



California Regional Water Quality Control Board

Central Coast Region


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TO: Thomas Howard
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FROM: 
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Central Coast Regional Water Quality Control Board

DATE: October 14, 2010

SUBJECT: COMMENTS ON DRAFT LOW-RISK CLOSURE RESOLUTION

Thank you for the opportunity to comment on the September 7 2010 draft of the proposed Underground Storage Tank (UST) low-risk closure policy and resolution (proposed resolution). Central Coast Water Board staff agrees that UST cases should be prioritized and that those threatening drinking water supply wells should be the highest priority. We also agree that UST cases which do not pose a significant risk to human health or the present or future beneficial uses of groundwater should be closed. However, we believe the proposed resolution is a significant departure from the risk-based, case-by-case approach for closure that we implement within our region. Additionally, the proposed resolution attempts to establish closure criteria consistency at the expense of water quality in more vulnerable hydrogeologic settings and could result in increased wellhead treatment costs in areas with limited groundwater resources.

Eighty-three percent of all the water supply used (i.e., industrial, domestic, municipal, and agricultural) in the Central Coast Region comes from groundwater. Consequently, some groundwater basins are sole-source aquifers for communities and these water resources require special consideration. Additionally, large portions of our major groundwater basins are impaired by nitrate pollution from numerous sources. This widespread nitrate impairment has significantly limited the availability of clean groundwater as municipalities look for water resources that won't require exorbitant treatment costs. Allowing further pollution to remain in groundwater, as the proposed resolution would do, further restricts the availability of unimpaired groundwater. This action also potentially shifts the burden and responsibility for protecting and restoring the resource from the discharging parties and the Water Boards onto the users at the wellhead. The proposed resolution, as it is currently written, is global in nature and does not consider area-specific factors, such as our varied communities' general plans, where water resource use and development are projected into the future. Considering the existing and anticipated future demands on the region's water supply due to projected population growth, combined with large-scale existing nitrate impairments, and potential drought impacts, the resolution as written presents significant

potential risks to human health, the environment, and economic risk to groundwater-dependent communities in the Central Coast Region.

Specific Comments

We have the following comments and suggestions.

Findings:

Finding No. 9 - What may be a "reasonable" time frame for one community to utilize groundwater resources for public supply may not be reasonable for another. The proposed resolution should address projected land and water use, and acceptable time frames for full restoration of beneficial uses based on information from water purveyors and local agency general plans. The proposed resolution offers no guidance as to what a "reasonable time" would be for groundwater to achieve maximum contaminant level (MCL). With climate change and drought cycles, it is difficult enough to predict potential need of shallow water from even low yielding aquifers, within the next ten or twenty years. To assume we can predict that shallow water will not be needed several decades into the future is unwise. Therefore, assumptions about attenuation beyond a couple of decades should not be relied upon for safe closure in some areas. During one of our droughts, the City of San Luis Obispo (which typically relies predominantly on water imported from the adjacent Salinas Valley via Santa Margarita Reservoir) had to activate historic wells within the city limits. In some areas, the city had to install well head treatment due to residual chemicals in groundwater. Although that case involved solvents, the city may have had to drill more wells within the city limits and within its water service area, had the drought continued. Costs for treating residual contamination should not be borne by the future water user; contaminants should be cleaned up by the responsible party.

Finding No. 12 – The fact that approximately 4,500 cases have been open for more than 15 years is not justification to relax the closure standard. This fact more likely reflects the lack of reimbursement incentives/disincentives from the tank fund to responsible parties to motivate moving cases towards closure more rapidly.

Finding No. 13 - This finding seems to ignore the properties of MTBE, and perhaps ethanol. MTBE dissolves into the water column and disperses quite readily.

We suggest the finding read: "Petroleum fuels as free product, excepting some oxygenate additives, are less dense than water and will float on groundwater preventing the migration of free product to deeper aquifers...."

Findings No. 16. We agree that monitoring for the sake of monitoring alone is not appropriate. However, for sites where the proposed level of wastes remain in place, institutional controls (deed notification or deed restriction) should be recorded and this information should be readily available to the public if property ownership changes or property is redeveloped. We suggest an additional tool in Geotraker which flags deed notification in a manner similar to the existing tool which flags deed restrictions.

Finding No. 18 – This statement may assume a geologic confining layer between shallow and deeper aquifers. Many aquifers in the Central Coast Region do not have geologic separation between aquifers (i.e., Scotts Valley, Morro Bay, etc.). The Central Coast Region also has a number of aquifers in wind-blown (Aeolian) sand deposits, again with only limited (discontinuous) confining layers to protect the deeper portions of the aquifer (i.e., Los Osos, Prunedale, etc.). A sanitary seal will keep surface runoff out of the well. However, a well with a conforming sanitary seal and screened in a zone some distance below the static water table will still draw shallow degraded water into the screen via the cone of depression. In these areas and situations, this Finding's dependence on protection provided by well seals and confining layers is not valid.

Finding No. 19 - This finding applies in cases where other water supplies are available. When no other water supply is available, treatment such as desalinization and extraction from multiple small wells are used to utilize "unlikely sources of water supply" (i.e., Morro Bay, City of Monterey, etc.).

We suggest this additional language; "It is also understood when other sources of water are available, that natural conditions may make some groundwater an unlikely source of water supply. These conditions include, but are not limited, elevated total dissolved solids and insufficient sustained yield."

We suggest an additional finding which states "In order to protect current and foreseeable future beneficial uses of groundwater, this policy should be applied in conjunction with sufficient contaminant source removal in areas with aquifers utilized for drinking supplies".

Specifications:

Specification No. 2 allows "Regulatory agencies may issue a closure letter for a case that does not meet these criteria." However, the proposed resolution does not allow regulatory agencies to be more protective of water quality, regardless of geologic or water-limited setting, as discussed above.

Specification No. 3 – The proposed resolution Specification No. 3.a states that "The unauthorized release consists only of petroleum". Please either put a broader definition into the text or at least refer to the definition with a footnote.

We suggest that you augment the Specification 3.c exclusion beyond bedrock aquifers, to include aquifers that do not have substantial or continuous confining layers to protect existing and future water supply wells. We have cited several examples within the Central Coast Region in the text above.

The proposed resolution does not directly address leaching of contaminants to groundwater. We recommend specification 3.d be revised as follows:

...other biological receptors (including leaching from soil to groundwater), ...

The proposed resolution does not require horizontal and vertical delineation of the site. We suggest you modify specification 3.e to include:

'The Responsible Party has removed the source of contamination and delineated the horizontal and vertical extent of the soil and groundwater plume to determine conformance with applicable criteria in this policy.'

Specification 3.f is confined to contaminants with Maximum Contaminant Levels (MCLs). Some contaminants do not have MCLs. We recommend that language be added as follows

... affected groundwater which exceeds the maximum contaminant level (MCL) **or other applicable action level (when no MCL exists)** for the constituents in Table 2...

We also recommend the term **drinking water** be replaced with the term **water supply** and that the phrase ...**determined by the extrapolation of data** be clarified. Any extrapolation should be limited to a reasonable distance from a real water quality data point, and should not unreasonably substitute for real data when making risk-based closure decisions.

Specification 3.f.i refers to Table 1 but should refer to Table 2

The 1000' criterion in 3.f.ii seems incongruous with Finding 10 (whether remaining petroleum constituents would migrate beyond a limited spatial extent) This criterion could easily allow a case to be closed where groundwater contamination, with hydrocarbon concentrations at three orders of magnitude above water quality objectives, has migrated underneath an adjacent property, potentially limiting the adjacent property's future use of groundwater, or even future adjacent property usage (i.e., underground parking, etc.) in cases of shallow groundwater. Would this policy suggest land-use restrictions for adjacent properties under these types of conditions? For these reasons, we suggest that the lateral extent of the plume be limited to the affected property.

Dr. Blayne Hartman states: "In general, the studies show that when oxygen levels are 10% or greater and at least two feet of vadose zone exist between the contaminant source and overlying structure, that hydrocarbons aren't likely to pose an unacceptable risk (a published study by New Jersey DEP suggested oxygen levels as low as 6% are sufficient)." (LUSTline #48, November 2004). Dr. Hartman has lectured on soil vapor methods, data interpretation, and vapor intrusion to over 20 state agencies, to all of the U.S. EPA regions, and the DOD. We recommend that you include documentation for the soil column characteristics of 4% oxygen in soil gas since they are considerably less conservative than the cited literature.

Most of the numbers in Tables 1 and 2 are considerably higher than ESLs and RSLs. We recommend a thorough, independent scientific peer review to justify the less conservative values.

Thank you again for allowing us to comment on the proposed resolution. Staff at the Central Coast Water Board agrees that we need a consistent policy that helps us close low-

risk UST cases while protecting human health, present and future beneficial uses, and the environment. We look forward to reviewing the CEQA document and staff report for the proposed policy. If you have any questions, please contact me at (805) 549-3140 or Chris Adair at (805) 549-3761.

cc: Mr. Jonathan Bishop, SWRCB
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Draft Underground Storage Tank Low-Threat Site Closure Policy
9/7/10

Whereas:

1. Water Code section 13140 provides that the State Water Resources Control Board (State Water Board) shall formulate and adopt state policy for water quality control.
2. The State Water Board is authorized to administer the petroleum Underground Storage Tank (UST) Cleanup Program, which was enacted by the Legislature in 1984 to protect health, safety and the environment, and the petroleum UST Cleanup Fund (Cleanup Fund), which was enacted by the Legislature in 1989 to assist UST owners and operators in meeting federal financial responsibility requirements and to provide reimbursement to those owners and operators for the high cost of cleaning up unauthorized releases of petroleum caused by leaking USTs.
3. The State Water Board has received extensive input on improvements to the UST Cleanup Program and Cleanup Fund Program from numerous sources over the years, including:
 - a. Lawrence Livermore National Laboratory report (1995)
 - b. SB1764 report (1996)
 - c. Cleanup Fund public workshop (2009)
 - d. UST Cleanup Program Task Force report (2010)
 - e. Cleanup Fund Task Force report (2010)
 - f. Cleanup Fund audit (2010)
4. The State Water Board provided direction to improve the administration of the UST Cleanup Program and the Cleanup Fund Program through Resolution 2009-0042 and Resolution 2009-0081.
5. In Resolution 2009-0042, the State Water Board stated that the issues identified in the resolution are of an ongoing nature and the State Water Board will take further appropriate action to improve the UST Cleanup Program and the Cleanup Fund Program. A state policy for water quality control that establishes criteria for closure of UST cases that present a low threat to human health, safety, and the environment will facilitate the appropriate closure of UST cases and improve both the UST Cleanup Program and the Cleanup Fund Program.
6. Several statutory and regulatory provisions provide the State Water Board, Regional Water Quality Control Boards, and local agencies with broad authority to require responsible parties to clean up a release from a petroleum UST (e.g., Health & Saf. Code, § 25296.10; Wat. Code, § 13304, subd. (a).) The State Water Board has promulgated regulations specifying corrective action requirements for petroleum UST cases, and these regulations are contained in Article 11 of Chapter 16 of Title 23 of the California Code of Regulations.
7. Closure of a UST case pursuant to Health and Safety Code section 25296.10 is appropriate where the corrective action ensures the protection of human health, safety, and the environment, is compliant with applicable corrective action regulations, and where the corrective action is consistent with: 1) Chapter 6.7 of the Health and Safety Code and implementing regulations; 2) Any applicable waste discharge requirements or other order issued pursuant to Division 7 of the Water Code; 3) All applicable state policies for water quality control; and 4) All applicable water quality control plans.
8. State Water Board Resolution 92-49, *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304* is a state policy for water quality control and applies to petroleum UST cases.

9. State Water Board Resolution 92-49 directs that water affected by an unauthorized release attain either background water quality or the best water quality that is reasonable if background water quality cannot be restored. 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. Resolution No. 92-49 does not require that the requisite level of water quality be met at the time of case closure; it specifies compliance with cleanup goals and objectives within a reasonable time frame.
10. The State Water Board has adopted numerous orders closing UST cases after applying relevant statutes and regulations referenced above and State Water Board Resolution 92-49. In these orders, several factors were considered, such as: (1) whether remaining petroleum constituents would migrate beyond a limited spatial extent, (2) the presence and location of drinking water wells in the area, (3) the likelihood that the impacted groundwater will be used in the foreseeable future; and (4) the protective nature of standard well-construction practices.
11. California has some of the most stringent UST leak prevention requirements in the country. The State Water Board is committed to the prevention of unauthorized releases for the protection of beneficial uses of water. New unauthorized releases from USTs should be rare and when they occur, they should be cleaned up quickly. It should be an exceptional case that takes more than five years to investigate a release, complete corrective action and close the case.
12. Fifty percent of the over 9,000 UST cleanup cases have been open for more than 15 years.
13. Petroleum fuels as free product are less dense than water and will float on groundwater preventing the migration of free product to deeper aquifers. It also has been well-documented in the literature and through experience at individual UST release sites that petroleum fuels naturally attenuate in the environment, largely through biological degradation. This natural attenuation slows and limits the migration of dissolved petroleum plumes in groundwater.
14. Residual petroleum at varying amounts has been left in the subsurface at most of the 35,000 UST cases that have been closed over the past 25 years. After source removal, natural attenuation can be relied upon to effectively remediate remaining residual soil and groundwater impacts at many sites.
15. Sites where residual petroleum hydrocarbons remain localized and human exposure pathways are eliminated pose little threat to human health, safety or the environment.
16. There is a significant financial burden to the Cleanup Fund as well as a financial and time burden to UST owners in keeping UST cleanup cases open when there is little or no environmental benefit associated with continued investigation, remediation, or monitoring.
17. Limited resources should be focused on UST cleanup cases where there is a threat to human health, safety and the environment. In particular, UST sites that have impacted a drinking water well should receive priority regulatory attention so that safe drinking water can be provided as early as possible and alternative supplies can be developed for the longer term, if necessary.
18. It has been understood for decades that societal activities tend to adversely impact shallow groundwater. In recognition of this, well standards were developed by the Department of Water Resources and adopted by local agencies as well ordinances. Such ordinances require drinking water wells to have sanitary seals to help prevent shallow impacted groundwater from entering well screens. Separation between drinking water wells and sources of impacts allows time for natural attenuation processes to occur.

19. It is also understood that natural conditions may make groundwater an unlikely source of water supply. These conditions include, but are not limited, elevated total dissolved solids and insufficient sustained yield.
20. Public disclosure of information regarding UST releases is a necessary and important part of our regulatory mandate. Posting of current and accurate information to the State Water Board's internet-based GeoTracker database is imperative. This information is and will continue to be relied upon during cleanup and after case closure for real estate transactions, zoning changes and other matters that affect the site and surrounding properties.

Therefore be it resolved:

1. This policy establishes closure criteria for certain types of sites with unauthorized releases of petroleum from USTs that present a low threat to human health, safety, and the environment. In the absence of unique site-specific conditions, cases that meet these criteria do not pose a threat to human health, safety or the environment and are appropriate for UST case closure pursuant to Health and Safety Code section 25296.10.
2. These criteria do not attempt to describe the conditions at all low-threat sites in the State. Regulatory agencies may issue a closure letter for a case that does not meet these criteria.
3. Unless unique site-specific conditions warrant otherwise, cases that meet all of the following criteria do not require further corrective action and shall be issued a uniform closure letter consistent with Health and Safety Code Section 25296.10:
 - a. The unauthorized release consists only of petroleum;
 - b. The unauthorized release from the UST has been stopped;
 - c. The unauthorized release does not occur in fractured bedrock, but has occurred in unconsolidated geologic materials such as clay, silt, sand, gravel, or any combination thereof;
 - d. Soil or groundwater affected by the unauthorized release have been investigated to determine conformance with applicable criteria in this policy including an identification of water supply wells, surface water bodies, and human and other biological receptors that may be impacted by the unauthorized release at the site;
 - e. Free product has been removed to the extent practicable;
 - f. If groundwater is affected by the unauthorized release, the current extent of the affected groundwater which exceeds the maximum contaminant level (MCL) for the constituents in Table 2 must be stable or decreasing and must be no closer than 250 feet from the nearest drinking water well and either:
 - i. Does not exceed 250 feet from the source of the release; or
 - ii. Does not exceed 1000 feet from the source of the release and the dissolved concentration in groundwater of each of the constituents in Table 1 is less than 1 ppm in the source area.

The extent of groundwater affected by the unauthorized release may be determined by extrapolation of data.

- g. The site and the groundwater affected by the unauthorized release are within the service area of a public water system;
- h. Sites where any occupied building or any future occupied building that may be built overlying the unauthorized release shall meet one of the following:
 - i. The thickness and required soil column characteristics described in Table 1 for all affected media; or
 - ii. Measured petroleum soil vapor concentrations below or adjacent to the building or potential building are less than applicable screening levels; or
 - iii. Criteria acceptable to the regulatory agency.

Table 1: Required Soil Column Characteristics for Sites with Occupied Buildings

Unauthorized Release		Soil Located Between Contaminant Source and Building Foundation	
Affected Media	Characteristics	Minimum Thickness	Required Soil Column Characteristics
Groundwater, dissolved contamination	≤1,000 ug/L dissolved phase benzene or ≤10,000 ug/L dissolved phase TPH	5 feet	TPHg in soil ≤100 mg/kg or ≥ 4% oxygen in soil gas
Groundwater, dissolved contamination	>1,000 ug/L dissolved phase benzene or >10,000 ug/L dissolved phase TPH	10 feet	TPHg in soil ≤100 mg/kg or ≥ 4% oxygen in soil gas
Free product	Measurable free product	30 feet	TPHg in soil ≤100 mg/kg or ≥ 4% oxygen in soil gas
Soil	Petroleum present in soil	5 feet	TPHg in soil ≤100 mg/kg or ≥ 4% oxygen in soil gas

- i. Soil with petroleum constituents that is located in an area where direct human contact may occur shall meet one of the following:
 - i. Concentrations of petroleum constituents in soil are less than or equal to those listed in table 2.
 - ii. Contact is mitigated in a manner acceptable to the regulatory agency.

**Table 2
Criteria for Direct Contact with Soil:**

Depth (feet)	Benzene (mg/kg)	Toluene (mg/kg)	Ethylbenzene (mg/kg)	Xylene (mg/kg)	MTBE (mg/kg)	TBA (mg/kg)	Naphthalene (mg/kg)
0 to 3	3.4	4,800	33	6,400	220	160	32
3 to 10	160	110,000	4,000	24,000	31,000	38,000	4,400

Definitions

- a. Petroleum – crude oil, or any fraction thereof, which is liquid at standard conditions of temperature and pressure, which means 60 degrees Fahrenheit and 14.7 pounds per square inch absolute, including the following substances: motor fuels, jet fuels, distillate fuel oils, residual fuel oils, lubricants, petroleum solvents and used oils, including any additives contained in the formulation of the substances.
- b. Water supply well – A well that supplies water for beneficial use including but not limited to public supply, domestic supply, and irrigation wells. This does not include monitoring or cathodic protection wells.