

**DIVISION OF WATER QUALITY RESPONSE TO COMMENTS ON THE PROPOSED  
UST CASE CLOSURE OF SUPER 7 (76 SERVICE STATION NO. 7331)  
901 ASHBY AVENUE, BERKELEY (Site)**

We received one comment letter during the public comment period, which ended on November 8, 2013 at noon. The comments and our responses are presented here.

Comment letter received:

1. Kevin D. Brown, CEG #2180

**COMMENT 1: In the “Case Information” section, there are several errors:**

- **The “Global ID” is incorrect— it should read: T0600101333.**
- **The “Petitioner” is listed as “ConocoPhillips Company”. This entity changed their name over a year ago to “Phillips 66.” Shelby Lathrop is listed as the contact person. Ms. Lathrop is a former employee of Shaw Environmental, and independent environmental consulting firm retained by ConocoPhillips.**

RESPONSE:

1. The correct information regarding the GeoTracker global identification is: **T0600101333**. Phillips 66 Company is the petitioner for this Site. The contact information for the petitioner is Mr. Edward Ralston, Phillips 66 Company, 76 Broadway, Sacramento, CA 95818. The UST Case Closure Summary (Closure Summary) was updated to reflect the changes.

**COMMENT 2: Who does the State Water Resources Control Board consider as the primary responsible party, or parties, for the soil and groundwater contamination? Southland Corporation (7 Eleven) owned and operated at the site when the primary fuel release occurred at the site in the early to mid-1980s; is this company considered a responsible party under the law? Why is ConocoPhillips considered a responsible party? Is it due solely to the MTBE release at the site? Is the Antea Group, who apparently acquired the environmental liability for the soil and groundwater contamination from ConocoPhillips, and the company who submitted the petition to the State Water Board to close the case, considered a responsible party under the law?**

1. The Responsible Party is Phillips 66 Company, 76 Broadway, Sacramento, CA 95818. Mr. Edward Ralston is the proper contact person for Phillips 66 Company regarding this case.

**COMMENT 3: Under the “Summary” section, it states, “The affected groundwater beneath the Site 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.”**

**A November 16, 2012, letter from the City of Berkeley to the State Water Resources Control Board says, “It has been our experience that shallow groundwater in Berkeley does meet yield and water quality objectives for MUN use.” The letter also correctly says, “The Basin Plan, SF Bay Region, is the master policy document for determining water quality objectives in Berkeley.**

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Please cite the regulatory reference(s) used to make the determination that shallow groundwater in the area of the site has no current anticipated beneficial uses.

**RESPONSE:**

1. The Closure Summary and the Water Quality Control Plan (Basin Plan) for the San Francisco Bay Basin lists municipal and domestic water supply (MUN) as one of the beneficial uses for groundwater in the East Bay Plain Basin (2-9.04).
2. The Closure Summary does not address or dispute the beneficial use designations of the basin's groundwater. Rather, the Closure Summary makes the determination that the shallow groundwater specifically affected by the petroleum releases from the Super 7 site does not currently serve any beneficial uses and is not anticipated to serve any beneficial uses in the foreseeable future.
3. Groundwater at the Site has demonstrated stable and decreasing trends over time. The petroleum constituent plume for contaminants above Water Quality Objectives (WQO) is approximately 200 feet in length. The Aquatic Park, located greater than 1,000 feet west of the Site, is the location of the nearest surface water. The nearest supply well is located greater than 1,000 feet southwest and crossgradient of the Site. 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. Furthermore, it is anticipated that the affected groundwater will meet water quality objectives within a reasonable time.

**COMMENT 4: Under the "Rationale for Closure under the Policy" section, under the bullet – "Groundwater Media- Specific Criteria," it states, "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."**

Maps prepared by the Antea Group show a diffuse groundwater plume that has migrated from the site in shallow groundwater to the north, northwest and west. On August 13, 1997, subslab (1-foot deep) soil vapor samples were collected within an existing commercial building (referred to on several maps as the "Former marine West" building), which is located directly west of the site. Several volatile organic compounds (VOCs), chiefly benzene and ethylbenzene, were detected in subslab vapor up to 73,000  $\mu\text{g}/\text{m}^3$  and 11,000  $\mu\text{g}/\text{m}^3$ , respectively. The August 17, 2012, Low-Threat for Underground Storage Tank Case Closure (Policy) indicates that under a commercial land use scenario, the maximum allowable benzene and ethylbenzene concentrations in soil vapor beneath an existing building would be 85  $\mu\text{g}/\text{m}^3$  and 3,600  $\mu\text{g}/\text{m}^3$ , respectively.

Chlorinated solvent releases from waste oil USTs at gasoline service stations are not uncommon. The 550-gallon UST removed from the site in 1999 is a frequent size for a waste oil UST at a gas station in the Bay Area. Trichloroethylene (TCE), a highly toxic and recalcitrant chlorinated VOC frequently used as a parts degreaser, was detected in soil vapor beneath the off-site building at 9,500  $\mu\text{g}/\text{m}^3$ ; this concentration is significantly higher than acceptable risk-based levels for commercial properties (e.g., OEHHA's shallow soil gas CHSL for TCE at commercial sites is 1,700  $\mu\text{g}/\text{m}^3$ ).

**What is the source of the TCE beneath the off-site building? What are the current levels of TCE in soil vapor beneath the off-site building?**

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The case closure evaluation conducted by the State Water Resources Control Board did not conclude that another property is the source of the VOCs detected beneath the off-site building, so it is presumed that groundwater contaminated by historic chemical releases at 901 Ashby Avenue is the primary source of the VOCs.

Please describe, in detail, the “analysis” conducted to determine that the “contaminant plume poses a low threat to human health.”

**RESPONSE:**

1. During 1993, concentrations of volatile organics, including TCE, were analyzed in groundwater samples collected from wells MW-6, MW-10, and RW-1. Concentrations of TCE in groundwater were less than 50 micrograms per liter ( $\mu\text{g/L}$ ), 5  $\mu\text{g/L}$ , and 500  $\mu\text{g/L}$ , respectively.
2. The case record indicates that during August of 1997, soil sample locations SB-5, SB-6, SB-7, and W-11 had low to non-detect concentrations of petroleum constituents. These samples were collected crossgradient of Former West Marine and downgradient of the Site.
3. During the same month, soil vapor from sample location V-2 reported high concentrations of both benzene and TCE and soil vapor sample W-12 reported high benzene while the soil vapor sample from location SB-7 reported benzene and TCE at concentrations below reporting limits. Analytical data indicate that an off-Site source of TCE in soil likely originated on or near the Former West Marine property.
4. Concentrations of volatile organics, including TCE, were analyzed in influent groundwater samples collected from Dual Phase Extraction (DPE) wells DPE-1 through DPE-7 during 2003 and 2005. Concentrations of TCE in groundwater were less than 0.50  $\mu\text{g/L}$  in all DPE wells.
5. The commenter asserts that since the case Closure Summary did not name a source for the TCE beneath the Former West Marine, it is presumed that the TCE release originated from the subject Site because a waste-oil UST was operated there. The presumption does not appear to consider: (1) Current and previous industrial operations at and near the Former West Marine facility site; or (2) The comparison of soil vapor data collected from SB-7 and V-2. The record indicates that an off-Site source of TCE at the Former West Marine would most likely have originated on or near the Former West Marine property.
6. The Site meets General Criteria of the Policy. Using the following rationale, an analysis of Site information indicates that the Media-Specific Criteria for Groundwater (CLASS 5) has been met: The plume that exceeds WQOs is less 200 feet in length. Free product was removed to the maximum extent practicable. The nearest supply well and the nearest surface water body, which is Berkeley Aquatic Park are both greater than 1,000 feet from the defined plume boundary. Dissolved concentration of benzene is less than 3,000  $\mu\text{g/L}$ . Since February 2008, MTBE in well MW-5 has been stable or decreasing.
7. In accordance with the Policy, the proposed closure would apply only to the site's petroleum USTs. The off-site TCE release may be addressed through a separate cleanup case.

**COMMENT 5: Under the bullet— “Petroleum Vapor Intrusion to Indoor Air” criteria, it states:**

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**“Exposures to petroleum vapors associated with historical fuel system releases are comparatively insignificant relative to exposures from small surface spills and fugitive vapor releases that typically occur at active fueling facilities.”**

The above statement is taken directly from the Low-Threat for Underground Storage Tank Case Closure (Policy), verbatim. However, the very next sentence in the Policy says:

**Therefore, 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.**

The City of Berkeley’s November 16, 2012, letter further says, “Vapor intrusion, suspected from groundwater migration from the site, has been identified in offsite buildings west of the site. While dual-phase extraction appears to have significantly improved groundwater quality, there has been no evaluation that remedial measures have corrected the vapor migration concern.”

Why hasn’t soil vapor sampling been conducted to evaluate the current levels of VOCs, if any, beneath the occupied structure to the west and to specifically rule out a vapor intrusion to indoor air problem, so human health is fully protected? What “analysis” was completed to determine that occupants of the adjacent building to the west are not being exposed to unacceptable levels of VOCs associated with historic contaminant releases at 901 Ashby Avenue?

**RESPONSE:**

- 1.** The commenter’s question does not clearly state which VOC should be evaluated. As stated earlier, the record indicates that an off-Site source of TCE at the Former West Marine would most likely have originated along the southern property boundary of the site.
- 2.** The Site meets General Criteria of the Policy. Using the following rationale, an analysis of Site information indicates that the Media-Specific Criteria for Petroleum Vapor Intrusion to indoor air CRITERIA (2) a, Scenario 3, in the Policy has been met at the Former West Marine building. Depth to water is greater than 10 feet below grade surface (bgs). Total petroleum hydrocarbons in soil (0-10 feet) bgs are less than 100 mg/kg. Benzene in groundwater is less than 1,000 µg/L.

**COMMENT 6: On Page 3, the case closure summary states, “Soil and groundwater conditions beneath the commercial building located west of the Site meets the Media-Specific Criteria for Petroleum Vapor Intrusion to Indoor Air CRITERIA(2), Scenario 3, in the Policy.” Appendix 3/ Scenario 3 of the Policy requires an evaluation of “oxygen data” and, where oxygen data does not exist or if the oxygen level is less than four percent, Total TPH (combined TPH-gasoline and TPH-diesel) in the vadose zone must be “less than 100 mg/kg throughout the entire depth of the bioattenuation zone.” Based on a review of GeoTracker, no such evaluation has been conducted (there is no applicable oxygen or TPH soil data).**

**RESPONSE:**

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1. Appendix 3 does not require the collection of oxygen data to define the bioattenuation zone. However, if oxygen has been collected it should be included in an evaluation of the bioattenuation zone. Since 1992, depth to groundwater beneath the site has been greater than 10 feet bgs, and shallow petroleum contamination above the groundwater table would not be expected beyond the primary source area. The benzene plume has demonstrated concentrations less than 100 µg/L for the past 10 years. The record provides shallow (0-10 feet bgs) soil data for over 10 different off-site locations including SB-5 through SB-7, W-11, and W-12. TPHg was less than 100 mg/kg at all locations. Collection of additional soil data is not needed to determine that the property west of the site meets the Policy's criteria for petroleum vapor intrusion to indoor air.

**COMMENT 7: On Page 7 of the summary, at least two issues should be reevaluated:**

***Minimum Groundwater Depth: approximately 13 feet bgs***

The most recent groundwater monitoring report (October 21, 2011) indicates the minimum groundwater depth recorded in a monitoring well is 8.17 feet (below the top of the casing).

***Hydrogeology: Groundwater beneath the Site is unconfined.***

Reports in GeoTracker indicated groundwater aquifers in the site vicinity are both confined and unconfined.

**RESPONSE:**

1. The minimum groundwater depth was reported in well MW-9 during February 1998. This well is located approximately 150 feet upgradient to the Site and Former West Marine. Soil and groundwater in the vicinity of this well meets the Policy. Based on depth to water data collected at this well, during the 10 year periods before and after February 1998, the depth to water measurement during February 1998 appears to be anomalous. Minimum depth to groundwater should not be re-evaluated based on this data point.
2. Existing reports support the commenter's comments. The Closure Summary was updated to reflect the changes.

**COMMENT 8: According to Page 8 of the summary, MTBE was detected in off-site monitoring well MW-5 at a concentration of 1,730 µg/L on September 6, 2011. This well is located in Potter Street north of the site, and plume maps from the Antea Group show Berkeley's Aquatic Swim Park approximately 30 feet north of the well (the location of the park may not be accurately depicted). There does not appear to be any groundwater monitoring wells north of MW-5.**

**How far does the MTBE groundwater plume extend to the north of the site?**

**RESPONSE:**

1. The most recent groundwater monitoring report (October 21, 2011) indicates the MTBE plume extends approximately 100 feet north of the site. The Aquatic Park is located at the foot of Bancroft Way (between Ashby and University Avenues) which is greater than 1000 feet west of the Site. Wells MW-5, MW-7, W-11, and W-12 indicate that MTBE in groundwater is stable, decreasing, and limited to the vicinity of the Site.

**COMMENT 9: Page 89 of the closure summary contains the following statement:**

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*There are no soil samples results in the case record for naphthalene. However, the relative concentrations 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 by a 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 of 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.*

- Does the Policy require the collection of naphthalene data for both soil and soil gas?
- It is appropriate to use benzene as a surrogate for naphthalene? I cannot find anywhere in the Policy where it states the staff and the State Water Resources Control Board can substitute benzene for naphthalene. Please explain why this reinterpretation of the Policy is appropriate.
- What is meant by a “safety factor of eight”?
- Potter and Simmons (1998) is a reference to the Total Petroleum Hydrocarbon Criteria Working Group Series (Volume 2). Volume 3 of the same series contains Appendix A (Petroleum Hydrocarbon Composition of Fuels Sorted by Fuel Type), which references the May 1988 “LUFT” Manual, a guidance document from the State Water Resources Control Board (later revised in October 1989). The 1989 LUFT Manual indicates that for gasoline, the weight percentages for benzene and naphthalene could range between 0.12 and 3.50 and 0.09 to 0.49, respectively.
- According to an August 2004 report from the Department of Civil and Environmental Engineering at the University of California, Berkeley, *Chemical Composition of Vehicle- Related Volatile Organic Compound Emissions in Central California*, in 1995 in Berkeley, the weight percentages of benzene and naphthalene in gasoline was 1.9814 and 0.4808, respectively. In 1996, the percentages for these compounds were 0.5846 and 0.1306.
- With the potential for so much variability in the weight percentages of benzene and naphthalene in gasoline in the 1980s (and surely nobody truly knows the exact ratio in the gasoline released at the subject site between 1983 and 1986 and even later for the 1990s MTBE release), is it acceptable to assume weight percentages of “2% benzene and 0.25% naphthalene” in the gasoline release for this site? Is it acceptable to state this assumption is “conservative”? Rather, it appears the derived numbers are “middle of the road estimates” (averages) and not conservative at all- the actual benzene to naphthalene ratio could be less than 1:1.

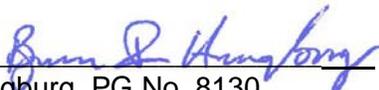
The argument about using benzene as a surrogate/ substitute for naphthalene is one that uses very poor reasoning. The Policy does not allow this substitution to occur, and there is certainly no logical justification to do so using the Potter and Simmons (1998) reference. Is the argument, which was been made in dozens of UST case closures by the State Water Resources Control Board over the past year, an overall attempt to get around the evaluation of naphthalene data required by the Policy? At

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**the very least, toxicologists with the OEHHA and DTSC offices of Cal/EPA should be immediately consulted to evaluate and weigh in on this important issue.**

**RESPONSE:**

1. The Policy does not necessarily require analysis of chemicals in the various media. Certain criteria in the Policy use individual chemicals known to drive risk as indicators of conditions that pose a low threat to human health. These criteria may be applied to pre-existing (pre-Policy) data or to data that are collected after adoption of the Policy. Naphthalene was often not analyzed for in soil samples prior to adoption of the Policy. Values reflecting the relationship of benzene and naphthalene concentrations in gasoline, as established by the referenced authority, have been used to estimate the potential risk posed by naphthalene in these cases of older datasets. Prior to assessing naphthalene concentrations in soil, regulatory agencies should assess the need for naphthalene analysis following an initial investigation that indicates petroleum constituents in soil would not meet the Policy.
2. The use of benzene concentrations as a surrogate for naphthalene concentrations for historical soil samples in which naphthalene was not analyzed for has been adopted by the State Water Board in several case Closure Orders since the Policy was adopted. In those cases, there were no soil sample results in the case records, and the Board determined the relative concentration of naphthalene in soil could be estimated using the published relative concentrations of naphthalene and benzene in gasoline, when evaluating the risks of direct contact to soil and outdoor air exposure..
3. The paragraph in the Closure Summary above should have read: .....*“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 threshold in Table 1 of the Policy criteria for direct contact. Therefore, it is highly unlikely that naphthalene concentrations in the soil, if any, exceed the threshold.”*
4. A “safety factor of eight” means that if a concentration of benzene in soil was eight times higher than the values in Table 1, the estimated concentration of naphthalene in soil would not exceed the Table 1 values.
5. Potter and Simmons (1998) is a widely-used reference for the weight percent of individual constituents in fuels; this reference shows that the average weight percent of benzene and naphthalene in gasoline is 2% and 0.25%, respectively, based on 123 samples. Therefore, the assumption of weight percentages of 2% benzene and 0.25% naphthalene is “acceptable” for gasoline mixtures historically released into the subsurface at a UST release site not involved with refining or storing of coal tar, crude oil, or naphthalene-rich chemical mixtures.
6. See response # 2 above.

Reviewed By:   
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6/30/14  
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Date