UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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STATE OF HAWAII
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June 10, 2024

Rear Admiral Stephen Barnett
Commander, Navy Region Hawai‘i
850 Ticonderoga St., Ste. 110
Joint Base Pearl Harbor Hickam, HI 96860-5101
(Sent via Electronic Mail)

Subject: Comments on Monitoring Well Installation Work Plan, Red Hill Bulk Fuel Storage Facility

Dear Rear Admiral Barnett:

The U.S. Environmental Protection Agency (EPA) and Hawai‘i Department of Health (DOH), hereinafter the "Regulatory Agencies" (RAs), have reviewed the *Monitoring Well Installation Work Plan, Red Hill Bulk Fuel Storage Facility* (Work Plan), dated February 22, 2024, submitted by the U.S. Department of the Navy (Navy) under the DOH 2022 Emergency Order and EPA 2023 Administrative Consent Order. The RAs are providing the enclosed comments for incorporation into the revised Work Plan. Please submit a revised Work Plan for review within 45 calendar days of receipt of this letter.

If you have any questions regarding this letter, please contact Matthew Cohen, EPA Red Hill Project Coordinator, at Cohen.Matthew@epa.gov or (415) 972-3691; or Kelly Ann Lee, DOH Red Hill Project Coordinator, at KellyAnn.Lee@doh.hawaii.gov or (808) 586-4226.

Sincerely,

/s/

Matthew Cohen PG
Red Hill Project Coordinator
U.S. Environmental Protection Agency, Region 9

/s/

Kelly Ann Lee
Red Hill Project Coordinator
State of Hawai‘i, Department of Health

Enclosure

cc w/encl. by email only:

RDML Marc Williams, Deputy Commander, Navy Closure Task Force – Red Hill
Sherri Eng, Executive Director, Navy Closure Task Force – Red Hill
Joshua Stout, ACO/AOC Portfolio Manager, Navy Closure Task Force – Red Hill
CAPT James Sullivan, Commanding Officer, NAVFAC Hawai‘i
CDR Benjamin Dunn, Red Hill Environmental OIC, NAVFAC Hawai‘i
LCDR Travis Myers, Aquifer Recovery Team Lead, NAVFAC Hawai‘i

Enclosure
Regulatory Agency Comments on *Monitoring Well Installation Work Plan, Red Hill Bulk Fuel Storage Facility* (Work Plan), dated February 22, 2024
June 10, 2024, Letter to Rear Admiral Stephen Barnett

General Comments:

1. The design for each monitoring well should consider where each lithologic interface lies (e.g., saprolite to fractured rock or valley fill wedge to saprolite) to decide the appropriate depth to place each well screen. In many cases, the stated well screen depth interval within the Work Plan may not accomplish the intended purpose of the well. The U.S. Department of the Navy (Navy) should provide the U.S. Environmental Protection Agency (EPA) and Hawai‘i Department of Health (DOH), hereinafter the "Regulatory Agencies" (RAs), with the field data, geophysical logs, etc. with sufficient time to provide input on the depth at which the well screens should be installed.
    a. For example, Well NMW35 lists a screen interval of 165-195 feet (ft) below ground surface (bgs) and a surface elevation of 195 ft above mean sea level (msl). This proposed well is located in the middle of Halawa Valley where the depth to the saprolite/basalt interface will likely be on the order of 400 to 500 ft bgs, significantly below the bottom of the stated well screen. A well screened at the stated depth will likely not provide critical stratigraphic information or a useable groundwater elevation for regional flow analysis. For example, the previously installed well NMW33 suffers from this issue in that it is screened in the low permeability tuffs and not the basal basalt aquifer.
    b. In Section 4, the sequence of events outline has monitoring well installation preceding lithologic investigation. Critical information for well screen placement can be gained from the lithologic investigation so it seems that well installation should occur after the lithologic investigation. This sequence will be particularly important for those wells where the basalt aquifer is confined.

Specific Comments:

2. **Sections 2.1 and 7, Pages 1 and 17**: The project procedures and references do not include a Quality Assurance Project Plan (QAPP). In Sections 2.1 and 7, specify which QAPP will be followed when conducting this work. If there is no applicable QAPP, advise when a QAPP will be written for this phase of the project.

3. **Section 3.1, Page 4**: It is stated that the contractor will use only approved materials during well installation. Identify the party that will approve the well materials, such as chemicals, lubricants, and drilling fluid additives to be used during drilling activities.

4. **Section 3.2, Page 5**: Clarify why the drilling water needs to be filtered through a granular activated carbon vessel prior to use and its source.

5. **Section 4.0, Page 5**: The text indicates "*At each well location, a corehole may be drilled, either before or after the well is advanced.*" Coreholes should always be drilled first to conduct reconnaissance, obtain important lithologic information, and to identify the optimal depth intervals for well screens.

6. **Section 4.1.1, Page 6**:
    a. The drilling methods mentioned (i.e., hollow-stem auger, bucket auger, and air rotary) yield a mixture of drill cuttings and may not all allow for the collection of representative field screening samples. Clarify what kind of field screening samples will be taken. Specifically, the RAs request that rock coring be done prior to well installation.
    b. The RAs should be notified in advance if the Navy decides to install a well using a mud-rotary rig.
    c. It would be helpful to understand where preferential flow is occurring before screening the wells. Drill deeper than the planned screen interval, then use packers to identify discrete flow intervals.

7. **Sections 4.1.1 & 4.1.2, Pages 6 and 7:** In addition to screening perched water, collect samples and analyze them for contaminants of concern.

8. **Sections 4.3.1 & 4.3.2, Page 7**:
    a. Include a clarifying statement on what steps laid out in Section 4.3.2 will need to be taken if the estimated water level does not stabilize within the specified range indicating the borehole has been drilled in confined conditions.
    b. When evaluating for confined verses unconfined conditions, in addition to verifying that the groundwater elevation is consistent with that of the basal basalt aquifer, the borehole needs to progress through potentially confining layers (e.g., alluvium and/or tuff) and encounter competent basalt.

9. **Section 4.4.1, Pages 9 and 10**:
    a. Indicate how close the corehole boring will be located relative to the well.
    b. Coreholes should precede well installation and should be advanced to -25 ft msl rather than -7 ft msl to provide better reconnaissance and assessment of groundwater conditions.
    c. Drill the core deeper than anticipated well depth. Then use the initial, adjacent coring to collect geophysics data that will inform well screen placement in the well borehole.

d. A sample should be collected for field analysis if visual and/or olfactory evidence indicate signs of potential contamination regardless of if it is outside of the indicated intervals.
e. This section proposed to backfill 32 ft of the corehole with sand. Confirm that this is the applicable standard for corehole abandonment.

10. **Section 4.4.1, Page 9 & Section 6, Page 16-17**: Provide the rationale as to why a measurement of less than 10 parts per million by volume of volatile organic compounds using a photoionization detector was chosen as the action limit for additional contamination analysis and mitigation actions.

11. **Section 4.6.2, Page 13**: It was stated during previous discussions between the Navy and RAs that casing O-rings were not used during installation, which may have caused grout to enter RHMW12A. Clarify whether O-rings will be used in future well installations, as appropriate measures should be taken to prevent grout from entering the well casing.

12. **Section 6.2, Page 16**: Clarify what observations will be used to determine that no contamination is observed.

13. **Section 6.3, Pages 16 and 17**:
    a. Bullet 3:
        i. After, "*Soil or groundwater sampling will be conducted*," add "in accordance with" and reference the appropriate QAPP and Sampling and Analysis Plan (SAP).
        ii. If the sampling results exceed the DOH Environmental Action Levels (EALs), the RAs should be notified within 24 hours of receiving the unvalidated results, not the validated results. Clarify or revise appropriately.
    b. Bullet 5:
        i. In addition to screening results against DOH EALs, also screen against EPA regional screening levels, or the project action levels specified in the QAPP and SAP.
        ii. Note that revised draft DOH EALs are now available for review on the Hazard Evaluation and Emergency Response Office website, as well as updated guidance regarding the implementation of DOH EALs for total petroleum hydrocarbons. Once the EALs and updated guidance have been

finalized, they will supersede the DOH EALs currently listed in the Work Plan.[1]

14. **Appendix B, page B-1 & B-2**:
    a. Monitoring well screen interval for RHP08B appears to be in elevation (ft msl) while the stated units are ft bgs.
    b. The proposed screen interval for NMW35 appears to be 0 to 30 ft msl. This will put the well screen well above the saprolite/basalt interface and in the vertical middle of the alluvial/saprolite wedge. Revise appropriately.
    c. In the revised Work Plan, indicate which wells are priority wells and which are backup locations. For example, Figures B-1 and B-2 depict three locations for Well KK, but in meetings the Navy indicated that a well will only be placed in one of the three locations.
    d. There does not appear to be a prioritization for the wells planned for installation. During previous discussions with the Navy, both the RAs and stakeholders have expressed that installing monitoring well(s) to the northwest of the Red Hill Bulk Fuel Storage Facility and in the direction of Halawa Shaft are of importance to demonstrate that risk to potential off-site receptors is currently managed. The table in Appendix B shall be revised to indicate the locations/specifications of potential deep co-located groundwater monitoring wells.
    e. Include specific details about the installation of deep groundwater monitoring wells at the proposed locations in Figure B-2.
    f. Provide more information about deep co-located monitoring well locations in Appendix B (i.e., which of the proposed locations presented on Figure B-2 will have co-located deep wells?).
    g. This letter will be followed by a tech memo describing additional well locations of interest and priorities for discussion at an upcoming special purpose meeting. The well location and prioritization discussions should not delay current work.

[1] https://health.hawaii.gov/heer/guidance/ehe-and-eals/ and https://health.hawaii.gov/heer/files/2024/04/Use-of-TPH-Action-Levels-HDOH-Draft-March-2024.pdf