

STATE OF CALIFORNIA  
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 98 - 08 - UST

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In the Matter of the Petition of  
**TEXACO REFINING AND MARKETING, INC.**  
for Review of Denial of  
Petroleum Underground Storage Tank Site Closure  
at  
51890 Harrison Street, Coachella, California.

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BY THE BOARD:

Texaco Refining and Marketing, Inc. (petitioner) seeks review of the decision of the Riverside County Department of Environmental Health (County) not to close petitioner's case involving an unauthorized release from a petroleum underground storage tank (UST) located at 51890 Harrison Street, Coachella, California. For the reasons set forth below, this order determines that petitioner's case should be closed and no further action related to the release should be required.

I. STATUTORY, REGULATORY, AND FACTUAL BACKGROUND

Tank owners and operators who are eligible for reimbursement from the UST Cleanup Fund can petition the Fund Manager for a review of their case if they feel the corrective action plan for their site has been satisfactorily implemented, but closure has not been granted (Health and Saf. Code, § 25299.39.2, subd. (b)).

Several statutory and regulatory provisions provide the State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards (RWQCBs), and local agencies with broad authority to require responsible parties to clean up a release from a petroleum UST (e.g., Health & Saf. Code, § 25299.37; Wat. Code, § 13304, subd. (a)). The County has been designated as an agency to participate in the local oversight program for the abatement of, and oversight of the abatement of, unauthorized releases of hazardous substances from USTs (Health & Saf. Code, § 25297.1). The SWRCB has promulgated regulations specifying corrective action requirements for petroleum UST cases (Cal. Code of Regs., tit. 23, §§ 2720-2728). The regulations define corrective action as "any activity necessary to investigate and analyze the effects of an unauthorized release, propose a cost-effective plan to adequately protect human health, safety and the environment and to restore or protect current and potential beneficial uses of water, and implement and evaluate the effectiveness of the activity(ies)." (Cal. Code Regs., tit. 23, § 2720). Corrective action consists of one or more of the following phases: (1) preliminary site investigation, (2) soil and water investigation, (3) corrective action plan implementation, and (4) verification monitoring (Cal. Code Regs, tit. 23, § 2722, subd. (a)).

The preliminary site assessment phase includes initial site investigation, initial abatement actions, initial site characterization and any interim remedial action (Cal. Code Regs., tit. 23, § 2723, subd. (a)). Corrective action is complete at the conclusion of the preliminary site assessment phase unless conditions warrant a soil and water investigation. A soil and water investigation is required if any of the following conditions exist: (1) There is evidence that surface water or groundwater has been or may be affected by the unauthorized release; (2) Free product is found at the site where the unauthorized release occurred or in the surrounding area; (3) There is evidence that contaminated soils are or may be in contact with surface water or groundwater; or (4) The regulatory agency requests an investigation, based on the actual or

potential effects of contaminated soil or groundwater on nearby surface water or groundwater resources or based on the increased risk of fire or explosion (Cal. Code Regs., tit. 23, § 2724).

The purpose of a soil and water investigation is "to assess the nature and vertical and lateral extent of the unauthorized release and to determine a cost-effective method of cleanup." (Cal. Code of Regs., tit. 23, § 2725, subd. (a)).

SWRCB Resolution No. 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code § 13304* also applies to petroleum UST cases. Resolution No. 92-49 directs that water affected by an unauthorized release attain either backgroundwater quality or the best water quality which is reasonable if backgroundwater quality cannot be restored (SWRCB Resolution No. 92-49, III.G). Any alternative level of water quality less stringent than background must be consistent with the maximum benefit to the people of the state, not unreasonably affect current and probable future beneficial use of affected water, and not result in water quality less than that prescribed in the water quality control plan for the basin within which the site is located (hereafter basin-plan). (*Ibid.*)

Resolution No. 92-49 does not require, however, that the requisite level of water quality be met at the time of site closure. Even if the requisite level of water quality has not yet been attained, a site may be closed if the level will be attained within a reasonable period (SWRCB Resolution No. 92-49, III.A).

The Colorado River RWQCB Water Quality Control Plan (Basin Plan) designates existing and potential beneficial uses of groundwater in Coachella Valley as municipal supply, industrial supply, agricultural supply, and as freshwater replenishment to surface waters (Id. at p. 2-18). The Basin Plan specifies a narrative taste and odor water quality objective as follows: "Groundwaters for use as domestic or municipal supply shall not contain taste or odor-producing substances in concentrations that adversely affect beneficial uses as a result of human activity."

(Id. at p. 3-9). In addition, the Basin Plan specifies "All waters shall be maintained free of toxic substances in concentrations which are toxic to, or which produce detrimental physiological responses in human, plant, animal, or indigenous aquatic life." (Id. at p. 3-2).

With regard to the water quality objective for toxicity, the State Department of Health Services (DHS) has set a maximum contaminant level (MCL) for drinking water of 1 part per billion (ppb) for benzene, 100 ppb for toluene, 680 ppb for ethylbenzene, and 1,750 ppb for xylene (Cal. Code of Regs., tit. 22, § 64444). Although DHS has not yet set an MCL for methyl tertiary butyl ether (MTBE), DHS has set an interim action level of 35 ppb (DHS Memorandum from Joseph P. Brown, Ph.D., Acting Chief, Water Toxicology Unit to Alexis M. Milea, P.E., Acting Supervisor, Standards and Technology Unit, Office of Drinking Water (February 19, 1991) at p. 2). DHS has more recently proposed a 5 ppb MTBE concentration as a secondary drinking water standard for taste and odor. The threshold odor concentration of commercial gasoline (measured as total petroleum hydrocarbon gasoline, or TPHg) in water is commonly accepted to be 5 ppb, with 10 ppb giving a strong odor. The threshold odor concentration of commercial diesel (measured as TPH-d) in water is commonly accepted to be 100 ppb (SWRCB, Water Quality Criteria (2d ed. 1963) p. 230).

The following is a brief historical summary of petitioner's site at 51890 Harrison Street in the City of Coachella. The site is located in the Coachella Valley groundwater basin otherwise known as the Salton Trough and is located one mile southwest of the Whitewater River which flows to the Salton Sea. The area around the site is characterized by commercial development although residential areas exist to the northeast and southeast. Three gasoline USTs and product dispensers at the site ceased operation in 1979 and were removed. One 280 gallon waste oil UST was also removed in 1979 and replaced with a 550 gallon waste oil UST for use in an auto repair garage. The "upgraded" waste oil UST was used until its removal in 1993.

Releases were reported from the waste oil tanks and gasoline dispenser island areas. A release was not confirmed from the gasoline tank area.

The native soil immediately underlying petitioner's site consists predominantly of coarse, fine grain, and silty sand to a depth of about 17 feet below ground surface (bgs) with groundwater as shallow as 11 feet bgs. Silty sand was encountered throughout the entire depth of 14 borings which became slightly clayey with increasing depth. The site is located in the lower Coachella Valley. Lake deposits consisting predominantly of fine grained materials are exposed throughout much of the lower Coachella Valley and were found beneath the site. Low permeability clayey lacustrine deposits were encountered 17 feet bgs in all of the borings. The clay layer appears to separate the shallow groundwater from the deeper aquifers below. The Basin Plan makes reference to a deeper clay aquitard in this area which "overlies the domestic-use aquifers" (Water Quality Control Plan, Colorado River Basin Region (7), 1993, p. 1-12).

The nearest water supply well was reported to be 0.25 mile upgradient of the site.

Following removal of the tanks in 1979, 14 soil borings were drilled to investigate the lateral extent of the gasoline and waste oil. Boring results indicated gasoline impacted soil and groundwater in the capillary fringe area. In 1993 following removal of the 550 gallon waste oil UST approximately 107 cubic yards of waste oil impacted soil was removed to a depth of 16 feet. An auto shop drainage sump adjacent to the 550 gallon UST was also removed at this time. Seven samples were collected from the waste oil excavation: four soil samples were collected from the sidewalls; two soil samples were collected just above the water table from the bottom of the excavation area; and one "grab" water sample was collected from the tank pit bottom. Soil removal was not reported from the gasoline USTs or dispenser island areas.

Four waste oil pit sidewall samples collected had total recoverable petroleum hydrocarbon (TRPH) concentrations of 50,470 parts per million (ppm); 6,105 ppm; 237 ppm;

and 21 ppm, respectively. Two bottom samples taken just above the water table toward the down-gradient side of the excavation had no detectable levels of TRPH at the detection limit of 10 ppm. The groundwater "grab" sample from the waste oil pit was also non-detect. Following soil removal and disposal no further action appears to have been required around the former waste oil pit.

Subsequent to waste oil tank remediation, seven groundwater monitoring wells were installed in 1993 to assess gasoline impact to the groundwater. The wells were screened between 5-20 feet bgs. Four of the wells indicated a dissolved groundwater plume across the southwest quadrant of the site. In 1994, an eighth monitoring well (AM-8) was installed further down-gradient to define off-site migration.

Initial groundwater sampling indicated petroleum impacts immediately south of the dispenser islands as evidenced by wells AM-3, AM-4, AM-5, and AM-6. The outlying wells (AM-2, AM-7, and AM-8) did not exhibit detectable levels of benzene above 1 ppb. The highest level of dissolved petroleum constituents detected on-site was collected in the November 1997 sampling event from well AM-3 as follows: 146,000 ppb (TPHg); 63 ppb (benzene); 5,880 ppb (toluene); 4,100 ppb (ethylbenzene); and 27,200 ppb (xylene). Measurable liquid petroleum was observed in 1994 in well AM-3 and in down-gradient well AM-6. Trace liquid petroleum was detected in well AM-3 in 1995 and 1996 but appears to have been mitigated by two years of vapor extraction. All of the monitoring wells with detectable petroleum constituents show a downward trend in benzene concentrations (the most mobile and toxic petroleum constituent detected at petitioner's site) over the past five years of sampling. Recent petroleum constituent concentrations reported for May 1998 in monitoring well AM-3 were 24,400 ppb (TPHg); 38 ppb (benzene); 1,580 (toluene); 1,290 ppb (ethylbenzene); and 7,120 ppb (xylene). The outlying wells (AM-1, AM-2, AM-5, AM-7, and AM-8) which define the limited lateral migration of the

dissolved petroleum constituent plume, all indicated "non-detect" benzene concentrations.

Additionally, off-site monitoring well AM-8, located about 190 feet down-gradient (i.e., south-east) of AM-3, has repeatedly indicated "non-detect" (e.g., less than 1 ppb) benzene over the past five years. Five out of the eight on-site monitoring wells are below MCLs for benzene and seven out of eight wells are below MCLs for toluene, ethylbenzene, xylene as of the last sampling event in May 1998. Benzene was not detected above 1 ppb approximately 80 feet east (cross-gradient) or 190 feet southeast (down-gradient direction) of the former dispenser island. Based on this information, the plume of detectable benzene concentrations appears to be less than 80 feet wide and less than 190 feet long. Finally, all eight monitoring wells have been sampled biannually for MTBE over the past two years. MTBE has not been detected in any of the monitoring wells.

A Corrective Action Plan (CAP) dated February 1994 was submitted to the County proposing vapor extraction on the southwest quadrant of the site. The County approved the CAP in March 1994. Vapor extraction began in October 1994 through May 1996 before being shutdown due to low influent concentrations. Traces of free product showed up in AM-3 in November 1996 and vapor extraction was resumed in December 1996, and continued until May 1997 when influent concentrations reached asymptotic levels. A reported 4,911 pounds (806 gallons) of hydrocarbons were removed from vadose and capillary zones. Free product has not reappeared in AM-3.

Three confirmation soil borings were drilled in September 1996. One of the confirmation borings was converted to a vapor extraction well in anticipation of possible additional vapor extraction around the former dispenser island area. Results of the borings indicate vapor extraction was effective in removing volatile petroleum constituents. The County

approved continued groundwater monitoring instead of further active remediation. Groundwater has been monitored biannually up until the last monitoring event in May 1998.

In December 1997, petitioner requested review of its case by the UST Cleanup Fund manager pursuant to Health and Safety Code § 25299.39.2, subdivision (b). In a January 15, 1998 letter to petitioner, the County stated it was denying closure because (1) elevated levels of TPHg in monitoring well AM-3 are "too high" to close the site and (2) the MTBE detection limit of 1,000 ppb reported in the November 1997, sampling event was above the County's acceptable limit of 10 ppb.

In a May 18, 1998 letter to the Fund manager, the County provided a copy of its record for review and reiterated these reasons for denying closure.

## II. CONTENTIONS AND FINDINGS

**Contention:** The petitioner contends its case should be closed because the extent of impacted soil and groundwater has been adequately assessed and the dissolved phase plume is stable.

**Findings:** Petitioner's contention has merit. As explained below, the facts in the record support the finding that the plume is stable and attenuating. Residual petroleum constituents at petitioner's site do not pose a threat to human health and safety, or the environment, and do not adversely affect current or probable future beneficial uses of water. In addition, the level of site cleanup is consistent with the maximum benefit to the people of the state and will meet the applicable objectives of the Colorado River Basin Plan within a reasonable time frame.

Gasoline tanks and dispensers were removed 19 years ago (1979). Vapor extraction was conducted for approximately two years and residual petroleum hydrocarbons in



shallow groundwater are attenuating through natural processes including biodegradation.

Groundwater samples taken from the down-gradient off-site well (AM-8) indicate dissolved petroleum constituents diminish to "non-detect" in groundwater within about 190 feet in the down-gradient direction of the former dispenser island area. Petroleum hydrocarbon levels are generally decreasing or have been non-detect in all wells sampled since monitoring began in 1993 with the exception of well AM-3. Past increases in dissolved phase petroleum concentrations in AM-3 appear to be a result of trapped residual petroleum, released from clayey deposits mobilized from fluctuations in the groundwater table.

Dissolved oxygen levels measured in the southwest quadrant of the site were considerably lower than dissolved oxygen in the outlying area of the plume. Monitoring wells with the highest benzene, toluene, ethylbenzene, xylene (BTEX) concentrations have the lowest dissolved oxygen levels and vice versa. The inverse correlation of dissolved oxygen/BTEX and the downward trend of petroleum constituents indicate aerobic biodegradation is occurring.

The County contends that elevated levels of TPHg in monitoring well AM-3 are "too high" to close the site and the MTBE detection limit of 1000 ppb used in the November 1997 sampling event is above the County's acceptable limit of 10 ppb. The County appears to imply that elevated TPH/BTEX levels in AM-3 and undetected MTBE are a threat to future beneficial uses of the groundwater. We disagree. The groundwater samples collected over the previous five years provide sufficient information to conclude that (1) dissolved phase constituents in groundwater are stable and decreasing, and (2) MTBE has not been detected.

Sampling results over time indicate a decreasing residual hydrocarbon trend. Although TPH/BTEX levels have fluctuated in well AM-3 in the heart of the plume near the original source, decreasing trends in down-gradient wells AM-4, AM-5, AM-6 (and the repeated

"non-detects" in AM-8 about 190 feet down-gradient) indicate substantial natural attenuation that is preventing further migration of residual concentrations beyond their current limited extent.

The County contends that the 1,000 ppb detection level for MTBE used during the sampling of AM-3 in November 1987 was "too high" to detect the presence of MTBE in groundwater. However, the 1,000 ppb detection level was a one time event. Other samples from this well also indicated "non-detect" MTBE at significantly lower detection limits. A total of 33 samples from eight monitoring wells have been analyzed for MTBE across the site between May 1996 and May 1998 at detection limits ranging from 1-30 ppb with constituent "non-detects" in each well. MTBE was not found in down-gradient well (AM-6) above the detection limit of 1 ppb during the May 1996 sampling event. Down-gradient wells (AM-6, AM-8) were sampled in May 1998 and MTBE was not found above the detection limit of 20 ppb. The repeated "non-detect" of MTBE in all eight monitoring wells and the fact that the USTs ceased operation prior to the first reported use of MTBE in gasoline together indicate MTBE is not a constituent of concern at this particular site.

Thus, the available facts indicate TPHg/BTEX constituents in groundwater are stable and decreasing and MTBE is absent from the plume. The facts in the record indicate that with no further regulatory action, residual detectable concentrations of TPHg and BTEX present in groundwater will continue to attenuate naturally over time.

The stable concentrations of residual petroleum constituents will not affect beneficial uses of groundwater. The maximum extent of detectable benzene (the most mobile and toxic constituent present at the site) is less than 200 feet in the downgradient direction and diminishing. According to Department of Water Resources well records the closest drinking water well is approximately 0.25 mile upgradient of petitioner's site, has a surface sanitary seal to 500 feet bgs and is screened from 500-800 feet bgs. Total dissolved solids (TDS) in on-site

wells range from 1,000-2,500 parts per million (ppm) which renders this shallow groundwater less desirable for future beneficial use as drinking or irrigation supply. Nevertheless, concentrations of TPHg/BTEX in the shallow groundwater will remain above water quality objectives for some period of time before the natural attenuation process is complete.

Considering the absence of existing wells in close proximity to petitioner's site, the local hydrogeologic considerations (e.g. low permeability clay rich deposits that effectively isolate shallow groundwater at about 11 feet bgs from deeper production zones), naturally occurring elevated TDS concentrations, and standard well construction practices which preclude shallow groundwater from deeper zones, the diminishing localized volume of affected groundwater will not unreasonably affect existing or probable future beneficial uses.

The source has been removed and vapor extraction has reduced residual volatile petroleum hydrocarbons to asymptotic levels. In light of ongoing natural attenuation processes that have been demonstrated by groundwater monitoring over the past five years, it is evident that dissolved concentrations of residual petroleum constituents will continue to diminish over time. The only way to ensure more immediate, complete removal of lingering, residual, detectable concentrations of TPHg at or above 5 ppb in the locally affected, shallow water-bearing zone would be to excavate several thousand cubic yards of affected soil to depths of about 20 feet. However, if complete removal of detectable traces of petroleum constituents becomes the standard for UST corrective actions, the statewide technical and economic implications will be enormous. For example, disposal of soils from comparable areas of excavation throughout the state would greatly impact already limited landfill space. In light of the precedent that would be set by requiring additional excavation at this site and the fact that beneficial uses are not threatened, attaining background water quality at petitioner's site is not feasible. While it is impossible to determine the precise level of water quality that will be

attained given the residual petroleum constituents that remain at the site, in light of all the factors discussed above, a level of water quality will be attained that is consistent with the maximum benefit to the people of the state.<sup>1</sup>

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 SWRCB Resolution No. 92-49, a site may be closed if the basin plan requirements will be met within a reasonable time frame.

In this specific case, TPHg in the shallow groundwater could remain above the commonly accepted 5 ppb odor threshold for TPHg in water for a significant period of time although MCLs for BTEX will likely be met in all monitoring wells within a few decades. Though the longer chain hydrocarbons comprising TPHg biodegrade more slowly than other petroleum constituents, such as benzene, they are also more recalcitrant (i.e., less volatile, less soluble and highly absorbent) and much less mobile. It is also highly unlikely that this particular isolated plume of shallow groundwater will be used directly as a source of drinking water in the foreseeable future. Thus, although it will take a significant period of time before water quality in

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<sup>1</sup> In approving an alternative level of water quality less stringent than background, the SWRCB 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 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 the direction of groundwater flow; the patterns of precipitation in the region, and the proximity of residual petroleum to surface waters.

this limited area will meet all basin plan objectives, that period of time is reasonable under the circumstances of this case.

### III. SUMMARY AND CONCLUSION

1. There is no evidence of MTBE at this site. Residual concentrations of petroleum hydrocarbons at petitioner's site have been remediated such that only one of eight monitoring wells indicate toluene, ethylbenzene, and xylene concentrations above their respective MCLs. Maximum benzene concentrations have diminished to less than 40 ppb and exceed the MCL of 1 ppb in only three of eight monitoring wells near the original source.

2. According to drilling logs, the nearest well (about 0.25 miles upgradient) has a surface sanitary seal to 500 feet bgs and is screened from 500-800 feet bgs. These data indicate that shallow groundwater observed at petitioner's site at 11 feet bgs is effectively precluded from adversely affecting deeper groundwater production zones.

3. Given the low permeability and shallowness of the clay-rich affected water bearing deposits at petitioner's site and the standard practice of installing surface sanitary seals in water supply wells to preclude this shallow groundwater, the residual detectable concentrations of petroleum hydrocarbons do not pose a threat to human health and safety, or the environment, and do not adversely affect current or probable future beneficial uses of water.

4. Five years of monitoring data have confirmed (a) the limited extent of detectable petroleum constituents in groundwater, (b) diminishing concentrations of residual petroleum constituents over time and distance from the original source, and (c) hydrogeological conditions conducive to ongoing natural attenuation. Therefore, additional groundwater monitoring is not necessary.

5. The level of site cleanup is consistent with the maximum benefit to the people of the state.

6. Given the adverse economic implications if further corrective action was required, and the minimal benefits, if any, that would be gained by continued corrective action, it is not feasible to attain backgroundwater quality at petitioner's site.

7. Detectable TPHg in shallow groundwater in the immediate vicinity of the original release will likely remain above 5 ppb (the commonly accepted odor threshold for drinking water) and thus violate the Basin Plan's narrative odor objective in this localized volume of shallow groundwater for anywhere from decades to hundreds of years.

8. The determination as to what constitutes a reasonable period to attain Basin Plan objectives must be based on evaluation of all relevant factors, including but not limited to the extent and gravity of any threat to public health and the environment during the period required to meet Basin Plan objectives. Although the time required to attain objectives in this case is lengthy, it is highly unlikely that TPHg detected in the immediate vicinity of the original release will migrate substantially beyond its current limited spatial extent, and it is highly unlikely that this limited volume of affected shallow groundwater will be used directly as a source of drinking water.

9. Therefore, no further corrective action is necessary.

10. The above conclusions are based on the site specific information relative to this particular case.

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IV. ORDER

IT IS THEREFORE ORDERED that petitioner's case be closed, and no further action related to the release be required. The UST Cleanup Fund Manager is directed to issue petitioner a uniform closure letter pursuant to Health and Safety Code § 25299.37, subdivision (h).

CERTIFICATION

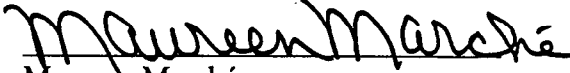
The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 22, 1998.

AYE: John Caffrey  
James M. Stubchaer  
Mary Jane Forster  
John W. Brown

NO: Marc Del Piero

ABSENT: None

ABSTAIN: None

  
Maureen Marché  
Administrative Assistant to the Board

