
State Water Resources Control Board

DRAFT

UST Case Closure Summary

Mission Linen Supply (Petitioner)

702 East Montecito Street, Santa Barbara, California (Site)

Summary:

The release from the subject Site was discovered during the removal of underground storage tanks (USTs) in 1988 and 1989. The County of Santa Barbara Fire Department, Fire Prevention Division (County) staff denied the Petitioner's request for closure because insufficient data exists to support the Petitioner's assertion that water quality objectives (WQOs) will be met over the next 5 to 20 years through natural attenuation. The County contends that adequate site assessment has not been conducted to determine the quantity of residual petroleum constituents in the vicinity of monitoring well MW702-01W that likely extends onto the adjacent property. The County contends that adequate assessment of 1,2-dichloroethane (1,2 DCA) in groundwater has been not been conducted.¹

Residual petroleum constituents are likely present in the ex-situ treated soil used to backfill the excavations of the former UST locations and in the soil surrounding the former excavations.² Petroleum constituents in soil have degraded over time. Declining concentrations in groundwater samples confirm that the residual petroleum constituents mass is reducing. The processes of adsorption, dispersion, dilution, volatilization, and biological degradation will continue, allowing the petroleum constituents to naturally attenuate over the course of decades to hundreds of years.

Land use at the Site is commercial bordered by commercial. The Site is currently developed as a commercial office building and parking area. Businesses in the area are provided water from the local utility district. A public supply well is located approximately 2,100 feet northwest (cross gradient) of the Site. Another public supply well is located approximately 2,100 feet southeast (down gradient) of the Site.

Based on the facts in the record and the hydrologic and geologic conditions at the Site, the limited residual petroleum constituents that remain in soil and shallow groundwater do not represent a significant threat to human health, safety, or the environment. For these reasons, case closure is appropriate.

¹ August 3, 2010 County Response to Petition.

² Soil remediation method was a self-contained transportable soil treatment system (STS-100). Pre-metered amounts of soil were fed by hopper and conveyed by belt into a mixer. The soil was sprayed with a hydrogen peroxide solution as it was transported along the mixer's tunnel. A vacuum blower continuously vented the reaction products into carbon adsorption canisters. (This remediation method was intended to remove a majority of the petroleum constituents in the soil used to backfill the excavations of the former UST locations).

Background:

This UST Case Closure Summary has been prepared in support of a petition to the State Water Resources Control Board (State Water Board) for closure of the UST case at 702 East Montecito Street, Santa Barbara. All record owners of fee title for this Site as well as the applicable Regional Water Quality Control Board (Regional Water 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.

Three USTs were formerly operated on Petitioner's Site. The USTs were removed in 1988 and 1989 and no known USTs remain on the Site. The Site is currently developed as a commercial office building and parking area. The Site is bordered by commercial properties. Businesses in the area are provided water from the local utility district.

The County contends adequate site assessment has not been conducted at the Site. The County contends that closure is inappropriate because insufficient data exists to support the Petitioner's assertion that WQOs will be met over the next 5 to 20 years through natural attenuation and that adequate assessment of 1,2 DCA in groundwater has not been conducted.

Petitioner contends that Site conditions do not threaten human health, safety, or the environment and that the burden of additional corrective actions outweighs the need for those actions.

Case Information:

Site Name: Mission Linen Supply 702 East Montecito	Address: 702 East Montecito Street Santa Barbara, 93103
Global ID: T0608300556	Petition Date: April 26, 2010
USTCF Claim No: 11869	USTCF Expenditures: None Recorded

Agency Information:

Agency Name: Santa Barbara County Fire Department, Fire Prevention Division	4410 Cathedral Oaks Road Santa Barbara, 93110-1042
Agency Case No: 50877	Number of Years Case Has Been Open: 23 years

Release Information:

USTs:

Tank No.	Size	Contents	Status	Date
1	550-gallon	Gasoline	Removed	1988
2	550-gallon	Gasoline	Removed	1988
3	1,000-gallon	Gasoline	Removed	1989

- Discovery Date: September 14, 1988
- Affected Media: Soil and shallow groundwater
- Source: Residual petroleum constituents in fine-grained soil
- Free Product: None reported
- Corrective Actions
 - September 1988 – Removal of two USTs
 - Early 1989 – Removal of one UST
 - October 1989 – Soil and groundwater assessment
 - December 1990 through March 1991 – Soil and groundwater assessment
 - September 1993 – Groundwater assessment

- March 1994 – Soil excavations (60 cubic yards from the location of former two 550-gallon USTs; 117 cubic yards from the location of former 1,000-gallon UST) – Ex-situ treatment of generated stockpiles (177 cubic yards) and backfilled into the excavations
- April 1994 through October 1997 – Pump and treat system operated; approximately 1.3 million gallons of impacted water was treated
- November 2003 – 690 pounds oxygen release compound injected in the vicinity of former USTs

Site Description/Conditions:

- Groundwater Basin: Santa Barbara
- Beneficial Uses: Municipal (MUN), Agricultural (AGR), Industrial Supply (IND)
- Land Use: Commercial
- Distance to Nearest Supply Wells: Public supply well ~2,100 feet northwest (crossgradient); Public supply well ~2,100 feet southeast (downgradient)
- Average Groundwater Depth: ~7 feet
- Minimum Groundwater Depth: ~5.5 feet
- Flow Direction: Westerly
- Geology: Alluvial deposits consisting of silty sand, sandy silt and silty clay
- Hydrology: Groundwater flow has been reported as unconfined to semi-confined
- Estimate of Remaining Mass: Small – low levels of residual petroleum constituents likely remain in the soil backfilled into the excavations of the former UST locations and in the vicinity of the former USTs
- Estimated Time to Meet WQOs for all constituents: Decades to hundreds of years

Site History:

In 1988 and 1989, three USTs were removed from two locations at the northern (two side-by-side 550-gallon) and southern (one 1,000-gallon slurry-filled abandoned in place) areas of the Site. Analytical results from soil and groundwater samples have indicated an impact by petroleum constituents. In 1994, approximately 177 cubic yards of generated stockpiles, from excavation of both former UST pits, were ex-situ treated and backfilled into the excavations. From April 1994 to October 1997, a pump and treat system operated, treating 1.3 million gallons of impacted water. In 2003, approximately 690 pounds oxygen release compound was injected in the vicinity of former USTs. Over the course of several corrective actions, 5 monitoring wells and 7 soil borings have been drilled and sampled.

Contaminant Concentrations:

Over the course of corrective actions at the Site, concentrations of total petroleum hydrocarbons as gasoline (TPHg) and benzene, toluene, ethylbenzene, and xylenes (BTEX), and 1,2 DCA have been primarily reported for samples from monitoring well MW702-01W. Minor concentrations of TPHg, BTEX, and 1,2 DCA were briefly reported in monitoring wells MW702-02W, MW702-A, MW702-B, and MW702C. Concentrations of petroleum constituents in groundwater have decreased over time confirming the remaining petroleum constituent mass is decreasing. The processes of adsorption, dispersion, dilution, volatilization, and biological degradation will continue, allowing the plume to naturally attenuate over a period of decades to hundreds of years (Table 1 presents the May 21, 2007 groundwater assessment sampling).

Table 1: May 21, 2007 Groundwater Assessment Sampling

Sample	TPHg (ppb)	Benzene (ppb)	Toluene (ppb)	Ethylbenzene (ppb)	Xylenes (ppb)
MW702-01W	2,100	<1.0	<1.0	22	28
MW702-02W	<50	<0.5	<0.5	<0.5	<1.0
MW702-A	<50	<0.5	<0.5	<0.5	<1.0
MW702-B	<50	<0.5	<0.5	<0.5	<1.0
MW702-C	<50	<0.5	<0.5	<0.5	<1.0
WQOs	50	1	42	29	17

Concentrations of 1,2 DCA were last sampled from monitoring well MW702-C in 1994, from monitoring wells MW702-01W, MW702-02W, and MW702-B in 1995, and from monitoring well MW702-A in 1996. Concentrations of 1,2 DCA were not detected above 0.2 parts-per-billion (ppb) in 1 of the 5 Site monitoring wells, not detected above 0.5 ppb in 3 of the 5 Site monitoring wells and reported not detected above 1.0 ppb in monitoring well MW702-01.³

Discussion:

The Source of the Unauthorized Petroleum Release has Been Removed: The primary source of the release was removed during UST-system removal activities that occurred in 1988 and 1989. Approximately 177 cubic yards of soil were ex-situ treated and backfilled into the excavations of the former UST locations. The data show that the low levels of residual petroleum constituents likely remain in the soil that was backfilled into the excavations of the former UST locations and in the vicinity of the former USTs.

Data Show that the Plume is Stable: A small area of contaminated soil and groundwater is encircled by monitoring wells that have shown non-detectable concentrations of petroleum constituents are present in groundwater.

Petroleum constituents in groundwater have not traveled far from the UST release. Over the course of several corrective actions, 5 monitoring wells and 7 soil borings have been drilled and sampled. Concentrations of TPHg, BTEX and 1,2 DCA have been reported in monitoring well MW702-01W located approximately 14 feet from the former UST system. In the remaining monitoring wells that encircle monitoring well MW702-01W and the former UST area, concentrations of TPHg, BTEX and 1,2 DCA have not been reported above the laboratory detection limits since 1993. Concentrations of petroleum constituents in groundwater have decreased over time confirming that the remaining residual petroleum constituent mass is limited and that robust biodegradation is mitigating the migration of affected shallow groundwater. The processes of adsorption, dispersion, dilution, volatilization, and biological degradation will continue, allowing the plume to naturally attenuate for many decades to hundreds of years.

Current and Anticipated Beneficial Uses: A public supply well is approximately 2,100 feet northwest (crossgradient) of the Site and another public supply well is approximately 2,100 feet southwest (downgradient) of the Site.

³ Concentrations of 1,2 DCA at these levels are considered de minimis because they are at or near the WQO concentration of 0.5 ppb.

The probability that the affected shallow groundwater will reach the public supply wells is very low because the plume is stable and natural attenuation processes of adsorption, dispersion, dilution, volatilization, and biological degradation will likely lower concentrations to below WQOs before groundwater would intercept the nearest public supply wells. Additionally, vertical migration is limited by aquitards between the affected shallow groundwater and the municipal producing aquifers.

Objections to Case Closure and Response:

Santa Barbara County contends that:

Objection 1: Insufficient data exists to support the contention that WQOs will be met over the next 5 to 20 years through natural attenuation.

Response: State Water Board Resolution 92-49 requires that water quality objectives be met, but provides discretion to close a case so long as there is a substantial likelihood to achieve the objectives within a reasonable period of time.

The likelihood that shallow groundwater in this area will be used and the fact that petroleum constituents naturally attenuate over time was considered when evaluating whether the time it will take to ultimately reach water quality objectives is a reasonable period. Time within which to achieve water quality objectives can be lengthy, but nonetheless reasonable given the Site specific characteristics. The State Water Board has considered:

- Size and stability of the dissolved-phase plume;
- Local and Site specific hydrology and geology;
- Demonstrated natural attenuation of petroleum constituents;
- The likelihood that the impacted shallow groundwater will be used for a beneficial use;
- Supply well construction standards that prevent the extraction of shallow groundwater and the vertical migration of petroleum constituents into a deeper zone; and
- Cost of continued remediation versus the benefit to human health, safety, and the environment.

Concentrations of petroleum constituents in groundwater have decreased over time confirming the remaining residual petroleum constituents mass is limited. The processes of adsorption, dispersion, dilution, volatilization, and biological degradation will continue, allowing the plume to naturally attenuate reasonably for decades to hundreds of years.

Objection 2: An adequate site assessment has not been completed to determine the quantity of residual petroleum constituents in the vicinity of monitoring well MW702-01W. The petroleum constituents likely extend onto the adjacent property.

Response: The primary source of the release was removed during UST system removal activities that occurred in 1988 and 1989. The data show that remaining low levels of residual petroleum constituents will naturally attenuate in the soil backfilled into the excavations of the former UST locations. Data show that the plume is stable. A small area of contaminated soil and groundwater is encircled by monitoring wells with no detectable concentrations of petroleum constituents in groundwater. (See Discussion Section above for additional data supporting plume stability).

These data are adequate to assess residual petroleum constituents in the vicinity of monitoring well MW702-01W.

Objection 3: The assessment of 1,2 DCA in groundwater has not been adequate.

Response: The case record included the following data:

- Concentrations were reported as 20 ppb during initial sampling of monitoring well MW702-01W in 1989.
- Concentrations of 1,2 DCA were last reported in 2 of the 5 Site monitoring wells in 1992. Monitoring well MW702-01W was reported with a 1,2 DCA concentration of 7 ppb and monitoring well MW702-A with a concentration of 0.4 ppb.
- Concentrations of 1,2 DCA were last sampled from monitoring well MW702-C in 1994, from monitoring wells MW702-01W, MW702-02W, and MW702-B in 1995, and from monitoring well MW702-A in 1996. Concentrations of 1,2 DCA were not detected above 0.2 ppb in 1 of the 5 Site monitoring wells, not detected above 0.5 ppb in 3 of the 5 Site monitoring wells and not detected above 1.0 ppb in monitoring well MW702-01W.

These data are an adequate assessment of 1,2 DCA in groundwater.

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 (See discussion below).

Is achieving background water quality feasible? No.

The data support the conceptual model that low levels of petroleum constituents likely remain in the soil used to backfill the excavations of the former UST locations and in the soil within 10 feet of the former UST removal excavations. To remove all traces of residual petroleum constituents at the Site would require significant effort and cost and result in minimal benefit. It is infeasible to attain background water quality at this Site in light of the precedent that would be set by requiring additional excavation at a site where beneficial uses are not threatened, constituent concentrations are stable and decreasing, and there is no demonstrated threat to human health, safety, or the environment.

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 petroleum constituents 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 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 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.

- **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. In this case, based on Site specific characteristics, it is reasonable for groundwater to reach WQOs in decades to hundreds of years.

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 and quantity of 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 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 constituents to surface waters.

Has the requisite level of water quality been met? No.

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


The approximate 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 data support that the deeper waters typically used for water supply are protected from the dissolved phase petroleum constituent plume. Other designated beneficial uses of water are not adversely impacted. The record indicates that the source was removed in 1988 and 1989 and a small affected groundwater plume created from the mass of residual petroleum constituents from an old release is naturally attenuating within a short distance. Existing supply wells have not been impacted.

Methyl Tertiary Butyl Ether (MTBE Testing):


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

Summary and Conclusions:

To the extent limited areas of groundwater may exceed water quality objectives for certain petroleum constituents, the impact will not unreasonably impair beneficial uses even if the period of impairment is decades to hundreds of years. 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, in part due to standard supply well construction practices, that the affected groundwater will be used as a source of drinking water or for any other beneficial use in the foreseeable future. Case closure is appropriate.

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December 1, 2011
Date