REVISED UST CASE CLOSURE REVIEW SUMMARY REPORT

Agency Information

Agency Name: Nevada County Environmental Health Department (County)	Address: 950 Maidu Lane, Nevada County, CA 95959
Agency Caseworker: Grant Eisen	Case No.: 30

Case Information

USTCF Claim No.: 13143	Global ID: T0605700083
Site Name: Former GV Exxon/SJ1 Partnership	Site Address: 257 Colfax Avenue, Grass Valley, CA 95945
Responsible Party (RP): SJ1 Partnership	Address: Private Address
USTCF Expenditures to Date: $736,555	Number of Years Case Open: 19

URL: http://geotracker.waterboards.ca.gov/profile_report.asp?global_id=T0605700083

Summary

The Low-Threat Underground Storage Tank (UST) Case Closure Policy (Policy) contains general and media-specific criteria, and cases that meet those criteria are appropriate for closure pursuant to the 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 (Conceptual Site Model)**. Highlights of the case follow:

An unauthorized leak was reported in February 1994 following the failure of a tank tightness test. Approximately 480 tons of contaminated soil were excavated and removed in 1998. Approximately 100 cubic yards of contaminated soil were excavated and removed in March 2003. Reportedly, 532 pounds and 260 pounds of total petroleum hydrocarbons as gasoline (TPHg) were removed by excavation in 1998 and 2003, respectively. In July 2005, 86 soil borings were drilled and backfilled with oxygen releasing compound slurry (Hodredge & Kull, 2008). According to groundwater data, water quality objectives have been achieved for all constituents except for TPHg, benzene, and methyl tert-butyl ether (MTBE).

The petroleum release is limited to the shallow soil and groundwater. According to data available in GeoTracker, there are no public supply wells regulated by California Department of Public Health within 1,000 feet of the defined plume boundary. The South Fork of Wolf Creek enters a totally enclosed concrete culvert that acts as the channel approximately 800 feet east (upgradient) of the Site. The enclosed concrete pipe channels the creek north of the Site along Highway 174 to a point where it again daylights approximately 850 feet west (downgradient) of the Site. As the concrete culvert passes the Site it is located approximately 40 feet north (crossgradient) of the Site. Water is provided to water users near the Site by the Grass Valley Public Works. No other water supply wells were identified in files reviewed to lie within 1,000 feet of the defined plume boundary.

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 foreseeable future.

Other designated beneficial uses of impacted groundwater are not threatened and it is highly unlikely that they will be, considering these factors in the context of the site setting. Remaining petroleum hydrocarbon constituents are limited, stable and concentrations declining. Corrective actions have been implemented and additional corrective actions will not likely change the conceptual site model. Any remaining petroleum hydrocarbon constituents do not pose significant risk to human health, safety or the environment.

- **Rationale for Closure under the Policy**
- General Criteria: The case meets all eight Policy general criteria.
- Groundwater: The case meets Policy Groundwater-Specific Criterion 1 by Class 5. No supply wells were identified within 1,000 feet from the defined plume boundary. The South Fork of Wolf Creek enters a totally enclosed concrete culvert that acts as the channel approximately 800 feet east (upgradient) of the Site. The enclosed concrete pipe channels the creek westerly, north of the Site along Highway 174 to a point where it again daylights approximately 850 feet west (downgradient) of the defined plume boundary. As the concrete culvert passes the Site it is located approximately 40 feet north (crossgradient) of the Site. The regulatory agency determines, based on an analysis of site specific conditions, which 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 water quality objectives will be achieved within a reasonable time frame.
- Vapor Intrusion to Indoor Air: The case meets Policy Criterion 2a by Scenario 3b. The maximum benzene concentration in groundwater is less than 100 µg/L. The minimum depth to groundwater is greater than 5 feet, overlain by soil containing less than 100 mg/kg of TPH. In addition, The remaining residual petroleum hydrocarbons are located near monitoring well MW-3 which is approximately 35 feet crossgradient of the vacant former commercial fueling facility building. Furthermore, the entire property surrounding the vacant structure is covered with asphalt concrete.
- Direct Contact and Outdoor Air Exposure: The case meets Policy Criterion 3a. Maximum concentrations in soil are less than those in Policy Table 1 for Residential and Commercial/Industrial and the concentration limits for Utility Worker are satisfied. There are no soil sample 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 percent benzene and 0.25 percent naphthalene. Therefore, benzene can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Policy Table 1. Therefore, the estimated naphthalene concentrations meet the thresholds in Table1 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 and Responses
The County objects to UST case closure because:

- Human health risk assessment is necessary if vapor pathway is deemed complete.
  RESPONSE: Soil and groundwater data demonstrate minimal residual mass remains and additionally, indicate soil vapor intrusion is highly unlikely.
- Soil vapor extraction well coverage map is required.
  RESPONSE: Unnecessary because soil vapor extraction was not implemented at the Site.
- Estimate of remaining mass is required.
  RESPONSE: Additional data will not alter conceptual site model which shows the Site meets all Policy criteria.

Determination
Based on the review performed in accordance with Health & Safety Code Section 25299.39.2 subdivision (a), the Fund Manager has determined that closure of the case is appropriate.

Fund Manager Recommendation for Closure
Based on available information, residual petroleum hydrocarbons at the Site do not pose a significant risk to human health, safety, or the environment, and the case meets the requirements of the Policy. Accordingly, the Fund Manager recommends that the case be closed. The State Water Board is conducting public notification as required by the Policy. Nevada County has the regulatory responsibility to supervise the abandonment of monitoring wells.

Lisa Babcock — 3/29/13

Lisa Babcock, P.G. 3939, C.E.G. 1235 — **Date**

Prepared by: Kirk Larson, P.G.

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

The case complies with the 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 case 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.
http://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/2012/rs2012_0016atta.pdf

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
Nuisance as defined by Water Code section 13050 does not 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 case 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 case 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 SITE INFORMATION (Conceptual Site Model)

Site Location/ History

- The Site is located at 257 Colfax Avenue in Grass Valley and comprises only a vacant former gas station building.
- The Site is bounded by Colfax Avenue to the north, residences to the west and east, and a parking lot to the south. The area surrounding the Site is mixed residential and commercial.
- Ten monitoring wells have been installed and monitored regularly since 1999.
- Site map showing the location of the former USTs, monitoring wells, and groundwater level contours is provided at the end of this summary.
- Nature of Contaminants of Concern: Petroleum hydrocarbons only.
- Source: UST system.
- Date reported: February 1994.
- Status of Release: USTs removed.
- Free Phase Hydrocarbons: None reported.

Tank Information

Tank No.	Size in Gallons	Contents	Closed in Place/ Removed/Active	Date
1	6,000	Gasoline	Removed	April 1998
2	4,000	Gasoline	Removed	April 1998
3	5,000	Gasoline	Removed	April 1998
4	300	Motor Oil	Removed	April 1998

Receptors

- GW Basin/Watershed: Bear River – Upper Bear – Wolf Creek.
- Beneficial Uses: Groundwater Recharge.
- Land Use Designation: None specified. Aerial photo from GeoTracker shows site land use is commercial surrounded by mixed commercial and residential.
- Public Water System: City of Grass Valley Public Works, Water Distribution Division, 125 East Main Street, Grass Valley, CA 95945, (530) 274-4350.
- Distance to Nearest Supply Well: According to data available in GeoTracker, there are no CDPH regulated water supply wells within 1,000 feet of the defined plume boundary. No other water supply wells were identified in files reviewed to lie within 1,000 feet of the defined plume boundary.
- Distance to nearest Surface Water: The South Fork of Wolf Creek enters a totally enclosed concrete culvert that acts as the channel approximately 800 feet east (upgradient) of the Site. The enclosed concrete pipe channels the creek north of the Site along Highway 174 to a point where it again daylights approximately 1,000 feet west (downgradient) of the Site. As the concrete culvert passes the Site it is located approximately 40 feet north (crossgradient) of the Site.
- located in the street in front of the Site (~40 feet north, crossgradient) that.

Geology/ Hydrogeology

- Stratigraphy: The Site is underlain by shallow crystalline rocks.
- Minimum Groundwater Depth: 2.10 feet below ground surface (bgs) at monitoring well MW-6.

- Maximum Groundwater Depth: 9.75 feet bgs at monitoring well MW-10.
- Current Average Depth to Groundwater: Approximately 6 feet bgs.
- Saturated Zones(s) Studied: 3 to 15 feet bgs.
- Groundwater Flow Direction: West at 0.015 feet/foot (September 2011).

Monitoring Well Information

Well Designation	Date Installed	Screen Interval (feet bgs)	Depth to Water (feet bgs) (09/28/2011)
MW-1	July 1999	?-14	5.98
MW-2	July 1999	?-12	6.06
MW-3	July 1999	?-15	7.27
MW-4	June 2003	?-14	5.63
MW-5	June 2003	?-14	6.50
MW-6	June 2003	?-14	3.62
MW-7	June 2003	?-14	5.59
MW-8	March 2001	?-15	6.55
MW-9	September 2001	?-14	3.22
MW-10	May 2007	?-18	9.51

Remediation Summary

- Free Product: None documented in GeoTracker.
- Soil Excavation: Approximately 480 tons of contaminated soil were excavated and removed in 1998. Approximately 100 cubic yards of contaminated soil were excavated and removed in March 2003. Approximately 532 pounds and 260 pounds of TPHg were removed by excavation in 1998 and 2003, respectively (Hodredge & Kull, 2008).
- In-Situ Soil Remediation: In July 2005, 86 soil borings were drilled and backfilled with oxygen releasing compound (ORC) slurry. (Hodredge & Kull, 2008)
- Groundwater Remediation: Approximately 540 pounds of ORC applied to the subsurface in July 2005.

Most Recent Concentrations of Petroleum Constituents in Soil

Constituent	Maximum 0-5 feet bgs [mg/kg (Date)]	Maximum 5-10 feet bgs [mg/kg (Date)]
Benzene	0.036 @ 3 ft in SGSP 3 (03/09/2012)	1.0 @ 7ft in SGSP 1 (03/09/2012)
Ethylbenzene	<0.005 @ 3 ft in SGSP 3 (03/09/2012)	26 @7 ft in SGSP 1 (03/09/2012)
Naphthalene	NA	NA
PAHs	NA	NA

NA: Not Analyzed, Not Applicable or Data Not Available
mg/kg: milligrams per kilogram, parts per million
<: Not detected at or above stated reporting limit
PAHs: Polycyclic aromatic hydrocarbons

Most Recent Concentrations of Petroleum Constituents in Groundwater

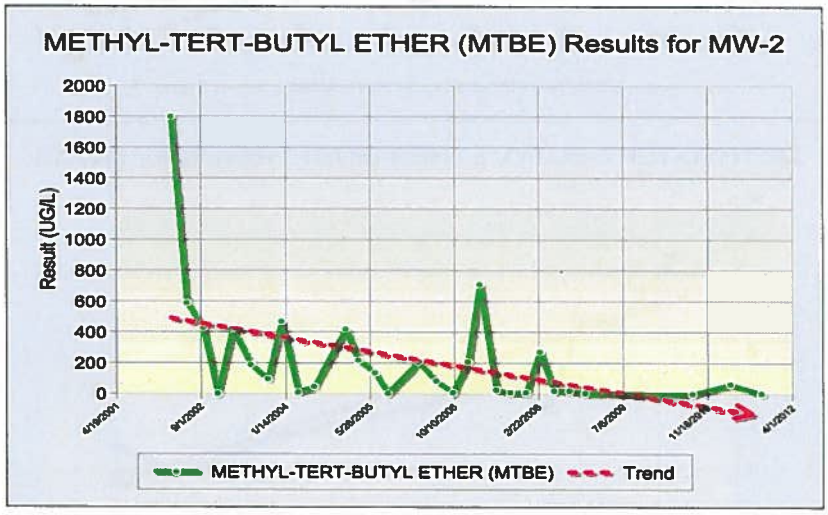
Sample	Sample Date	TPHg (µg/L)	Benzene (µg/L)	Toluene (µg/L)	Ethyl-Benzene (µg/L)	Xylenes (µg/L)	MTBE (µg/L)	TBA (µg/L)
MW-1	03/30/2011	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-2	09/28/2011	**58.6**	<0.5	<0.5	<0.5	<0.5	4	<5
MW-3	09/28/2011	**672**	**10.1**	<0.5	<0.5	3.9	1.8	<5
MW-4	09/28/2011	**56**	<0.5	<0.5	<0.5	<0.5	2.4	<5
MW-5	09/28/2011	**130**	**1**	<0.5	<0.5	<0.5	**122**	<50
MW-6	09/28/2011	**57.2**	<0.5	<0.5	<0.5	<0.5	4.1	<5
MW-7	09/28/2011	**109**	**11.2**	0.5	1.7	<0.5	**22.3**	<5
MW-8	03/30/2011	<50	<0.5	<0.5	<0.5	<0.5	<0.5	<5
MW-9	09/28/2011	**56.3**	<0.5	<0.5	<0.5	<0.5	**12.4**	<5
MW-10	09/28/2011	**55.4**	<0.5	<0.5	<0.5	<0.5	3.5	<5
WQOs	-	**5**	**0.15**	**42**	**29**	**17**	**5**	**1,200[a]**

µg/L: micrograms per liter, parts per billion
<: Not detected at or above stated reporting limit
TPHg: Total petroleum hydrocarbons as gasoline
TPHd: Total petroleum hydrocarbons as diesel
MTBE: Methyl tert-butyl ether
TBA: Tert-butyl alcohol
WQOs: Water Quality Objectives, Region 5 Basin Plan
[a]: California Department of Public Health, Response Level

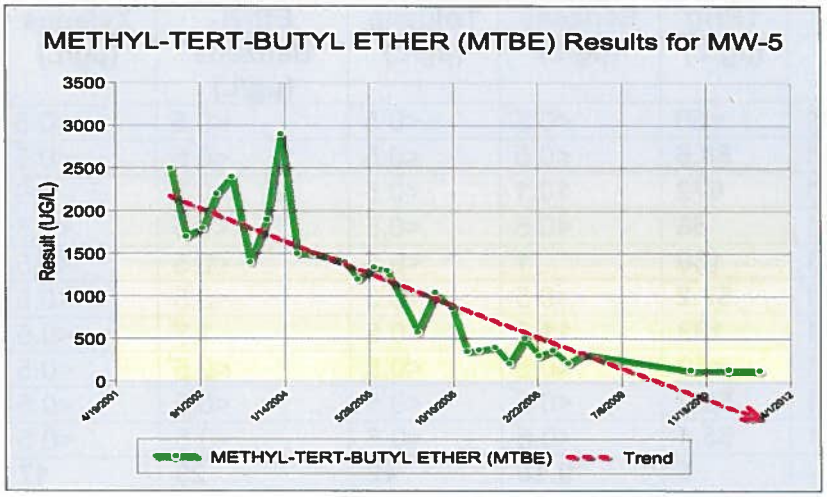
Groundwater Trends:

This Site has been monitored regularly since 1999. MTBE trends are shown below: Source area (MW-2), Nearby Downgradient (MW-5), and Further Downgradient (MW-9 and MW-10).

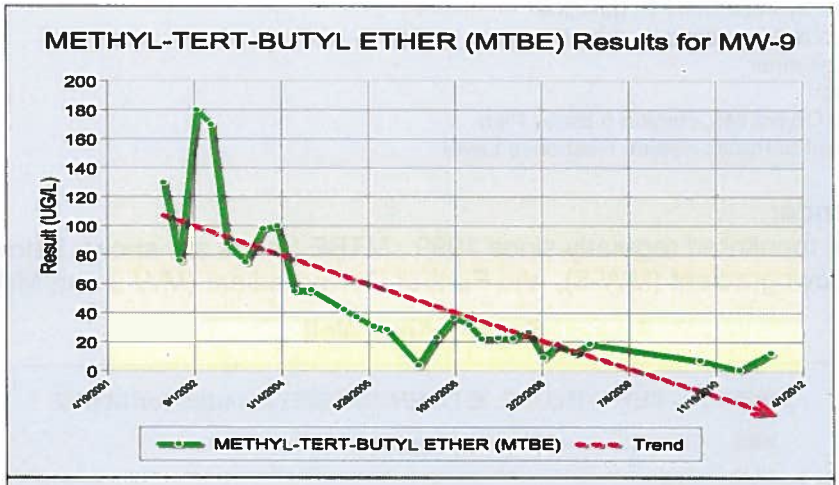
Source Area Well

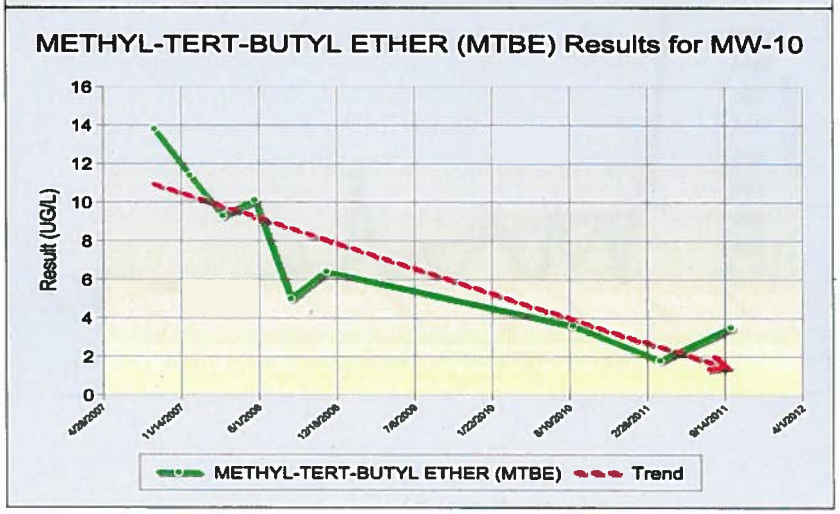


Nearby Downgradient Well



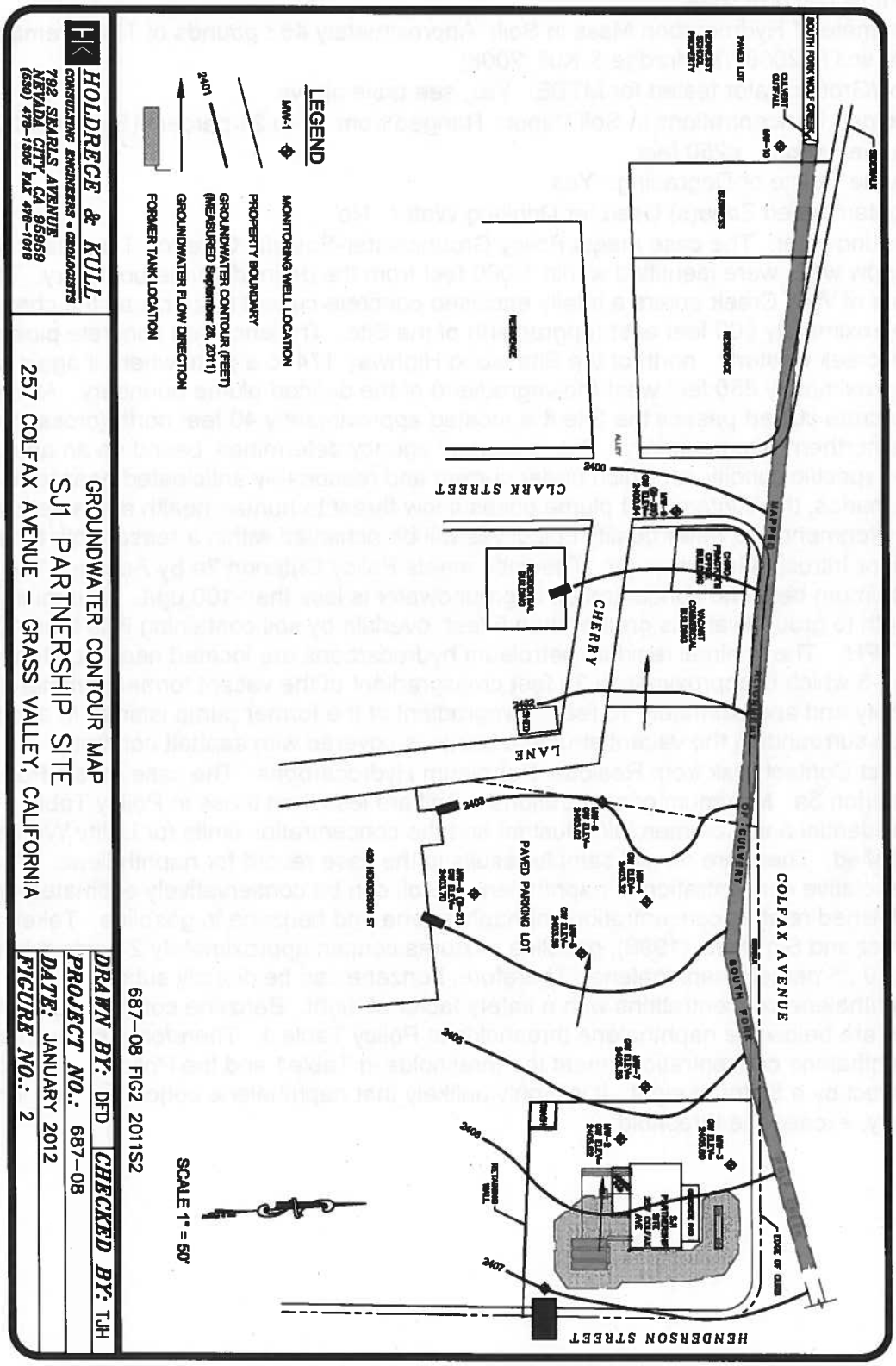
Further Downgradient Wells





Evaluation of Current Risk

- Estimate of Hydrocarbon Mass in Soil: Approximately 453 pounds of TPHg remained in site soil in 2008. (Hodredge & Kull, 2008)
- Soil/Groundwater tested for MTBE: Yes, see table above.
- Oxygen Concentrations in Soil Vapor: Ranged from 13 to 21 percent (February 2012).
- Plume Length: <250 feet.
  Plume Stable or Degrading: Yes.
- Contaminated Zone(s) Used for Drinking Water: No
- Groundwater: The case meets Policy Groundwater-Specific Criterion 1 by Class 5. No supply wells were identified within 1,000 feet from the defined plume boundary. The South Fork of Wolf Creek enters a totally enclosed concrete culvert that acts as the channel approximately 800 feet east (upgradient) of the Site. The enclosed concrete pipe channels the creek westerly, north of the Site along Highway 174 to a point where it again daylights approximately 850 feet west (downgradient) of the defined plume boundary. As the concrete culvert passes the Site it is located approximately 40 feet north (crossgradient) of the northern Site boundary. The regulatory agency determines, based on an analysis of site specific conditions, which 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 water quality objectives will be achieved within a reasonable time frame. .
- Vapor Intrusion to Indoor Air: The case meets Policy Criterion 2a by Scenario 3b. The maximum benzene concentration in groundwater is less than 100 µg/L. The minimum depth to groundwater is greater than 5 feet, overlain by soil containing less than 100 mg/kg of TPH. The minimal residual petroleum hydrocarbons are located near monitoring well MW-3 which is approximately 35 feet crossgradient of the vacant former commercial fueling facility and approximately 10 feet downgradient of the former pump island. In addition, the area surrounding the vacant structure onsite is covered with asphalt concrete.
- Direct Contact Risk from Residual Petroleum Hydrocarbons: The case meets Policy Criterion 3a. Maximum concentrations in soil are less than those in Policy Table 1 for Residential and Commercial/Industrial and the concentration limits for Utility Worker are satisfied. There are no soil sample 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 percent benzene and 0.25 percent naphthalene. Therefore, benzene can be directly substituted for naphthalene concentrations with a safety factor of eight. Benzene concentrations from the Site are below the naphthalene thresholds in Policy Table 1. Therefore, the estimated naphthalene concentrations meet the thresholds in Table1 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.


LEGEND
MW-1 MONITORING WELL LOCATION
PROPERTY BOUNDARY
2401 GROUNDWATER CONTOUR (FEET) (MEASURED September 29, 2011)
GROUNDWATER FLOW DIRECTION
FORMER TANK LOCATION
SOUTH FORK WOLF CREEK
CULVERT OUTFALL
MW-10
PAVED LOT
HONEYBEE PROPERTY
BUSINESS
RESIDENCE
RESIDENCE
ALLEY
2400
CLARK STREET
RESIDENTIAL BUILDING
CHERRY LANE
2402
2403
MW-6 GW ELEV= 2400.22
MW-4 GW ELEV= 2400.32
MW-5 GW ELEV= 2400.58
MW-8 (P-2) GW ELEV= 2400.70
480 HENDERSON ST
PAVED PARKING LOT
2405
MW-7 GW ELEV= 2400.55
2406
MW-9 GW ELEV= 2400.60
RETAINING WALL
2407
HENDERSON STREET
COLFAX AVENUE
SOUTH FORK
OF CULVERT
EDGE OF CURB
SCALE 1" = 50'
687-08 FIG2 2011S2
HOLDREGE & KULL
CONSULTING ENGINEERS • GEOLOGISTS
782 SEARLS AVENUE
NEVADA CITY, CA 95959
(530) 478-1305 FAX 478-1019
GROUNDWATER CONTOUR MAP
SJ1 PARTNERSHIP SITE
257 COLFAX AVENUE – GRASS VALLEY, CALIFORNIA
DRAWN BY: DFD
CHECKED BY: TJH
PROJECT NO.: 687-08
DATE: JANUARY 2012
FIGURE NO.: 2