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Dr. Bruce Anderson
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Attention: Roxanne Kwan
Solid and Hazardous Waste Branch

Dear Dr. Anderson and Ms. Kwan:

Subject: Honolulu Board of Water Supply (BWS) Comments on the Underground Storage Tank (UST) Permit Application for the Red Hill Bulk Fuel Storage Facility (Red Hill), Joint Base Pearl Harbor Hickam (JBPHH), Oahu, Department of Health (DOH) Facility ID NO. 9-102271

The BWS has reviewed the April 12, 2019 DOH response (DOH, 2019) to the United States Department of the Navy's (Navy) March 13, 2019 permit application (Navy, 2019a) and the Navy's May 15, 2019 revised permit application (Navy, 2019b), and offers the following comments.

Based on the permit application and the information available to the BWS for review currently, the Red Hill tanks do not satisfy the mandate of Hawaii Revised Statutes Section 342L-32(b) that all USTs and UST systems must "be designed, constructed, installed, upgraded, maintained, repaired, and operated to prevent releases of the stored regulated substances for the operational life of the tank or tank system" and do not meet any of the enumerated requirements in Hawaii Administrative Rules (HAR) Section 11-280.1-20(b) for corrosion protection. Accordingly, the BWS believes that it is not appropriate for the DOH to issue an operating permit for the existing field-constructed USTs at Red Hill. Instead, the Red Hill tanks should be relocated away from the sole source groundwater aquifer that nourishes Oahu's drinking water if upgrading the tanks with secondary containment is not feasible.

Attached to this letter are the reference documents that serve as the basis for these comments.

Corrosion Protection

We are pleased to see that the DOH shares many of the concerns we have regarding the Navy's initial permit application that were raised in our comment letter to Dr. Bruce Anderson dated March 28, 2019 (BWS, 2019c), including deficiencies related to corrosion protection, containment materials, and release detection. However, our principal concern remains: neither the original permit application nor the revised version satisfy the requirements of Chapter 11-280.1 of the HAR with respect to corrosion protection. Nothing in the Navy's initial permit application, the DOH's response, or the Navy's revised permit application alleviates this concern.

In its original application, the Navy stated that the Red Hill tanks were exempt from the prescribed methods of corrosion protection by determination of a corrosion expert (Section E of the application). Notwithstanding the Navy's reference to the Administrative Order on Consent (AOC) process in its application cover letter, the BWS was not (and still is not) aware of any such determination by a corrosion expert. Based on subsequent DOH correspondence and the draft operation permit, it appears that the DOH has rejected the Navy's initial corrosion expert approach but nonetheless effectively waived this essential corrosion protection requirement by indicating that the Red Hill tanks are clad or jacketed with non-corrodible concrete even though it has been conclusively demonstrated that this concrete has not prevented and cannot prevent corrosion during these tanks' operational life as required by Hawaii law. The BWS strongly recommends that the DOH and the Navy revisit this issue for the reasons stated below.

We refer the DOH to HAR Section 11-280.1-21, which prescribes the upgrade requirements for UST systems. Paragraph (a) of this section is key as it requires UST systems with field-constructed tanks installed before the effective date of the current administrative rules, like the Red Hill tanks, to comply with the performance standards in Section 11-280.1-20(b), among others, or be closed. HAR Section 11-280.1-20(b) enumerates the five criteria by which a tank can comply with the performance standards for corrosion protection:

1. The tank is constructed of fiberglass-reinforced plastic;
2. The tank is constructed of steel and cathodically protected;
3. The tank is constructed of steel and clad or jacketed with a non-corrodible material;
4. The tank is installed at a site that is determined by a corrosion expert not to be corrosive enough to cause it to have a release due to corrosion during its operating life; or
5. The tank construction and corrosion protection are determined by the DOH to be designed to prevent the release or threatened release of any stored regulated

substance in a manner that is no less protective of human health and the environment than criteria 1-4.

None of the five allowable corrosion protection alternatives, as stated in the administrative rules, have been met. The first two options are to construct the tanks with non-corrodible material (plastic) or to employ cathodic protection; neither of these apply to the Red Hill tanks. The third option requires that steel tanks be clad or jacketed with a non-corrodible material. This is also not applicable to the tanks at Red Hill, as even the Navy recognizes that the tanks at Red Hill are concrete tanks with steel liners, not steel tanks (Navy, 2016; DOH and EPA, 2017a; EPA and DOH, 2017b; BWS, 2015a). Moreover, the steel liners are not clad or jacketed; rather, they have had concrete cast against the unprotected steel surface. In fact, the outside surfaces of the steel liners, in many locations, are not in intimate contact with concrete, and moisture between the steel and the concrete tanks is causing them to corrode. The fourth option is for a "corrosion expert" to determine that the site is not corrosive enough to cause it to have a release due to corrosion during its operating life. The BWS is unaware of any report by a corrosion expert indicating the site is not corrosive enough to cause releases from the Red Hill tanks. Further, the BWS finds it implausible that this condition could be satisfied considering the documented through-wall corrosion at the Red Hill tanks. Nonetheless, this is the option identified by the Navy in its original permit application. It is clear to the BWS, however, that the Navy's reference to the AOC in that application cover letter does not meet this requirement. Finally, the fifth option is for the DOH to independently determine that the existing corrosion protection is no less protective than provided by options 1 to 4 above. The BWS is unaware of any such determination by the DOH. To the extent the DOH has made an independent determination concerning the existing corrosion protection for the Red Hill tanks, the BWS requests that the DOH share its analysis that demonstrates the site is not corrosive to the steel liners.

The DOH response to the application (Page 2, Item 3.a) correctly requests that the Navy uncheck the box indicating that a corrosion expert has made a determination that the site is not corrosive. Without explanation, the DOH goes on to state that the tanks are clad or jacketed with a "non-corrodible material (concrete)", thus appearing to take the position that the corrosion protection for the Red Hill tanks conforms to the third option listed in the administrative rules. The BWS notes that the options for corrosion protection in the permit application form do not include option 3 (clad or jacketed steel tanks) from the administrative rules, that is, there is no check box for steel tanks that are clad or jacketed. Instead the Navy has marked the Section 6.E "Other, please specify" box as "N/A", presumably based on the statement in the DOH response letter.

The BWS strongly disagrees with this application of the administrative rules. The current Hawaii UST regulations largely incorporate material from their federal counterparts and conform with the general organization of the federal rules. The United

States Environmental Protection Agency (EPA) provides a description of clad or jacketed steel tanks conforming to the third option. According to the EPA:

“...The 1988 regulation also allows use of other tank technologies that implementing agencies determine are no less protective of human health and the environment than those listed above. Additional non-corrodible materials are now used as claddings for steel tanks, and they are as effective at preventing corrosion as technologies in the 1988 regulation. **EPA considers a cladding to be a non-corrosive dielectric material, bonded to the steel tank with sufficient durability to prevent corrosion during the tank's life.** EPA did not include jacketed tanks in the 1988 regulation, even though they are no less protective of human health and the environment than technologies listed in the regulation. **EPA considers jacketed to be a non-corrosive dielectric material that: Is constructed as secondary containment (jacketed) around a steel tank; has sufficient durability to prevent corrosion during the tank's life; and prevents a regulated substance released from the primary steel tank wall from reaching the environment.**” 40 CFR Volume 76, No. 223, Parts 280 and 281 (EPA, 2011) (emphasis added).

It is clear to the BWS that the absence of any meaningful corrosion protection for the Red Hill tanks meets neither the letter nor spirit of Hawaii law and its implementing regulations. The Red Hill tanks cannot be clad because the concrete is not of sufficient durability to prevent corrosion during the tanks' operational life. And they cannot be jacketed because the concrete is not of sufficient durability to prevent corrosion during the tanks' operational life and does not prevent releases from reaching the environment. The EPA and DOH agree, stating that “...it is our understanding that the current concrete portions of the tanks are not engineered to be liquid tight.” (EPA and DOH, 2017b). Most importantly, it is undisputed that the steel liners are corroding and leaking, as demonstrated by years of repairs, nondestructive testing, groundwater impact, the condition of steel liner samples (commonly referred to as “coupons”) recently removed from Tank 14, and the 2014 Tank 5 fuel release. Simply put, the BWS does not believe a reasonable determination can be made that the Red Hill tanks are clad and jacketed such that the Red Hill tanks are “protected from corrosion, in accordance with a code of practice developed by a nationally recognized association or independent testing laboratory” during the tanks' operational life. Accordingly, the DOH should not issue an operating permit for the Red Hill tanks.

Leak Detection

The Navy states in its cover letter to the permit application that the tank tightness test meets the 0.5 gallon per hour leak rate as specified in HAR Section 11-280.1-43(10)(A) and refers to the *Final 2018 Annual Leak Detection Testing Report of 17 Bulk Field-Constructed Underground Storage Tanks at the Red Hill Fuel Storage Complex* of

January 2019, which is provided as Enclosure 10. The BWS notes that Table 2-1 (Leak Detection Results Summary) within Enclosure 10 is entirely redacted and therefore the BWS cannot confirm if the release detection requirements for the Red Hill tanks has been met. The redaction of the results makes it impossible for either the BWS or any member of the public to determine if the leak detection results do meet the tank tightness testing requirements as the Navy claims. The BWS requests that the DOH provide an unredacted version of this report for the BWS to review.

Even if the new release detection equipment was to be permanently installed in all Red Hill tanks, the Navy is only obligated to perform leak detection testing on a semi-annual basis. Both the Naval Audit Service (BWS, 2017c) and BWS (BWS, 2015b) have previously raised concerns regarding the effectiveness of current leak detection methods in detecting slow, chronic fuel releases. As stated before, BWS continues to strongly urge the Navy to incorporate continuous monitoring of any new technology that allows earlier detection of releases, and in the event the DOH issues the Navy a permit to operate the Red Hill tanks, continuous leak detection should be a permit requirement.

Release Notification

Finally, the BWS requests that, in the event the DOH issues a permit, the DOH add as a condition of the permit that the BWS be notified of any confirmed release at the Red Hill facility by the Navy within 24 hours of the release.

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

Very truly yours,



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