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STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 99 - 04 - UST

In the Matter of the Petition of
FALLBROOK PUBLIC UTILITY DISTRICT
for Review of Denial
of Petroleum Underground Storage Tank Site Closure at
990 E. Mission Road, Fallbrook, California.

BY THE BOARD:

Fallbrook Public Utility District (petitioner) seeks review of the decision of the San Diego County Department of Environmental Health (County) not to close petitioner's case involving an unauthorized release of petroleum at its site located at 990 East Mission Road, Fallbrook, 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 Underground Storage Tank (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 exists: (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)).

The San Diego RWQCB Basin Plan (Basin Plan) designates existing and potential beneficial uses of groundwater in the Ysidora Hydrologic area as municipal and domestic supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PROC) (SDRWQCB & SWRCB, Water Quality Control Plan, San Diego Region (1994) at p.II-53). The Basin Plan specifies a narrative taste and odor water quality objective as follows: "Waters shall not contain taste or odor producing substances in concentrations which cause nuisance or adversely affect beneficial uses." (Id. at p. III-15). The Basin Plan also contains the following narrative water quality objective for organic chemicals: "...ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of maximum contaminant levels (MCLs) specified in...Title 22 of the California Code of Regulations..." (Id. at p. III-10).

With regard to the water quality objectives for organic chemicals, the State Department of Health Services (DHS) has set maximum contaminant levels (MCLs) for benzene, toluene, ethylbenzene, and xylene (BTEX) in drinking water of 1 ppb, 100 ppb, 680 ppb, and 1,750 ppb, respectively. (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). A public health goal for MTBE of 13 ppb in drinking water was recently developed by the Office of Environmental Health Hazard Assessment. DHS has adopted a 5 ppb MTBE concentration as a secondary drinking water standard for taste and odor, and the Office of Environmental Health Hazard Assessment has set a public health goal for MTBE at 13 ppb (February 9, 1999). The threshold odor concentration of commercial gasoline (measured as total petroleum hydrocarbon gasoline, or TPH-g) in water is commonly accepted to be 5 ppb, with 10 ppb giving a strong odor.

The following is a brief historical summary of petitioner's site at 990 E. Mission Road, Fallbrook California. The site is petitioner's vehicle and equipment maintenance facility and

is located in a commercial/residential area. There are no supply wells within 5,000 feet, and the nearest surface water body is the Santa Margarita River located 1.5 miles to the north.

The site is located within the Santa Margarita River Watershed. The soil in the vicinity of the UST is clayey and silty sand, is about 12 to 15 feet thick, and was formed in place by the weathering of the underlying granitic bedrock. Shallow, confined groundwater is encountered in the underlying fractured granitic bedrock at depths of about 20 to 24 feet below ground surface. The groundwater apparently flows to the southwest with a moderate hydraulic gradient of about 0.05.

In August 1990, petitioner's 1000-gallon gasoline UST failed a tank integrity test. Petitioner removed the tank, and determined that a release had occurred. The UST pit was over-excavated to a depth of 10 feet, removing an estimated eight to ten cubic yards of affected soil. Soil samples from the bottom of the excavation or of the excavated soil were not collected.

In November 1990, petitioner installed three groundwater monitor wells within 15 feet of the UST excavation. During the drilling of these wells, groundwater was not encountered in the mantel of soil overlying the granitic bedrock, but rather within the bedrock, 4 to 10 feet below the soil/bedrock interface. The wells were completed to depths of 30 feet with well screens 25 feet long. The confined groundwater rose in each well to an elevation above the soil/bedrock interface.

Soil samples were collected from each well boring at depths of 6 and 11 feet. Analyses of these samples revealed TPH-g concentrations ranging from 3 to 3,300 ppm at 6 feet, and less than 1 to 280 ppm at 11 feet. Concentrations of benzene ranged from 0.003 to 2.9 ppm at a depth of 6 feet, and less than 0.001 to 1.3 ppm at the 11 foot depth. The initial sampling of groundwater in the three wells detected benzene at concentrations of 54 ppb and 4.5 ppb (in wells MW-1 and MW-3, respectively), concentrations of toluene and xylene ranged from 1.3 ppb to 13 ppb and 2.6 ppb to 41 ppb, respectively, and TPH-g and ethylbenzene were not detected.

From March of 1992 to June of 1995, the concentrations of benzene and TPH-g in groundwater samples collected from well MW-1 ranged from 47 to 650 ppb and 320 to 2,300 ppb respectively. In groundwater samples from wells MW-2 and MW-3, concentrations of benzene and TPH-g ranged from "not detected" to 20 ppb and "not detected" to 240 ppb, respectively. Cyclical fluctuations in constituent concentrations appear to correspond to seasonal groundwater elevation changes. As the groundwater elevation increases, concentrations of constituents also increase.

In August 1995, a pump and treat system was installed at this site using well MW-1 as the groundwater recovery well. The system operated for 10 months and was then shut down because repeated analyses of the recovered groundwater indicated "non detect" concentrations of benzene or TPH-g. Subsequent sampling of groundwater from MW-1 has detected benzene concentrations ranging from 7 to 590 ppb, and TPH-g concentrations ranging from 200 to 1,600 ppb. Analyses performed on groundwater samples in 1998 detected MTBE at 44 ppb (EPA Method 8020), and 67 ppb (EPA Method 8260) in samples from well MW-1; MTBE was not detected in the samples from wells MW-2 and MW-3.

By letter dated November 22, 1996, petitioner requested that the County close its case on the basis that site conditions do not pose a threat to human health and safety or the environment. Responding in a letter dated March 18, 1997, County staff informed petitioner that after consultation with RWQCB staff, the site could not be closed due to presence of dissolved phase petroleum hydrocarbons in groundwater at concentrations greater than Basin Plan water quality objectives. County staff also noted that the extent of affected groundwater had not been defined, and that pump and treat systems are an ineffective method of remediation. The County requested that additional soil and groundwater investigation be performed in order to determine the most effective method of site remediation.

By letter dated April 14, 1997, petitioner requested that the UST Cleanup Fund manager review its case and grant closure status.

II. CONTENTIONS AND FINDINGS

Contention: The petitioner contends its case should be closed because the residual petroleum hydrocarbon constituents in site soil and groundwater pose a "low risk" to public health and safety, the environment, and to current or anticipated future beneficial uses of water.

Findings: Petitioner's contention has merit. As explained below, the facts in the record support the finding that the concentrations of petroleum constituents at petitioner's site do not pose a threat to human health and safety, or the environment. More specifically, the evidence indicates that the groundwater beneath petitioner's site has not been impacted but rather as explained below, that the investigation activities conducted at the site in response to the UST release caused the appearance of a condition of pollution. Closure of the case, with the proper destruction of the site's three groundwater monitor wells will remedy this situation. Additional soil and groundwater investigation or remediation is not necessary and residual petroleum hydrocarbon constituents in soil at petitioner's site will not adversely affect, or threaten to affect, groundwater once the wells are properly destroyed.

The primary source of the release was removed in 1990. Free product is not present in the subsurface, and there is no evidence to suggest that shallow groundwater in the vicinity of petitioner's site is being used presently or that it has any likelihood of being used in the foreseeable future for domestic or municipal supply. According to the Department of Water Resources (DWR) Water Master for the Santa Margarita District and petitioner, 95 to 99% of the water supply for the Fallbrook area is imported by the Metropolitan Water District. The nearest water supply well, used for industrial purposes, is over 5,000 feet away. Wells in closer proximity to the site (as near as 500 feet) are either abandoned or used for dewatering purposes. Additionally, groundwater in the area is rated as marginal to inferior for domestic uses because of high concentrations of nitrate (greater than 45 ppm), sulfate (250 to 500 ppm), and TDS (750 to 1,000 ppm). At petitioner's site, analysis of the groundwater revealed the following constituent concentrations: nitrate - 52.5 ppm, sulfate - 360 ppm, TDS - 1,270 ppm. The analysis

also showed that the concentrations of iron and manganese, 7.85 ppm and 1.42 ppm respectively, exceed secondary drinking water standards by more than twenty-five times.

Further, concentrations of TPH-g and benzene detected in shallow groundwater are a consequence of the manner in which the monitor wells were constructed. The wells have 25 foot screens which allow confined groundwater to come into contact with the shallow affected soil. This is evidenced by: 1) the correlation of constituent concentrations with the rise and fall of the groundwater level, and 2) "non detect" concentrations in groundwater samples from well MW-1 during the pump and treat period when the pumping water level was generally below the soil/bedrock interface. This evidence indicates that the release was a "soil only case," that shallow confined groundwater, in its natural state, is not affected by the release, and that only through inadvertent, induced contact through improperly constructed monitor wells are residual petroleum constituents in shallow soil introduced into groundwater samples.

Given the demonstrated absence of detectable concentrations of benzene and TPH-g in groundwater recovered during the pump and treat phase of site remediation, and the detectable concentrations prior to and after that phase, it is evident that the shallow confined groundwater is only affected when it is allowed to rise in the well and come into immediate contact with the more shallow contaminated soils. In light of these facts, there is little likelihood that the groundwater encountered in bedrock was affected by the release. Thus, proper destruction of these wells will restore the integrity of the confining stratum and preclude further apparent impacts to that groundwater. The absence of nearby water supply wells, the poor quality of local groundwater, reliance on imported water for consumption in the Fallbrook area, and standard well construction practices which mandate surface sanitary seals to preclude shallow groundwater from entering the well, altogether indicate that residual concentrations of petroleum hydrocarbons in shallow soils do not threaten existing or anticipated beneficial uses.

III. SUMMARY AND CONCLUSION

1. Petitioner's site is located in a commercial/residential area. No water supply wells are located within 5,000 feet of the site and the nearest surface water is at a distance of about 1.5 miles from the site.
2. Groundwater in the Fallbrook area is generally of poor quality containing elevated concentrations of TDS, sulfates, and nitrates. Groundwater at petitioner's site has been shown to also contain elevated concentrations of iron and manganese.
3. The release is limited to shallow soils and the low but detectable concentrations of TPH-g, BTEX, and MTBE in some groundwater samples is a consequence of improper monitor well construction which has allowed deeper confined groundwater to rise and come into direct contact with the limited volume of shallow soil containing detectable concentrations of residual petroleum constituents.
4. Additional soil and water remediation at petitioner's site is not necessary as the site presents a low risk to human health, safety, and the environment.

5. The level of site cleanup, which included removal of the USTs in 1990, groundwater monitoring, and a pump and treat system, is consistent with the maximum benefit to the people of the state.
6. The site's three monitor wells must be properly destroyed to restore the natural barrier separating residual petroleum hydrocarbons present in shallow soil from underlying confined groundwater.
7. Once the monitor wells are properly destroyed, no further corrective action is necessary.
8. The above conclusions are based on the site-specific information relative to this particular case.

IV. ORDER

IT IS Therefore ORDERED that, following proper destruction of the site's three monitoring wells, petitioner's case be closed, and no further action related to the release be required. Once the monitoring wells are properly destroyed, the UST Cleanup Fund Manager is directed to issue petitioner a uniform closure letter consistent with Health and Safety Code section 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 May 20, 1999.

AYE: James M. Stubchaer

John W. Brown

NO: Mary Jane Forster

ABSENT: None

ABSTAIN: None

/s/

Maureen Marché

Administrative Assistant to the Board