8	--	<50
06/21/06[16,21]		166.46	155.38	11.08	56	92	<0.5	<0.5	0.5	2	10	--	<50
09/05/06[16,21]		166.46	155.07	11.39	67	62	<0.5	<0.5	<0.5	<0.5	9	--	<50
12/28/06[16,21]		166.46	156.32	10.14	300	260	<0.5	0.5	<0.5	1	3	--	<50
03/26/07[21]		166.46	INACCESSIBLE - VEHICLE PARKED OVER WELL					--	--	--	--	--	--
06/26/07[16]		**166.46**	**155.32**	**11.14**	**67**	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**8**	--	**<50**
09/26/07[16]		**166.46**	**155.02**	**11.44**	**84**	**180**	**<0.5**	**0.5**	**3**	**5**	**6**	--	--
MW-7													
09/25/95		168.80	157.20	11.60	1,400[1]	220	0.79	<0.5	0.67	<0.5	--	--	--
12/28/95		168.80	158.14	10.66	590[1]	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
03/05/96		168.80	159.74	9.06	320[1]	1,400	<10	<10	47	<10	5,300	--	--
06/27/96		168.80	157.27	11.53	630[1]	<2,500	<25	<25	<25	<25	14,000	--	--
09/13/96		168.80	156.88	11.92	1,400	1,100	26	<10	24	<10	20,000	--	--
12/19/96		168.80	158.29	10.51	1,100[3]	<5,000	<50	<50	<50	<50	12,000	--	--
03/20/97		168.80	157.84	10.96	1,600[3]	<1,000	<10	<10	<10	<10	2,100/2,000[13]	--	--
06/27/97		168.80	157.02	11.78	1,600[1]	2,000	<20	<20	<20	<20	11,000	--	--
09/19/97		168.80	156.87	11.93	1,900[1]	<1,000	35	<10	<10	<10	13,000	--	--
12/05/97		168.80	158.40	10.40	1,100[1]	2,100	47	2.7	28	<2.5	15,000	--	--
03/31/98		168.80	158.89	9.91	780[1]	410	4.0	0.61	2.2	<0.5	<2.5	--	--
06/19/98		168.80	159.09	9.71	480[1]	1,100	16	<10	17	<10	12,000	--	--
08/31/98		168.80	157.11	11.69	580[1]	<500	350	22	<5.0	<5.0	47,000	--	--
12/17/98		168.80	157.70	11.10	970	1,800	<10	<10	24	<10	13,000/14,000[1]	--	--
03/19/99		168.80	158.51	10.29	615[1]	1,280	<5.0	5.0	16.3	<5.0	2,240/2,910[13]	--	--
06/23/99		168.80	157.25	11.55	1,240[1]	<5,000	<50	<50	<50	<50	18,000	--	--
09/16/99		168.80	157.31	11.49	2,230	<5,000	<50	<50	<50	<50	13,700	--	--
12/16/99		168.80	158.27	10.53	973[1]	1,330	<1.0	6.44	14	5.17	10,800	--	--
03/02/00		168.80	159.25	9.55	880[1]	1,980	7.22	<5.0	6.11	<5.0	4,230	--	--
06/30/00		168.80	157.68	11.12	620[7]	2,500[6]	6.0	8.5	16	72	6,900	--	--
09/30/00	NP	168.80	157.23	11.57	1,600[7]	1,700[10]	750	<5.0	<5.0	<5.0	7,300	--	--
12/19/00		168.80	158.26	10.54	1,100[12]	1,800[10]	<10	<10	<10	<10	4,900	--	--

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MW-7 (cont)												
03/13/01	168.80	158.74	10.06	1,500[12]	1,470	9.34	5.09	6.08	2.69	2,920	--	--
06/12/01	168.80	157.45	11.35	910[15]	920[10]	260	4.2	9.7	2.8	4,500	--	--
09/18/01	168.80	156.87	11.93	3,000	2,000	<0.50	<0.50	<0.50	<1.5	5,300	--	--
12/17/01	168.80	157.99	10.81	7,000	1,700	<5.0	<0.50	7.1	<1.5	4,100	--	--
03/21/02	168.80	158.56	10.24	13,000	3,200	<5.0	<0.50	24	<1.5	980	--	--
06/08/02	168.80	157.32	11.48	3,500	1,500	3.6	<0.50	8.5	<1.5	2,800	--	--
09/13/02	168.80	157.02	11.78	2,400	1,200	1.8	<1.0	2.8	<1.5	3,300	--	--
12/13/02	168.80	157.97	10.83	3,400	1,100	2.4	<0.50	2.3	<1.5	2,000	--	--
03/17/03	168.80	158.71	10.09	3,700	1,600	<10	<0.50	5.1	<1.5	1,000	--	--
06/16/03[16]	168.80	157.81	10.99	4,400	2,500	1	0.5	14	<0.5	260	--	--
09/15/03[16]	168.80	157.38	11.42	4,700	1,700	1	<0.5	6	0.5	790	--	<50
12/15/03[16]	168.80	158.58	10.22	3,200	610	<0.5	<0.5	1	<0.5	780	--	<50
03/01/04[16]	168.80	159.19	9.61	2,200	1,500	<0.5	<0.5	4	<0.5	16	--	<50
06/28/04[16]	168.80	157.38	11.42	3,700	2,500	2	<0.5	8	<0.5	300	--	--
09/13/04[16]	168.80	156.78	12.02	2,000	2,000	1	<1	4	<1	700	--	<100
12/22/04[16]	168.80	158.39	10.41	1,300	970	0.8	<0.5	5	<0.5	370	--	<50
03/04/05[16]	168.80	159.12	9.68	890	790	<0.5	<0.5	1	<0.5	5	--	<50
06/30/05[16]	168.80	157.63	11.17	2,600	1,300	<0.5	<0.5	3	<0.5	68	--	<50
09/16/05[16]	168.80	157.29	11.51	1,300	1,200	<0.5	<0.5	1	<0.5	380	--	<50
12/21/05[16]	168.80	158.74	10.06	1,600[20]	1,300	<0.5	<0.5	2	<0.5	170	--	<50
03/21/06[16]	168.80	159.28	9.52	2,800	810	<0.5	<0.5	<0.5	<0.5	200	--	<50
06/21/06[16]	168.80	157.35	11.45	1,100	1,800	0.5	<0.5	2	<0.5	260	--	<50
09/05/06[16]	168.80	157.01	11.79	2,100	910	<0.5	<0.5	<0.5	<0.5	370	--	<50
12/28/06[16]	168.80	158.34	10.46	7,200	2,700	0.5	<0.5	3	<0.5	140	--	<50
03/26/07[16]	168.80	157.46	11.34	6,500	1,300	<0.5	<0.5	1	<0.5	150	--	<50
06/26/07[16]	**168.80**	**157.15**	**11.65**	**2,100**	**1,900**	**0.6**	**<0.5**	**2**	**<0.5**	**170**	--	**<50**
09/26/07[16]	**168.80**	**156.98**	**11.82**	**2,200**	**670**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**420**	--	**<50**
TRIP BLANK												
10/08/91	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
11/04/91	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/04/91	--	--	--	<50	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/05/92	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/30/92	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
01/27/93	--	--	--	<50	--	--	--	--	--	--	--	--

As of 09/26/07

Table 1

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2920 Castro Valley Boulevard

Castro Valley, California

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TRIP BLANK (cont)												
03/05/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/17/93	--	--	--	--	--	--	--	--	--	--	--	--
06/18/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<1.5	--	--	--
09/28/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/30/93	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
04/07/94	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
05/31/94	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/23/94	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
11/30/94	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/30/95	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/06/95	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/25/95	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/28/95	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
03/05/96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
06/27/96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
09/13/96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	--	--	--
12/19/96	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
03/20/97	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
06/27/97	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
09/19/97	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/05/97	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
03/31/98	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
06/19/98	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
08/31/98	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
03/19/99	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.0	--	--
09/16/99	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/16/99	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
12/20/99	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
03/02/00	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<2.5	--	--
06/30/00[8]	--	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--
09/30/00	--	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--
12/19/00	--	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--
03/13/01	--	--	--	--	<50.0	<0.500	0.534	<0.500	1.25	<0.500	--	--
06/12/01	--	--	--	--	<50	<0.50	<0.50	<0.50	<0.50	<2.5	--	--
09/18/01	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--

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WELL ID/ DATE	TOC (ft.)	GWE (msl)	DTW (ft.)	TPH-D (ppb)	TPH-G (ppb)	B (ppb)	T (ppb)	E (ppb)	X (ppb)	MTBE (ppb)	TOG (ppb)	ETHANOL (ppb)
QA												
12/17/01	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
03/21/02	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
06/08/02	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
09/13/02	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
12/13/02	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
03/17/03	--	--	--	--	<50	<0.50	<0.50	<0.50	<1.5	<2.5	--	--
06/16/03[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
09/15/03[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
12/15/03[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
03/01/04[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
06/28/04[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
09/13/04[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
12/22/04[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
03/04/05[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
06/30/05[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
09/16/05[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
12/21/05[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
03/21/06[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
06/21/06[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
09/05/06[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
12/28/06[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
03/26/07[16]	--	--	--	--	<50	<0.5	<0.5	<0.5	<0.5	<0.5	--	--
06/26/07[16]	--	--	--	--	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	--	--
09/26/07[16]	--	--	--	--	**<50**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	**<0.5**	--	--

Table 1

Groundwater Monitoring Data and Analytical Results

Chevron Service Station #9-6991
2920 Castro Valley Boulevard
Castro Valley, California

EXPLANATIONS:

Groundwater monitoring data and laboratory analytical results prior to June 30, 2000, were compiled from reports prepared by Blaine Tech Services, Inc.

TOC = Top of Casing
(ft.) = Feet
GWE = Groundwater Elevation
(msl) = Mean sea level
DTW = Depth to Water
TPH-D = Total Petroleum Hydrocarbons as Diesel
TPH-G = Total Petroleum Hydrocarbons as Gasoline
B = Benzene
T = Toluene
E = Ethylbenzene
X = Xylenes
MTBE = Methyl tertiary butyl ether
TOG = Total Oil and Grease
(ppb) = Parts per billion
-- = Not Measured/Not Analyzed
NP = No Purge
QA = Quality Assurance/Trip Blank

1 Chromatogram pattern indicates an unidentified hydrocarbon.
2 Chromatogram pattern indicates a non-diesel mix.
3 Chromatogram pattern indicates an unidentified hydrocarbon and weathered diesel.
4 Chromatogram pattern indicates a non-diesel mix + discrete peaks.
5 Laboratory report indicates unidentified hydrocarbons C6-C12.
6 Laboratory report indicates gasoline C6-C12 + unidentified hydrocarbons C6-C12.
7 Laboratory report indicates unidentified hydrocarbons C9-C24.
8 Laboratory report indicates this sample was analyzed outside of the EPA recommended holding time.
9 Laboratory report indicates discrete peaks.
10 Laboratory report indicates gasoline C6-C12.
11 Laboratory report indicates unidentified hydrocarbons >C16.
12 Laboratory report indicates diesel C9-C24 + unidentified hydrocarbons <C16.
13 Confirmation run.
14 Insufficient water to obtain sample for TPH-D.
15 Laboratory report indicates unidentified hydrocarbons C9-C17.
16 BTEX and MTBE by EPA Method 8260.
17 Laboratory report indicates the observed sample pattern is not typical of #2 fuel/diesel. The reported result is due to individual peak(s) eluting in the DRO range.
18 Laboratory report indicates the observed sample pattern is not typical of #2 fuel/diesel. It elutes in the DRO range later than #2 fuel and contains individual peaks eluting in the DRO range.
19 Laboratory report indicates the observed sample pattern includes #2 fuel/diesel, an additional pattern which elutes later in the DRO range, and individual peaks eluting in the DRO range.
20 Laboratory report indicates the observed sample pattern includes #2 fuel/diesel and additional patterns which elute earlier and later in the DRO range.
21 Incorrect TOC elevation (168.80) was used in past reports. Correct TOC and GWE are shown.

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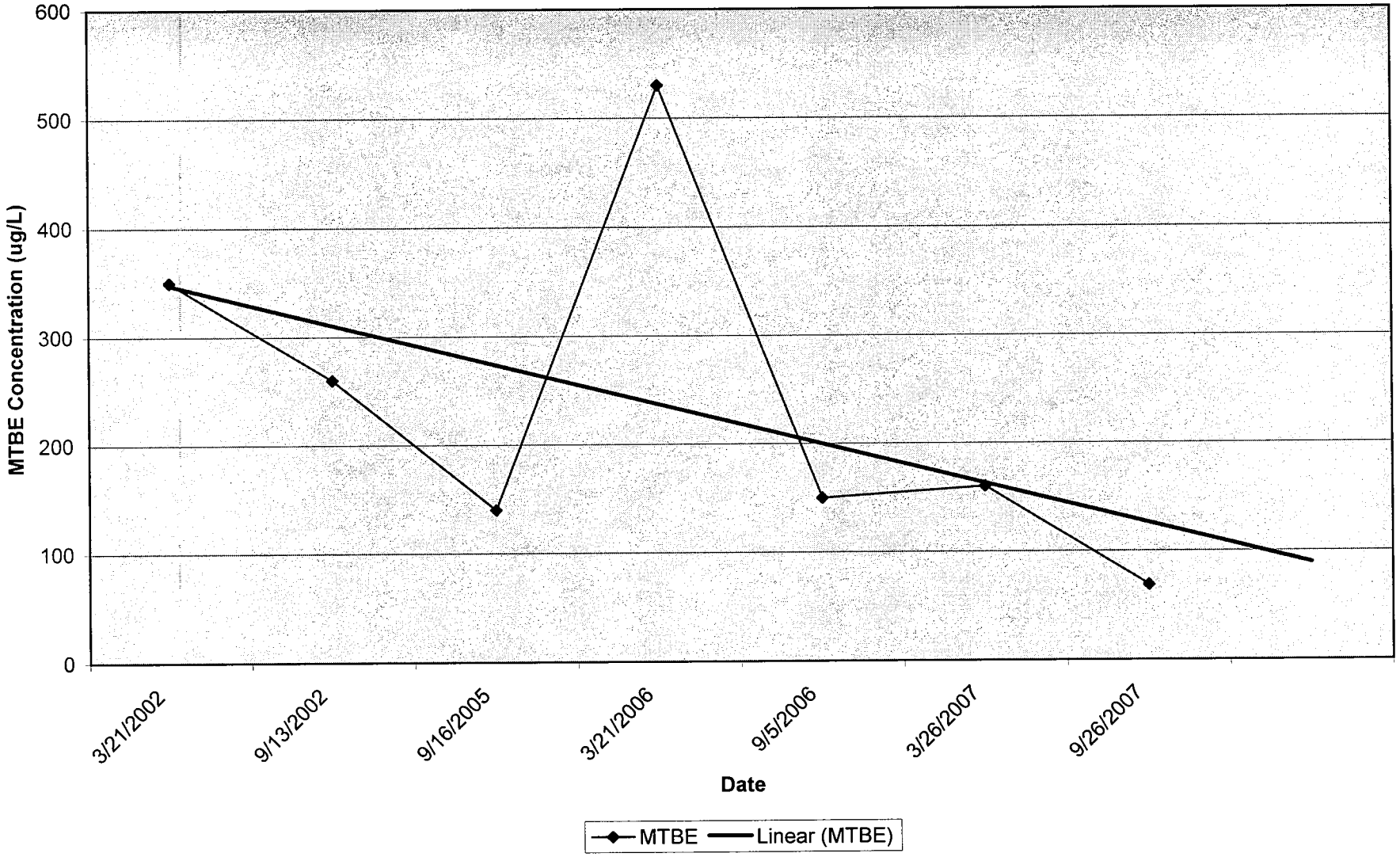
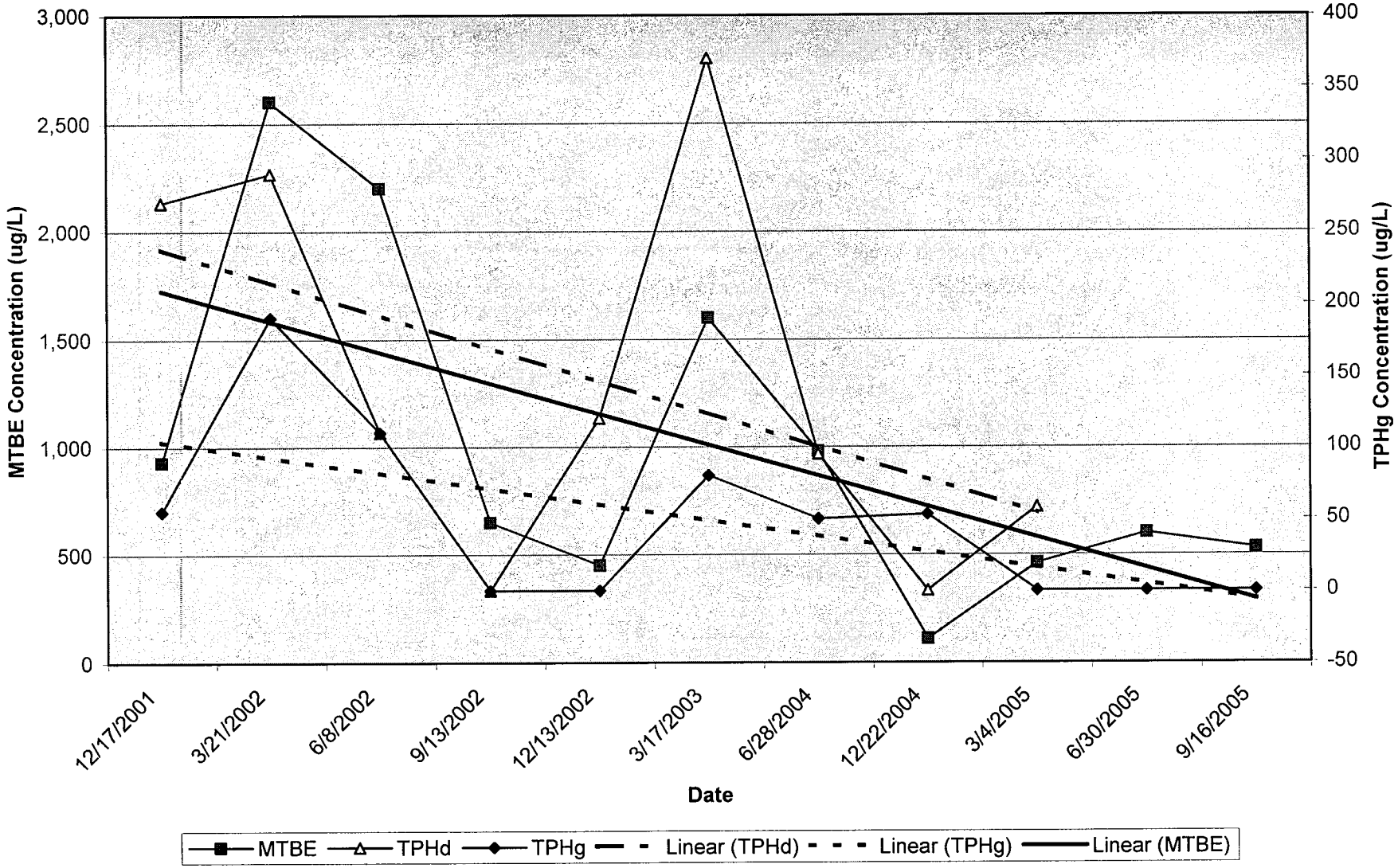
ATTACHMENT D

HYDROCARBON CONCENTRATION TREND GRAPHS

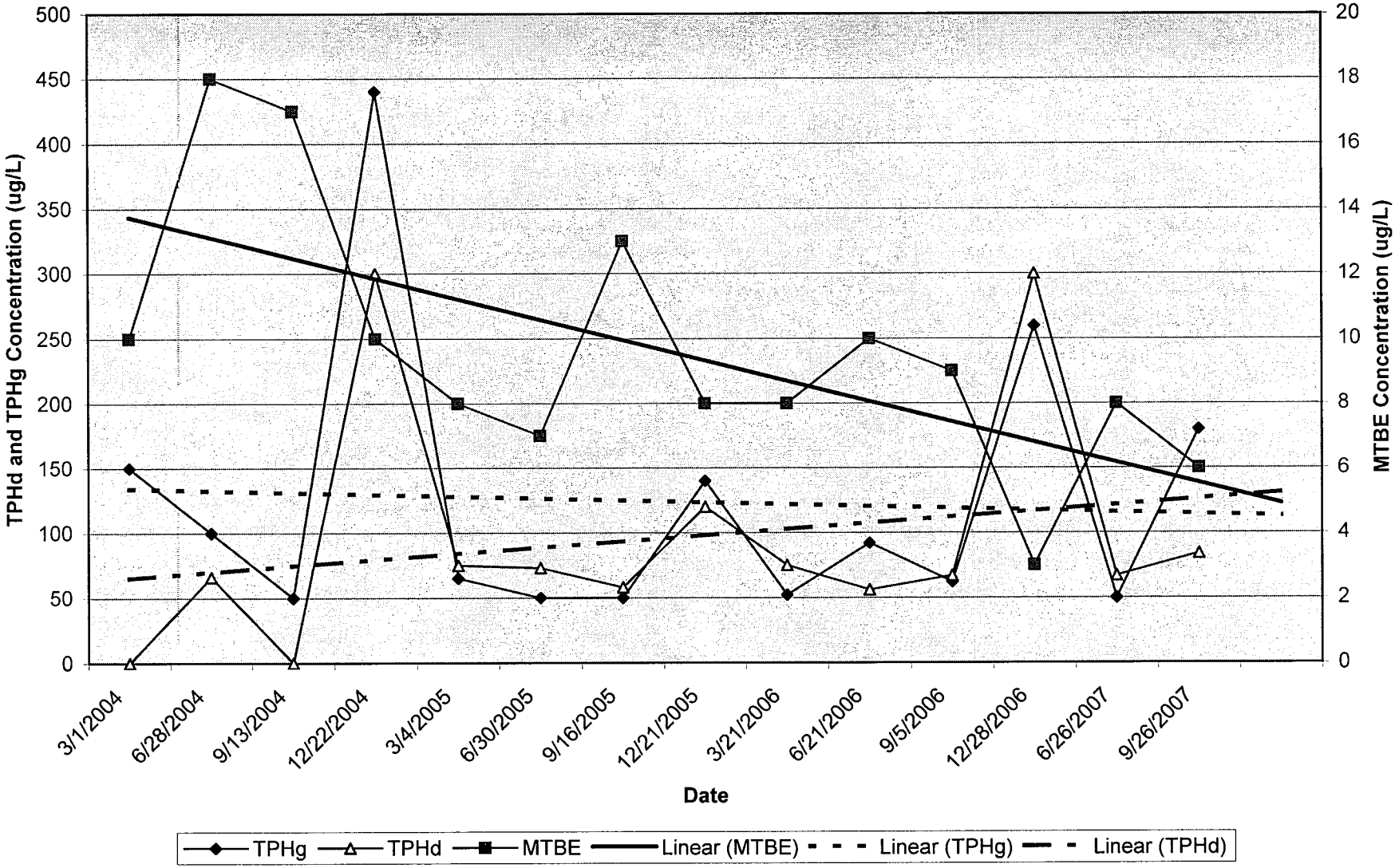
MW-2 MTBE Concentration Trend



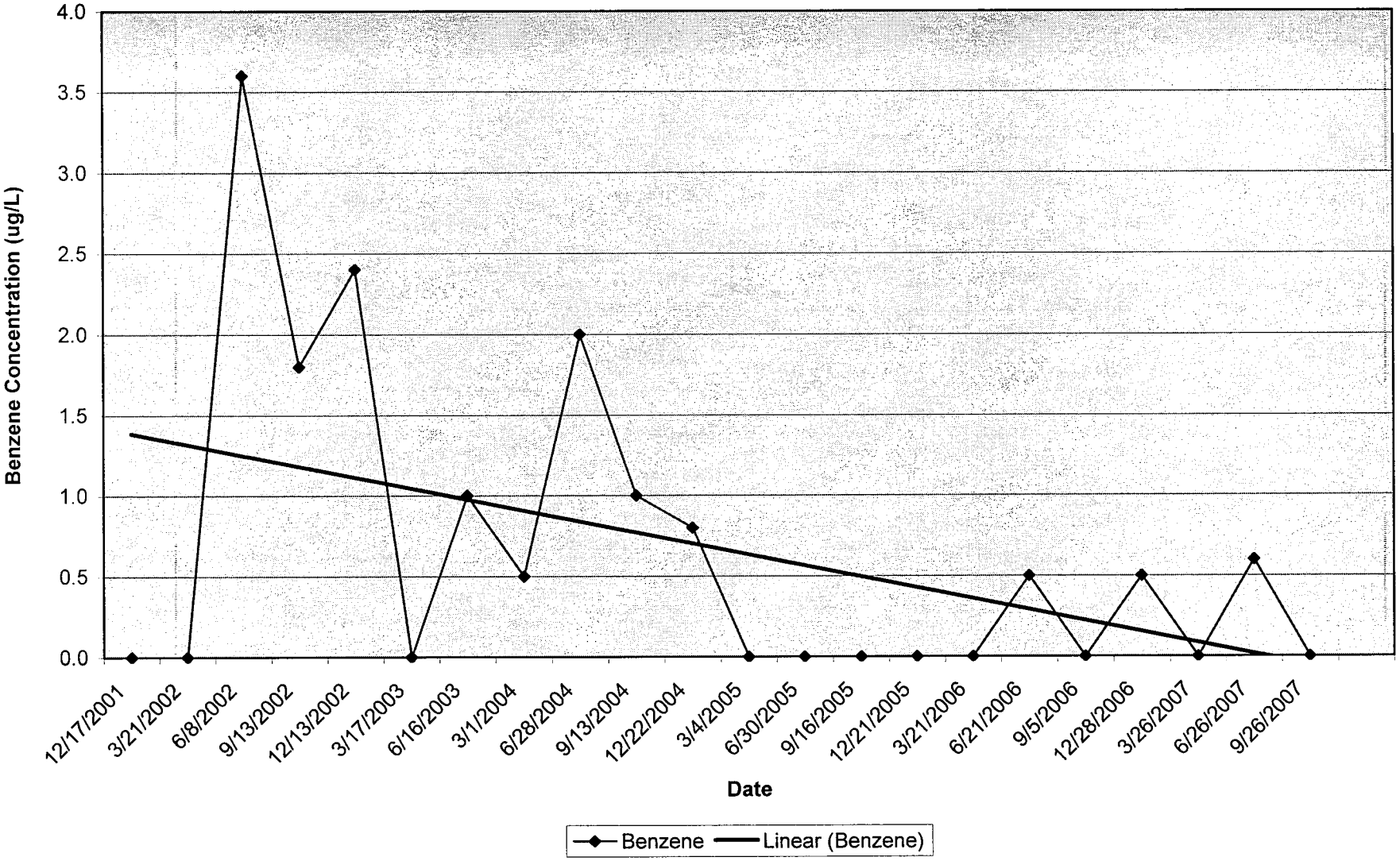
MW-3 TPHd, TPHg, and MTBE Concentration Trends



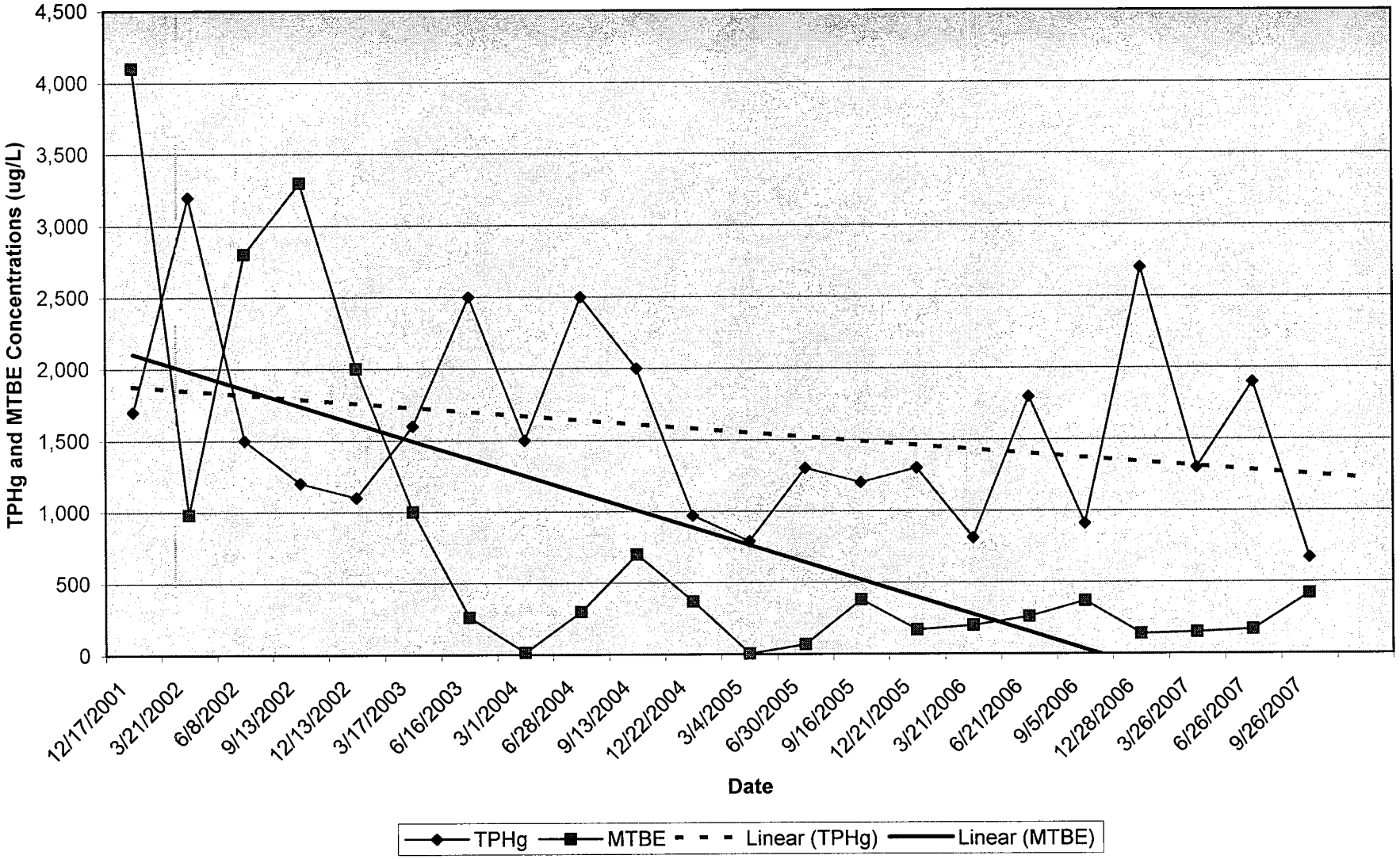
MW-6 TPHd, TPHg, and MTBE Concentration Trends

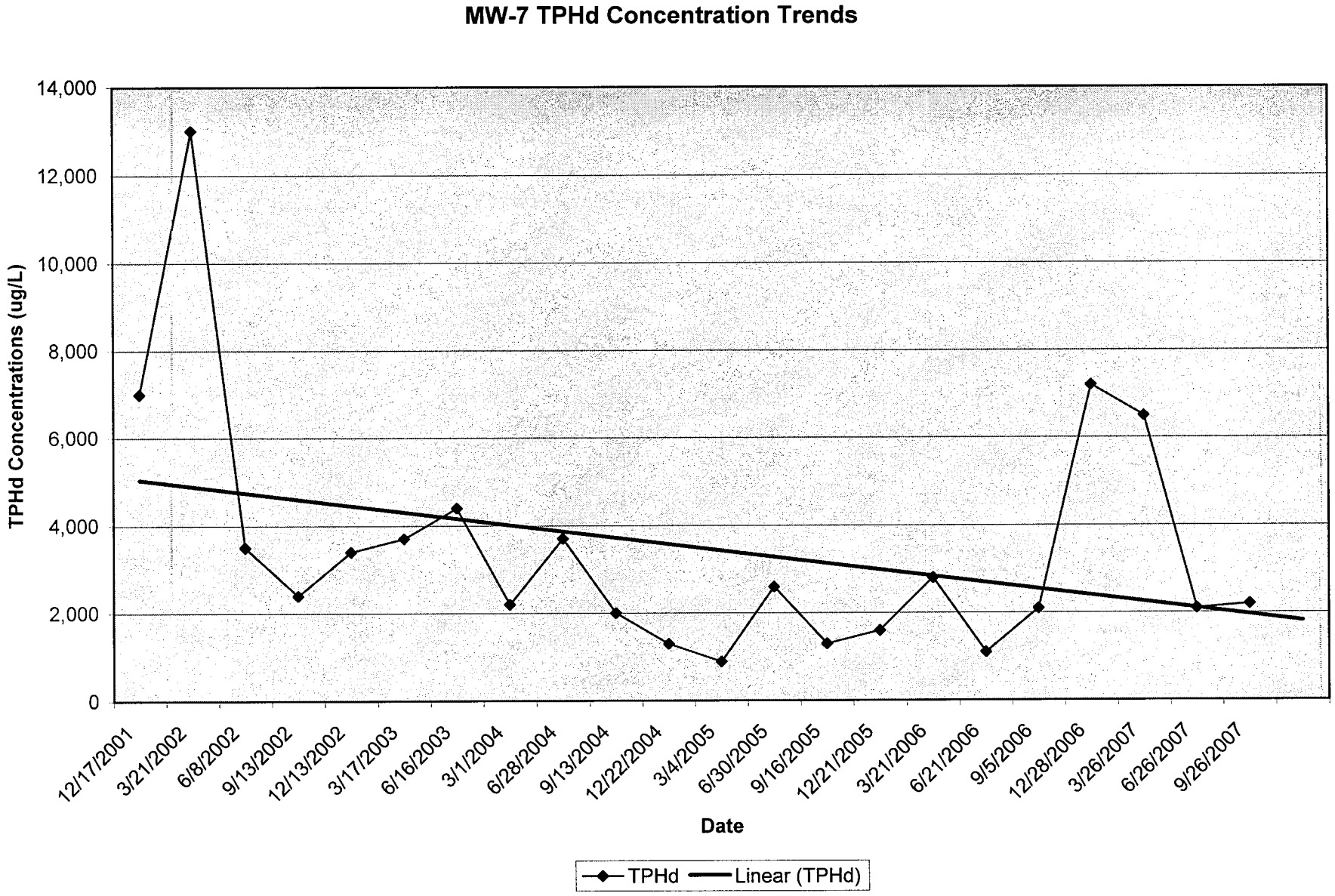


MW-6 Benzene Concentration Trends



MW-7 TPHg and MTBE Concentration Trends




MW-7 TPHd Concentration Trends
TPHd Concentrations (ug/L)
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
12/17/2001
3/21/2002
6/8/2002
9/13/2002
12/13/2002
3/17/2003
6/16/2003
3/1/2004
6/28/2004
9/13/2004
12/22/2004
3/4/2005
6/30/2005
9/16/2005
12/21/2005
3/21/2006
6/21/2006
9/5/2006
12/28/2006
3/26/2007
6/26/2007
9/26/2007
Date
TPHd
Linear (TPHd)

CONESTOGA-ROVERS
& ASSOCIATES

ATTACHMENT E

CRA's STANDARD OPERATING PROCEDURES

CRA

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 Unified Soil Classification System by a trained geologist working under the supervision of a California Professional Geologist (PG).

Soil Boring and Sampling

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.

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STANDARD FIELD PROCEDURES FOR MONITORING WELL DESTRUCTION

This document presents standard field methods for properly destroying groundwater monitoring wells. The objective of well destruction is to destroy wells in a manner that is protective of potential water resources. The two procedures most commonly used are pressure grouting and drilling out the well. These procedures are designed to comply with Federal, State and local regulatory guidelines. Specific field procedures are summarized below.

Pressure Grouting

Pressure grouting consists of injecting neat Portland cement through a tremie pipe under pressure to the bottom of the well. The cement is composed of about five gallons of water to a 94 pound. sack of Portland I/II Cement. Once the well casing is full of grout, it is pressurized for five minutes by applying a pressure of 25 pounds per square inch (psi) with a grout pump. The well casing can also be pressurized by extending the well casing to the appropriate height and filling it with grout. In either case, the additional pressure allows the grout to be forced into the sand pack. After grouting the sand pack and casing, the well vault is removed and the area resurfaced or backfilled as required.

Well Drill Out

When well drill out is required, the well location is cleared for subsurface utilities and a hollow-stem auger (or other appropriate) drilling rig is used to drill out the well casing and filter pack materials. First, drill rods are placed down the well and used to guide the augers as they drill out the well. A guide auger is used in place of the drill rods if feasible. Once the well is drilled out, the boring is filled with Portland cement injected through the augers or a tremie pipe under pressure to the bottom of the boring. The well vault is removed and the area resurfaced or backfilled as required.