UST CASE CLOSURE SUMMARY

Agency Information

Agency Name: Central Valley Regional Water Quality Control Board	Address: 11020 Sun Center Drive #200 Rancho Cordova, CA 95670-6114
Agency Caseworker: Paul Sanders	Case No.: 5T22000061

Case Information

USTCF Claim No.: 975, 11581	Global ID: T0604300060
Site Name: Mariposa Quick Stop, Shell	Site Address: 4989 Highway 140 Mariposa, CA 95338 (Site)
Petitioner: Dieter Dubberke	Address: PO Box 2127 Mariposa, CA 95338
USTCF Expenditures to Date: $1,495,000	Number of Years Case Open: 21

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id= T0604300060

Summary

The Low-Threat Underground Storage Tank Case Closure Policy (Policy) contains general and media-specific criteria, and cases that meet those criteria are appropriate for closure pursuant to the Low-Threat Policy. This Case meets all of the required criteria of the Policy. A summary evaluation of compliance with the Policy is shown in **Attachment 1: Compliance with State Water Board Policies and State Law**. The Conceptual Site Model upon which the evaluation of the Case has been made is described in **Attachment 2: Summary of Basic Site Information.** Highlights of the Conceptual Site Model of the Case are as follows:

The unauthorized release was discovered in 1991 when free phase product was observed in Mariposa Creek. The historic plume paralleled Mariposa Creek for nearly 1,200 feet. One shallow hand dug well was impacted and several private domestic wells were taken offline as a precautionary measure. The Underground Storage Tanks (USTs) were removed in 1994 along with 200 cubic yards of surrounding soil. The USTs were not replaced and no USTs remain at the Site. A soil vapor extraction system and an extensive groundwater extraction system with interceptor trenches were utilized to remediate the contaminants. The aggressive remediation has reduced the Miller Road area contamination to below water quality objectives (WQO), and near or below detection limits.

Public water service is provided to the properties adjacent to the Site by Mariposa Public Utility District (MPUD). The private domestic wells located outside of the MPUD boundary were extensively pumped, analyzed, and placed back in service in 2002. The twelve years of post-remediation monitoring data demonstrates that the plume remains stable, near the source area, and is not migrating laterally or vertically.

Petroleum concentrations in soil and groundwater remain elevated. However, the corrective actions have reduced the hydrocarbon plume to the shallow soil and groundwater within approximately 200 feet of the source area. The affected groundwater is not currently being used as a source of drinking water or for any other beneficial use. It is highly unlikely that the affected groundwater will be used as a source of drinking water or for any other beneficial use in the foreseeable future. Any future public supply wells will likely be constructed with competent sanitary seals and screens that are in deeper more protected aquifers. Remaining petroleum constituents are limited and stable. Remedial actions have been implemented to the extent practicable and given the Site conditions further remediation would likely be ineffective and expensive. Additional assessment/monitoring will not likely change the conceptual model. Any remaining petroleum constituents do not pose significant risk to human health, safety, or the environment.

Rationale for Closure under the Policy

- General Criteria – Site **MEETS ALL EIGHT GENERAL CRITERIA** under the Policy.

- Groundwater Media-Specific Criteria – Site meets the criterion in **CLASS 5**. Based on an analysis of Site specific conditions that under current and reasonably anticipated near-term future scenarios, the contaminant plume poses a low threat to human health and safety and to the environment and WQOs will be achieved within a reasonable time frame. The 2002 pumping and sampling of the private domestic wells demonstrates that the wells are no longer threatened by the groundwater plume. The twelve years of post-remedial monitoring data demonstrates the groundwater plume is stable and is no longer a threat to Mariposa Creek.

- Petroleum Vapor Intrusion to Indoor Air – Site meets **CRITERIA (2) a, Scenario 3**. Benzene in groundwater is less than (<) 1,000 micrograms per liter (µg/L); total petroleum hydrocarbons (TPH) is <100 milligrams per kilogram (mg/kg) in soil at depths less than 10 feet.

- Direct Contact and Outdoor Air Exposure – Site meets **CRITERIA (3) a**. Maximum concentrations of petroleum constituents in soil are less than or equal to those listed in Table 1. The estimated naphthalene concentrations in soil meet the thresholds in Table 1 and the Policy criteria for direct contact by a factor of eight. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.

Objections to Closure

Central Valley Regional Water Quality Control Board (Regional Water Board) staff objected to UST case closure because:

1. Substantial concentrations are present in groundwater beneath the Site. Since 2001 dissolved total petroleum hydrocarbons as gasoline (TPHg) in MW-5 and MW-11 averaged over 30,000 µg/L with no consistent decline. The consistently high hydrocarbon concentrations in groundwater suggest free product my still exist in fractured rock and sensitive receptors remain vulnerable as long as substantial contamination is present in groundwater.
   RESPONSE: Dissolved petroleum constituents at the Site remain elevated; however, the aggressive Site cleanup efforts have reduced the offsite impacts to below WQOs. The Regional Water Board approved usage of the private domestic wells and destruction of the monitoring wells (MWs) immediately downgradient of the plume (MW-15, MW-17, and MW-18) indicating that migration is not a concern. The investigation data and Site hydrogeology plus the 12 years of post-

remedial sampling has demonstrated that the plume is localized, stable, and not impacting the nearby creek. Remediation and natural attenuation have eliminated the presence of free product.

2. Benzene MCL exceeded in 98 percent of samples collected since 2000.
   RESPONSE: Benzene concentrations continue to steadily decrease and the plume remains localized, stable, and does not pose a threat to human health or the environment.

3. After not being analyzed since 2000, methyl-tertiary-butyl-ether (MTBE) was detected during the most recent event indicating the source and extent has not been determined.
   RESPONSE: Gasoline was sold and stored at the Site during the time period when MTBE was widely used as a fuel oxygenate. The tanks, pump island, and associated piping were removed and not replaced. No other known fuel stations are located near the Site. Cumulative data from twenty seven groundwater monitoring wells provides adequate plume definition.

4. An estimate of mass of hydrocarbons remaining in groundwater and the extent of plume have not been determined.
   RESPONSE: Cumulative data from twenty seven monitoring wells, five extraction wells, and six interceptor trenches has provided adequate plume definition. While the mass of the remaining plume has not been calculated since 1997, the plume remains stable, reducing in size, and is localized near the source area.

5. Natural attenuation is not effective at the subject property.
   RESPONSE: The 1,200 foot long historic plume is now limited to within approximately 200 feet of the source area. Post remedial source area dissolved benzene concentrations have demonstrated a consistently declining trend. While dissolved TPHg concentrations fluctuate, they remain horizontally stable and localized near the source area.

6. Secondary source removal has not been completed to the extent practicable and dual phase extraction has been proven effective.
   RESPONSE: Approximately 200 cubic yards of soil immediately beneath the former USTs were removed during the removal of the USTs. Over 3 million dollars has been spent at the Site on corrective action and the plume has been reduced to a localized area near the former source. Further corrective action is not necessary and would not change the conceptual site model.

7. The threat to downgradient receptors is exacerbated by the thin layer of highly permeable soil.
   RESPONSE: The Mariposa Creek alluvium is highly permeable and also biologically active as evidenced by the natural attenuation of the original 1,200 foot plume. The source has been removed and the plume has stabilized laterally and vertically as evidenced through the past 12 years of post-remedial monitoring data. The wells immediately downgradient of the plume (MW-15, MA-17, and MW-18) were destroyed due to low or non-detect analytical data. Impacts to Mariposa Creek have not been identified since 1998. The only known active wells are located approximately 2,000 feet downgradient of the plume and were extensively pumped and monitored before being placed back in service.

8. The risk from vapor intrusion has not been adequately assessed because the reporting limit for benzene was not low enough to provide adequate risk analysis.
   RESPONSE: The site meets Criteria (2) a, Scenario 3 of the vapor intrusion media specific criteria as defined in the Policy.

Recommendation for Closure

The corrective action performed at this Site ensures the protection of human health, safety, the environment and is consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations, applicable state policies for water quality control and the applicable water quality control plan, and case closure is recommended.

Prepared By: _____ 6/4/2013
Matthew Cohen — Date
Engineering Geologist

Reviewed By: _____ 6/4/2013
George Lockwood, PE No. 59556 — Date
Senior Water Resource Control Engineer

ATTACHMENT 1: COMPLIANCE WITH STATE WATER BOARD POLICIES AND STATE LAW

The Site complies with State Water Resources Control Board policies and state law. Section 25296.10 of the Health and Safety Code requires that sites be cleaned up to protect human health, safety, and the environment. Based on available information, any residual petroleum constituents at the site do not pose significant risk to human health, safety, or the environment.

The Site complies with the requirements of the Low-Threat Underground Storage Tank (UST) Case Closure Policy as described below.[1]

Is corrective action consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations? The corrective action provisions contained in Chapter 6.7 of the Health and Safety Code and the implementing regulations govern the entire corrective action process at leaking UST sites. If it is determined, at any stage in the corrective action process, that UST case closure is appropriate, further compliance with corrective action requirements is not necessary. Corrective action at this Site has been consistent with Chapter 6.7 of the Health and Safety Code and implementing regulations and, since this case meets applicable case-closure requirements, further corrective action is not necessary, unless the activity is necessary for case closure.	☒ Yes ☐ No
Have waste discharge requirements or any other orders issued pursuant to Division 7 of the Water Code been issued at this Site?	☐ Yes ☒ No
If so, was the corrective action performed consistent with any order?	☐ Yes ☐ No ☒ NA
General Criteria General criteria that must be satisfied by all candidate sites:	
Is the unauthorized release located within the service area of a public water system?	☒ Yes ☐ No
Does the unauthorized release consist only of petroleum?	☒ Yes ☐ No
Has the unauthorized ("primary") release from the UST system been stopped?	☒ Yes ☐ No
Has free product been removed to the maximum extent practicable?	☒ Yes ☐ No ☐ NA
Has a conceptual site model that assesses the nature, extent, and mobility of the release been developed?	☒ Yes ☐ No

[1] Refer to the Low-Threat Underground Storage Tank Case Closure Policy for closure criteria for low-threat petroleum UST sites.

Has secondary source been removed to the extent practicable?	☒ Yes ☐ No
Has soil or groundwater been tested for MTBE and results reported in accordance with Health and Safety Code, Section 25296.15?	☒ Yes ☐ No
Does nuisance as defined by Water Code, section 13050 exist at the Site?	☐ Yes ☒ No
Are there unique site attributes or site-specific conditions that demonstrably increase the risk associated with residual petroleum constituents?	☐ Yes ☒ No
Media-Specific Criteria Candidate sites must satisfy all three of these media-specific criteria: **1. Groundwater:** To satisfy the media-specific criteria for groundwater, the contaminant plume that exceeds water quality objectives must be stable or decreasing in areal extent, and meet all of the additional characteristics of one of the five classes of sites:	
Is the contaminant plume that exceeds water quality objectives stable or decreasing in areal extent?	☒ Yes ☐ No ☐ NA
Does the contaminant plume that exceeds water quality objectives meet all of the additional characteristics of one of the five classes of sites? If YES, check applicable class: ☐ **1** ☐ **2** ☐ **3** ☐ **4** ☒ **5**	☒ Yes ☐ No ☐ NA
For sites with releases that have not affected groundwater, do mobile constituents (leachate, vapors, or light non-aqueous phase liquids) contain sufficient mobile constituents to cause groundwater to exceed the groundwater criteria?	☐ Yes ☐ No ☒ NA
2. Petroleum Vapor Intrusion to Indoor Air: The site is considered low-threat for vapor intrusion to indoor air if Site-specific conditions satisfy all of the characteristics of one of the three classes of sites (a through c) or if the exception for active commercial fueling facilities applies.	
Is the Site an active commercial petroleum fueling facility? Exception: Satisfaction of the media-specific criteria for petroleum vapor intrusion to indoor air is not required at active commercial petroleum fueling facilities, except in cases where release characteristics can be reasonably believed to pose an unacceptable health risk.	☐ Yes ☒ No
a. Do Site-specific conditions at the release site satisfy all of the applicable characteristics and criteria of scenarios 1 through 3 or all of the applicable characteristics and criteria of scenario 4? If YES, check applicable scenarios: ☐ **1** ☐ **2** ☒ **3** ☐ **4**	☒Yes ☐ No ☐ NA
b. Has a Site-specific risk assessment for the vapor intrusion pathway been conducted and demonstrates that human health is protected to the satisfaction of the regulatory agency?	☐ Yes ☐ No ☒ NA

c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that petroleum vapors migrating from soil or groundwater will have no significant risk of adversely affecting human health?	☐ Yes ☐ No ☒ NA
3. Direct Contact and Outdoor Air Exposure: The Site is considered low-threat for direct contact and outdoor air exposure if Site-specific conditions satisfy one of the three classes of sites (a through c).	
a. Are maximum concentrations of petroleum constituents in soil less than or equal to those listed in Table 1 for the specified depth below ground surface (bgs)?	☒ Yes ☐ No ☐ NA
b. Are maximum concentrations of petroleum constituents in soil less than levels that a Site-specific risk assessment demonstrates will have no significant risk of adversely affecting human health?	☐ Yes ☐ No ☒ NA
c. As a result of controlling exposure through the use of mitigation measures or through the use of institutional or engineering controls, has the regulatory agency determined that the concentrations of petroleum constituents in soil will have no significant risk of adversely affecting human health?	☐ Yes ☐ No ☒ NA

ATTACHMENT 2: SUMMARY OF BASIC INFORMATION (Conceptual Site Model)

Site Location/ History

- Site Location: The Site is located at the intersection Highway 140 and Miller Road in Mariposa. The Site is a Real estate office and auto parts store.
- Surrounding Land Usage: The Site is bounded by commercial and rural residential properties.
- Contaminants of Concern: Petroleum hydrocarbons only.
- Primary Source of Release: UST system.
- Discovery Date: 1991.
- Release Type: Petroleum[2].
- Free Product: From 1998 to 2001, MW-3 contained free product, but not after 2001.

Table A. USTs:

Tank No.	Size	Contents	Status	Date
1	7,500	Gasoline	Removed	12/1/1994
2	5,000	Gasoline	Removed	12/1/1994
3	3,000	Gasoline	Removed	12/1/1994

Receptors

- Groundwater Basin: Tributary to San Joaquin Valley.
- Groundwater Beneficial Uses: Municipal (MUN), Agricultural Supply (AGR), Industrial Supply (IND), and Industrial Process Supply (PRO).
- Designated Land Use: General commercial.
- Public Water System: Mariposa Public Utility District.
- Distance to Nearest Surface Waters: Mariposa Creek ~ 150 feet east.
- Distance to Nearest Supply Wells: Inactive supply well approximately 500 feet lateral gradient, inactive hand dug well approximately 1,000 feet downgradient, and active private domestic wells greater than 1,000 feet downgradient.

Geology/ Hydrogeology

- Average Groundwater Depth: Source area ~15-18 feet below ground surface (bgs), Miller Road area ~5 feet bgs.
- Minimum Groundwater Depth: ~ 5 bgs. (source area).
- Groundwater Flow Direction: Southwesterly.
- Geology: The soils consist of alluvial silty sands and sandy gravels interbedded with zones of gravels and cobble to a maximum depth of 20 ft. bgs over metavolcanic and greenstone, quartzite, and slate bedrock.
- Hydrogeology: Groundwater at the Site occurs within shallow alluvial deposits and fractured bedrock. The shallow groundwater flow direction parallels the flow direction of Mariposa Creek.

[2] "Petroleum" means crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means at 60 degrees Fahrenheit and 14.7 pounds per square inch absolute.
(Health & Saf. Code, § 25299.2.)

Corrective Actions

- 1991 – Petroleum product removed from Mariposa Creek with absorbent pads.
- 1992 through 2000 – Groundwater extraction and treatment from 920 feet of interceptor trenches along Mariposa Creek.
- 1994 – USTs and approximately 200 cubic yards of soil was removed from the Site.
- 1996 through 2000 October – Groundwater was extracted and treated from the extraction wells.
- 1996 through 1999 – A vapor extraction system was operated.
- 2008 – An 8-hour dual phase extraction pilot test was conducted.

Table B. Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs (mg/kg)	Maximum 5-10 feet bgs (mg/kg)
Benzene	1.3	0.007
Ethylbenzene	1.9	0.009
Naphthalene	Not Analyzed	Not Analyzed
PAHs*	Not Analyzed	Not Analyzed

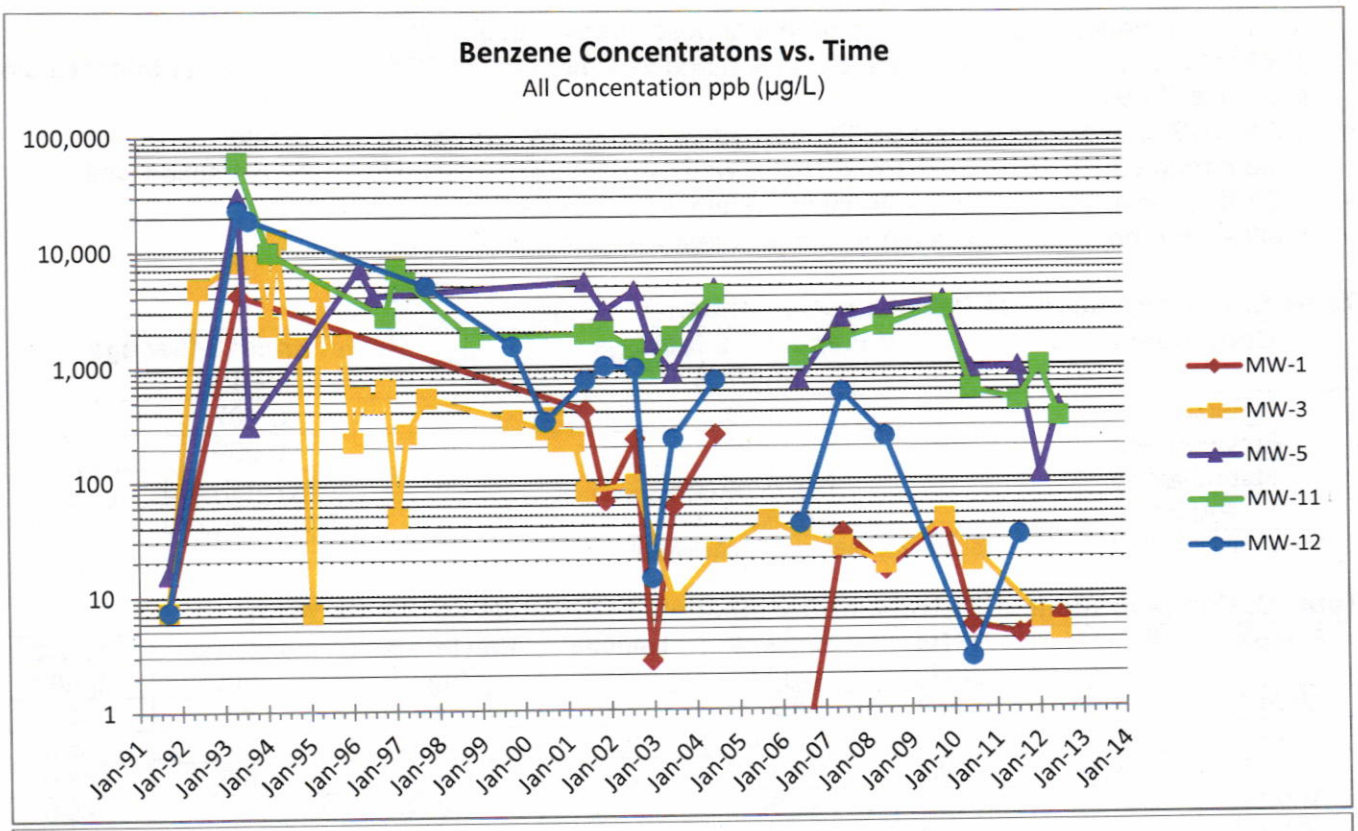
*Poly-aromatic hydrocarbons as benzo(a)pyrene toxicity equivalent

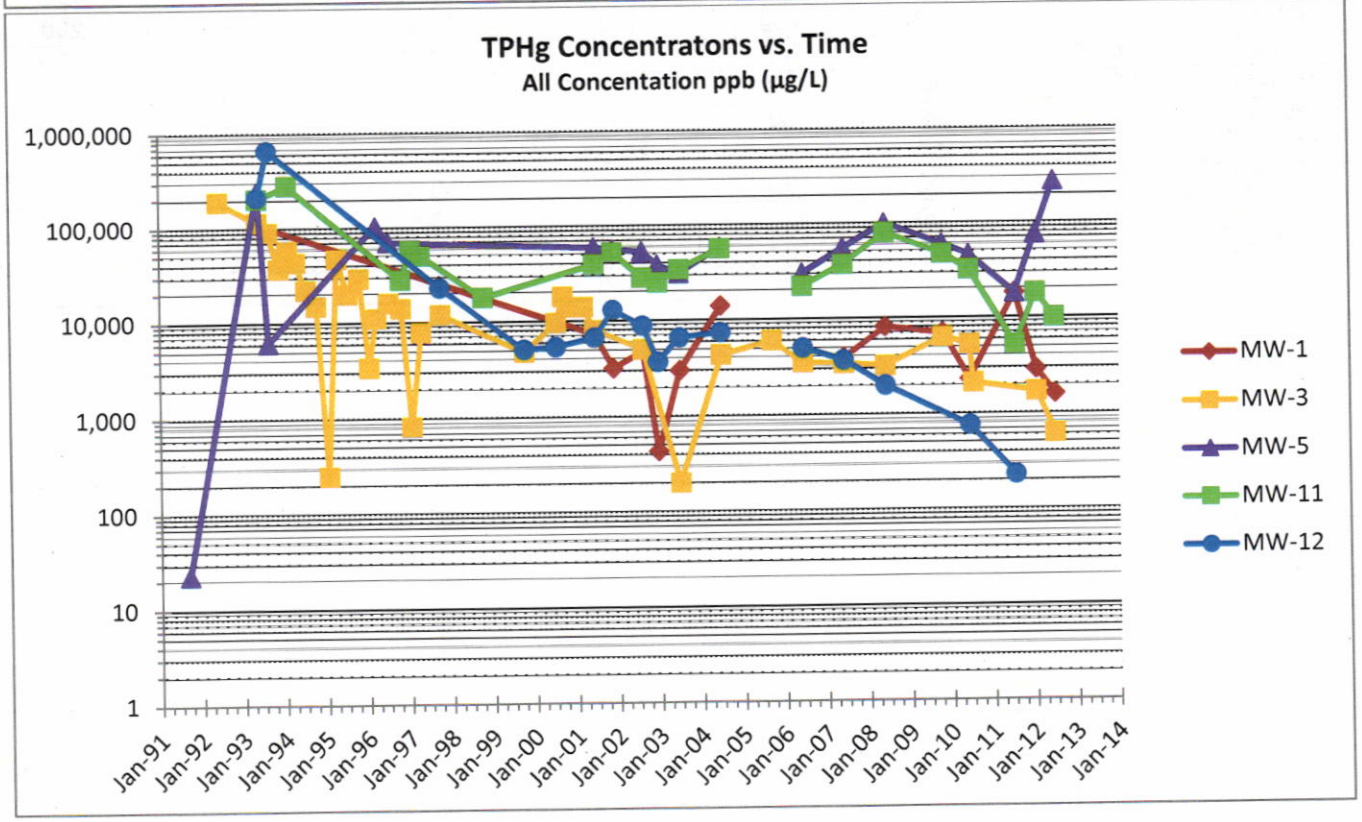
Table C. Concentrations of Petroleum Constituents in Groundwater (June 2012)

Sample	Sample Date	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethylbenzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)
MW-01	7/8/12	**1,600**	**6.2**	13	45	81	<5.0
MW-02	7/8/12	<100	<0.50	<0.50	<0.50	<1	<5.0
MW-03	7/8/12	**620**	**4.7**	3.1	2.4	5.5	<5.0
MW-04	1/27/12	<100	<0.50	<0.50	<0.50	<1	<5.0
MW-05	7/8/12	**270,000**	**430**	**1,300**	**1,000**	**3,900**	**290**
MW-08	7/8/12	<100	<0.50	<0.50	<0.50	<1	<5.0
MW-11	7/8/12	**10,000**	**350**	**160**	48	**2,000**	**98**
MW-12	7/28/11	**230**	**32**	2	3.6	7.6	<5.0
MW-13	7/8/12	<100	<0.50	<0.50	<0.50	<1	<5.0
MW-20	1/27/12	<100	<0.50	<0.50	<0.50	1	<5.0
MW-21	7/8/12	<100	<0.50	<0.50	<0.50	<1	<5.0
MW-25	7/8/12	<100	<0.50	<0.50	<0.50	<1	<5.0
WQOs	-	**50**	**1**	**150**	**300**	**1750**	**5**

Mariposa Quick Stop (Shell)
4989 Highway 140, Mariposa, Mariposa County

Groundwater Trends:





Evaluation of Risk Criteria

- Maximum Petroleum Constituent Plume Length above WQOs: TPHg plume is approximately 200 feet in length.
- Petroleum Constituent Plume Determined Stable or Decreasing: Yes.
- Soil/Groundwater Sampled for MTBE: Yes, see Table C above.
- Residual Petroleum Constituents Pose Significant Risk to the Environment: No.
- Residual Petroleum Constituents Pose Significant Vapor Intrusion Risk to Human Health: No – The site satisfies all of the applicable characteristics and criteria for petroleum vapor intrusion to indoor-air under criteria (2) a. scenario 3. Site conditions demonstrate that the residual petroleum constituents in soil and groundwater are protective of human health.
- Residual Petroleum Constituents Pose a Nuisance[3] at the Site: No.
- Residual Petroleum Constituents in Soil Pose Significant Risk of Adversely Affecting Human Health: No.
- Residual Petroleum Constituents Pose Significant Direct Contact and Outdoor Air Exposure to Human Health: No – There are no soil samples results in the case record for naphthalene. However, the relative concentration of naphthalene in soil can be conservatively estimated using the published relative concentrations of naphthalene and benzene in gasoline. Taken from Potter and Simmons (1998), gasoline mixtures contain approximately 2% benzene and 0.25% naphthalene. Therefore, benzene concentrations can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Table 1 of the Policy. Therefore, estimated naphthalene concentrations meet the thresholds in Table 1 and the Policy criteria for direct contact by a factor of eight. It is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.

[3] Nuisance as defined in California Water Code, section 13050, subdivision (m).

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