

Department response to comments

Amendments to Hawaii Administrative Rules chapter 11-280.1 proposed October 29 and 30, 2019

Hawaii Department of Health

Notes:

Comments have been summarized. All written comments received and the transcript of the public hearing held on December 2, 2019 are available at <http://health.hawaii.gov/shwb/ust-har/>.

All section numbers refer to the proposed chapter 11-280.1, Hawaii Administrative Rules (HAR), unless otherwise noted.

At this time the department is responding only to comments unrelated to the proposed change to §11-280.1-21 regarding upgrades to airport hydrant fuel distribution systems and underground storage tank (UST) systems with field-constructed tanks. The department has received many comments pertaining to the proposed changes to §11-280.1-21 and defers action on the proposed changes to this section due to the volume of comments, the complexity of the technical issues involved with implementing the proposed changes, and the need to collect additional information about the implications of changes to this section. In addition, the department is aware that current SB2774 pertains to the same subject matter as §11-280.1-21 and would prefer not to make substantive changes to this section of the rule until the intent of the 2020 legislature has been realized.

Commenter: Neil Nakai, Inc. (Neil I. Nakai, President)

Comment #1: My comment/suggestion pertains to 11-281.1-52 1 (System Test). Can the allowable related to a confirmation testing requirements stated in 11-281-33 (4), (5) & (6) and 11-281.1-43 (3) and 11-281.1-44(2) that are related to a repair to the UST System, UST and piping be clarified to remove the term "UST System" and just refer to them as "UST" and "Piping"? There have been arguments in the past when a section of piping is repaired and tested using the required 0.1-gph piping test method that the UST has to also be tested even though the UST is double-walled and has a properly functioning leak detection system. The term "UST System Test" has caused some DOH Inspectors to require that a test be conducted on the UST as well, even though no problems were observed with the UST. The same issue would apply to the testing requirements to piping if only the UST were repaired due to a leak. Can this language be revised to remove the need to test piping if the UST is repaired and vice versa?

Response: Thank you for your comment. The department is finalizing the change to §11-280.1-52(b)(1) as proposed. This change clarifies the intent of the existing regulation, which is for both tanks and piping to be tested when investigating a suspected release and for both

tightness testing of the inner wall and secondary containment integrity testing of the interstitial space to occur when appropriate.

The intent of the section titled “Release investigation and confirmation steps” (now §11-280.1-52) has always been “to determine whether a leak exists in *any portion* of the UST system” (§11-281-63(b)(1) in 2013 rules; emphasis added). The 1988 federal and 2000 state rules reflect this as “to determine whether a leak exists in that portion of *the UST* that routinely contains product, *or the attached delivery piping, or both*” (federal Title 40 Code of Federal Regulations (40 CFR) §280.52(a), state §11-281-63(b)(1); emphasis added). The term “system test” is used in §11-280.1-52(b)(1) specifically to indicate the entire UST system, meaning both tanks and attached piping (see definition in §11-280.1-12). When there is a suspected release, both the tank and the piping must be tested to determine the presence of a leak.

Note that when piping is repaired, but there is no suspected release, only the piping must be tested (§11-280.1-33(a)(5); likewise for a tank repaired when there is no suspected release).

Commenter: Par Hawaii

Comment #2: This comment is regarding paragraph §11-280.1-21(a)(2) requiring UST systems to be double-walled with interstitial monitoring by July 15, 2028. While we agree with the nature and intent of the regulation, we respectfully request that the Department of Health (the “Department”) consider either an extension to the deadline or an alternative method of release detection for double-walled piping installed before August 9, 2013. The Federal EPA UST regulation does not require UST systems installed prior to April 11, 2016 to be upgraded to double-walled with interstitial monitoring.

The current Hawaii UST regulation requires containment sumps “used for the interstitial monitoring of piping” to be liquid tight and tested every 3 years [§11-280.1-35(a)(2)]. With Hawaii requiring interstitial monitoring as the only allowable method of release detection for double-walled piping by July 15, 2028, this consequently requires all UST systems’ turbine sumps and UDCs to be tested and liquid tight by July 15, 2028.

Although most of the UST system piping in Hawaii is already double-walled, many UST systems may not have liquid tight UDCs/turbine sumps, as it was not required for systems installed prior to the 2013 regulation. Therefore, every UST owner, even if they have already installed double-walled UST systems, will need to test and potentially replace or retrofit countless sumps in the next 8.5 years. There are only a few qualified UST repair companies in Hawaii to make these kinds of repairs.

There are also a limited number of approved sump test procedures and a limited number of qualified vendors to perform sump testing. If water is used as part of the approved PEI RP1200 hydrostatic test procedure (low or high level), there may be hazardous waste generated, which creates additional costs.

As a potential solution, we respectfully request that the Department recognize the costs to UST operators and accept the continued use of annual line tightness testing for double-walled piping installed prior to August 9, 2013. [This which would have the effect that fewer sumps would require testing under §11-280.1-35(a)(2).]

Par Hawaii is not a small business as defined by chapter 201M, HRS. However, we would like to point out that the Small Business Impact assessment created prior to the promulgation of chapter 11-280.1 (on July 15, 2018) only speaks to the upgrades required for single-walled systems to be upgraded to double-walled systems. It does not assess the impacts to small businesses that already have invested in double-walled systems but will now need to repair or replace several UDCs and sumps. Additionally, the cost of testing sumps every 3 years is typically higher than the cost to perform an annual line tightness test.

Response: This comment is outside the scope of the proposed rule changes, but the department appreciates the opportunity to clarify changes made to the UST rules in 2018.

This comment is addressing three different issues, as they pertain to UST systems other than airport hydrant distribution systems and UST systems with field-constructed tanks:

1. Requirement for interstitial monitoring of piping
2. Requirement for periodic testing of sumps
3. Sump testing methods

The secondary containment requirement cited by the commenter is not a new requirement, but was proposed to be moved from §11-280.1-21(b) to §11-280.1-21(a)(2) (the department is not finalizing this proposed change, therefore, the requirement will remain in §11-280.1-21(b)). The interstitial monitoring of piping installed prior to August 9, 2013 is likewise already required by §11-280.1-41(b)(2). The department believes that the requirement for interstitial monitoring of this piping provides added protection for human health and the environment. The department is aware that its requirements are more stringent than the federal requirements, and they are intended to be.

The commenter appears to have an overly broad interpretation of the applicability of the existing requirement for periodic testing of containment sumps used for interstitial monitoring of piping (§11-280.1-35(a)(2)). The requirement in §11-280.1-35(a)(2) applies *only* to those containment sumps used for interstitial monitoring of piping; it does not apply to every sump associated with a double-walled piping run that is using interstitial monitoring to meet the release detection requirements of §11-280.1-41.

A containment sump used for interstitial monitoring of piping is typically located at the lowest point in the piping run and contains a sensor monitoring the piping's interstitial space. Dispenser system components such as flexible connectors are not considered part of piping; rather, the dispenser system components "connect the dispenser to the underground piping" ("dispenser system" definition, §11-280.1-12). If the sensor in a UDC is monitoring secondary

containment for dispenser system components only, the UDC is not part of the interstitial monitoring of the piping.

The department appreciates the concern for the proper management of wastewater generated by sump testing under the state's hazardous waste regulations. The department is currently aware of two alternatives to the PEI RP1200 test procedure listed in §11-280.1-38(f) that may be used to meet the requirement in §11-280.1-35(a)(2)(B):

- Dri-Sump™ Containment Tightness Test Method has been tested by Ken Wilcox Associates, a code and standard developing organization recognized by the U.S. Environmental Protection Agency (EPA).
- DPLeak Leak Detection and Leak Location Method™ has been tested by Ken Wilcox Associates, a code and standard developing organization recognized by the EPA.

The department does not issue determination letters on codes of practice developed by nationally recognized associations or independent testing laboratories to permit these methods to be used under §11-280.1-35(1)(B)(iii) because they are already allowed under §11-280.1-35(a)(1)(B)(ii).

In addition, the department has determined that the Low Liquid Level UST Containment Sump Testing Procedure described by EPA in their UST technical compendium is no less protective of human health and the environment than the requirements listed in §11-280.1-35(a)(1)(B)(i) and (ii). Therefore, the department is now approving the Low Liquid Level UST Containment Sump Testing Procedure for use under §11-280.1-35(a)(1)(B)(iii). Documents describing the approved procedure are attached to this response to comments for reference (Attachment 1).

Any concerns about the costs associated with repairing and replacing defective sumps (above and beyond the cost of testing their integrity) not being properly evaluated in the department's small business impact statement seem to be based upon the mistaken presumption that these costs are new, additional costs created by the requirement to periodically test the integrity of containment sumps. This is not the case because owners and operators of UST systems were already required to have properly functioning containment sumps at all times, and problems must be fixed when they are discovered. The periodic testing of containment sumps used for interstitial monitoring of piping may simply reveal existing problems earlier than if no tests were conducted, resulting in repair or replacement of defective sumps sooner rather than later.

Proposed regulations that affect small businesses are defined as those that "will cause a direct and significant economic burden upon a small business" (§201M-1, Hawaii Revised Statutes (HRS)). Due to both the small number of affected containment sumps per UST system and the small number of UST systems owned per small business, the department determined that the requirement for periodic testing of containment sumps would not affect small businesses. Contact persons for owners and operators of all UST systems within the state were included on

the mailing list for announcements regarding the proposal for the rulemaking finalized in July 2018, and the department received no comments from small businesses.

Commenter: Honolulu Board of Water Supply

Comment #3: The department should eliminate all discretionary exemptions for large, field-constructed USTs from the UST rules.

Specifically, the BWS urges the department to modify the language of the proposed rules to eliminate the potential for application of the following discretionary exemptions to USTs or UST systems with a capacity greater than 50,000 gallons:

- §11-280.1-20(b)(5) - Tank construction and corrosion protection
- §11-280.1-332- Variances

These exemptions should be removed for such high-risk USTs and UST systems.

Response: This comment is outside the scope of the proposed rule changes.

Both provisions mentioned by the commenter apply to the department's discretion in regulating all USTs, not only to large field-constructed tanks.

The allowance in 11-280.1-20(b)(5) for alternative tank designs that the department determines are no less protective than the designs specified in §11-280.1-20(b)(1) to (4) has been part of the state UST rules since their original adoption in 2000. The EPA included the same language in its original 1988 UST rules because the agency "does not desire to restrict or eliminate emerging technologies and recognizes the numerous site-specific factors that may allow for the use of alternative designs" (53 FR 37082 p. 37127).

The department's authority to grant variances, which is derived from chapter 342L, HRS, is also designed to enable the department to more effectively regulate USTs. The commenter's proposed modification to §11-280.1-332 limiting the department's regulatory authority would effectively substitute the Board of Water Supply's current preferences for the department's subject matter expertise and discretion. The department is not the object of these regulations, rather it is the department's job to enforce them and as such, and as a matter of public policy, will not adopt rules that would restrict the authority granted to it by the legislature. The statutes and rules regarding variances speak to the fact that, in a particular set of circumstances, granting a variance may be in the interest of public health and the environment and the department is the agency best equipped to make that determination.

Commenter: Gina Hara

Comment #4: I don't understand why the TPH-d has been changed last year in October, and that answer hasn't been gotten. It's a hundred parts per UL, U over L, so per liter. But I don't understand why now it's 400. It looks really bad and it's wrong to do that without us knowing about it.

Response: This comment is outside the scope of the proposed rule changes. However, the department welcomes the opportunity to address a possible misunderstanding.

The commenter is referring to the Tier 1 Screening Level for Total Petroleum Hydrocarbons (TPH)—middle distillates (TPH-d) for groundwater listed under “drinking water source threatened” in Table 1 in §11-280.1-65.3(e). Table 1 replaced the table in §11-281-80.1 when chapter 11-281, HAR, was repealed and replaced with chapter 11-280.1, HAR, effective July 15, 2018. The groundwater screening level for TPH-d on the left side of the table (drinking water source threatened) was changed from 100 to 400 micrograms per liter (ug/L) as part of a comprehensive update of the table to reflect the most current Tier 1 Environmental Action Levels (EALs) set by the department's Hazard Evaluation and Emergency Response (HEER) Office. The technical background of the TPH action levels is discussed in Appendix 1, Section 6 of the HEER Office guidance document *Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater* (<https://health.hawaii.gov/heer/files/2019/11/Volume-2-App-1-HDOH-2017.pdf>).

The most recent update of the EALs by the HEER Office was completed in Fall 2017. The proposed version of Table 1 in chapter 11-280.1 was shared with the public by the UST Program beginning on December 20, 2017. The rulemaking action included a public comment period between April 30, 2018 and June 5, 2018. The department did not receive any comments on the proposed changes to Table 1 and those changed became effective on July 15, 2018.

Note that the function of Table 1 in chapter 11-280.1 is to provide a general baseline for site cleanup criteria at all UST sites. Section 11-280.1-65.3(c) specifically notes that “The department may require the owners and operators to modify cleanup activities being performed at a site if the department determines that the activities...are not achieving cleanup levels that are protective of human health and the environment.” Site-specific action levels as approved by the department can be imposed as an alternative to the Default Tier 1 Screening Levels if the department believes that this is necessary for the protection of human health and the environment.

The commenter may be also be referring to correspondence between the Board of Water Supply (BWS) and the department regarding the Fall 2017 update to the EALs. The department responded to BWS's request for an explanation of the basis for the increase in the EAL for TPH-d on October 22, 2018. In that letter, the department explained that “the increase in the HDOH drinking water action level for TPHmd from 0.10 mg/L to 0.40 mg/L [or from 100 ug/L to 400 ug/L] was based on a review of original reference documents and a more up-to-date

understanding of the physiochemical and toxicological nature of TPH-related compounds in groundwater following a release of fuel.” The letter also lists various considerations incorporated into the development of the EAL, goes into some scientific detail regarding volatility, biological degradation, and laboratory testing for hydrocarbon compounds, and notes that the department considers the Fall 2017 EALs “highly conservative for screening of groundwater data at the majority of petroleum-release sites overseen by HDOH.” A copy of the (ongoing) correspondence is attached to this response to comments for reference (Attachment 2).

The HEER Office is currently in the process of working on an update to the EALs that are expected to be finalized in summer 2020, including possible changes to the TPH action levels. Further information on the EALs can be found on the HEER Office’s website at: <https://health.hawaii.gov/heer/guidance/ehe-and-eals/>

Commenters: Honolulu City Councilmember Carol Fukunaga, Board of Water Supply (Ernie Lau), Tyrone Tahara, Ellen Sofio, Kealohilani Wong, Gina Hara, Kapua Keli’ikoa-Kamai, Colleen Soares

Comment #5: The public hearing should be held in a larger, more central or less remote venue and outside of regular working hours. The venue should have a microphone and speaker system. People, especially Hawaiians, want to speak face to face about anything that’s meaningful rather than submit written comments. There should be media coverage of the public hearing. Hearings should not be scheduled near the holidays.

Response: The hearing location (the State Laboratory) was selected because it is a department facility located near the department’s Solid and Hazardous Waste Branch office that is large enough to accommodate up to 100 people and has been used for public hearings on proposed rulemakings in the past. This location in Pearl City is actually relatively central relative to the island of O’ahu as a whole and has ample free parking. Public hearings for administrative rulemaking are typically conducting during regular working hours because civil service staff are involved in running the hearing.

The hearings officer did not anticipate a need for a speaker system because in the past being able to hear speakers without the use of amplification in this room has not been a problem. In addition, the department did not receive any requests for auxiliary aids or services prior to the hearing. Members of the public who indicated they had difficulty hearing were invited to move down to the many empty seats at the front of the auditorium and a transcript of the public hearing was posted online within two weeks of the hearing date. The department will consider ensuring the availability of a microphone and speaker system for future public hearings.

The department appreciates the comments regarding the preference for community members to give oral testimony rather than submitting written testimony and will consider this in scheduling future public hearings.

The hearings officer noted the presence of members of the media representing both television and radio at the public hearing.

The department does not consider December 2, 2019 to be on or near a holiday. In fact, in scheduling the hearing as soon as possible after preparation of the public notice, consideration was given to holiday schedules by *not* scheduling the hearing for November 29 (the day after Thanksgiving), although this is not a State Holiday.

Commenter: Amy Chiang

Comment #6: The deadlines for public comment are too short and those that comments represent only a small fraction of the population. I believe that many, if not most people, would agree with my comments, however, we are all so busy juggling our lives that it is hard to voice our views. Please continue to provide more forums and opportunities for the community to communicate its concerns.

Response: The procedures for administrative rulemaking contained in §91-3, HRS, and §11-1-53, HAR, result in a minimum public comment period of thirty-five days. The comment period for this rulemaking was considerably longer than the minimum, at fifty-three days (October 25 to December 16, 2019).

Low Liquid Level UST Containment Sump Testing Procedures

This document provides procedures for low liquid level hydrostatic testing as one method of meeting the requirements in 40 CFR 280.35 for periodically testing the integrity of certain containment sumps. The federal underground storage tank (UST) regulation at 40 CFR 280.35 requires that owners and operators using interstitial monitoring of UST system piping as their primary release detection method prevent releases to the environment by ensuring the integrity of each containment sump used for interstitial monitoring of piping. Check with your implementing agency before using this method because it may have requirements that differ from those listed here.

Each containment sump used for interstitial monitoring of piping must be tested using a vacuum, pressure, or liquid testing method at least once every three years to ensure the equipment is liquid tight according to one of these criteria in 40 CFR 280.35(a)(1)(ii)¹:

- Requirements developed by the manufacturer – owners and operators may use this option only if the manufacturer developed requirements;
- Code of practice developed by a nationally recognized association or independent testing laboratory – EPA will accept the integrity test method listed in Petroleum Equipment Institute (PEI) Publication RP1200, *Recommended Practices for the Testing and Verification of Spill, Overfill, Leak Detection and Secondary Containment Equipment at UST Facilities*, available on PEI's website <http://www.pei.org/recommended-practices-exams>; or
- Requirements determined by the implementing agency to be no less protective of human health and the environment than the two requirements listed above.

EPA determined that the requirements, including meeting the conditions and following the procedures, in this document are no less protective of human health and the environment as the first two requirements listed above. These procedures are intended for facilities where EPA is the implementing agency. However, they may also be used as appropriate in states and territories which allow low level hydrostatic testing of containment sumps, but do not already have similar instructions; owners and operators should check with their implementing agencies.

These procedures cover:

- Required conditions;
- Pre-testing checklist;
- Testing steps; and

¹ Testing is not required if the containment sump is double walled and the integrity of both walls is periodically monitored at the same frequency of walkthrough inspections described in 40 CFR 280.36.

- After completing the tests.

In addition, EPA developed a sample form that you may use to document compliance with these procedures.

Required Conditions

The sumps must meet these conditions to use this test method and comply with the requirements of 40 CFR 280.35(1)(ii)(C).

- A liquid sensor is mounted and remains at the lowest point in the sump.
- An owner is required to test the functionality of the liquid level sensor in conjunction with the low level sump test and verify that the sensor works correctly and shuts down the appropriate pump or dispenser. In addition, 40 CFR 280.40(a)(3)(ii) requires an annual test of any liquid sensor used as part of a release detection system. The test of the liquid level sensor performed at the time of low level sump testing may be used to comply with the annual sensor test requirements of 40 CFR 280.40(a)(3)(ii), if all other conditions of 40 CFR 280.40 are completed as required.
- And either:
 - The pump automatically shuts off when liquid activates the sensor, or
 - The dispenser automatically shuts off when liquid activates the sensor, and the facility is always staffed when the pumps are operational.

To use these procedures, ensure all sensors are properly installed and programmed so that they shut off either the pump or dispenser per the instructions above when the sensor detects liquid. You may only use these instructions if your sensors are programmed to both alarm and shut off when in contact with any liquid.

Pre-testing Checklist

Check the three items listed below before using the following step-by-step instructions to perform the low liquid level hydrostatic testing of a containment sump. If after checking the three items you find no issues, then follow the step-by-step instructions to hydrostatically test the containment sump using a low liquid level. If you find issues, you should not test your sump using the step-by-step instructions until you address the issues and your sump passes this pre-testing checklist.

Check 1 – Determine if there is liquid present in the sump at levels high enough to trigger a properly positioned sensor, even if the alarm is not activated. An active alarm may need to be treated as a suspected release per 40 CFR 280.50. Remove any debris or liquid in the containment sump prior to testing.

Check 2 – Identify if sensors' positions are elevated or otherwise manipulated to prevent activation.

- At this point, EPA recommends that you visually inspect the sensor and electrical connections for signs of damage or corrosion to a point where functioning may be impaired. Signs of corrosion suggest the sensor may soon deteriorate and become inoperable. If you believe the sensor is damaged, check with the manufacturer.

Check 3 – Determine if the sump has cracks, holes, or compromised boots located in the portion of the sump where water will be added during the low liquid sump test. The test requires you add at least 4 inches of water above the height required for sensor activation, so this area must be free of cracks, holes, or compromised boots. If any of these are present in this area, this test method cannot be used.

- At this point, EPA recommends you visually inspect the entire sump. Cracks, holes, or compromised boots anywhere in the sump, including above the sensor activation level, may indicate a degrading sump. Consider replacing or repairing worn components.

Testing Steps

Part A contains steps to test sump sensors for functionality and the ability to shut down product flow. Part B contains steps to test the integrity of the sump itself.

Part A – Functional testing of the sump sensor

Step 1 – Prepare for the sensor functionality test by determining and documenting how the test should be performed.

- Determine the manufacturer of your sensor and details of how the manufacturer specifies a functionality test be performed. A functionality test is performed by adding sufficient liquid to the sump to ensure the sensor activates, unless the manufacturer specifies a different method.
- Different sensor manufacturers may specify different procedures or volumes of water to properly test their products; you must perform the sensor activation test according to the sensor manufacturer's instructions for testing non-discriminating or discriminating sensors. Some manufacturers may specify testing in a container other than in the sump. If your manufacturer specifies testing in the sump, proceed to complete the test by moving to step 2. If the manufacturer specifies testing in a separate container, complete the test and replace the sensor in the sump and proceed to step 2.
- Ensure you keep written documentation from the manufacturer detailing the required procedure and minimum amount of liquid required to activate the sensor, in case your implementing agency requests it.

Step 2 – Secure a measuring stick vertically against the wall nearest the lowest level of the sump and ensure it is located in a visually accessible place so you can read the markings on the measuring stick. Use a clamp, tape, or other adhesive method to immobilize the stick for

the entire course of the test, even while the measuring stick is underwater. Leave several inches of markings visible, ideally between 2 to 8 inches from the bottom of the sump.²

Step 3 – According to the manufacturer’s instructions, immerse the sensor in liquid at least to a height that ensures the sensor alarm can activate.

Step 4 – Determine if the sensor is in alarm.

- You may only use this low level procedure if the sensor alarm activates at the level set per manufacturer’s instructions. If a sensor failed, you may use this procedure only if the failed sensor is repaired or replaced and an alarm activates.

Step 5 – If the sensor alarms successfully, verify that either:

- The pump has automatically shut off when liquid activated the sensor, or
- The dispenser has automatically shut off when liquid activated the sensor, and the facility is always staffed when the pumps are operational.

Step 6 – If the sensor passed the visual inspection, the functional inspection for alarm, and each pump or dispenser is disabled, then go to Part B for integrity testing.

Part B – Testing the integrity of a containment sump

Step 1 – If necessary, add more water into the sump until the liquid level is at least 4 inches above the height required to activate the sensor.

- If you are testing other sumps, remove the sensor from this sump now before adding water. Removing the sensor from the liquid allows for testing other sensors in the UST system for functionality and positive shutdown without interrupting the one-hour liquid tightness test of this sump.

Step 2 – Wait 5 minutes.

- Waiting allows the water level sufficient time to settle in case there is sump deflection from the weight of the added water.

Step 3 – Measure and record the liquid height in the sump. Document the level and the current time on the test report form.

Step 4 – Do not disturb the water in the sump for at least one hour.

Step 5 – After one hour has elapsed since measuring the height of the liquid, check the liquid level again. Record the liquid measurement and the current time on the test report form.

² It may be impractical to access the bottom of some sumps to install a measuring stick against the wall. For this reason or other reasons, some owners or operators may choose to use a float and console type of probe to perform liquid integrity testing. Owners planning to use a float and console type method should position it in the sump now in lieu of securing a measuring stick against the wall.

Step 6 – Compare the two liquid measurement numbers. If the level has dropped by more than 1/8 inch, then the sump failed the low liquid level hydrostatic integrity test. Record the result on the test report form.

After Completing The Tests

Step 1 – Remove the measuring stick from the sump.

Step 2 – Remove water from the sump.³

Step 3 – Reposition the sensor and replace the sump cover and manhole cover.

³ When done with sump testing, properly dispose of the sump test water according to appropriate wastewater disposal authority requirements.

Sample Form For Documenting Compliance With Low Liquid Level UST Containment Sump Testing Procedures

Facility Number: _____ Facility Name: _____

Company: _____

Street Address: _____ City: _____ State: _____ Zip: _____

County: _____

Testing Company Name And Number, If Applicable: _____

Street Address: _____ City: _____ State: _____ Zip _____

County: _____

Tester Name, Printed: _____ Signature: _____

Date Of Test ____/____/____

Instructions: Unless instructed otherwise, place your initials in the boxes on the right side of this form to indicate compliance with the checklist or steps for each sump.		Sump 1	Sump 2	Sump 3	Sump 4	
Pre-testing Checks	1	Determine if there is liquid present in the sump at levels high enough to trigger a properly positioned sensor, even if the alarm is not activated. Remove any debris or liquid in the containment sump prior to testing.				
	2	Identify if sensors' positions are elevated or otherwise manipulated to prevent activation.				
	3	Confirm the sump has no cracks, holes, or compromised boots located in the portion of the sump where water will be added during the low liquid sump test. The test requires you add at least 4 inches of water above the height required for sensor activation, so this area must be free of cracks, holes, or compromised boots. If any of these are present in this area, this test method cannot be used.				
Part A – Functional Testing Steps	1	Prepare for the sensor functionality test by determining and documenting how the test should be performed.				
	2	Secure a measuring stick vertically against the wall nearest the lowest level of the sump and ensure it is in a visually accessible place so you can read the markings on the measuring stick. Use a clamp, tape, or other adhesive method to immobilize the stick for the entire course of the test, even while the measuring stick is underwater. Leave several inches of markings visible, ideally between 2 to 8 inches from the bottom of the sump. Some owners may choose to use a float and console type of probe instead of a measuring stick.				
	3	Immerse the sensor in liquid at least to a height that ensures the sensor is activated and alarm activates.				
	4	Determine if the sensor is in alarm.				
	5	If the sensor alarms successfully, verify that either: The pump has automatically shut off when liquid activated the sensor; or the dispenser has automatically shut off when liquid activated the sensor, and the facility is always staffed when the pumps are operational.				
	6	If the sensor passed the visual inspection, the functional inspection for alarm, and each pump or dispenser is disabled, continue to Part B for liquid tightness and integrity testing. Write pass or fail in the box on the right.				

**Spill Buckets, Under Dispenser Containment Sumps, Containment Sumps Category
Containment Sump – Alternative Test Procedures Question & Answer Addendum**

Instructions: Unless instructed otherwise, place your initials in the boxes on the right side of this form to indicate compliance with the checklist or steps for each sump.		Sump 1	Sump 2	Sump 3	Sump 4
Part B – Integrity Testing Steps	1	If necessary, add more water into the sump until the liquid level is at least 4 inches above the height required to activate the sensor.			
	2	Wait 5 minutes.			
	3	Measure and record the liquid height in the sump. Document the level and the current time on the test report form. Record the level and time in the box on the right.			
	4	Do not disturb the water in the sump for at least one hour.			
	5	After one hour has elapsed since measuring the height of the liquid, check the liquid level again. Record the liquid measurement and the current time on the test report form. Record the level and time in the box on the right.			
	6	Compare the two liquid measurement numbers. If the level has dropped by more than 1/8 inch, then the sump failed the low liquid level hydrostatic integrity test. Write pass or fail in the box on the right.			
After Test Steps	1	Remove the measuring stick or probe from the sump.			
	2	Remove as much water from the sump as possible. Ensure you properly dispose of the sump test water according to all legal requirements.			
	3	Reposition the sensor, if needed, and replace the sump cover and manhole cover.			
Indicate Pass Or Fail For Each Sump					

BOARD OF WATER SUPPLY

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18 AUG 28 P 3:03

Dr. Bruce S. Anderson
Director
State of Hawaii
Department of Health
1250 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Anderson:

Subject: Honolulu Board of Water Supply (BWS) Request to Hawaii Department of Health (DOH) for an Explanation of the Basis for the Increase in the Environmental Action Levels (EALs) for Total Petroleum Hydrocarbon Middle Distillate Fraction (TPH-d)

In November 2017, the DOH raised its groundwater EALs for TPH-d. The TPH-d EAL based on health protection was increased from 160 micrograms per liter ($\mu\text{g/L}$) to 400 $\mu\text{g/L}$ and the EAL based on odor or taste was increased from 100 $\mu\text{g/L}$ to 500 $\mu\text{g/L}$ (DOH 2016, 2017).

These EALs are amounts of TPH-d in water that DOH considers to be "safe" for drinking water and household use of tap water. An increase in TPH-d EALs means that DOH is now allowing more TPH-d in tapwater at what it regards as a safe level.

The BWS considers these EALs for certain constituents that do not have drinking water standards to help ensure that the water we provide our customers is safe and free of objectionable qualities. Consequently, the BWS respectfully requests a detailed explanation of the scientific basis of these changes in TPH-d EALs. This will greatly assist us in responding to public comments and concerns regarding the safety and quality of our water.

The DOH (2017) report (Volume 2, Appendix 1, Section 6.6, p. 6-12, pdf page 66) states that the reason for the EAL increase is because:

...petroleum-related compounds reported in this range will be dominated by non-volatile, degradation compounds or "metabolites" of biogenic origin (Zemo

Dr. Bruce Anderson
August 20, 2018
Page 2

et al. 2013, 2016). The resulting action level is therefore based on ingestion only and does not incorporate an inhalation pathway.

In other words, DOH is assuming that TPH-d in tapwater will be almost entirely changed into a form that will stay in the water such that it will not be released into the air nor will it be absorbed through the skin. DOH thus appears to assume TPH-d will not get into the human body by breathing it or by taking it up through the skin while showering, bathing, or washing dishes. By assuming less exposure from these sources, DOH is effectively allowing more TPH-d in drinking water at the higher EAL concentration. However, the studies used to support this assumption (Zemo et al. 2013, 2016) are studies of historical TPH release sites on the mainland.

The BWS has concerns about using TPH-d analyses from the mainland in the establishment of a TPH-d EAL for use in Hawaii. TPH-d in local groundwater may travel faster from a release to drinking water wells because of Hawaii's more hydraulically conductive volcanic soils and rock. As a result, there may also be less time for TPH-d to degrade into forms that stay in the water, particularly for sites with recent or ongoing releases.

The BWS would like to know whether the DOH considered in its evaluation the unique subsurface conditions in Hawaii that differ from those at petroleum release sites on the mainland. Please provide your data and analyses from sites in Hawaii, including those with recent or ongoing releases, that support DOH's key assumption of near 100% change of TPH-d into a form that results in less exposure.

Thank you for your assistance with this request. If you have any questions, please contact Mr. Erwin Kawata, Program Administrator of the Water Quality Division at (808) 748-5080.

Very truly yours,



ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

cc: Mr. Steve Linder, United States Environmental Protection Agency, Region IX
Mr. Mark Manfredi, NAVFAC Hawaii

References

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2017. Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater. Fall.
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DAVID Y. IGE
GOVERNOR OF HAWAII



BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File: 2018-315- RB

October 22, 2018

Mr. Ernest Y.W. Lau, P.E.
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

RE: Honolulu Board of Water Supply (BWS) Request to Hawaii Department of Health (DOH) for an Explanation of the Basis for the Increase in the Environmental Action Levels (EALs) for Total Petroleum Hydrocarbon Middle Distillate Fraction (TPH-d)

Dear Mr. Lau,

Thank you for your letter dated August 20, 2018, requesting clarification of the basis of 2017 updates to the Hawaii Department of Health's (HDOH) Environmental Action Level (EAL) for Total Petroleum Hydrocarbons (TPH) in groundwater that serves as a source of drinking water. Your question was specific to compounds associated with releases of middle distillate fuels such as diesel (TPHmd). Dr. Roger Brewer, Senior Environmental Scientist with the Hazard Evaluation and Emergency Response Office, has provided the following detailed technical response to your inquiry.

As discussed in the 2017 update of our office's EAL guidance, the increase in the HDOH drinking water action level for TPHmd from 0.10 mg/L to 0.40 mg/L was based on a review of original reference documents and a more up-to-date understanding of the physiochemical and toxicological nature of TPH-related compounds in groundwater following a release of fuel. Our office considers this action level to be highly conservative for screening of groundwater data at the majority of petroleum-release sites overseen by HDOH. Considerations incorporated into development of the TPHmd drinking water action level include:

- Use of an ingestion-based toxicity factor that reflects the most conservative value of recently published research for hydrocarbon compounds and their degradation products;

- Assumed continuous use of petroleum-impacted water source 350 days a year for a period of six years, reflecting the USEPA default, conservative exposure scenario for assessment of noncancer health hazards;
- No allowance for likely mixing and dilution of impacted groundwater with unimpacted groundwater as it is drawn into a production well.

The TPHmd action levels were revised to reflect the fact that hydrocarbon compounds measured in groundwater under this test method as well as related, biological degradation products are not significantly volatile. This negates the need to consider the risk posed by the inhalation of petroleum-related vapors during the use of tapwater.

The basis for this update was two-fold. "Diesel range" hydrocarbon compounds, typically considered to include compounds with 10 to 24 carbon molecules are, by definition, not considered to be significantly "volatile." This is why laboratory "extraction" methods are used to test for these compounds in groundwater (e.g., Method 8015-DRO). A focus of drinking water action levels for compounds collectively reported as "TPHmd" on ingestion only (i.e., drinking the water) is therefore appropriate. It is important to note that additional exposure via dermal absorption while bathing is insignificant in comparison to ingestion-based exposure.

"Gasoline range," volatile hydrocarbon compounds, normally characterized by having less than 10 to 12 carbon molecules, are collectively tested for and quantified as "TPHg" using "purge and trap" laboratory methods (e.g., Method 8015-GRO). Middle distillate fuels can contain small amounts of these compounds which, under some scenarios, can pose vapor emission concerns (Brewer et al. 2014). This requires that both TPHg and TPHmd be tested for at middle distillate release sites. Related volatile, degradation compounds, if present, would be captured by the same test method and incorporated into the reported concentration of TPHg. The HDOH drinking water action level for TPHg therefore considers inhalation of vapors during the use of tapwater for bathing, dishwashers, etc., in addition to direct ingestion of these compounds in drinking water (HDOH 2017; refer to Appendix 1, Section 6.6).

Hydrocarbon compounds are also highly susceptible to biological degradation once dissolved into groundwater and can be expected to rapidly degrade to oxidized, low-volatility "metabolites." These compounds will subsequently be reported as part of the non-volatile, TPHmd component of the impacted groundwater. This is why relatively high concentrations of TPHmd are often reported for groundwater samples collected at weathered, gasoline-only release sites and why both TPHg and TPHmd range contaminants should likewise be tested for under these scenarios. Degradation rates can be also expected to be enhanced in Hawaii in comparison to most areas of the mainland due to the relatively high, year-round temperature of the groundwater.

Mr. Ernest Y.W. Lau, P.E.
October 22, 2018
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As one example, data for groundwater samples collected from immediately beneath the Red Hill Tank Farm complex tested with and without silica gel cleanup consistently indicate that the majority of TPH-related compounds present are heavily degraded (NAVFAC 2016, 2017, 2018). Volatile compounds collectively reported as TPHg were rarely detected in samples, and even when detected comprised less than 10% of the total, TPH-related compounds present.

It is possible that a higher percentage of dissolved-phase, volatile compounds could be present in groundwater immediately following a significant release of fuel, as you suggested in your letter. If so, then these compounds would again be captured and assessed as part of the TPHg data. In such cases it is important to consider and calculate the combined health risk posed by both TPHmd and TPHg, since cumulative risk is not considered in the individual action levels.

In conclusion, it is our opinion that drinking water action levels for both TPHg and TPHmd presented in the 2017 edition of the HDOH EAL guidance are highly protective of potential exposure to petroleum-impacted groundwater. HDOH staff are currently working with local experts and experts on the mainland to identify better test methods to quantify the "TPHmd" component of heavily degraded, petroleum-related compounds. Additional guidance on this subject will be forthcoming.

Should you have questions or require further technical clarification, please contact Dr. Brewer or Fenix Grange at the Hazard Evaluation and Emergency Response Office at (808) 586-4249 or by email at roger.brewer@doh.hawaii.gov or gabrielle.grange@doh.hawaii.gov.

Sincerely,



BRUCE S. ANDERSON, Ph.D.
Director of Health

c: Steven Linder, United States EPA Region IX
Mark Manfredi, NAVFAC Hawaii

Attachment: Board of Water Supply letter dated August 20, 2018

Mr. Ernest Y.W. Lau, P.E.
October 22, 2018
Page 4 of 4

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Deputy Manager and Chief Engineer

December 28, 2018

Dr. Bruce S. Anderson
Director
State of Hawaii, Department of Health
1250 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Anderson:

Subject: Response to Hawaii Department of Health (DOH) Reply to Honolulu Board of Water Supply (BWS) Request for an Explanation of the Basis for the Increase in the Environmental Action Levels (EALs) for Total Petroleum Hydrocarbon Middle Distillate Fraction (TPH-d)

Thank you for your letter (dated September 14, 2018) (Anderson, 2018a) in response to the BWS request (dated July 19, 2018) (Lau, 2018a) for detailed information regarding the scientific basis of the increase in the EALs for TPH-d. Our request noted that both the TPH-d EAL based on odor and taste and the EAL based on health protection for drinking water use were increased from 100 micrograms per liter ($\mu\text{g/L}$) to 500 $\mu\text{g/L}$ and from 160 $\mu\text{g/L}$ to 400 $\mu\text{g/L}$, respectively, in Fall 2017 (DOH, 2016; DOH, 2017).

Thank you also for your follow up letter (dated October 22, 2018) (Anderson, 2018b) in response to the BWS request (dated August 20, 2018) (Lau, 2018b) for additional clarification of the DOH's explanation for increasing the health-based EAL for TPH-d in Fall 2017 (DOH, 2016; DOH, 2017). Our letter also inquired as to whether the decision for raising the health-based EAL for TPH-d considered the unique subsurface conditions in Hawaii that differ from those in the mainland studies (Zemo et al. 2013, 2016) apparently used to support the key assumption that resulted in the increase in the EAL (Lau, 2018b).

In response to your September 14, 2018 letter, we request additional clarification from DOH as noted in our comments below and offer our rationale in support of a 160 $\mu\text{g/L}$ health-based EAL, a 100 $\mu\text{g/L}$ EAL for odor and taste, and our perspective on the purpose of groundwater screening levels.

Health-Based EAL

As noted by the BWS (Lau, 2018b), the DOH (2017) report (Volume 2, Appendix 1, Section 6.6, p. 6-12, pdf page 66) states that the reason for the EAL increase is because:

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...petroleum-related compounds reported in this range will be dominated by non-volatile, degradation compounds or “metabolites” of biogenic origin (Zemo et al. 2013, 2016). The resulting action level is therefore based on ingestion only and does not incorporate an inhalation pathway.

In other words, DOH is assuming that TPH-d in tap water will be entirely changed into a form that will stay in the water such that it will not be released into the air nor will it be absorbed through the skin. DOH thus assumes that exposures to TPH-d do not involve inhalation or absorption through the skin while showering, bathing, or washing dishes. By assuming less exposure from these sources, DOH is effectively allowing more TPH-d in drinking water at the higher EAL concentration. However, the studies used to support this assumption (Zemo et al. 2013, 2016) are studies of historical TPH release sites on the mainland.

According to the recent DOH response (Anderson 2018b), the TPH-d EAL was revised because DOH expects that 1) the hydrocarbon compounds measured in groundwater by the test method (Method 8015-DRO) will not be “significantly” volatile nor will they be absorbed through the skin, and 2) the biological degradation products are also not “significantly” volatile. Nevertheless, other information indicates that these assumptions are not necessarily correct, particularly for Hawaii.

Point 1: TPH-d Hydrocarbons Measured in Water will not be “Significantly” Volatile

This rationale was not previously provided by DOH (2017) in justifying the increase in the EAL. Although the laboratory method for quantifying the middle distillate fraction comprising TPH-d may include classes of compounds that are not significantly volatile (e.g., longer chain aliphatic hydrocarbons), not all of the various compounds quantified by this method will be soluble in water and therefore present in a groundwater sample.

The California State Water Resources Control Board, San Francisco Bay Region (Regional Water Board [RWB]) recognizes that only the fraction of TPH-d that is soluble in water will be quantified and reported in groundwater samples (RWB, 2016). RWB also notes that this soluble fraction of TPH-d, aromatic compounds with 9 to 16 carbon molecules, is also volatile (resulting in breathing vapors from water use) and passes through the skin (RWB, 2016). U.S. Environmental Protection Agency risk assessment calculations (U.S. EPA 2009, 2018) used by RWB (2016) indicate that exposure to TPH-d aromatic compounds via skin absorption is nearly equal exposure to that from the oral ingestion route of exposure. The inhalation route of exposure contributes nearly three times more exposure than the oral or dermal route of exposure. Thus, inhalation and dermal absorption are potentially very important routes for exposure to TPH-d in groundwater. RWB (2016) has accordingly derived a TPH-d screening level of

150 µg/L based on the soluble aromatic compounds in this hydrocarbon fraction, including oral, dermal, and inhalation exposure.

The DOH response notes that gasoline range volatile hydrocarbon compounds (less than 10-12 carbon molecules) are collectively tested for at sites along with TPH-d, and that this testing would pick up any volatile compounds that might pose vapor concerns. However, testing for TPH-g does not measure all of the middle distillate aromatic compounds (up to 16 carbon molecules) that are soluble and volatile. Thus, measurement of low TPH-g concentrations does not mean that elevated TPH-d concentrations in groundwater samples are not volatile.

Point 2: The Biological Degradation Products are not Significantly Volatile

The BWS is concerned about DOH's use of TPH-d data from the mainland to justify the TPH-d EAL in Hawaii (DOH 2017; Lau, 2018). DOH's response postulates that degradation may proceed faster in Hawaii because of higher year-round temperatures but does not address the likelihood that TPH-d in groundwater may travel faster from a release to drinking water wells in Hawaii because of its volcanic soils and rock. As a result, even with higher temperatures, there will be less time for TPH-d to degrade into forms that stay in the water and are not released to air or penetrate the skin. Sites with recent or ongoing releases will also have had less time for TPH-d to completely change.

The DOH response cites data collected from the Red Hill Tank Farm complex, noting that samples tested with and without silica gel cleanup (to remove biological degradation products) "consistently indicate that the majority of TPH-related compounds present are heavily degraded (NAVFAC 2016, 2017, 2018)". Nevertheless, the limited analysis with silica gel cleanup do not allow full characterization of the extent of degradation in these samples. Samples with and without silica gel cleanup for 2016, 2017 and 2018 for monitoring wells RHMW-01, RHMW-02, and RHMW-03 indicate between 14% to 100% of the TPH-d fraction is made up of hydrocarbons and not polar organic compounds as assumed by the DOH revised EAL (Table 1). For RHMW-02, concentrations of hydrocarbons after silica gel cleanup ranged from 230 to 640 µg/L (Table 1). All of these data except for three samples from 510 µg/L to 640 µg/L concentration would be screened out as not a health concern using the revised DOH health-based limit of 400 µg/L which assumes 100% non-volatile polar organic compounds. However, all of these concentrations would exceed health-based limits based on the soluble hydrocarbon fraction of TPH-d which is also volatile (e.g., 150 µg/L based on RWB 2016). They would also exceed the previous DOH health-based EAL of 160 µg/L. Thus, the revised EAL of 400 µg/L is not scientifically appropriate for evaluating whether the TPH-d results after silica gel cleanup pose health concerns. The revised EAL is also not appropriate for screening TPH-d results without silica gel cleanup given that site data in Hawaii indicate that samples are not 100% polar organics as assumed by DOH in the derivation of the revised EAL.

Table 1: Comparison of TPH-d concentrations, with and without Silica Gel Cleanup (SGC)*

Well ID	Sample Date	TPH (middle distillates), silica gel cleanup	TPH (middle distillates)
		concentration (ug/L)	
RHMW-01	10/17/2016	<25	120
	5/1/2017	<51	110
	6/5/2017	36	98
	7/5/2017	<25	110
	10/25/2017	<25	86
	3/12/2018	<25	150
	4/25/2018	-	<25
RHMW-02	10/19/2016	300	1300
	5/1/2017	<480	1000
	6/5/2017	570	1000
	7/6/2017	250	1000
	10/23/2017	230	1600
	3/13/2018	640	1900
	4/24/2018	510	2800
RHMW-03	10/19/2016	<25	65
	5/1/2017	<25	50
	6/6/2017	50	46
	7/6/2017	<25	49
	10/23/2017	<25	210
	3/12/2018	<25	190
	4/25/2018	<25	160

*Data from "Final Second Quarter 2018 – Quarterly Groundwater Monitoring Report" (NAVFAC, 2018; Table 4-1; page 39)

The DOH response also acknowledges the possibility of a sudden release of petroleum product but states that measurement of TPH-g along with TPH-d will be able to quantify the presence of volatiles after such a release. However, jet fuel has a limited amount of constituents in the carbon range measured by TPH-g (only those in the 9-12 carbon range). Larger aromatic compounds (up to 16 carbons) that are soluble and volatile will be measured as TPH-d and will not be detected by TPH-g analysis. The revised EAL for TPH-d thus will not be sufficiently protective in such a situation because it does not include exposure from airborne emissions or skin penetration by these soluble and volatile aromatic compounds.

EAL Based on Odor and Taste

Regarding the EAL for TPH-d based on odor and taste, thank you for pointing out the basis of this increase (DOH 2017 Volume 2, Appendix 1, Section 6.6). We note, however, the considerable uncertainty in studies used by DOH (2017) to increase this level from 100 to 500 µg/L. Therefore, DOH (2017) (Volume 2, Appendix 1, Section 6.6, p. 6-12, end of the third paragraph) notes:

The adequacy of this threshold [500 µg/L] should be verified if impacts to actively used sources of drinking water are identified.

Please confirm that this new TPH-d odor and taste EAL of 500 µg/L cannot be used without verification in a situation in which an actively used source of drinking water has been impacted by a release. In addition, please provide details on who would be responsible for verifying the adequacy of this threshold in this situation.

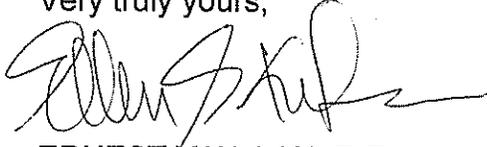
Comment on the Purpose of Generic Groundwater Screening Levels

Screening levels are intended to be health protective of all possible conditions, such that if they are not exceeded, one is confident that no further action needs to be taken. Exceedance of screening levels triggers further investigation which then might determine whether chemical levels actually pose a concern for a specific situation. In this case, however, the revised EALs for TPH-d appear to be intended to be protective of expected or typical conditions (e.g., complete degradation whether that is actually the case or not, based on data from mainland sites), but not all possible conditions that might be occurring in Hawaii.

From our review of the available data and studies, we believe there is sufficient basis to warrant revision of the EALs for TPH-d that DOH set in 2017 to its former levels.

Thank you for the opportunity to comment and discuss this matter. If you have any questions, please contact Mr. Erwin Kawata, Program Administrator of the Water Quality Division at (808) 748-5080.

Very truly yours,



ERNEST Y.W. LAU, P.E.
Manager and Chief Engineer

cc: Mr. Steve Linder
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References

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Zemo, D.A., O'Reilly, K.T., Mohler, R.M., Magaw, R.I., Espino Devine, C., Ahn, S. and A.K. Tiwary. 2016. Life Cycle of Petroleum Biodegradation Metabolite Plumes, and Implications for Risk Management at Fuel Release Sites. *Integrated Environmental Assessment and Management*. DOI: 10.1002/ieam.1848.



STATE OF HAWAII
DEPARTMENT OF HEALTH
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HONOLULU, HI 96801-3378

In reply, please refer to:
File: 2019-038 RB

August 26, 2019

Mr. Ernest Y.W. Lau, P.E.
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

RE: Response to Hawaii Department of Health (DOH) Reply to Honolulu Board of Water Supply (BWS) Request for an Explanation of the Basis for the Increase in the Environmental Action Levels (EALs) for the Total Hydrocarbon Middle Distillate Fraction (TPH-d)

Dear Mr. Lau:

First, let me begin by expressing my apologies for the untimely delay of our response to your letter, requesting DOH lower the TPH EAL. We take your concerns seriously, and immediately drafted a response, however, the original letter was inadvertently lost. To that end, we offer the following comments below for your review and consideration.

Your continued interest in the use of Total Petroleum Hydrocarbons (TPH) data to assess impacts to drinking water resources is both welcome and timely. Hawaii has been working with the United States Environmental Protection Agency and numerous other agencies on this issue for 25 years and is one of the few states with detailed guidance and risk-based action levels for TPH.

As discussed below, the Hazard Evaluation and Emergency Response Office (HEER) intends to update TPH action levels for soil and groundwater over the next year. The planned updates will address the issues that you discussed in your December 28, 2018 letter to our office. While the current TPH action levels incorporate a significant margin of safety and are considered to be protective of human health, technical adjustments to the action levels to better take into consideration these and other issues are warranted. Direct meetings with technical staff of your office to discuss the updates would be beneficial to both agencies.

Mr. Ernest Y.W. Lau
August 26, 2019
Page 2 of 3

The updates are being coordinated with staff of the San Francisco Bay Area Regional Water Quality Control Board (RWB), an office of the California Environmental Protection Agency. Dr. Roger Brewer of the HEER office is the original author of the RWB TPH guidance you reference in your December 28, 2018 letter, where he worked as a senior scientist 1999 to 2005 before returning to Hawaii. Dr. Brewer and RWB staff have routinely coordinated to update each agency's TPH guidance since that time (e.g., Hellmann-Blumberg et al. 2016).

Your letter highlights several issues raised within a national work group that recently published a technical document on the assessment of TPH risk for petroleum releases (ITRC 2018; see also HIDOH 2018). Dr. Brewer and RWB staff were key members of this work group. Many of the discussions focused on the chemistry and toxicity of dissolved-phase, diesel-related, hydrocarbon compounds in groundwater as well as the chemistry and toxicity of TPH-related degradation compounds. The volatility of these compounds in terms of potential vapor emissions to indoor air during tapwater use, as discussed in your letter, was also reviewed.

A detailed discussion of the technical issues associated with the planned updates is beyond the scope of this letter but will include:

- Chemistry, volatility, and toxicity of TPH-related compounds anticipated to partition from gasoline-range and diesel-range fuels into groundwater;
- Review of the "Volatilization Factor" component of the USEPA tap water screening level model in terms of the volatility of dissolved-phase, TPH-related compounds in groundwater;
- Review of exposure assumptions incorporated into the "Volatilization Factor" component of the USEPA tap water screening level model with respect to water use, building ventilation, and related factors appropriate to each state;
- Review of recent updates to USEPA's dermal exposure model for tap water;
- Publication of separate action levels for non-degraded versus degraded TPH-related compounds in groundwater;
- Identification of more reliable analytical methods for measurement of non-degraded and degraded TPH-related compounds in groundwater.

Adjustment of action levels for non-degraded TPH diesel-related compounds in tap water to take into account some degree of volatilization and emission to indoor air is being considered. The generic approach used to incorporate vapor emission into past TPH-d tap water action levels was likely overly conservative, however, due both to the toxicity factors applied (based on makeup of the parent fuel rather than compounds likely to partition into groundwater) and the model used to predict impacts to indoor air (based on building ventilation assumptions for cold, rather than tropical, climates). These issues will be re-evaluated as part of the update.

Mr. Ernest Y.W. Lau
August 26, 2019
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As noted in your letter, the HEER Office TPH taste and odor action level of 500 µg/L is predicted to be adequate under most circumstances. This should be confirmed on a case-specific basis by entities using the groundwater as a source of drinking water.

The Board of Water Supply's input during the review and update of the HDOH action levels for TPH is welcome. Please provide contact information to Dr. Brewer (roger.brewer@doh.hawaii.gov or 586-4249) at your earliest convenience so that an introductory meeting of technical staff can be scheduled and an outline for a pathway ahead developed, preferably within the next few weeks.

Again, we regret that this did not reach you in a timelier manner. Thank you for your interest and I look forward to our cooperative input on this matter.

Sincerely,



BRUCE S. ANDERSON, Ph.D.
Director of Health

References:

HIDOH. 2018: Collection and Use of Total Petroleum Hydrocarbon Data for the Risk-Based Evaluation of Petroleum Releases - Example Case Studies: Hawaii Department of Health, Hazard Evaluation and Emergency Response Office. March 2018.

Hellmann-Blumberg U, Steenson RA, Brewer RC, Allen E. 2016. Toxicity of polar metabolites associated with petroleum hydrocarbon biodegradation in groundwater. Environ Toxicol Chem 35: 1900–1901.

ITRC. 2018. PH Risk Evaluation at Petroleum-Contaminated Sites: Interstate Technology and Regulatory Council, November 2018.

c: Lene Ichinotsubo, Solid and Hazardous Waste Branch (SHWB)

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
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October 7, 2019

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Deputy Manager and Chief Engineer

Bruce S. Anderson, Ph.D.
Director of Health
State of Hawaii, Department of Health
1250 Punchbowl Street
Honolulu, Hawaii 96813

Dear Dr. Anderson:

Subject: Response to Hawaii Department of Health (DOH) Reply to Honolulu Board of Water Supply (BWS) Request for an Explanation of the Basis for the Increase in the Environmental Action Levels (EALs) for Total Petroleum Hydrocarbon Middle Distillate Fraction (TPH-d)

Thank you for your August 26, 2019 letter (Anderson, 2019) in response to our request (Lau, 2018) for more clarification of the DOH's scientific basis for increasing the EALs for TPH-d. We also asked if DOH would consider an approach that we feel would be more applicable to Hawaii.

We appreciate DOH's willingness to consider updating the health-based EAL for TPH-d and to discuss the technical issues with the BWS. We would like to learn more about the approach you suggest and recommend we set up a conference call to discuss further and to establish a schedule for meeting in-person.

Regarding the EAL for TPH-d based on odor and taste, we wish to clarify that our letter (Lau, 2018) did not note that the 500 µg/L is predicted to be adequate under most circumstances. Instead, our letter noted considerable uncertainty in the studies used by DOH to increase the odor and taste EAL from 100 to 500 µg/L (DOH, 2017), and we requested confirmation that the new EAL of 500 µg/L cannot be used without verification in a situation in which an actively used source of drinking water has been impacted by a release. In addition, we asked for information on who would be responsible for verifying the adequacy of this threshold in such a situation.

Thank you for your response that the 500 µg/L EAL should be confirmed on a case-specific basis as adequate by entities using the groundwater as a source of drinking water. However, we request that DOH consider an approach in which the party that is threatening an actively used source of drinking water has the burden of demonstrating the adequacy of the 500 µg/L value before relying upon it. Otherwise, the drinking

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water source could be contaminated to a TPH-d concentration (i.e., 500 µg/L) that may later be determined to be objectionable for drinking water users. Such an approach would be more protective of Hawaii's irreplaceable drinking water supply.

Thank you for the opportunity to comment and discuss this matter. If you have any questions, please contact Mr. Erwin Kawata, Program Administrator of the Water Quality Division at (808) 748-5080.

Very truly yours,


ERNEST Y.W. LAU, P.E.
Manager and Chief Engineer

cc: Mr. Steve Linder
United States Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

References

- Anderson, B. 2019. Response to BWS letter dated December 28, 2018. State of Hawaii, Department of Health. August 26.
- Hawaii Department of Health (DOH). 2017. Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater. Volume 2, Background Documentation for the Development of Tier 1 Environmental Action Levels. Appendix 1 Detailed Lookup Tables, Section 6.6. Hawaii Edition.
- Lau, E.Y.W. 2018. Honolulu Board of Water Supply (BWS) Request to Hawaii Department of Health (DOH) for an Explanation of the Basis for the Increase in the Environmental Action Levels (EALs) for Total Petroleum Hydrocarbon Middle Distillate Fraction (TPH-d). December 28.

19-1175

DAVID Y. IGE
GOVERNOR OF HAWAII



BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File: 2020-10 RB

February 13, 2020

Mr. Ernest Y.W. Lau, P.E.
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

RE: Request for Additional Consideration of Toxicity-Based and Taste and Odor Threshold Action Levels for Total Petroleum Hydrocarbons (TPH) in Drinking Water.

Dear Mr. Lau:

Thank you for following up on DOH's 2017 updates to health-based and taste and odor-based environmental action levels (EALs) for Total Petroleum Hydrocarbons (TPH) in drinking water (Board of Water Supply (BWS) letter dated October 27, 2019). We appreciate your continuing technical engagement on Hazard Evaluation and Emergency Response (HEER) Office plans to further review TPH-d action levels for drinking water in 2020. As discussed, we recognize that additional guidance on the case-specific assessment of petroleum impacts to drinking water resources in high-risk areas is needed.

The following is noted in response to your letter:

- The TPH taste-and-odor threshold of 100 µg/L referenced in earlier EAL guidance was based on a mistranslation (Polish to English) of a 1940s era study that served as the sole reference in the 1982 USEPA document and was never valid;
- The updated DOH taste-and-odor action level for TPH of 500 µg/L is based on more recent studies and on the low side of published thresholds for fuel, which can be up to an order of magnitude higher;
- The BWS makes a reasonable point regarding the need for a drinking water, taste-and-odor threshold specific to the type of fuel stored at Red Hill, primarily JP-5;

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- Specific protocols for the development of taste and odor will be compiled and referred to for a potential study of JP-5 in early 2020.

As a followup to our BWS letter dated August 26, 2019, Dr. Roger Brewer with our office has initiated a laboratory study to better define the chemistry and toxicity of dissolved TPH in groundwater underlying different types of fuel. Fuels being used in the study include gasoline, diesel, JP-5 and JP-8. The results of the study will be used to develop toxicity-based action levels for TPH in drinking water impacted by fresh releases of petroleum. These action levels are anticipated to be more stringent than current, default TPH action levels that assume degree of petroleum degradation before potential impacts to wells. The action levels can be used on a case-by-case basis to assess impacts in high-risk areas of the state, where the volume of fuel released and proximity to actively used water supply wells might preclude significant degradation before reaching a well.

The tests are anticipated to be completed within the next two months. Dr. Brewer will coordinate with local experts, including BWS staff, to review the results of the study and develop additional action levels. Downward adjustment of the default, TPH taste and odor threshold for assessment of groundwater in high-risk areas might also be appropriate and will be discussed.

The Board of Water Supply's input during the review and update of the HDOH action levels for TPH is again welcome. Please provide contact Dr. Roger Brewer (roger.brewer@doh.hawaii.gov) of my staff at your earliest convenience so that an introductory meeting of technical staff can be scheduled as soon as the new research data are available and to discuss possible interim measures for high-risk areas of vulnerable groundwater resources.

Thank you for your interest and I look forward to our cooperative input on this matter.

Sincerely,



BRUCE S. ANDERSON, Ph.D.
Director of Health

c: Joanna Seto, Safe Drinking Water Branch (SDWB)
Lene Ichinotsubo, Solid and Hazardous Waste Branch (SHWB)