State Water Resources Control Board

Linda S. Adams
Secretary for
Environmental Protection

Division of Water Quality
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EXHIBIT 3

UST Case Closure Summary
Former Chevron Service Station 20-5929; Ms. Stacie Hartung-Frerichs (Petitioner)
631 West Carrillo, Santa Barbara

Summary:
The release from the subject site was discovered during soil and groundwater assessment activities in 1988. The underground storage tanks (USTs) were removed and the excavations were backfilled with excavated soil and fill in 1989. The residual petroleum hydrocarbons impact only soil and shallow groundwater in the immediate vicinity of the site. The Santa Barbara County Local Oversight Program (County) denied Chevron Environmental Management Company's (petitioner) request for closure. The County denied closure because it believes that more site assessment is necessary and more remediation is required to remove remaining petroleum hydrocarbons including the fuel oxygenate tertiary butyl alcohol (TBA).

The mass of remaining residual petroleum hydrocarbons including fuel oxygenate compounds is adsorbed to fine grain soil and dissolved petroleum hydrocarbon constituents in groundwater are degrading. Since May 2004, TBA (also a breakdown product of MTBE), is the only compound that has exceeded the Central Coast Region's Water Quality Control Plan's (Basin Plan) low risk threshold (LRT) of 12 parts per billion for UST cases. Although monitoring wells screened in this area have consistently had concentrations of residual petroleum hydrocarbons including fuel oxygenate compounds in groundwater, after over 20 years the groundwater plume does not extend more than about 50 feet from the UST excavation. Down gradient onsite monitoring wells show that the LRT for TBA will be attained at the perimeter of the source area in approximately a decade. Offsite monitoring wells located approximately 100 feet down gradient from the UST excavation have consistently indicated non-detect concentrations of petroleum hydrocarbons and below LRT concentrations for fuel oxygenate compounds.

The commercial area of Santa Barbara relies on a public water supply. Except for the partially concrete-lined unnamed tributary to Mission Creek which passes approximately 400 feet north of the site, the nearest surface water is Mission Creek which is located approximately 1,200 feet northeast of the site. The nearest water supply well is a standby well (Santa Barbara City Hall Well) located approximately 4,200 feet northeast of the site. The affected shallow groundwater is not used as a source of water supply nor is it likely to be used as a source of water supply in the future. Based on facts in the record and hydrologic and geologic conditions at the site, the limited residual petroleum hydrocarbons, including oxygenate compounds that remain in shallow soil and groundwater pose a low risk to human health, safety and the environment. For these reasons, case closure is appropriate.

Background
This UST Case Closure Summary has been prepared in response to a petition to the State Water Resources Control Board (State Water Board) for closure of the Former Chevron Service Station 20-5929 UST case located at 631 West Carrillo Street, Santa Barbara. All record owners of fee title for this site as well as adjacent property owners and other interested parties have been notified of the recommendation for closure and were given an opportunity to provide comments.

The site operated as a gasoline service station for an unknown period of time prior to the removal of the USTs by the petitioner in 1989. The site is currently operated as a retail store with a paved parking lot. The surrounding areas are developed and consist of commercial and residential properties.

County staff rejected the petitioner's August 18, 2007 request for UST case closure. The County disagreed with the petitioner because: No confirmation borings were placed within the UST footprint to assess soil contamination beneath the tank pit; No further investigation has been conducted to determine the extent or severity of soil contamination beneath the residence on the adjoining property to the southeast; No further soil remediation has been completed to remediate residual petroleum hydrocarbons; and a soil vapor study has not been completed at the site.

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Petitioner Information

Ms. Stacie Hartung-Frerichs, Chevron Environmental Management Co./ Former Chevron #20-5929	631 West Carrillo Street, Santa Barbara, CA 93101
Global ID No: 0608300623	Petition Date: May 19, 2008
USTCF Claim No.: 4882	USTCF Expenditures to Date: $172,358

Agency Information

Agency Name: County of Santa Barbara Fire Department, SMU/LUFT Program	Address: 4410 Cathedral Oaks Road Santa Barbara, CA 93110
County Case No. 52139	Regional Board Case No: 3191
Years case open: 23	

Release Information:
USTs:

Tank No.	Size in Gallons	Contents	Status	Date
1	550	Waste oil	Removed	July 1989
2	10,000	Gasoline	Removed	July 1989
3	10,000	Gasoline	Removed	July 1989
4	10,000	Gasoline	Removed	July 1989

- Discovery Date: July 1989
- Affected Media: Shallow soil and groundwater.
- Free Product: None reported.
- Corrective Actions:
  - July 1989 - UST removal.
  - April 1991 through October 1991 – Soil and groundwater investigation.
  - April 1995 through June 1995 – Operation of Soil Vapor Extraction (SVE) system.
  - 1999 and 2000 – Soil confirmation borings.
  - 2002 and 2003 – Offsite soil and groundwater investigation.

Site Description/Conditions:

- Groundwater Basin: Santa Barbara.
- Beneficial Uses: Domestic (DOM), Municipal (MUN), Industrial (IND), Industrial Process Supply (PRO), Agricultural Supply (AGR).
- Land Use: Commercial with paved parking lot.
- Distance to Nearest Supply Well: Standby Well ~4,200 feet
- Minimum Groundwater Depth: ~9 feet.
- Distance to Nearest Surface Water: Except for the partially concrete-lined unnamed tributary to Mission Creek located approximately 400 feet north of the site, the nearest surface water is Mission Creek which is located approximately 1,200 feet northeast of the site.
- Groundwater Flow Direction: Southeast to northeast.
- Geology: Boring logs show that the site is underlain by silty sandy and clayey alluvial fan deposits with low permeability to depths of greater then 100 feet bgs.
- Hydrology: Depth to groundwater beneath the site has ranged between 9 and 17 feet bgs. The area surrounding the site is completely paved so groundwater recharge is derived from subsurface inflow.
- Estimate of Remaining Mass: During 1991, the volume of hydrocarbons in soil was estimated to be ~1,750 pounds.
- Time to Meet Water Quality Objectives: Several decades

Site History:

In October 1986, an engineering soil survey was completed to facilitate a property transfer. During the investigation, concentrations of gasoline constituents were reported in soil. Following the initial soil investigation, six groundwater wells were installed. The County became aware of the petroleum hydrocarbons in soil and groundwater in June 1989 and opened a UST case in July 1989 when elevated concentrations of gasoline constituents were reported in soil samples to 15 feet bgs within the UST excavation.

In July 1989, the UST system including three 10,000-gallon USTs and one 550 gallon waste oil UST were removed, the base of the UST excavations were excavated to approximately 15 feet bgs (top of saturated zone).

Between July 1989 and May 2008, corrective actions undertaken by the petitioner included advancing over 20 borings to multiple depths down to 40 feet bgs, collecting and analyzing over 50 soil samples, installing 4 monitoring wells, and the completion of a Remedial Action Plan that extracted groundwater and vapor phase hydrocarbons from numerous remediation wells.

In May 2008, the petitioner petitioned the State Water Board for case closure.

Contaminant Concentrations in Groundwater:
Currently, petroleum hydrocarbon constituents in groundwater including fuel oxygenates are below MCLs in all wells.

While reportable and decreasing concentrations of TPH as gasoline, benzene, MTBE and TBA have been reported in these wells, TBA at a maximum concentration of 15 parts per billion (ppb) was the only compound to exceed the Basin Plan low risk threshold for UST cases during the past four years. The following table shows the TBA concentrations in these wells consistently indicated non-detect or decreasing concentrations of TBA. While there is no drinking water standard or water quality objective for TBA, the Basin Plan states that TBA at a value less than 12 ppb is commonly used to indicate a low risk case that can be closed. Because remaining petroleum hydrocarbons are adsorbed in tight soils it is likely to be several decades before Basin Plan water quality objectives are met in the immediate vicinity of the residual petroleum left in soil.

December 2004 through December 2009 TBA Concentrations (µg/L) in Groundwater Wells within 50ft of Source Area									
Sample Date	12/04	06/05	12/05	05/06	11/06	12/07	11/08	06/09	12/09
Well									
GTI-4	10	ND<5	ND<5	ND<5	ND<5	ND<2	ND<2	ND<2	ND<2
GTI-5	ND<10	NS	NS	ND<5	ND<5	ND<2	**15**[1]	**12**[1]	3
GTI-7	ND<10	ND<5	ND<5	ND<5	ND<5	ND<2	ND<2	ND<2	NS
1. Basin Plan low risk threshold = <12(µg/L).									

Objections to closure and response:
The County staff did not concur with the Petitioner's request for case closure because of the following concerns;

- No conformation borings were placed within the UST footprint to assess soil contamination beneath the tank pit.

This statement is accurate. However, because residual petroleum hydrocarbons are adsorbed to tight soils, the low rate of dissolution of the remaining mass has effectively limited the length of the dissolved plume to less than 100 feet from the source area for the past 20 years and all wells are currently below MCL. Currently, TBA in groundwater is not detected beyond approximately 50 feet from the UST excavation. Therefore, the impact to water quality is limited and localized as discussed above.

The site is paved and the former service station building has been used for commercial retail since the tank removals in 1989. No building is located directly over the impacted soil or groundwater. Post remediation soil assessments completed between 1999 and 2000 indicate that all fourteen soil samples collected between four and ten feet bgs reported non-detect concentrations of petroleum hydrocarbons and fuel oxygenate compounds.

- No further soil remediation has been completed to remediate an estimated 1,750 pounds of total petroleum hydrocarbons (TPH) as gasoline beneath the site; and a soil vapor study has not been completed at the site

The 1992 volumetric calculation for impacted soil and petroleum hydrocarbons remaining within the UST excavation incorrectly includes unsaturated soil between approximately 10 and 15 feet bgs previously reported as being excavated and mixed with fill prior to being used as backfill. Reductions in the volume of volatile hydrocarbons in the UST excavation due to mixing, non-native soil conditions, volatilization, and biodegradation of petroleum hydrocarbons that would have occurred over the past 20 years were apparently not considered. Groundwater contaminant concentrations in down gradient wells within 50 feet of the source area do not support the existence of approximately 1,750 pounds of total petroleum hydrocarbons present beneath the site with 70% of the mass contained within the former tank pit between depths of 10 to 18 feet bgs.

Concentrations of dissolved petroleum constituents in shallow groundwater do not support the need for a soil vapor study.

- No further investigation has been conducted to determine the extent or severity of soil contamination beneath the residence on the adjoining property to the southeast;
- The vapor intrusion exposure to human health has not been calculated.

Following the operation of an SVE system in 1995, supplemental soil assessments were completed along the along the eastern property boundary of the site including areas down gradient and adjacent to the UST excavation. Residual concentrations of TPH-g, ethyl-benzene and xylenes were reported above “County Investigation Levels” in two soil samples collected near or below the water table between thirteen and twenty-one feet bgs. Sample locations located near well GTI-7 reported the highest residual petroleum hydrocarbons and fuel oxygenate compounds in soil. Well GTI-7 has

reported below MCL concentrations of petroleum hydrocarbons and fuel oxygenate compounds since February 2004.

Residual petroleum hydrocarbon mass is confined to tight soils at or near fifteen feet bgs that underlie a paved parking lot and commercial building.

There is an adjacent residential property to the southeast with one residential building. located down gradient of the UST excavation. Post remediation soil samples collected between the UST excavation and residential building, reported non detect petroleum hydrocarbons and fuel oxygenate compounds.

Based on soil and groundwater data, it appears that petroleum hydrocarbons and fuel oxygenate compounds in soil and groundwater do not extend beneath the adjacent residential building.

Ten feet of unsaturated soil has been shown to effectively degrade petroleum vapors over free product to non-detect levels. At this site, over 10 feet of unsaturated soil exists over the remaining on-site mass. Free product was never reported. Residual petroleum hydrocarbons and fuel oxygenate compounds are below water quality objectives in all wells.

This demonstrates that the thin layer of petroleum hydrocarbons and fuel oxygenates near fifteen feet bgs are degraded, adsorbed in tight soils, and are not present at concentrations likely to be present or migrate beneath the adjacent property. Therefore, no investigation is needed to determine the extent of off-site soil contamination beneath the residence on the adjacent property

Closure:

Does corrective action performed to date ensure the protection of human health, safety, and the environment? Yes.

Is corrective action and UST case closure consistent with State Water Board Resolution 92-49? Yes.

Is achieving background water quality feasible? No.

To remove all traces of residual petroleum constituents at the site would require significant effort and cost. If complete removal of detectable traces of petroleum constituents becomes the standard for UST corrective actions, however, the statewide technical and economic implications will be enormous. For example, disposal of soils from comparable areas of excavation throughout the state would greatly impact already limited landfill space. In light of the precedent that would be set by requiring additional excavation at this site and the fact that beneficial uses are not threatened, attaining background water quality at this site is not feasible.

If achieving background water quality is not feasible,
Is the alternative cleanup level consistent with the maximum benefit to the people of the state? Yes.

It is impossible to determine the precise level of water quality that will be attained given the limited residual petroleum hydrocarbons that remain at the site, but in light of all the factors discussed above, and the fact that the residual petroleum constituents will not unreasonably affect present and anticipated beneficial uses of groundwater beyond the immediate vicinity of the site of the UST excavation, a level of water quality will be attained that is consistent with the maximum benefit to the people of the state.

Will the alternative cleanup level unreasonably affect present and anticipated beneficial uses of water? No.

Impacted groundwater is not used as a source of drinking water or for any other beneficial use currently and it is highly unlikely that the impacted groundwater will be used as a source of drinking water or for any other beneficial use in the foreseeable future.

Will the alternative level of water quality exceed water quality prescribed in applicable Basin Plans? No.

The final step in determining whether cleanup to a level of water quality less stringent than background is appropriate for this site requires a determination that the alternative level of water quality will not result in water quality less than that prescribed in the relevant basin plan. Pursuant to State Water Board Resolution 92-49, a site may be closed if the basin plan requirements will be met within a reasonable time frame.

Have factors contained in Title 23 of the California Code of Regulations, Section 2550.4 been considered? Yes.

In approving an alternative level of water quality less stringent than background, the State Water Board has also considered the factors contained in California Code of Regulations, title 23, section 2550.4, subdivision (d). As discussed earlier, the adverse effect on shallow groundwater will be minimal and localized, and there will be no adverse effect on the groundwater contained in deeper aquifers, given the physical and chemical characteristics of petroleum constituents, the hydrogeological characteristics of the site and surrounding land, and the quantity of the groundwater and direction of the groundwater flow. In addition, the potential for adverse effects on beneficial uses of groundwater is low, in light of the proximity of the groundwater supply wells, the current and potential future uses of groundwater in the area, the existing quality of groundwater, the potential for health risks caused by human exposure, the potential damage to wildlife, crops, vegetation, and physical structures, and the persistence and permanence of potential effects. Finally, a level of water quality less stringent than background is unlikely to have any impact on surface water quality, in light of the volume and physical and chemical characteristics of

petroleum constituents; the hydrogeological characteristics of the site and surrounding land; the quantity and quality of groundwater and direction of groundwater flow, the patterns of precipitation in the region, and the proximity of residual petroleum to surface waters.

Has the requisite level of water quality been met? No

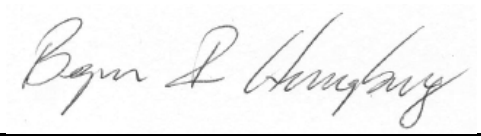
If no, the approximate time period in which the requisite level of water quality will be met:

The approximate time period in which the requisite level of water quality for dissolved petroleum hydrocarbons will be met is estimated to be several decades.

Though the requisite level of water quality has not been met, water quality objectives will be achieved via natural attenuation in approximately a decade. This is a reasonable period in which to meet the requisite level of water quality because the affected groundwater is not currently being used as a source of drinking water and it is highly unlikely that the affected groundwater will be used as a source of drinking water in the future. Other designated beneficial uses of water are not adversely impacted and it is highly unlikely that they will be.

Summary and Conclusions:

Based on the hydrology, geology, and other factors at and in the vicinity of the site, the residual petroleum hydrocarbons that remain in soil and groundwater pose a low risk to public health, safety and the environment. The remaining mass of residual petroleum hydrocarbons is limited to the immediate vicinity of the former USTs, the dissolved petroleum constituent plume in groundwater is stable, and concentrations are decreasing. Affected groundwater is not currently used as a source for beneficial uses and it is highly unlikely that it will be used for beneficial uses in the future. Case closure is appropriate.



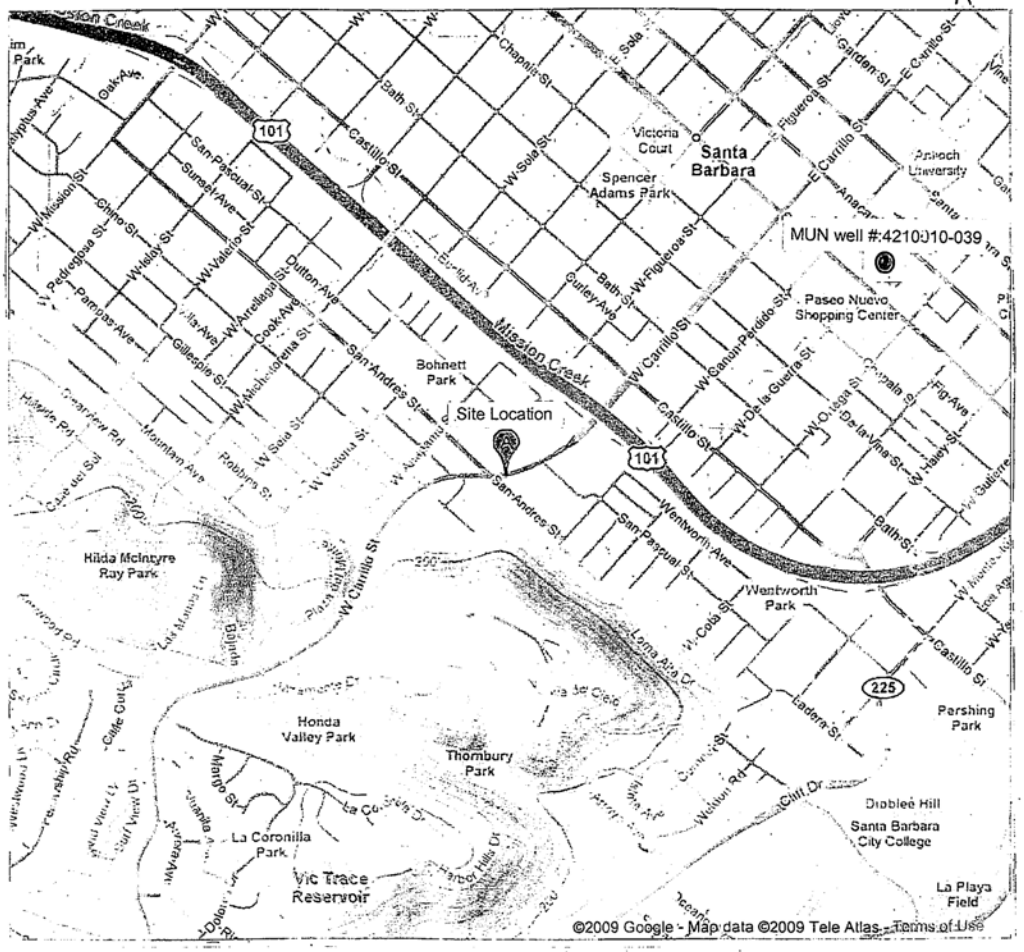
June 8, 2010

Benjamin Heningburg
Engineering Geologist
Professional Geologist No. 8130

Date

SITE LOCATION MAP

FORMER CHEVRON SERVICE STATION NO.20-5929
631 W. CARILLO STREET
SANTA BARBARA, CA

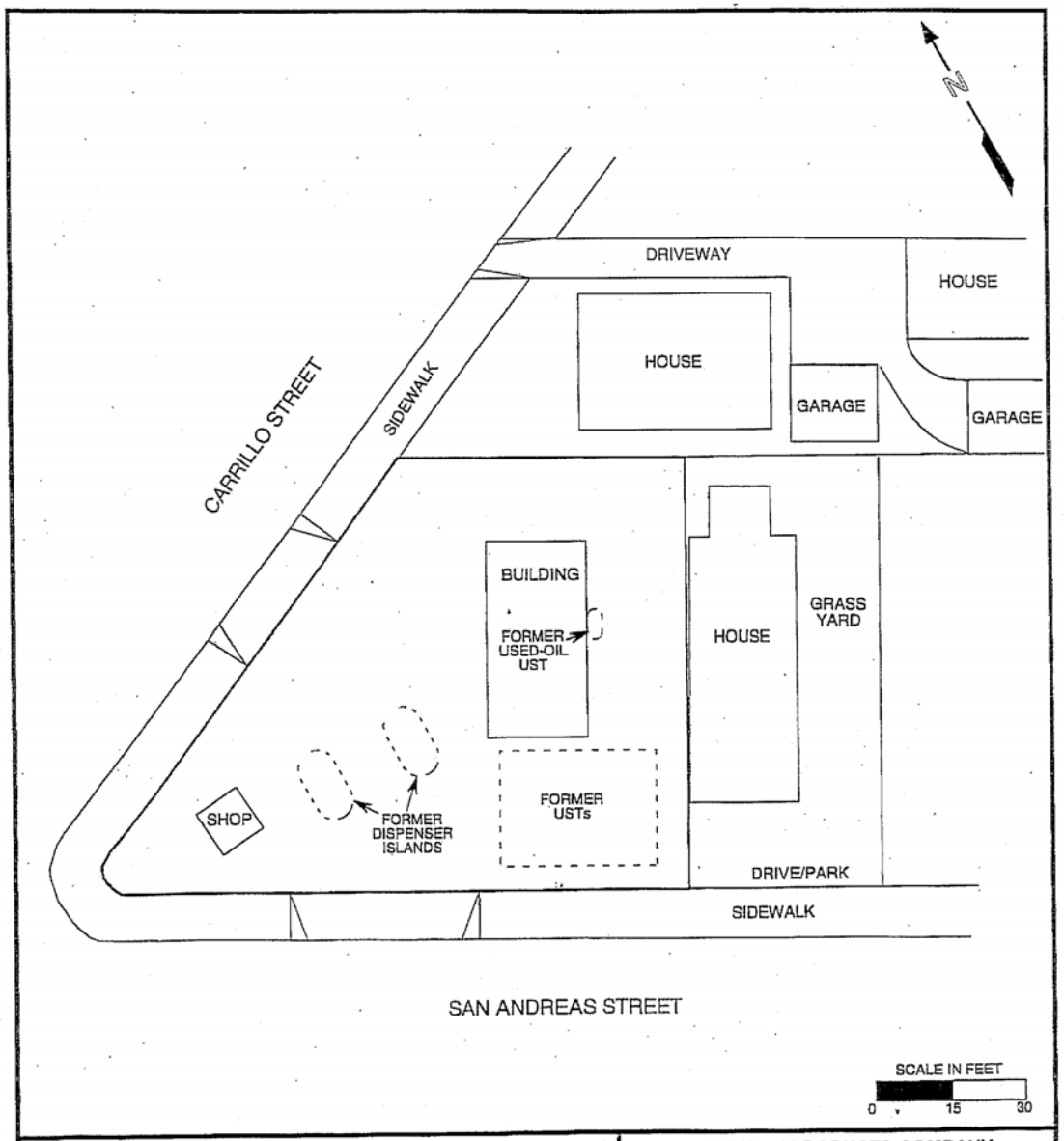


Scale 1" = 1,000 feet

Figure 1

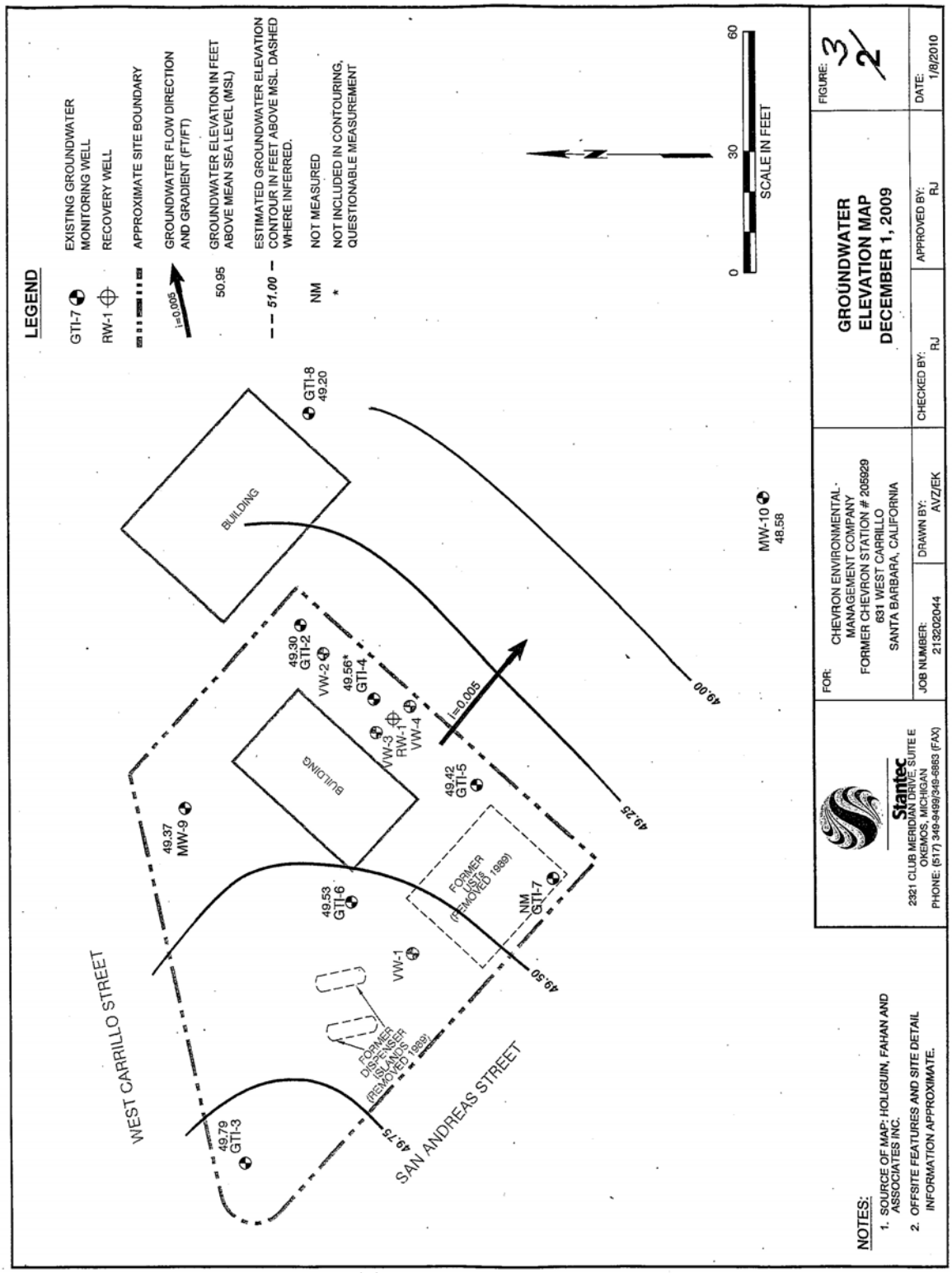
HOLGUIN, FAHAN & ASSOCIATES, INC.
ENVIRONMENTAL MANAGEMENT CONSULTANTS

Figure 2



LEGEND	CHEVRON PRODUCTS COMPANY
	FORMER SERVICE STATION #205929 631 WEST CARRILLO STREET SANTA BARBARA, CALIFORNIA FIGURE 2 - PLOT PLAN
	HOLGUIN, FAHAN & ASSOCIATES, INC.

REVISION DATE: AUGUST 26, 1999: JMK


LEGEND
GTI-7 EXISTING GROUNDWATER MONITORING WELL
RW-1 RECOVERY WELL
APPROXIMATE SITE BOUNDARY
i=0.005 GROUNDWATER FLOW DIRECTION AND GRADIENT (FT/FT)
50.95 GROUNDWATER ELEVATION IN FEET ABOVE MEAN SEA LEVEL (MSL)
51.00 ESTIMATED GROUNDWATER ELEVATION CONTOUR IN FEET ABOVE MSL. DASHED WHERE INFERRED.
NM NOT MEASURED
* NOT INCLUDED IN CONTOURING, QUESTIONABLE MEASUREMENT
0 30 60
SCALE IN FEET
N
BUILDING
BUILDING
GTI-8 49.20
MW-10 48.58
49.30 GTI-2
VW-2
49.56* GTI-4
VW-3
RW-1
VW-4
i=0.005
49.42 GTI-5
49.37 MW-9
49.53 GTI-6
VW-1
FORMER DISPENSER ISLANDS (REMOVED 1989)
FORMER USTs (REMOVED 1989)
NM GTI-7
49.79 GTI-3
49.75
49.50
49.25
49.00
WEST CARRILLO STREET
SAN ANDREAS STREET
NOTES:
1. SOURCE OF MAP: HOLIGUIN, FAHAN AND ASSOCIATES INC.
2. OFFSITE FEATURES AND SITE DETAIL INFORMATION APPROXIMATE.
Stantec
2321 CLUB MERIDIAN DRIVE SUITE E
OKEMOS, MICHIGAN
PHONE: (517) 349-9499/349-6863 (FAX)
FOR:
CHEVRON ENVIRONMENTAL-MANAGEMENT COMPANY
FORMER CHEVRON STATION # 205929
631 WEST CARRILLO
SANTA BARBARA, CALIFORNIA
JOB NUMBER: 213202044
DRAWN BY: AVZ/EK
CHECKED BY: RJ
APPROVED BY: RJ
GROUNDWATER ELEVATION MAP DECEMBER 1, 2009
FIGURE: 3 2
DATE: 1/8/2010