



JOSH GREEN, M.D.
GOVERNOR OF HAWAII
KE KIA'ĀINA O KA MOKU'ĀINA 'O HAWAII

KENNETH S. FINK, MD, MGA, MPH
DIRECTOR OF HEALTH
KA LUNA HO'OKELE

STATE OF HAWAII
DEPARTMENT OF HEALTH
KA 'OIHANA OLAKINO
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:

August 12, 2024

Rear Admiral Stephen Barnett
Navy Closure Task Force – Red Hill
850 Ticonderoga Street, Suite 110
Joint Base Pearl Harbor-Hickam, Hawai'i 96860
[via email only: stephen.d.barnett.mil@us.navy.mil]

Dear Rear Admiral Barnett:

SUBJECT: Disapproval of Tank Closure Plan – Supplement 3

The Hawai'i Department of Health (DOH) received the Navy Closure Task Force – Red Hill's (NCTF-RH's) *Tank Closure Plan, Supplement 3 (Supplement 3)*, dated June 28, 2024, enclosed with:

- *Draft Tank Closure Plan, Supplement 3: Phase 1 Site Assessment, Red Hill Bulk Fuel Storage Facility*, hereinafter the Site Assessment Work Plan (SAWP), Revision Number: 00, Revision Date: June 2024; and
- *Navy Closure Task Force – Red Hill Integrated Master Schedule*, dated June 27, 2024.

To expedite closure, in a letter on December 19, 2023, the DOH provided our expectations for the site assessment portion of the Closure Plan, required in our May 2022 Emergency Order. Per this letter, the site assessment plan must explain how the NCTF-RH will conduct site assessment, investigation, and remediation required for release response and closure of the entire underground storage tank (UST) system, in accordance with Hawai'i Administrative Rules Chapter 11-280.1 (HAR 11-280.1). Accordingly, we expect the SAWP to propose methodologies to identify past releases from the entire UST system, as well as outline the path for site investigation and remediation of those releases.

The submitted SAWP only discusses site assessment for the Red Hill Facility (not the entire UST system) and does not provide a comprehensive outline of all environmental activities associated with closure of the UST system. In addition, it is unclear whether the methodology proposed to detect and identify releases will work because the NCTF-RH has not yet conducted its planned site-specific passive soil vapor pilot study. As we have communicated in several meetings, it is, therefore, premature to request our approval of the SAWP because we have not yet received the pilot study results. The NCTF-RH also did not submit a complete version of the

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Draft Technical Memorandum, Site Assessment Pilot Study Work Plan (Pilot Study WP) until after the SAWP on August 8, 2024, so we have not yet concurred on the pilot study design. Accordingly, we are disapproving *Supplement 3* because we are unable to evaluate whether the SAWP meets the HAR 11-280.1 requirements.

Our response to the Pilot Study WP is forthcoming. After the NCTF-RH receives our concurrence on the pilot study design and conducts the pilot study, provide the results with conclusions and recommendations for our review and concurrence. Within 45 calendar days of receiving our concurrence on the pilot study results, conclusions, and recommendations, revise the SAWP and Integrated Master Schedule based on the enclosed comments and resubmit both to the DOH for review and approval.

If you have any questions regarding this letter or its enclosure, please contact Kelly Ann Lee, DOH Red Hill Project Coordinator, at KellyAnn.Lee@doh.hawaii.gov or (808) 586-4226.

Sincerely,

Kathleen Ho

KATHLEEN S. HO
Deputy Director for Environmental Health

Enclosure

c (w/encl.) [via email only]:
Ash Nieman, EPA
Jamie Marincola, EPA
Matthew Cohen, EPA
RDML Marc Williams, NCTF-RH
Milton Johnston, NCTF-RH
Noor James, NCTF-RH
Joshua Stout, NCTF-RH

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General Comments

1. The Site Assessment Work Plan (SAWP) references the old Hawai'i Department of Health (DOH) Environmental Action Levels (EALs) from Fall 2017. The current EALs were published in Spring 2024 with a memorandum explaining implementation of the updated EALs for total petroleum hydrocarbons (TPH) in water. Update the EALs throughout the document.
2. In Worksheet #10, PDF page 41, there are varying levels of detail provided for different areas of the Red Hill Bulk Fuel Storage Facility (Red Hill Facility or Facility). The level of detail should be consistent throughout the Facility. If certain details are unknown or not available for any reason, clearly state this in the text. Examples are provided below.
 - a. There are details missing regarding the surge tanks. It is unclear where they are located, their purpose, and what kind(s) of fluid they held.
 - b. Estimated volumes of releases are missing from some areas of the Facility but are provided for others.
3. Throughout the document, the Navy Closure Task Force – Red Hill (NCTF-RH) makes hypotheses regarding different phenomena without providing concrete supporting lines of evidence. Provide references and data to support hypotheses. Use site specific data where available. Examples are provided below.
 - a. Section 10.2.3, PDF page 49, regarding the quarry water altering groundwater flow pattern.
 - b. Section 10.4.1, PDF page 61, statements regarding LNAPL (light non-aqueous phase liquid) migration through the subsurface.
4. The primary reference for field and sampling procedures in the SAWP is the Department of the Navy's 2015 *Final Project Procedures Manual* for the Environmental Restoration Program. While we recognize the NCTF-RH has an internal procedures manual, the SAWP must clearly specify whether the proposed procedures are in accordance with the DOH Hazard Evaluation and Emergency Response (HEER) Office Technical Guidance Manual (TGM), available at: <https://health.hawaii.gov/heer/tgm/>. If the proposed procedures are not in accordance with the DOH HEER Office TGM, justification for such deviations must be provided to the DOH for review and concurrence. Note that the most recent version of the TGM should be referenced. One example of a deviation is noted below.
 - a. The SAWP proposes to collect discrete soil samples. However, the DOH HEER Office TGM specifies that Multi Increment (MI) soil samples are to be collected, as discrete soil samples are not typically accepted by the DOH for final decision-making. MI soil samples are to be collected and analyzed in accordance with the TGM. If collecting MI soil samples is infeasible due to low recovery, then a discrete

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soil sample may be collected, and the data may be used in conjunction with other lines of evidence for decision-making.

5. Ensure all acronyms are defined. In addition, technical terms throughout the SAWP are used in ways inconsistent with peer-reviewed scientific literature. For example, transmissivity, porosity, permeability, and saprolite.
6. Although no releases were identified from Tank 311 and the underground portion of the fuel oil reclamation (FOR) line, we understand both will be used during tank cleaning. Because the FOR line will carry tank wash water mixed with residual fuel to Tank 311, it may be prudent to delay site assessment around Tank 311 until tank cleaning is complete and Tank 311 is empty.
7. Our December 19, 2023 letter of expectations requires “[a] description of the entire UST [underground storage tank] system constructed and operated from its initiation through closure, including portions that may have been removed or abandoned” The SAWP only discusses the Red Hill Facility portion of the UST system and states the NCTF-RH will evaluate which portions of the offsite Joint Base Pearl Harbor-Hickam fuel system are determined to be part of the Red Hill UST system at a later time. Clearly describe the entire UST system that is being closed.
8. This SAWP is missing the NCTF-RH’s overarching plan to completely address the environmental activities associated with UST system closure, as described in our December 19, 2023 letter of expectations. While Section 16 provides a schedule of activities, there is no description of the scope of each activity or how each one fits into the UST closure requirements outlined in Hawai’i Administrative Rules (HAR) 11-280.1. Provide an overarching plan that outlines all environmental activities associated with closure of the entire UST system.

Specific Comments

9. **Section 10.1, PDF page 41**

- a. This section states non-petroleum contaminants will be addressed in a separate regulatory program under applicable regulations. It is unclear which contaminants are being referred to, as the contents of the UST system and associated release(s) include petroleum hydrocarbons, associated additives, and cleaning products. Clarify which contaminants will be evaluated under this UST closure, and which additional contaminants will be assessed under different regulatory programs. Define the other regulatory programs.
- b. HAR Section 11-208.1-72(d) is referenced, but this citation does not exist. The correct citation is HAR Section 11-280.1-72(b), which states that if contaminated soil or groundwater or free product is discovered, then release response actions are required.

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10. **Section 10.2.1.4, PDF page 44:** In Figure 2 (PDF page 278) and Figure 18 (PDF page 294), the inset makes it difficult to see the underground pumphouse details due to the low resolution of the figure. Ensure all parts of the figures submitted to the DOH are legible.
11. **Section 10.2.2.3, PDF page 48:**

Describe how climate and weather may impact contaminant migration, particularly in the vadose zone. An example of this would be to describe cyclonic and frontal storms. A good reference is *“Prevailing Trade Winds: Weather and Climate in Hawaii”*, edited by M. Sanderson (Published in 1994).
12. **Section 10.2.3, PDF page 49:** Statements in this section seem to imply there is no risk of contamination to the surface water due to the Facility’s placement. For example, the SAWP mentions the depth of the bottoms of the tanks relative to the stream bed. However, the bottoms of the tanks are not be the only sources of contamination associated with releases from the Facility. The SAWP also states the groundwater beneath the Facility does not intercept the surface water. However, this does not account for perched water within the Facility boundaries located near Hālawa Stream that may contribute to surface water. While portions of Hālawa Stream are concrete lined, there is still the potential for upwelling through joints and cracks. Revise this section accordingly.
13. **Section 10.2.3, PDF page 49:** The statement that most precipitation percolates to the freshwater lens (i.e., basal aquifer) and does not maintain base flows in the streams is not completely accurate because it ignores the significant fraction of precipitation that becomes direct runoff and evapotranspiration. We assume the NCTF-RH’s intent was to point out that the flow in Hālawa Stream is from direct runoff or shallow infiltration, not from discharge of basal groundwater to the stream (i.e., baseflow).
14. **Section 10.2.4, PDF page 49:** The following sentence does not seem accurate: “The results of a seismic survey conducted in North and South Halawa Valleys, Red Hill, and Moanalua Valley (DON 2018a) found that valley fill and saprolite extend much deeper in the valleys surrounding Red Hill ridge, particularly in the center of the valleys and below the streambeds.” It is also unclear what the criteria is for “extend much deeper.” The seismic study of the Red Hill Area in 2018 showed that the alluvial/saprolite wedge is much shallower adjacent to the upper end of the Facility and much deeper adjacent to the lower end of the Facility than characterized in the 2019 conceptual site model (CSM). This difference between the CSM and actual valley fill and saprolite geometry has significant implications for evaluating potential contamination migration pathways.
15. **Section 10.2.4, PDF page 51 and Section 10.2.5, PDF page 52:** High level dike confined groundwater is not listed as a principal aquifer type. Add this to the list.

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16. Section 10.2.25, PDF page 53

- a. The list of Honolulu Board of Water Supply wells that stopped pumping after the November 2021 release is incomplete. List all drinking water wells that were shut off after the November 2021 release.
- b. The list of “active water supply wells in the region [that] continue to provide safe drinking water to the public” is missing many public supply wells that were in service at the time of the releases and that are closer to the Facility than the Waiawa Shaft .

17. Section 10.2.5, PDF page 52

- a. Figure 6 (PDF page 282) does not show infiltration processes, whether from precipitation (the major source) or streambed infiltration (a minor source). We suggest removing the reference to Figure 6 and potentially adding a new figure that shows the infiltration processes.
- b. It should also be noted that impacts to the perched aquifer on the Facility were observed in 2022 and will need to be addressed, as stated in the DOH’s June 24, 2024 letter on the holding tank and leach tank closure.

18. Section 10.3.3, PDF page 55: It is unclear what the following sentence means: “It was later determined that some below-tank soil vapor monitoring point (SVMP) vaults on the tunnel floor near the May 2021 release affecting the utility of these SVMPs for identifying releases from their associated USTs.” Provide clarification.

19. Section 10.3.6, PDF page 56: Describe the depth at which the contamination in the soil and perched water was found in Red Hill Monitoring Well 17 (RHMW17).

20. Section 10.4.1, PDF page 61:

It is inaccurate to say that the onsite portion of the Phase 1 Red Hill UST system is no longer a potential source of new releases, as tank cleaning is still ongoing and there is residual fuel in this portion of the system. While the potential of a substantial release is no longer present, there still is the potential for a release from portions of the system during tank cleaning.

21. Section 10.4.4.2, PDF page 62: This section will benefit from a more concise description of the extent of the contamination. While Figure 12 (PDF page 288) may illustrate the TPH as diesel (TPH-d) and as oil (TPH-o) concentrations detected in the groundwater monitoring wells during the third quarter of 2023, citing only this figure infers that the extent of contamination has reached the western portion of Hālawā (as indicated by a low-level TPH-d detection in monitoring well NMW24). A more concise description of the known extent of contamination is needed.

22. Section 10.4.4.5, PDF page 63: There are no analytical results shown on Figure 10 (PDF page 286). Revise to reference the correct figure.

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23. **Section 11, general:** Overall, this section should clearly describe how the NCTF-RH will present the data gathered both during the site assessment associated with the UST closure, as well as other investigations conducted at the Facility, and how this data will be evaluated in a manner that demonstrates its applicability and technical adequacy in accordance with our December 19, 2023 letter.
24. **Section 11.2, PDF page 66:** It is stated that the project quality objective (PQO) process involves identifying alternative outcomes and developing decision statements. However, neither of those items are clearly identified in this document. Specify what the alternative outcomes and decision statements are for this project, and how the results of the assessment will be used to determine whether a release has occurred.
25. **Section 11.3, PDF page 67:** It is stated that fuel contamination has already been determined at the Collection, Holding, and Transfer (CHT) Tank. However, the DOH is not aware of the CHT tank investigation starting as of the date of this DOH letter. Provide clarification.
26. **Section 11.4, PDF page 68:** The first bullet on the page mentions the Tank Farm Study Area, but then states that environmental samples will be collected in the lower access tunnel study area. Revise accordingly for consistency.
27. **Section 11.4, PDF pages 68 – 69**
- a. The list describing the horizontal boundaries for the Phase 1 Closure Site Assessment does not include the Former Slop Tank area. Identify which region the Former Slop Tank will be in.
 - b. As the Facility is closing, provide a statement why the seal in the 100-foot section of the Adit 6 tunnel floor must be protected and samples will not be collected in that section.
 - c. It is stated that the sampling will focus on shallow subsurface environmental media beneath aboveground pipes, aboveground storage tanks, and buried pipes. However, there were previous field indications of contamination at approximately 30 feet below ground surface (bgs) in Boring B-5 near the Former Slop Tank. While the bottom of the 8-inch slop tank pipeline is not anticipated to be deeper than 4 feet bgs, the vertical boundary may need to be extended deeper than 5 feet bgs particularly in this area to fully evaluate the potential for historical releases.
28. **Section 11.5, PDF page 69:** Outcome 2 (PSQ #2) states that if the sample results do not suggest the presence of previously unidentified fuel contamination from the “Red Hill UST system” that the NCTF-RH will continue to implement and assess the existing response actions under its existing regulatory programs. It is unclear what “existing regulatory programs” means. Instead, any areas of the Red Hill portion of the UST system where a

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release has been identified should be addressed in accordance with HAR 11-280.1, Subchapter 6, and should be included in the overall closure plan for the UST system.

29. **Sections 14.1.3 and 14.1.4, PDF pages 78 and 79:** The figures that are provided do not include labels for streets referenced throughout the text, such as Icarus Way or the Adit 3 access road. Label locations that are mentioned throughout the text on the figures.
30. **Section 14.2.1, PDF page 79**
- a. It is unclear whether vegetation will be cleared before or after the geophysical surveys are conducted. As the geophysical methods mentioned typically require vegetation to be cut down prior to conducting the survey, clarify the type of geophysical tools that will be used (airborne, surface) and if vegetation will be cleared for the geophysical surveys, and if so, how much vegetation will be cleared.
 - b. It is stated that green waste will be managed in accordance with the March 22, 2022 Joint Base Pearl Harbor Hickam Green Waste Policy. This policy states that green waste from the Red Hill Facility will be chipped onsite and transported to the Navy's Biosolids Treatment Facility. According to a DOH July 26, 2024 letter, this facility will be closing within thirty (30) calendar days. Provide an updated description of how green waste generated at the Facility will be managed.
31. **Section 14.4.1, PDF page 81**
- a. The first paragraph states that holes will be drilled to between 1-2 feet below tunnel floor. This statement is inconsistent with the depth range of 2-3 feet below tunnel floor presented in the table at the beginning of Section 14.4.1. Revise the text accordingly.
 - b. Specify what constitutes an "elevated" photo ionization detector (PID) reading and how PID readings will be used as part of the decision process.
32. **Section 14.4.3, PDF page 82:** Specify at what frequency PID screening readings will be collected.
33. **Section 14.5.1.1, PDF page 83:** The active soil vapor sampling methodology proposed for measuring biogenic gases consists of collecting grab field measurements. Due to the collection methodology, these measurements may be biased low. Based on the results of the site assessment pilot study, collecting active soil gas samples for laboratory analysis at a frequency of at least 10% may be necessary to verify the representativeness of these field measurements.

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34. Section 14.5.1.2, PDF page 83

- a. The pressure differential in various areas of the tunnel needs to be understood to maintain data quality and should be consistent throughout the assessment. A cross-slab transducer can be used to understand air pressure in the tunnel, and pressure should be measured in the various areas of the tunnel prior to the assessment to identify any potential impacts it may have on the soil gas results.
- b. As tank ventilation and tank cleaning will continue through mid-2026, specify whether any additional steps will be taken to verify that the soil gas measurements collected are not impacted by work conducted in the tunnel.
- c. Specify at what depth the screened portion of the casing will be installed in the deep borings.

35. Section 14.5.1.3, PDF page 84

- a. It is stated that the passive soil gas samplers will be retrieved within 14 calendar days of installation. Specify what is the earliest date after installation they may be retrieved.

36. Section 14.5.2, PDF page 85

- a. Provide the rationale for why soil samples collected at the Surge Tank study area will not be analyzed for TPH-g, especially since the borings will be significantly deeper.
- b. As MI soil samples are to be collected, specify the vertical depth ranges for each of the single borehole decision units from which soil samples will be collected.

37. Section 14.5.3, PDF page 86:

Groundwater samples should also be analyzed for TPH-o.

38. Worksheet #15, general

- a. Clearly specify the screening level for each analyte for all media analyzed and how these screening levels will be used to determine if the results indicate a release from the UST system.
- b. The Limits of Quantitation (LOQ) presented are above the DOH EALs for TPH in groundwater. In the event that TPH is detected in groundwater samples below the LOQ, forensic analysis is to be performed in accordance with the June 12, 2024 DOH TPH memorandum to determine whether the detection is petroleum-related or not. If forensic analysis is not performed, then by default the detection will be considered petroleum related.

39. Worksheet #15, PDF page 94: In the legend, screening level (SL) is listed, but the values are not provided in the chart. Provide the SLs for all of the analytes.

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40. **Worksheet #16:** This worksheet appears to generally follow the Comprehensive Environmental Response and Liability Act (CERCLA) process, as opposed to the UST closure process outlined in HAR 11-280.1. While this is a complex UST system closure, the process should still follow the steps in HAR 11-280.1 and DOH's May 2022 Emergency Order, and use the language provided in these authorities. For example, after a release from the UST system is identified, site investigation should be conducted to determine the magnitude and extent of the releases, followed by preparing a corrective action plan. The corrective action plan may include many of the actions specified in the worksheet. However, the worksheet should be revised to more accurately reflect the language and actions specified in HAR 11-280.1.
41. **Worksheet #16, Section 16.1, PDF page 101**
- a. A minimum of 30 calendar days should be allotted for the DOH to review submissions. Requesting regulatory review times of 10 business days is not reasonable.
 - b. According to the schedule, the regulatory agencies will not have an opportunity to review pre-Final documents. The DOH may have comments on the "Final" document and be unable to approve it until revisions are made.
 - c. As explained in our cover letter, we are unable to approve the SAWP because we have not reviewed the results from the NCTF-RH's upcoming site assessment pilot study. Update the schedule accordingly to include revising the SAWP based on these comments and the pilot study results, and subsequent DOH review.
42. **Worksheet #17, PDF page 107:** As specified in our December 19, 2023 letter, bullet point number 5, this section should include how original/previous data collected for other purposes in each study area will be used as part of this current site assessment. Refer to the letter for further details regarding expectations for the SAWP.
43. **Section 17.2, PDF page 108:** The number of samples reported are not an approximation in Worksheet #20, therefore, the number of sampling locations in Section 17 should match the numbers in Worksheet #20.
44. **Sections 17.2.5, 17.2.6, and 17.2.7, PDF page 110:** It should be noted that additional data may need to be collected in these areas. Consequently, any additional data gathered should also be integrated into the Closure Site Assessment report.
45. **Section 17.2.9, PDF page 111:** If native soil is present in the core, in addition to collecting a groundwater sample, an MI soil sample should be taken of the interval above the capillary fringe in accordance with the DOH HEER Office TGM.
46. **Section 19, PDF page 202:** It is unclear why field sampling requirements include 1-liter Summa canisters and analysis by ASTM D 1946 for soil gas, when active soil gas sample collection using Summa canisters is not discussed elsewhere in the SAWP.

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47. **Figure 16, PDF page 292:** Based on the location of the pipeline leading to Tank 311 illustrated in Figure 16, at least one additional sampling location should be added to adequately assess for potential leaks from the pipeline.
48. **Figure 18, PDF page 294:** Add sampling locations to the northern sides of the surge tanks to evaluate potential releases from the surge tanks toward the underground pumphouse.
49. **Figure 20, PDF page 296**
 - a. The callout in Figure 20 illustrates different spacing between samples for the former AVGAS (Abandoned Aviation Gasoline) line inside of Adit 6 compared to outside of Adit 6. Provide the rationale for the increased spacing.
 - b. Clearly identify the brown dashed line and the solid blue line in the callout of the figure because the lines seem to be mislabeled when comparing them to the legend that is provided for this figure.