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In reply, please refer to:
File:

August 30, 2023

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

Dear Rear Admiral Barnett,

Subject: Initial Comments on Draft Report of Findings, Red Hill Shaft Flow Optimization Study

The Hawai'i Department of Health (DOH) is in receipt of the U.S. Department of the Navy's (Navy's) August 17, 2023 *Draft Report of Findings, RHS Flow Optimization Study*, hereinafter referred to as the "Draft Report." The Draft Report was submitted for the DOH's preliminary comments prior to the Navy's submission of the final report. We understand that the final report will be submitted to the DOH to support the Navy's August 1, 2023 request to reduce the rate of pumping from the Red Hill Shaft (RHS) granulated activated carbon (GAC) system. Since January 2022, the Navy has pumped the RHS as a step to minimize contaminant migration from the RHS, in accordance with the January 2022 Red Hill Shaft Recovery and Monitoring Plan (RHSRMP) and the DOH's May 6, 2022 Emergency Order. The RHSRMP was established without defining the extent of anticipated capture and without any optimization of flow rate because it was imperative at the time to attempt to create containment to remove fuel product and minimize contaminant migration from the RHS. Pumping the RHS was not selected as the overall remedy for the site, nor is it intended to address petroleum releases from other areas of the Red Hill Bulk Fuel Storage Facility.

At this time, the DOH is unable to conduct a detailed review of the Draft Report, as the post-processed supporting datasets associated with the flow optimization study were not included as part of the document. In addition, the Draft Report does not include the analytical results of groundwater sampling conducted during the flow optimization study to evaluate any potential changes in contaminant concentrations associated with reducing the average pumping rate of the RHS GAC system. Neither does the report contain the modeling files used in the Navy's reported evaluations. We also note the draft report does not appear to have gone through contractor quality control or the Navy's quality assurance, as there are numerous errors and incomplete analyses throughout the report. For example, the northing and easting coordinates are swapped or duplicated for a significant percentage of the well locations; the vertical gradient

for RHMW13 appears to be backwards; the range of uncertainty for water levels is listed at 0.1 to 0.2 feet without justification, but it is utilized to marginalize data; the discussion of TPH-o at RHS in summer 2021 is used to support the conclusion that there is groundwater and dissolved constituent movement from the tanks to RHS, yet the Navy also states that TPH-o at RHMW03 and the RHS is not related to fuels stored within the tanks, strongly inferring the contamination was not related to the May 2021 release; and there is insufficient analysis of the isotope and water quality data.

For the DOH to conduct a detailed review of the flow optimization study, the post-processed data are to be formally provided to the DOH in working digital formats to confirm the datasets are complete, accurate, and are in fact the precise sets used in the Draft Report, as well as to allow independent data evaluations. This includes all post-processed data (converting raw field data into useable response datasets) used to generate the following charts, graphs, and evaluations:

- Water level elevations throughout the period of study as presented on PDF Pages 51 through 55 of the Draft Report.
- Vertical gradients and compiled drawdown over time as presented on PDF Pages 61 through 73 of the Draft Report.
- The dataset(s) used to create the scatter plots presented on PDF Page 75 of the Draft Report.
- Water level over time with compiled water quality parameter measurements as presented on PDF Pages 88 through 106 of the Draft Report.
- A copy of the excel spreadsheet presented on PDF Page 118 of the Draft Report.
- The underlying dataset(s) used to prepare figures and graphs presented on PDF Pages 125 through 227 of the Draft Report.
- Working copies of the groundwater models used in the optimization study.

Post-processed data that was collected but not used in the flow optimization analysis should be explicitly described, including justification for why it was not used.

From our precursory review of the Draft Report, the DOH is concerned that the flow optimization study conclusions are primarily based on models, one of which (or variants thereof) the DOH has previously disapproved. As with past reviews of Navy submissions, the DOH does not rely on modeling results that are inconsistent with actual site data and basic hydrogeologic principles, and none of the models used in the flow optimization study appear to adequately reflect the measured gradient data at the site. The DOH and U.S. Environmental Protection Agency (EPA) are currently reviewing the Navy's latest submission of an interim groundwater flow model. Until this review is complete and the interim model has been accepted, results from the interim model should not be used as a primary line of evidence when developing conclusions for the flow optimization study. As the purpose of the flow optimization study is to support the Navy's request to reduce the average pumping rate of the RHS GAC system, not necessarily to illustrate robust capture, the DOH suggests that the Navy further evaluate

whether some of the other lines of evidence presented in the Draft Report (e.g., vertical gradients, water quality data, isotopes, and analytical data) support this request.

The DOH believes the average pumping rate of the RHS GAC system can likely be reduced, as several lines of evidence suggest the fuel impacts have significantly contracted and returned to pre-2021 conditions, but primarily due to natural attenuation processes and not pumping from RHS. However, such a determination cannot be made until an evaluation of the groundwater sampling data collected during the flow optimization study can be conducted to determine whether there were any substantive changes in contaminant concentrations during the study. We understand that the Navy had not yet received the verified analytical data of samples collected during this study.

Lastly, in your response to our December 15, 2022 comments on the *Red Hill Shaft Flow Optimization Study Work Plan*, you stated "[t]he Navy awarded a contract to CAPE Environmental Management, Inc. in January 2022 to conduct an evaluation of potential water use courses of action (COAs) for effluent from the Red Hill Shaft GAC [granular activated carbon] system." The DOH and EPA requested a copy of this evaluation in letters dated March 30, 2023, May 18, 2023, and August 9, 2023. None of these requests have been acknowledged in writing. We again request that you provide a copy of the CAPE evaluation to the DOH and EPA.

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

Sincerely,

Kathleen Ho

KATHLEEN S. HO
Deputy Director for Environmental Health

c: Mr. Grant Scavello, U.S. Environmental Protection Agency [via email only]
Mr. Joshua Stout, Navy Region Hawai'i [via email only]