BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
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December 19, 2017

Mr. Bob Pallarino
EPA Red Hill Project Coordinator
United States Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, California 94105

and

Ms. Roxanne Kwan
Solid and Hazardous Waste Branch
State of Hawaii
Department of Health
919 Ala Moana Boulevard, Room 212
Honolulu, Hawaii 96814

Dear Mr. Pallarino and Ms. Kwan:

Subject: Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Meeting Held November 16, 2017 and the Groundwater Modeling Working Group Meeting No. 5 Held on November 17, 2017

The Honolulu Board of Water Supply (BWS) offers the following comments on the above referenced meetings. In summary, the information presented by the Navy and its contractors continues to heighten our concerns that the AOC work will leave our Sole Source Aquifer inadequately protected from Red Hill fuel releases. Focusing the interim groundwater modeling on capture of contaminated groundwater by the Red Hill Shaft should be independent of making a risk-informed selection of the tank upgrade alternative (TUA). The interim model needs more data to ensure a well-informed TUA decision. Proposing to use Red Hill Shaft as a capture well for leaked fuel in the interim model without adequate data and analysis of important uncertainties is not recommended. Furthermore, suggesting that there is a barrier to groundwater flow across South Halawa Valley on the basis of a single borehole log is not good science. During the November AOC meeting, the Navy presented evidence and its expert made statements that indicate there has been at least one unreported release of fuel in 2005

that reached the water table, which suggests there have been other unreported fuel leaks in the past.

General Comments

The proposal to focus the interim groundwater modeling on capture of fuel contaminated groundwater by the Red Hill Shaft introduces a bias without also evaluating the risks to our water supply points and Sole Source Aquifer given the many hydrogeologic uncertainties. Given that the Regulatory Agencies asked that the interim model be used to inform the TUA selection process, the proposed modeling approach will provide little to no useable or defensible information about the fate and transport risks from Red Hill to our aquifer and water supplies to this selection process. Choosing to model the potential capture zones created by pumping at Red Hill Shaft to capture or contain fuel releases from the Red Hill Bulk Fuel Storage Facility assumes that the capture zone will work for all future conditions far into the future. The capture zone modeling approach precludes contaminated groundwater migrating from Red Hill to Halawa Shaft and Moanalua Wells. So how will the interim model provide any useful information in choosing a TUA that minimizes the risk to our drinking water from Red Hill tank fuel leaks? We hope that the Regulatory Agencies understand that the proposed interim modeling approach will provide little to no information about risk to our drinking water and so it is not fit for the purpose of informing the TUA selection. The Regulatory Agencies should direct the Navy to conduct modeling that directly evaluates the risks to our water supply points and Sole Source Aquifer and fully incorporates uncertainty through a constrained Monte Carlo uncertainty analysis.

From our viewpoint, the Parties appear to be confident that operating Red Hill Shaft as a pump and treat system will protect Halawa Shaft, Moanalua Wells, and other water resources. The Parties need to collect the data and conduct the necessary pilot studies to validate its pump and treat approach. Pump and treat alone is not a long-term solution for protecting our water resources without simultaneously installing a TUA capable of interstitial monitoring and tank wall inspection.

The BWS would like to remind the Regulatory Agencies of the need to protect our groundwater resources as described in Sections 1, 7, and 9 of Article XI of the Hawaii State Constitution. The proposed approach to pump and treat Red Hill Shaft should not be a reason to select a low cost TUA that has a low probability of leaks. Choosing the TUA with the smallest probability of leaks will ensure the effectiveness and success of the pump and treat system.

The interim modeling approach proposed during the meetings contradicts the statements about Red Hill hydrogeology made by the Navy's contractor. John

Thackston of AECOM indicated that the hydraulic conductivity of the basalt aquifer along the Moanalua side of Red Hill Shaft is "ten times larger" than the hydraulic conductivity near the Red Hill Shaft pumps (Halawa side). Mr. Thackston based his conclusions on the different inflow rates reported along the Red Hill Shaft length during its construction. At the same time, Dr. Sorab Panday of GSI stated that they will assume a constant hydraulic conductivity for the basalt aquifer in the interim model, which contradicts Mr. Thackston's statement that there is large variability in basalt hydraulic conductivity. This is an important contradiction because the extent of the Red Hill Shaft's capture zone will likely be affected by such a large variation in hydraulic conductivity and the proposed modeling approach will not provide any analysis of how such variations affect the capture zone extent. The Regulatory Agencies should understand that if the Red Hill Shaft begins operating as a pump and treat system, most of the water pumped will come from the Moanalua side of the shaft because it has a far higher hydraulic conductivity than the remainder of the shaft. If most of the pumped water comes from the Moanalua side of the shaft, then relatively little water will come from the Halawa side, which will likely limit the capture zone extent on the Halawa side. We ask that the Regulatory Agencies direct the Navy to investigate the effects of spatial variations in hydraulic conductivity in the basalt aquifer on capture zone extent and efficacy.

The BWS asks that the Regulatory Agencies consider the following important conditions for planning the use of Red Hill Shaft as a pump and treat system:

1. A written commitment to install a properly designed pump and treat system at Red Hill Shaft.

2. Ensure that pump and treat does not preselect a lower cost TUA with a higher probability of fuel leaks.

3. Impacts of long-term pumping on groundwater levels and salinity in the area.

4. Obtaining the data and analyses needed to validate the pump and treat design.

During the November 16, 2017 AOC Section 6 and 7 meeting, the Navy's contractor presented information that confirms our concerns about past unreported fuel leaks at Red Hill. Dr. Ileana Rhodes of GSI presented concentration plots for two fuel constituents that had values that met or exceeded their effective solubility values for jet fuel in 2005 and perhaps in 2006. Dr. Rhodes stated that the effective solubility of naphthalene in jet fuel is about 80 micrograms per liter (μg/l) and is about 5,000 μg/l for diesel range total petroleum hydrocarbons. Dr. Rhodes agreed with BWS that the concentrations for these two analytes observed at monitoring well RHMW02 indicated

that fuel had reached the groundwater near the well during that time period. Mr. Steve Linder of the United States Environmental Protection Agency expressed to us his agreement with this conclusion. Based on the information currently available to the BWS, there is no Navy report of a leak at Red Hill during this 2005-2006 period. How will the Regulatory Agencies address this unreported 2005-2006 release as well as the very real likelihood that there have been other unreported fuel releases in the historical and recent past?

We are concerned about statements made on multiple occasions during the November meetings by the Navy's contractors that the materials found while drilling monitoring well RHMW11 in South Halawa Valley act as a "barrier" to groundwater flow between Red Hill and Halawa Shaft. A single well with saprolite cannot justify the presence of such a barrier. No evidence was presented about the hydraulic properties of the interval logged as saprolite at monitoring well RHMW11. A barrier can only be present if it has sufficient length and thickness below the water table and if it has hydraulic conductivity values that are uniformly much lower than the basalt aquifer hydraulic conductivity values. The BWS asks the Regulatory Agencies to request that the Navy acquire and provide site-specific data that are of sufficient number and quality to scientifically support the presence of groundwater barrier in South Halawa Valley. Until that time, we ask the Regulatory Agencies to request that the Navy conduct all modeling and analyses with the assumption that there is no barrier.

We continue to ask that the Navy distribute meeting handouts and other information documents two weeks prior to the start of each meeting to ensure subject matter experts, the BWS, and other stakeholders are afforded the opportunity to thoroughly review the materials ahead of time. We also request that the Navy and its contractors provide copies all materials disclosed at the meeting that they committed to share with subject matter experts.

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

Very truly yours,

ERNEST Y. W. LAU, P.E.
Manager and Chief Engineer

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