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In reply, please refer to:
File:

March 15, 2023

Rear Admiral Stephen Barnett
Commander, Navy Region Hawai'i
850 Ticonderoga Street, Suite 110
Joint Base Pearl Harbor Hickam, Hawai'i 96860-5101
[via email only: stephen.d.barnett.mil@us.navy.mil]

Dear RDML Barnett:

SUBJECT: Red Hill Tank Closure Plan Analysis of Alternatives & Concept Design to Close in Place

The Hawai'i Department of Health (DOH) received your letter, dated December 22, 2022, seeking approval of Closure in Place for the Red Hill Bulk Fuel Storage Facility (Facility). The letter was submitted with the following documents prepared by third-party group, Jacobs Engineering Group Inc.:

- Red Hill Tank Closure Plan of Analysis of Alternatives & Concept Design to Close in Place;
- Enclosure (1) Cost Analysis for "Closure in Place;"
- Enclosure (2) Cost Analysis for "Closure in Place & Secured;"
- Enclosure (3) Cost Analysis for "Closure in Place – Fill w/ Inert Material;" and
- Enclosure (4) Cost Analysis for "Demo Incl Steel Liner – Fill w/ Inert."

While we understand the U.S. Department of the Navy (Navy) is proposing the concept of Closure in Place, the February 28, 2023 Tank Closure Plan Supplement 1, which we expect to contain details on the proposed tank cleaning process and responses to our comments dated January 10, 2023, remains under review. We also understand the Navy will conduct a structural analysis on the proposed design for Closure in Place, which will be provided in a later supplement in May 2023. Being that these submittals contain crucial information on what Closure in Place entails, the DOH is unable to complete our review of the Navy's request at this time. For instance, the Navy has not yet provided details on which portions of the facility will be left in place versus removed, post-closure monitoring and maintenance for the remaining underground storage tank system to ensure structural integrity, and most importantly, how the closure design will prevent future hazardous substance storage at the Red Hill Bulk Fuel Storage Facility.

Furthermore, the DOH will not be able to approve a closure method until the closure design is fully before us. We understand the Navy intends to conduct a beneficial nonfuel reuse study before submitting a closure design for the DOH to review. With this understanding, and to expedite the schedule as much as possible, we reiterate our previous recommendation to submit the Tank Closure Plan in phases – with the cleaning plan, associated waste management plan, and spill mitigation and release response plans taking priority – so that these portions of work can be completed while the closure design is being determined.

Should you have any questions regarding this letter or the enclosed comments, please contact Ms. Kelly Ann Lee, Red Hill Project Coordinator, at (808) 586-4226 or kellyann.lee@doh.hawaii.gov.

Sincerely,

Kathleen Ho

KATHLEEN S. HO
Deputy Director for Environmental Health

Enclosure

c: Mr. Grant Scavello, U.S. Environmental Protection Agency (w/encl.) [via email only]

GENERAL COMMENTS

1. The Hawai'i Department of Health (DOH) understands this evaluation of alternatives is based on the concepts of closure in place, tank filling, or partial tank removal and filling. However, in order for the DOH to approve the selected closure alternative, more information on the closure design is necessary. The purposes of filling or partially removing and filling the tanks are, in part, to ensure long-term structural stability and prevent future storage of hazardous substances. More information on the closure design, including details on which portions of the facility will be left in place versus removed, post-closure monitoring and maintenance for the remaining underground storage tank (UST) system to ensure structural integrity, and what changes will be made to prevent hazardous substance storage, are needed to address these concerns.

2. In general, UST system post-closure monitoring and maintenance needs and associated costs of future inspections and repairs for structural integrity are absent from this analysis, which is problematic for purposes of comparison. For instance, we would expect Alternative 1 ("Closure in Place") and Alternative 2 ("Closure in Place and Preparation for Non-fuel Reuse of Tanks") to have significantly higher long-term resource needs and costs than Alternative 3 ("Closure with Fill [with inert material]") and Alternative 4 ("Remove Tank Steel Liner, and Fill"). The omission of long-term costs from the analysis makes it difficult to compare the true costs of the four alternatives.

SPECIFIC COMMENTS

3. **Page 5, 2. Evaluation of Alternatives:** This section states "[a]ll four closure alternatives will render the tanks incapable of being used for fuel storage and will effectively eliminate any future possibility of the tanks containing fuel." While this may be true, details regarding the final closure design to prevent future hazardous substance storage have not yet been discussed, especially for Alternatives 1 and 2. Please provide this information. Alternatives 3 and 4, on the other hand, would make it virtually impossible to revert the Red Hill Bulk Fuel Storage Facility (Facility) back to fuel storage.

4. **Page 6, 2.3 Engineering Feasibility Evaluation:** The second paragraph states "[r]emoval of the surrounding concrete would create additional safety concerns, including potential destabilization of the rock face and overburden, risk of catastrophic failure, and loss of life during construction." This statement similarly speaks to the potentially catastrophic effects of concrete failure over time if the tanks are not filled. The cost of mitigating this risk was not factored into the analysis for Alternatives 1 and 2 but should have been (see comment 2). Provide information on the long-term inspection and maintenance program for Alternatives 1 and 2.

5. **Page 7, 3. Closure Alternatives:** The first sentence assumes closure according to American Petroleum Institute Recommended Practice 1604. However, the Tank Closure Plan references several other standards, for example, for tank cleaning. Please clarify.

6. **Page 7, 3. Closure Alternatives, item 1:** This item states the U.S. Department of the Navy (Navy) must determine if any significant restrictions will remain after defueling. When will this determination be made? How will it affect the Tank Closure Plan's discussion of potentially opening the Facility to the public, for example, as a museum, or a different beneficial reuse?

7. **Page 7, 3. Closure Alternatives, item 3:** Has the Navy considered filling the surge tanks with sand, UST foam, or a similar substance as an alternative to concrete? We note that, while foam may minimize air and water intrusion, it will not provide structural support, as sand or concrete would. Please note, the DOH has not fully evaluated these alternatives or the suitability of these alternatives but is only asking if they have been considered, and if not, why.

8. **Page 8, 3. Closure Alternatives, item 4:** How will piping with asbestos insulation or piping supports with lead-based paint be closed in place? This is not described in the Tank Closure Plan or Red Hill Tank Closure Plan Analysis of Alternatives & Concept Design to Close in Place. However, from the cost estimates, it appears the Navy intends to demolish these portions of piping. Please confirm. How will the pipes be cleaned and verified as clean? Unless beneficial reuse of the site would use the three fuel pipelines, the DOH recommends all fuel pipelines located in the lower access tunnel and harbor access tunnel be removed. Without long term maintenance, these overhead pipelines may eventually become a safety issue.

9. **Page 8, 3. Closure Alternatives, item 5:** This item states the Navy will use cleaning solution with the pressure washer. Identify the proposed cleaning solution and provide its material composition and safety data sheet. The Navy has also indicated during a meeting that cleaning could be done without surfactants. Is this option still available or realistic?

10. **Page 8, 3. Closure Alternatives, item 5:** The Facility may be opened to the public in the future, depending on the proposed beneficial reuse. This should be considered when determining the "level of repair" needed to provide safe access. Due to the historical significance of the site, after closure would the Facility be transferred to another Federal Agency, such as, the National Park Services?

11. **Page 9, 3. Closure Alternatives, item 14:** Please explain why it is necessary to weld the 750 two-inch diameter openings in the steel liner of Tank 18.

12. **Page 9, 3. Closure Alternatives, item 17:** This item states, "[f]or Alternative 4, removal of the tank steel liner would likely meet DOH requirements for permanent tank closure." The DOH disagrees with this statement. Simply removing the steel tank liner without filling the remaining void with inert material would not meet the tank closure requirements. We understand Alternative 4 also proposes to fill the tank cavity with inert material, so it is only the quoted statement we disagree with.

13. **Page 10, 3.1 Alternative 1: Closure in Place, item 1:** Explain why the vent to the tanks will be capped if ventilation is needed to prevent condensation and organic growth from forming inside the tanks? Tanks 1 and 19 have been out of use for years – has condensation been an issue in those tanks? Were the vent lines to those Tanks capped?

14. **Page 10, 3.1 Alternative 1: Closure in Place, item 2:** This item states the access manhole "must be secured to prevent unauthorized access or use." Explain how it will be secured.

15. **Page 10, 3.1 Alternative 1: Closure in Place, item 4:** This item states "[t]he existing gauging provision, including nozzles and gauge tube, can be left in place since the structural stability of these items is not a concern to the overall integrity of the concrete tanks and liner." All parts of the tank system that are not necessary to ensure structural stability for closure should be removed. Metal components have greater recycling value when recycled prior to being rusted out.

16. **Page 11, 3.1 Alternative 1: Closure in Place:** The estimate of fifty to one hundred years in the first paragraph is highly speculative. If the tanks are emptied and water intrudes into the tank in the presence of oxygen, the steel liners could corrode more rapidly, exposing the concrete and rebar to more rapid failure. It appears structural integrity is an important aspect of selecting the appropriate alternative, meaning seismic analysis should be performed and a plan for long-term monitoring and maintenance of the tanks provided.

17. **Page 11, 3.1 Alternative 1: Closure in Place:** The first paragraph states, "[i]n addition, during normal operations the tanks are never filled to the top of the upper dome, so portions of the upper dome of all tanks have been exposed to air/vapor mixtures for the past 80 years." Please note, it is the DOH's understanding the tanks were not recently filled within the upper dome, due to the increased prevalence of identified metal thinness (likely due to backside corrosion).

18. **Page 11, 3.1 Alternative 1: Closure in Place:** The third paragraph states "Alternative 1 would require ongoing site access and continued maintenance of roads, tunnels, ventilation systems, water-based fire protection system, electrical service, and systems for collection, processing, and disposal of water that may enter the tanks or tunnels." We understand additional structural integrity evaluation will be performed, and a determination of which UST system features will be removed or remain in place will be made. Until the final closure design and proposed post-closure monitoring and maintenance program are provided, the DOH is unable to complete our review of the Closure in Place option.

19. **Page 12, 3.1.1 Alternative 1: Cost:** The cost estimate does not appear to include costs associated with long-term maintenance of the Facility, which will likely not be the same for all Alternatives (see comment 2).

20. **Page 12, 3.1 Alternative 1: Closure in Place, Table 1:** One of the "pros" listed is that "[t]ank closure tasks are well defined, with minimal uncertainty." However, the Navy has yet to define how the tanks will be closed in place (e.g., which portion of the system will be removed, what will remain, how future hazardous substance storage will be prevented, and the final design). Additionally, methods of tank closure other than removal or filling with inert material require approval from the DOH, which is uncertain.

21. **Page 12, 3.1 Alternative 1: Closure in Place, Table 1:** Another "pro" listed is "[t]he estimated schedule is significantly shorter than any other alternative." While this may be true, the schedule for Alternative 1 is only one year shorter than Alternative 2, which could be significantly reduced if the beneficial nonfuel reuse is identified and proposed to the DOH during defueling, rather than waiting until after defueling.

22. **Page 12, 3.2 Alternative 2 Closure in Place and Preparation for Non-Fuel Reuse of Tanks:** This section assumes "the tanks will be used to store products other than fuel." However, if the tanks are reused as a public education center or something similar, this would change the alternatives analysis. For example, the cost of Alternative 2 would be similar to Alternative 1.

23. **Page 12, 3.2 Alternative 2 Closure in Place and Preparation for Non-Fuel Reuse of Tanks:** This section states "there is significant uncertainty in the schedule and level of effort for this alternative." For these reasons, the DOH is unable to evaluate this option until the closure design, structural analysis and corresponding plan for structural maintenance are provided.

24. **Pages 13 and 14, 3.2 Alternative 2 Closure in Place and Preparation for Non-Fuel Reuse of Tanks, Table 2:** The "pros" for Alternatives 1 and 2 appear to be the same. However, an additional "pro" for Alternative 2 should be that, if the beneficial non-fuel

reuse option is determined before defueling is complete, preparations for reuse can be completed concurrently with tank closure, saving time and possibly money.

25. **Page 13, 3.2 Alternative 2 Closure in Place and Preparation for Non-fuel Reuse of Tanks, Table 2:** The primary "con" listed focuses on uncertainty, which will be resolved once the Navy identifies a beneficial reuse option.

26. **Page 14, 3.2.1 Alternative 2: Cost:** This section states one of the two driving factors of cost for Alternative 2 is re-coating the tank liners. This means, the capital cost may be significantly lower, if the non-fuel reuse is a public education center or something similar that does not require an epoxy coat. However, it is difficult to determine true cost without knowing what the reuse is, as there may also be an economic benefit from the reuse.

27. **Page 14, 3.3 Alternative 3: Closure with Fill (with inert material):** Has the Navy considered using UST foam (or something similar) to fill the tanks? This type of material could be pumped into the tanks and would be more lightweight and potentially more cost effective than sand (but maybe not dredge sand). UST foam could provide approximately 40 psi (pounds per square inch) compressive strength, adding some dome support, although not as much as sand. It may also prevent water or air intrusion, which would help to preserve the tank liner and eliminate condensation concerns for the insides. Please note, the DOH has not evaluated this alternative or its suitability but is only asking if it has been considered, and if not, why.

28. **Page 15, 3.3 Alternative 3: Closure with Fill (with inert material):** Could sand be hydraulically dredged in (i.e., as "flowable fill") and pumped into the tanks, possibly using water drained from the tank bottoms? This could reduce the traffic issues associated with Alternative 3 and provide long-term structural stability. Please note, the DOH has not evaluated this alternative or its suitability but is only asking if it has been considered, and if not, why.

29. **Page 17, 3.3 Alternative 3: Closure with Fill (with inert material), Table 3:** The first "con" listed states Alternative 3 would eliminate the possibility of a beneficial non-fuel reuse. However, this may not be true if one or more of the tanks is left unfilled. For example, if the Navy proposes to build a museum, one tank could be saved for public access, while the rest are filled with inert material. This would also help to mitigate the other "cons" associated with Alternative 3. In other words, consideration should also be given to the possibility of a combination of alternatives.