Underground Storage Tank (UST) Case Closure Summary

76 Service Station #5994
ConocoPhillips Company (Petitioner)
195 West Napa Street, Sonoma (Site)

Summary:
The Site is an active gas station located at the corner of West Napa Street and 2nd Street West in the city of Sonoma. The land use is commercial and surrounding land use is commercial/residential. The Petitioner contends that the Site is not a threat to human health, safety, and the environment and there is no benefit to be gained by further corrective actions related to the unauthorized petroleum releases that occurred at the Site. The Local Oversight Program Agency, Sonoma County Department of Health Services Division of Environmental Health (County), asserts that the plume is unstable and increasing concentrations of petroleum constituents prevents them from closing this case.

A UST release impacted soil and groundwater at the Site. The USTs and contaminated excavated soil were removed in 1989. Residual petroleum constituents are limited to soil and shallow groundwater in the immediate vicinity of the Site. The nearest sensitive receptor is a private domestic well approximately 600 feet north of the Site and upgradient to groundwater flow.

Data obtained from on-site and off-site monitoring wells over the past 19 years demonstrate that Methyl Tertiary Butyl Ether (MTBE) in the groundwater has generally decreased over time confirming that the remaining residual petroleum mass is limited. Natural attenuation is occurring and the processes of adsorption, dispersion, dilution, volatilization and biological degradation will continue allowing the plume to naturally attenuate and meet North Coast Regional Water Quality Control Board's Basin Plan Water Quality Objectives (WQOs) for constituents of concerns in decades to hundreds of years.

Considering the Site's geology, hydrology, geochemistry, as well as the petroleum release source and its characteristics, the residual petroleum constituents remaining in Site soil and groundwater do not and will not pose a threat to human health, safety and the environment during the period of impairment. The Site is completely developed and paved. The shallow groundwater is not presently used as a source of drinking water or other beneficial use. It is highly unlikely the impacted groundwater will be used as such during the anticipated period of impairment because of available water service and Department of Water Resources (DWR) and municipal well construction standards. Closure is consistent with State Water Resources Control Board (State Water Board) Resolution No. 92-49 and is consistent with the maximum benefit to the people of the state.

Background:
This UST Case Closure Summary has been prepared in support of a petition to the State Water Board for closure of the UST case at 195 West Napa Street, Sonoma. All record owners of fee title for this Site as well as the applicable Regional Water Quality Control Board and local agency, water districts, adjacent property owners, and other interested parties have been notified of the recommendation for closure and were given the opportunity to provide comments.

The case was opened in 1989 when petroleum releases were discovered following the removal of three USTs and a separate new excavation for three replacement USTs. Groundwater in the bottom of the old UST and the new UST excavations were found to contain petroleum constituents. Approximately 26,700 gallons of groundwater were pumped from the excavations. In addition, approximately 2,300 cubic yards of soil were removed from the Site. The Petitioner submitted a corrective action plan (CAP) to the County in 2004 in which the County did not concur with the proposed remediation method of 24-hour dual phase vacuum extraction in conjunction with monitored natural attenuation. The County's decision was due to deficiencies in the CAP and the need for additional information. In January 2007, a CAP was resubmitted and continued groundwater monitoring was accepted as an appropriate form of action.

The Site had been monitored for over 19 years when the Petitioner requested closure from the County on January 29, 2010. County staff denied Petitioner's request for UST case closure asserting that closure is inappropriate due to an unstable MTBE groundwater plume with increasing concentrations. The Petitioner contends that the Site conditions do not threaten public health, safety, and the environment and that the burden of additional corrective actions outweighs the need for those actions. The Petitioner appealed the County's decision to deny case closure to the State Water Board on July 12, 2010.

Case Information

Site Name: 76 Service Station #5994	Site Address: 195 West Napa Street Sonoma, CA 95476
Global Identification Number: T0609700959	Petition Date: July 12, 2010
UST Cleanup Fund Claim Number: 6693	UST Cleanup Fund Expenditures: $0

Agency Information

Lead Agency: Sonoma County Department of Health Services Division of Environmental Health	Agency Address: 475 Aviation Blvd. #220 Cloverdale, CA 95425
Number of years case has been open: 22	Agency Case No: 00000139

Release Information:
USTs

Tank No.	Size	Contents	Status	Date
1	10,000 Gallon	Gasoline	Removed	October 1989
2	10,000 Gallon	Gasoline	Removed	October 1989
3	550 Gallon	Waste Oil	Removed	October 1989

- Source of Release: UST system
- Discovery Date: October 1989
- Affected Media: Soil and shallow groundwater
- Free Product: None reported

- Corrective Actions
  - October 1989 – removal of 3 USTs
    - soil excavation and disposal
  - July 1990 – Groundwater Monitoring
  - January 2007 – Corrective Action Plan submitted

Site Description/Conditions:

- Groundwater Basin: Napa-Sonoma Valley
- Beneficial Uses: Municipal, Agricultural, Industrial, Industrial Process Supply
- Land Use: Commercial
- Minimum Groundwater Depth: ~5 feet
- Flow Direction: Southerly
- Distance to Nearest Supply Well: Private well 600 feet north (upgradient)
- Nearest Surface Water: Nathanson Creek and an unnamed creek ~1600 feet southeast and southwest respectively
- Geology: The Site is underlain by alluvial deposits predominantly of sandy gravel, silt, and sand. A less permeable layer of tuffaceous silt exists approximately 20 feet below ground surface.
- Hydrology: Shallow groundwater is recharged by inflow, infiltration of rainfall, and irrigation water within the vicinity of the Site and is discharged via evapotranspiration and subsurface outflow.
- Estimate of Remaining Mass: Small – low levels of petroleum constituents likely remain in the soil
- Estimated Time to Meet WQOs for all constituents: Decades to hundreds of years

Site History:
The Site is an operating gas station. The release was identified during tank removal and installation in 1989 at which time the UST cleanup case was opened. The unauthorized release has affected soil and shallow groundwater in the immediate vicinity of the Site. Approximately 2300 cubic yards of soil have been excavated and properly disposed of off-site. The release is characterized by 12 monitoring wells, both on-site and off-site. Since July of 1990 monitored natural attenuation has been implemented.

Constituent Concentrations:
A historic Site maximum MTBE concentration of 3600 µg/L was detected December of 1992 in Monitoring Well 1(MW-1) [Table 1]. MTBE concentrations in MW-1 have dramatically decreased with the most recent sample in June of 2011 detecting 10.2 µg/L [Table 2]. MTBE concentrations in MW-9 have steadily decreased over the last twelve and a half years from 1400 µg/L to the current Site maximum of 109 µg/L [Figure 1]. MTBE concentrations in all monitoring wells during the most recent sampling event in June 2011 detected lower concentrations than initial sampling data for MTBE [See Table 1 & 2].[1] MW-12 is the furthest downgradient monitoring well approximately 205 feet from the original tank location and has already achieved WQOs.

[1] MTBE concentrations are low and fluctuating in MW-10 with no clear declining trend.

Table 1

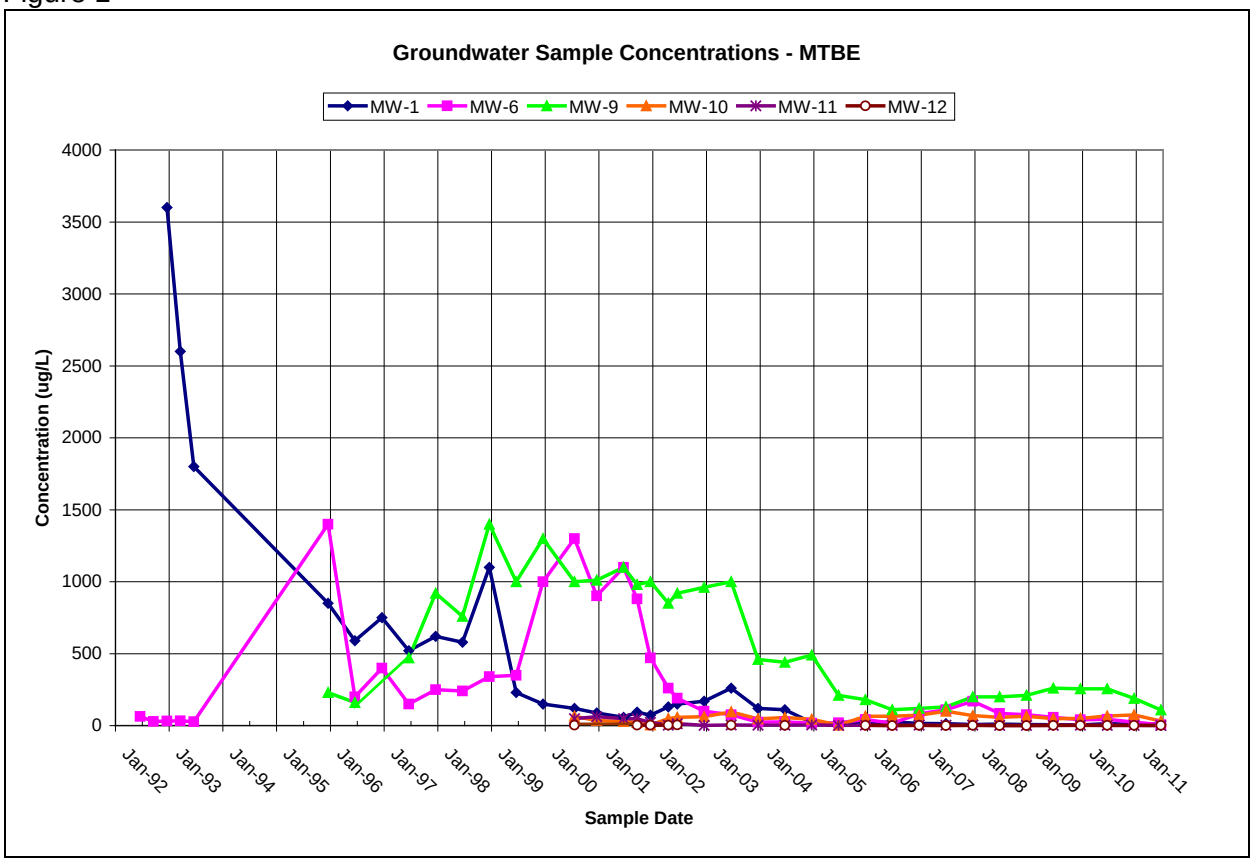
Initial MTBE Concentrations (µg/L)						
Sample Date	MW-1	MW-6	MW-9	MW-10	MW-11	MW-12
6/4/1992		63				
12/4/1992	3600					
12/5/1995			230			
7/17/2000				65	49	3

Table 2

Most Recent MTBE Concentrations (µg/L)						
Sample Date	MW-1	MW-6	MW-9	MW-10	MW-11	MW-12
6/16/2011	10.2	6.1	109	31.1	0.67	0.91

Water Quality Objective for MTBE is 5 µg/L. MW-2, MW-3, MW-4, MW-5, MW-7 & MW-8 have been below laboratory reporting limits since 2001.

Figure 1



Discussion:

The monitored groundwater in the vicinity of the Site has declining trends for residual MTBE concentrations [Figure 1]. MTBE concentration levels in groundwater have reached or are approaching WQOs [Table 2]. During the past 22 years the overall plume has migrated approximately 250 feet, but in the last eleven years of monitoring, the plume has migrated very

little. All monitoring wells with the exception of MW-10 have shown a declining trend. Concentrations in MW-10 have fluctuated, but they have not shown an appreciable increase. This indicates that the overall mass of residual MTBE is decreasing and that the plume is stabilizing and beginning to shrink in size and concentration.

Affected soil and groundwater do not present a threat to human health, safety, and the environment as the dissolved-phase MTBE concentrations are declining. The groundwater is not used, nor expected to be used, as a source of drinking water during the period of impairment. The nearest potential receptor is a private domestic well located about 600 feet north (upgradient) of the Site. Businesses and residents in the area are provided with a public water supply. DWR well construction standards would require a 50-foot minimum sanitary seal preventing shallow groundwater from impacting the beneficial uses of the underlying groundwater. Residual MTBE is confined in the vadose zone (approximately 5 feet) and does not pose a vapor threat. The processes of adsorption, dispersion, dilution, volatilization, and biological degradation are occurring and will continue to occur allowing the plume to naturally attenuate beneath 2nd Street West. MTBE concentrations are estimated to reach the requisite WQO within decades to hundreds of years.

Objections to Case Closure and Response:

Objection 1: *The MTBE groundwater plume is not stable.*

Response: Data show that the center of mass of the MTBE plume is slowly migrating, but the downgradient extent of the plume is stable.

- Residual MTBE remains in the soil and is localized within 50 feet of the Site.

- Petroleum constituents in groundwater have not traveled far from the UST release. During the past 22 years the plume grew to a length of approximately 250 feet. Currently the furthest well approximately 205 feet downgradient has achieved WQOs. With low concentrations of petroleum constituents detected at the edges of the plume and low concentrations at the center of the plume, the data and the Site conditions do not suggest the groundwater plume will continue to advance.

- Downward migration of MTBE is unlikely. A less permeable layer of tuffaceous silt exists approximately 20 feet below ground surface (bgs) which impedes downward migration.

Objection 2: *MTBE groundwater concentrations are increasing.*

Response: All concentrations in all monitoring wells except MW-10, which is located at the center of the plume, are decreasing. There is no clear increasing or decreasing trend in MW-10, but the overall mass of the plume is decreasing as indicated by the decreasing concentrations of all surrounding monitoring wells. While concentrations of residual MTBE have fluctuated in MW-10, it is anticipated that the concentrations will decrease in a similar fashion as in the other wells and will naturally attenuate to reach the requisite WQO within decades to hundreds of years

Closure:

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

Are corrective actions and UST case closure are consistent with State Water Board Resolution 92-49? Yes

Is achieving background water quality feasible? No.
The data show that low levels of MTBE remain in the soil and groundwater extending to the southwest of the former USTs. To remove all traces of residual MTBE at the Site would require considerable effort and cost. The presence of a roadway and paved parking lots restrict further remediation through excavation, soil vapor extraction, or pumping and treating. Excavation, generally used to remove residuals from a source area when other forms of remediation are exhausted, is not appropriate since the majority of the plume is off-site. Both soil vapor extraction and pumping and treating would require installing wells along the roadway, and perhaps in the roadway, as well as any trenches necessary to connect and operate the system. This could create disruption to traffic as well as a safety risk to those maintaining the system. Soil vapor extraction would require sparging to volatize the constituents to be removed as soil vapor but MTBE is highly water soluble and has a low Henry's constant which makes it difficult to volatize. This process would be long with very little return because of the low concentrations. Pump and treat would not only require extraction wells to be installed along the roadway it would require an area for the pumping equipment. A large amount of water would need to be pumped and treated for a long extended period with little return due to low concentrations. If complete removal of detectable traces of MTBE becomes the standard for UST corrective actions, the statewide technical and economic implications will be enormous. In light of the precedent that would be set by requiring additional active remediation at this Site given the fact that beneficial uses are not threatened, nor are likely to be threatened, attaining background water quality at this Site is not feasible.

If achieving background water quality is not feasible, then will the alternate cleanup level:

- **Be 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 MTBE that remain at the Site. In light of all the factors discussed above, and the fact that the residual MTBE 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 and between the background level and the applicable water quality objective.

- **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. 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. The impacted groundwater is not and will not be used because the surrounding area is provided water by a water service. If any future water supply well were installed, DWR well construction standards would require a 50-foot minimum sanitary seal and thereby prevent the flow of shallow groundwater from impacting the beneficial uses of the underlying groundwater.

- **Exceed water quality prescribed in applicable Basin Plan?** 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.

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 will be met for all constituents of concern is decades to hundreds of years. 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. The Site characteristics show that the deeper waters, used exclusively for water supply, are protected from the MTBE plume by a less permeable tuffaceous silt layer at approximately 20 feet bgs. Other designated beneficial uses of water are not adversely impacted and it is highly unlikely that they will be. The record indicates that the source was removed in 1989, and an MTBE plume resulted from an old release that is slowly moving and naturally attenuating. All constituents, including MTBE, have not impacted existing drinking water wells and affected groundwater will likely meet WQOs by the time the impacted groundwater reaches any sensitive receptor.

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.

MTBE Testing: Yes.
Site soil and groundwater has been tested for MTBE pursuant to reporting requirements of Health and Safety Code section 25296.15.

Summary and Conclusions:
Although shallow groundwater affected by the release from the former USTs exceeds the WQO for MTBE in a localized area, WQOs will be achieved in a reasonable period of time. Shallow affected groundwater is not currently being used as a source of drinking water or for any other designated beneficial use and 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. Closure is appropriate.

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