

# BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU  
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May 24, 2018

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Mr. Omer Shalev  
United States Environmental Protection Agency  
Region IX  
75 Hawthorne Street  
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and

Ms. Roxanne Kwan  
State of Hawaii  
Department of Health  
Solid and Hazardous Waste Branch  
2827 Waimano Home Road  
Pearl City, Hawaii 96782

Dear Mr. Shalev and Ms. Kwan,

Subject: Honolulu Board of Water Supply (BWS) Comments on the Groundwater Flow Model Progress Report 04, Red Hill Bulk Fuel Storage Facility (RHBFSF), dated April 5, 2018

The BWS offers the following comments on the above referenced document. This Department of Navy (DON) progress report (DON, 2018) describes the activities already completed and to be completed as part of the Groundwater Flow Model (GWFM) work conducted under the Administrative Order on Consent (AOC) Statement of Work (SOW) Section 7.

While we did not directly comment on the previous three groundwater model progress reports, the BWS chose to comment on this particular report given the most recent Groundwater Model Working Group (GMMWG) meetings. According to DON (DON, 2018), "*The working group was formed to coordinate the Navy's development of accurate and reliable groundwater flow and contaminant fate and transport (CF&T) models, and solicit technical feedback from stakeholders during the model development process.*" Based on the available data and Navy's statements and presentations made during the GMMWG meetings, the BWS has concluded the Navy and its modeling team ignore our extensive technical feedback and the interim groundwater model developed to date is neither accurate nor reliable.

The BWS has provided the AOC Parties with technical feedback through our questions and comments made in person at the GMMWG meetings and through our numerous comment letters (Lau, 2017a; Lau, 2017b; Lau, 2017c; Lau, 2017g; Lau, 2018a; Lau, 2018b; Lau, 2018d; and Lau, 2018e). BWS has also provided technical feedback on plans related to the groundwater modeling efforts (Lau, 2017d; Lau, 2017e; Lau, 2017f; and, Lau, 2018c). Our letters explain our most important concerns with the data and approaches used to construct, calibrate, and apply groundwater models. Our attendance during the GMMWG meetings and our written inputs have made significant demands on our resources, yet the various versions of the interim groundwater model do not reflect any of our most important concerns, even after ten GMMWG meetings.

In our comment letter for the ninth GMMWG meeting (Lau, 2018e), the BWS showed how the interim groundwater flow model's predicted 2017 steady-state groundwater levels did not match any measured levels made during six different months in 2017 at the monitoring wells at the RHBFSF. Data presented by the Hawaii Department of Health (DOH) and the United States Geological Survey (USGS) during the April 13, 2018 GMMWG meeting further demonstrated the interim groundwater model's inability to provide a reasonable match to observed groundwater levels in the areas of interest. Based on our examination of the available data and the Navy's modeling approach as described in our comment letters, we believe that the interim groundwater flow model's predicted groundwater levels would provide a much better match to measured groundwater levels if the Navy had addressed a number of our concerns and recommendations. Recent comments made by subject matter experts (SMEs) for the Regulatory Agencies (Beckett, 2018; Tonkin, 2018) echo many of our most important concerns.

Apparently, the Navy has carried out a sizeable amount of work as described in the groundwater model progress report (DON, 2018), but we question whether there has been sufficient progress toward an "accurate and reliable" groundwater flow model. At present, all the available information shows that the Navy interim groundwater flow model cannot give us "accurate and reliable" predictions of groundwater levels in the RHBFSF and its surroundings. The interim groundwater model's inability to match observed groundwater levels or patterns during 2017 renders the interim groundwater model not fit to provide defensible fate and transport inputs to the tank upgrade alternative (TUA) selection process. Progress to date, in our opinion as an SME, has yielded an interim groundwater flow model that cannot match any of the groundwater levels observed during 2017 to a reasonable degree while also continuing to employ non-conservative assumptions about hydrogeologic units, hydraulic properties, and groundwater flow directions. Therefore, given that this interim groundwater model is neither accurate, nor reliable, nor technically defensible for predicting groundwater flow in the area of concern or providing defensible inputs to the TUA selection process, we recommend that the Regulatory Agencies work with the Navy to develop a new work

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plan that will provide the AOC Parties and the SMEs with a groundwater flow model that is accurate, reliable, and defensible.

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

cc: Mr. Steve Linder  
United States Environmental Protection Agency  
Region IX  
75 Hawthorne Street  
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Mr. Mark Manfredi  
Red Hill Regional Program Director/Project Coordinator  
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850 Ticonderoga Street, Suite 110  
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#### References

- Beckett, G. 2018. Memo to Ms. G. Fenix Grange, Hawaii Department of Health: Comments on the State of the Conceptual Site Model and Related Evaluations for the Navy Red Hill Tank Farm Facility, Pearl City, Hawai'i. Letter dated February 15, 2018.
- Lau, E. 2017a. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Groundwater Modeling Working Group Meeting No. 2 held June 26, 2017. July 3, 2017.
- Lau, E. 2017b. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Groundwater Modeling Working Group Meeting No. 3 held August 17, 2017. August 28, 2017.

- Lau, E. 2017c. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Groundwater Modeling Working Group Meeting No. 4 held September 22, 2017. October 18, 2017.
- Lau, E. 2017d. Board of Water Supply Comments on the Attenuation Evaluation Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility Administrative Order on Consent (AOC) in the Matter of Red Hill Bulk Fuel Storage Facility, EPA Docket Number RCRA 7003-R9-2015-01 and OOH Docket Number 15-UST-EA-01, Attachment A, Statement of Work (SOW) Section 6.2, Section 7\_1-2, Section 7.2.2, and Section 7.3.2 dated September 1, 2017. October 24.
- Lau, E. 2017e. Board of Water Supply Comments on the Groundwater Model Evaluation Plan (GMEP), Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility Administrative Order on Consent (AOC) in the Matter of Red Hill Bulk Fuel Storage Facility, EPA Docket Number RCRA 7003-R9-2015-01 and OOH Docket Number 15-UST-EA-01, Attachment A, Statement of Work (SOW) Section 6.2, Section 7\_1-2, Section 7.2.2, and Section 7.3.2 dated September 8, 2017. November 13.
- Lau, E. 2017f. Board of Water Supply Comments on the Conceptual Site Model Development and Update Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility Administrative Order on Consent (AOC) in the Matter of Red Hill Bulk Fuel Storage Facility, EPA Docket Number RCRA 7003-R9-2015-01 and OOH Docket Number 15-UST-EA-01, Attachment A, Statement of Work (SOW) Section 6.2, Section 7\_1-2, Section 7.2.2, and Section 7.3.2 dated September 1, 2017. November 13.
- Lau, E. 2017g. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Groundwater Modeling Working Group Meeting No. 5 held November 17, 2017. December 19, 2017.
- Lau, E. 2018a. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Groundwater Modeling Working Group Meeting No. 6 held December 20, 2017. January 25, 2018.
- Lau, E. 2018b. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6

and 7 Groundwater Modeling Working Group Meeting No. 7 held January 11, 2018. February 13, 2018.

- Lau, E. 2018c. Board of Water Supply Comments on the Sentinel Well Development Plan, Investigation and Remediation of Releases and Groundwater Protection and Evaluation, Red Hill Bulk Fuel Storage Facility Administrative Order on Consent (AOC) in the Matter of Red Hill Bulk Fuel Storage Facility, EPA Docket Number RCRA 7003-R9-2015-01 and OOH Docket Number 15-UST-EA-01, Attachment A, Statement of Work (SOW) Section 6.2, Section 7\_1-2, Section 7.2.2, and Section 7.3.2 dated December 11, 2017. March 13, 2018.
- Lau, E. 2018d. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Groundwater Modeling Working Group Meeting No. 8 held February 12, 2018. March 21, 2018.
- Lau, E. 2018e. Honolulu Board of Water Supply (BWS) Comments on the Red Hill Administrative Order on Consent (AOC) Statement of Work (SOW) Sections 6 and 7 Groundwater Modeling Working Group Meeting No. 9 held March 16, 2018. April 26.
- Tonkin, M. 2018. Letter to Mr. B. Pallarino, United States Environmental Protection Agency and Ms. G. Fenix Grange, Hawaii Department of Health: Comments on Presentation Materials from the Red Hill Groundwater Modeling Working Group (GMMWG) Meeting#7 and Status of Interim Modeling as Presented Associated with Administrative Order on Consent ("AOC") Statement of Work Requirements 7.1.3 (Groundwater Flow Model Report) and 7.2.3 (Contaminant Fate and Transport Report). Letter dated February 19, 2018.