STATE OF CALIFORNIA
STATE WATER RESOURCES CONTROL BOARD

ORDER: WQ 98 - 13 - UST

In the Matter of the Petition of
LANDIS INCORPORATED
for Review of Denial of
Petroleum Underground Storage Tank Site Closure
at
304 West Ojai Avenue, Ojai, California.

BY THE BOARD:

Landis Incorporated (petitioner) seeks review of the decision of the Ventura County Resource Management Agency, Environmental Health Division (County) not to close petitioner's case involving an unauthorized release from petroleum underground storage tanks (USTs) located at 304 West Ojai Avenue, Ojai, 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 background water quality or the best water quality which is reasonable if background water 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 anticipated 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 Los Angeles RWQCB Water Quality Control Plan (Basin Plan) designates existing and potential beneficial uses of groundwater in the Lower Ojai Valley area of the San Antonio Creek Hydrologic area as municipal supply (MUN), industrial supply, and agricultural supply (LARWQCB & SWRCB, Water Quality Control Plan (1994) at p. 2-16). The Basin Plan specifies a narrative taste and odor water quality objective as follows: "Groundwaters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses." (Id. at p. 3-18). In addition, the Basin Plan also specifies that groundwater designated as MUN "shall not contain concentrations of chemical constituents in excess of the limits specified in . . . Title 22 of the California Code of Regulations." (Id. at p. 3-18.)

With regard to the water quality objective for chemical constituents, 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 TPH_g) 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 which is located at the three-way intersection of Ojai Avenue (State Highway 150), Canada Street, and El Paseo (formerly Foothill) Road at the base of Stewart Canyon in the Lower Ojai Valley. Several sewer mains converge at this intersection, as well as the Stewart Canyon drainage channel which runs along Canada Street less than 200 feet east of petitioner's site. The Stewart Canyon debris basin is upstream, less than one mile due north of the site. Intermittent but significant storm runoff from the basin flows south from the spillway past petitioner's site and eventually discharges into San Antonio Creek which is one mile south of the site. In addition local surface runoff from State Highway 150, Canada Street and El Paseo Road, is directed via storm drains to the Stewart Canyon drainage channel.

The soil immediately underlying petitioner's site and surrounding areas consists predominantly of "mudflow" deposits up to 50 feet thick. These deposits exhibit a chaotic orientation of sandstone boulders and cobbles embedded in an unsorted matrix of low permeability clays, silts, and fine sands. The unpredictable presence of underlying boulders in these mudflow deposits has forced the abandonment of numerous soil borings (and other subsurface exploratory attempts). The mudflow deposits in turn overlie stratified bedrock of the Sespe Formation which dips to the north. A homogeneous clay stratum is encountered beginning at depths of 25-50 feet below ground surface (bgs) at the contact between the base of the mudflow deposits and the underlying Sespe Formation.

The site is located in the extreme western portion of the Lower Ojai Basin in an area where the Sespe Formation crops out. Groundwater production in the Lower Ojai Basin for domestic and municipal use is generally derived from unconsolidated alluvium. The greatest yield is from wells in the permeable sediments in the eastern part of the

basin with substantially lower yields in the west. Well logs from the western part of the groundwater basin indicate substantially higher clay content which correlates to the substantially lower yield reported in wells. According to the Department of Water Resources (Bulletin No. 12, "Ventura County Investigation", 1953) the Sespe Formation is "non-water bearing." Petitioner's consultant conducted a well survey including municipal and private wells and no water supply wells within a 0.5 mile radius of petitioner's site were identified.

The site operated as a service station from 1962 to 1984. Petitioner's site is presently a vacant commercial property. There is a residence across the street between a restaurant and an art gallery. Three gasoline (one 8,000 and two 4,000 gallon) tanks, one 6,000 gallon diesel, and one 550 gallon waste oil tank ceased operation in 1984 and were all removed in 1990. Between 1991 and 1995 a total of 1,500 cubic yards of surrounding soil were excavated to a depth of about 20 feet bgs. Approximately 3,240 gallons of petroleum were removed from the site as a result of soil excavation and vapor extraction.

Three monitoring wells were drilled in 1990 which encountered confined groundwater at 50, 65, and 74 feet bgs in the bedrock. During that investigation it was evident that petroleum constituents were limited to the mudflow deposits except for traces of petroleum constituents introduced into the underlying bedrock during drilling. These trace concentrations of petroleum constituents in confined groundwater in the underlying bedrock warranted the installation of two additional monitoring wells in 1991. An analysis of soil samples and soil vapor from these bedrock wells indicate that migration of petroleum in soil was limited to about 40-50 feet and that it did not penetrate the underlying clay layer. Petitioner had also drilled six shallow (less than 35 feet bgs) soil borings in the mudflow deposits during November 1990 and converted two into vapor extraction wells. Although groundwater was not encountered in any of these at that time, water did appear after the winter of 1991. This led to investigation directed by the County in 1993 resulting in the installation of eight additional shallow monitoring wells. One of the shallow wells was abandoned in 1994 and two of the vapor extraction wells (SGD-4, SGD-5) were utilized as monitoring wells.

Boring log and monitoring well data from this investigation indicated detectable petroleum constituents that extended less than 200 feet north and northwest of the former USTs along the top of the clay layer. In 1993 a "sheen" was reported in shallow monitoring well SGD-4, adjacent to the former UST pit. This sheen has not reappeared since December 1993.

The highest concentrations of petroleum constituents reported in September 1998 were in shallow monitoring wells MW-10, SGD-4, and SGD-5. Petroleum constituents were also detected in MW-7 and MW-8, but were "non-detect" in the other shallow wells, including MW-9, MW-11, MW-12, MW-13. Samples from MW-10 indicated TPH_g at 28,600 ppb, benzene at 3,030 ppb, toluene at 1,600 ppb, ethylbenzene "non-detect", and xylene at 2,630 ppb. Concentrations of MTBE in MW-10 were reported at 2,500 ppb (EPA Method 8020) and "non-detect" (EPA Method 8260, with a detection limit of 200 ppb). Samples from SGD-4 indicated TPH_g at 37,500 ppb, benzene at 5,750 ppb, toluene at 1,800 ppb, ethylbenzene at 50 ppb, and xylene at 3,750 ppb. Again, MTBE was detected using EPA Method 8020 (2,400 ppb) and was "non-detect" using EPA Method 8260 with a detection limit of 20 ppb. Similarly, SGD-5 indicated TPH_g at 16,000 ppb, benzene at 2,070 ppb, toluene at 270 ppb, ethylbenzene at 15 ppb, and xylene 1,250 ppb. MTBE was reported as "non-detect" using EPA Method 8260 with a detection limit of 200 ppb, although earlier analyses using EPA Method 8020 ranged from 850 ppb to as high as 2,600 ppb.

Maximum BTEX concentrations historically at the site have been reported in MW-10. Dissolved benzene concentrations have declined over time from 18,547 ppb in October 1992 to 3,030 ppb in September 1998. Over the same time in MW-10, toluene has declined from 31,700 ppb to 1,600 ppb; ethylbenzene has declined from 2,619 ppb to "non-detect"; and xylene has declined from 18,762 ppb to 2,630 ppb. This downward trend in BTEX concentrations is also evident in all other shallow wells.

Shallow well MW-7 which is located within the former tank pit, detected TPH_g at 1,120 ppb and benzene at 188 ppb. Toluene and ethylbenzene were "not detected" and xylene was detected at 21 ppb, which is below its 1,750 ppb MCL. Detectable MTBE was confirmed in this well by EPA Method 8260 at 311 ppb and 184 ppb in January 1998

and April 1998, respectively. Shallow well MW-8 located approximately 50 feet east of the former tank pit indicated TPH_g at 2,040 ppb and benzene at 4 ppb. Toluene (1 ppb), ethylbenzene (1 ppb), and xylene (2 ppb) were all below their respective MCLs. Detectable MTBE concentrations were confirmed by EPA Method 8260 at 202 ppb in January 1998 and at 160 ppb in April 1998. The remaining shallow wells including MW-9 (60 feet north), MW-11 (160 feet northeast), MW-12 (about 200 feet north), and MW-13 (150 feet northwest) of the former USTs indicated "non-detect" for all constituents, including MTBE in September 1998.

Four monitoring wells (MW-1, MW-2, MW-4, MW-5) are completed in the underlying bedrock. The highest petroleum constituent concentrations in these wells have been reported in MW-4, which is about 40 feet west of shallow monitoring well MW-10, which has reported the highest concentrations in shallow groundwater. Initial groundwater samples from MW-4 in May 1991 indicated TPH_g at 3,800 ppb, benzene at 40 ppb, toluene at 120 ppb, ethylbenzene at 16 ppb, and xylene at 400 ppb. MTBE was "not detected" above 1 ppb). As of September 1998 BTEX has attenuated to below 1 ppb in MW-4 and all of the other bedrock wells and TPH_g was "not detected." Trace "hits" of MTBE appeared in the bedrock wells in December 1996 and have subsequently been confirmed using EPA Method 8260 at a range of 5.2 ppb to 9.5 ppb, which is less than the 35 ppb interim action level and slightly above the proposed taste and odor threshold. MTBE concentrations in all four wells have not exceeded 10 ppb via EPA Method 8260.

In April 1991, 280 cubic yards of petroleum-affected soil was over-excavated from the former UST area and from the former hydraulic lift and oil/water separator areas and disposed of offsite. Additional soil removal, treatment, and disposal in February 1995 eliminated another 1,280 yards of petroleum affected soil from the mudflow deposits.

In addition to the removal of over 1,500 cubic yards of soil, soil vapor extraction (SVE) was conducted from June 1995-March 1996. By early 1996, an estimated 7,444 lbs (or the equivalent of 1,226 gallons) of petroleum constituents had been removed from the immediate vicinity of the former USTs and residual soil concentrations had reached asymptotic levels. Treatment and disposal of affected soil

and nearly nine months of SVE eliminated an estimated total of about 19,673 lbs (3,240 gallons) of petroleum hydrocarbons from petitioner's site.

In addition, a groundwater "pump and treat" system began in July 1995 and operated intermittently up to the present. Air sparging began in 1996 and was performed intermittently through April 1998. Although pump and treat technology and air sparging appears to have had limited effectiveness with respect to mass removal, air sparging (air injection into the shallow mudflow deposits) increased the amount of available oxygen in the subsurface environment to stimulate natural biodegradation processes.

All of the remedial activities to date were conducted under the direction and approval of the County. The County has concluded (by letter dated May 19, 1997) that petroleum levels are decreasing and that remedial options may be exhausted. Nevertheless, the County contends that post remedial monitoring should continue on a quarterly basis as it has up to the present time.

In January 1998, petitioner requested review of its case by the UST Cleanup Fund manager pursuant to Health and Safety Code section 25299.39.2, subdivision (b). In a April 15, 1998 letter to petitioner, the County stated it was denying closure because (1) benzene concentrations in groundwater were as high as 4,080 ppb (2) concentrations of MTBE were as high as 3,300 ppb in one well and present in six others and (3) additional investigation and remediation is required. Subsequently, the County provided a copy of its record to the Fund Manager for review.

II. CONTENTIONS AND FINDINGS

Contention: Petitioner contends its case should be closed because soil and groundwater remediation has been completed to the extent that is technically and economically feasible and the site represents a low risk to public health, safety and the environment.

Findings: Petitioner's contention has merit. As explained below, the facts in the record support the finding that additional investigation and remediation is not necessary and that residual petroleum hydrocarbon constituents at petitioner's site do not pose a threat to human health and safety, or the environment, and do not adversely affect,

or threaten to 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 in the Los Angeles RWQCB Basin Plan within a reasonable time frame.

Petitioner has conducted soil and water investigations; has implemented corrective actions as directed and approved by the County; and has continued to demonstrate that residual petroleum is limited to mudflow deposits in the immediate vicinity of the original release and extends less than 200 feet north of the former tank pit. About 1,500 yards of affected soil has been excavated and disposed. Additional petroleum product was removed and shallow groundwater in the area of the release has been air sparged or pumped and treated intermittently for over 3.5 years.

Soil remediation processes removed significant quantities of petroleum. However groundwater pump and treat and air sparging processes have removed a limited amount of mass due to the low permeability of the mudflow deposits.

The County contends that the groundwater plume is not defined to the north of the site and that further groundwater characterization is necessary to evaluate potential offsite impacts to water wells, although none are known to exist within one half mile of the site, and to evaluate the potential risk posed by residual benzene vapor to a neighboring residence located about 30 feet from monitoring well MW-10 (which has detected 3,030 ppb benzene in the shallow water).

To address the County's concern regarding vapor transport, petitioner collected soil vapor and soil samples within 15 feet of the nearby residence (north of the site) in September 1998. Soil vapor samples collected immediately above the saturated zone were all "non-detect" for MTBE, BTEX, and TPH_g indicating no vapor transport threat exists.

With regard to the undefined northward migration alleged by the County, monitoring well MW-11 located approximately 160 feet northwest of the former tank pit, has not exhibited BTEX above the detection limit of 1 ppb or MTBE above the detection limit of 2 ppb during any of the sampling events over the last three years. Recent samples from MW-9 located 70 feet north of the tank pit indicates that MTBE and BTEX

are also "non-detect." This groundwater sampling north of the site indicates that detectable petroleum constituents in groundwater are localized in the immediate vicinity and limited to a distance of less than 200 feet north of the former tank pit. This evidence refutes the County's contention that the extent of residual petroleum north of the former USTs needs further definition.

The County also expressed concern that MTBE is present at a concentration of 3,300 ppb in one well and is detectable in six others. The County has apparently relied upon reported MTBE concentrations as analyzed by EPA method 8020 to conclude that a MTBE plume exists and that it warrants further corrective action. However, when comparing sampling methods EPA Method 8020 and EPA Method 8260 it is evident that over-estimations have occurred via EPA Method 8020 because of interferences due to the occurrence of elevated TPH_g concentrations in the same sample. Results of EPA Method 8260 should be relied upon to obtain accurate concentration data at this site.

The County has apparently based its concern about the magnitude and the extent of dissolved MTBE upon EPA Method 8020 laboratory data. However, the maximum MTBE concentration reported at the site using EPA method 8260 is 311 ppb in MW-7 which is in the immediate vicinity of the former USTs.

In the shallow mudflow zone MTBE concentrations diminish to "non-detect" further away from the former tank pit. MTBE was detected at a maximum concentration of 311 ppb (via EPA Method 8260) in the well (MW-7) closest to the former tank pit and diminishes to "non-detect" (less than 2 ppb) in MW-9 about 80 feet north of the former tank pit.

Trace quantities of MTBE were detected in the bedrock zone. Two of the bedrock wells are located essentially within, and penetrate bedrock underlying, the former tank pit. The other two are located 30-60 feet from the former tank pit. Sampling for MTBE in the "bedrock" began in May 1996. TPH_g and BTEX constituents were initially detected in 1990 and 1991 in the deep zone (introduced during drilling) at concentrations of TPH_g (3,800 ppb), benzene (40 ppb), toluene (120 ppb), ethylbenzene (16 ppb), and xylene (400 ppb). BTEX constituents have attenuated to "non-detect" in all of the deep

wells as of September 1998. MTBE concentrations in these deep wells were reported as either "non-detect" or below 10 ppb in September 1998.

MTBE in the four monitoring wells completed in the bedrock was "not-detected" above 2 ppb in May 1996 and in September 1996. In December 1996 after pump and treat remediation began, however, trace concentrations less than 10 ppb of MTBE were first detected in the bedrock wells. Under ambient hydrogeologic conditions, the shallow and deep zones are hydraulically separated. Thus, given the coincidence of the induced vertical gradients resulting from groundwater pumping and air sparging that began in 1996 and the first detection of MTBE at that time, it appears that deep groundwater monitoring wells have provided an artificial conduit between shallow and deep zones that resulted in the marginal "hits" of MTBE drawn from the overlying mudflow deposits.

The County also has cited benzene concentrations as high as 4,080 ppb. Benzene was detected in five shallow wells in September 1998 within 70 feet of the former USTs. In contrast, benzene concentrations have attenuated to less than 1 ppb in the deep bedrock wells in September 1998. Although BTEX concentrations are locally above their respective MCLs in an area of shallow groundwater less than 200 feet north of the former USTs, concentrations over the last six years of sampling have indicated a declining trend and do not appear to be migrating beyond their current, limited extent.

The source has been removed along with 1,500 yards of affected soil and SVE has reduced residual volatile petroleum hydrocarbons in the soil to asymptotic levels. The facts in this particular case indicate that with no further regulatory action, residual detectable concentrations of TPH-g, BTEX, and MTBE in shallow groundwater and adsorbed to shallow soils are (and will remain) localized and will continue to attenuate naturally over time with no further corrective action. Given the demonstrated, ongoing natural attenuation of residual BTEX to date, it is evident that MCLs will be met for these constituents within a matter of decades. Residual concentrations of TPH-g and MTBE in the mudflow deposits may remain above the 5 ppb odor threshold in a localized volume of groundwater for a significantly longer period of time. However, considering the absence of existing wells in close proximity to petitioner's site, the local hydrogeologic

considerations, and standard well construction practices which mandate (a) surface sanitary seals to preclude introduction of shallow groundwater such as encountered at petitioner's site and (b) minimum distances from existing sewer lines and storm drains, the limited magnitude and extent of residual petroleum will not unreasonably affect existing or anticipated beneficial uses.

The only way to ensure more immediate, complete removal of lingering, residual, detectable concentrations of petroleum in the mudflow deposits would be to excavate an additional several thousand cubic yards of affected soil to depths of about 50 feet. This would also entail substantial disruption of streets, State Highway 150, businesses, sewers, and other utilities while producing little or no benefit to current or anticipated beneficial uses of the minimal area of groundwater not meeting Basin Plan objectives.

Furthermore, 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 minimal if any benefit to be gained, the evidence of continuing attenuation of residual petroleum concentrations, and the precedent that would be set by requiring additional excavation at this site, attaining background water quality in this limited area 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.[1]

---

[1] 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.

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, BTEX could remain above MCLs and TPH_g and MTBE could remain above their respective 5 ppb odor thresholds in the shallow groundwater for a significant period of time. This time period could be anywhere from a few decades for BTEX to degrade below MCLs, to several decades for MTBE to attenuate below the proposed taste and odor threshold, and possibly hundreds of years for TPH-g to be below 5 ppb. Though the longer chain hydrocarbons comprising residual TPH_g 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. In the case of MTBE, it is also resistant to biodegradation but will undergo dilution by dispersion over time. It is highly unlikely that shallow groundwater in the low permeability mudflow deposits will be used as a source of drinking water in the foreseeable future. Thus, although it will take a significant period of time before water quality in 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. The maximum detectable concentration of MTBE analyzed by EPA Method 8260 in shallow water was 311 ppb. There is no MTBE "plume" in the confined groundwater in the underlying bedrock, rather only traces of MTBE (less than 10 ppb) that were inadvertently introduced during the investigation and subsequent operation of the groundwater pump and treat and air sparging systems.

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.

2. Groundwater meets Basin Plan objectives within a distance of less than 200 feet from the original source.

3. The rate of groundwater movement (both shallow and deeper) is very slow as illustrated by the fact that monitoring wells take up to 6 hours or more after purging to recover sufficiently to obtain a groundwater sample and the maximum sustained yield was on the order of 10-15 gallons per day. Thus, the locally affected groundwater does not provide the minimum 200 gpd sustained yield set by State Board Resolution No. 88-63.

4. There is no evidence in the record to indicate that either shallow groundwater in the mudflow deposits or deeper confined groundwater in the underlying Sespe Formation are presently being used for drinking water or that they would reasonably be capable of providing and sustaining water for beneficial use in the future.

5. Active remediation in the form of excavation and disposal of 1,500 cubic yards of petroleum impacted soil, SVE, groundwater pump and treat, and air sparging have been completed as directed and approved by the County.

6. Upon closure of the site, including abandonment of deep wells that are serving as a conduit for groundwater and trace petroleum constituents to move between the two zones, residual petroleum in shallow groundwater will be isolated from the underlying bedrock water-bearing zone.

7. More than seven years of groundwater monitoring data have been collected which have verified both the limited area of shallow groundwater that has been affected and the continuing decline in residual concentrations over time in that limited area. In light of the above, additional monitoring to delineate plume extent or to confirm declining concentrations would be of little value.

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

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

10. Detectable concentrations of BTEX in shallow groundwater in contact with the limited residual petroleum hydrocarbons adsorbed to soil particles may remain above MCLs for several decades and thus violate the Basin Plan objectives in a very localized volume of surrounding groundwater for a number of years to come.

11. Detectable concentrations of MTBE as measured by EPA Method 8260, will likely remain above the proposed 5 ppb taste and odor threshold for drinking water and thus violate the Basin Plan's narrative odor objectives in a very localized volume of shallow groundwater for several decades.

12. Detectable concentrations of TPH_g in shallow groundwater in contact with the limited residual petroleum hydrocarbons adsorbed to soil particles will likely remain above its 5 ppb odor threshold for drinking water and thus violate the Basin Plan's narrative odor objectives in a very localized volume of shallow groundwater for anywhere from decades to hundreds of years.

13. The determination as to what constitutes a reasonable period of time to attain water quality objectives and the level of hydrocarbon constituents allowed to remain in the shallow groundwater 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 with respect to the 5 ppb odor threshold for TPH_g in this case may be more lengthy (e.g. decades to hundreds of years) than that for BTEX and MTBE, it is a reasonable period of time considering the facts of this particular case, including that there are no known drinking water wells within one half mile of the site and that it is highly unlikely that remaining petroleum constituents detected in localized areas in the immediate area of the pre-1985 release will migrate substantially beyond the current limited spatial extent. It is also highly unlikely that this particular very limited volume of shallow groundwater in this area of very low yield and in close proximity to numerous surface street runoff collection basins, storm drains, and sanitary sewer mains, will be used as a source of drinking water in the foreseeable future.

14. Therefore, no further corrective action or verification monitoring is necessary.

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

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 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 November 19, 1998.

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

NO: None

ABSENT: None

ABSTAIN: None

Maureen Marché
Administrative Assistant to the oard