



STATE OF HAWAII
DEPARTMENT OF HEALTH
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In reply, please refer to:
File: 22-027 LG

March 3, 2022

TO: Rear Admiral Timothy Kott
Commander Navy Region Hawaii
[via email only]

THROUGH: Kathleen S. Ho, Deputy Director *Kathleen Ho*
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**SUBJECT: Amendment of the Hawaii Department of Health Public Health
Advisory No. 21-165 related to the Joint Base Pearl Harbor-Hickam
Public Water System (PWS No. 360) Flushing Zone G1**

This memo serves as official notification that the Hawaii Department of Health (DOH) Safe Drinking Water Branch (SDWB) and Hazard Evaluation and Emergency Response (HEER) Office have reviewed the data provided by the Interagency Drinking Water System Team (IDWST) and have determined that the drinking water quality and system infrastructure satisfies all lines of evidence for amending the public health advisory dated November 29, 2021 (see enclosure).

At this time, the water is determined to be safe for drinking in Flushing Zone G1; and all Navy water system users within this zone may now use their water for all purposes including drinking, cooking, and oral hygiene. This includes consumption by pets.

Rear Admiral Timothy Kott

March 3, 2022

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Several residential homes in Flushing Zone G1 exceeded DOH's Total Organic Carbon (TOC) Incident Specific Parameter (ISP) set at two (2) parts per million (ppm). Although there are no health-based standards for TOC, it is important for DOH to evaluate TOC in water distribution systems when levels are at or above DOH's ISP. TOC can also be an indicator of other issues within a water distribution system that can impact drinking water quality and potentially public health. In addition, TOC analysis is used as a marker of the possible presence of disinfection byproducts. TOC are naturally occurring organic molecules found in water and when elevated levels of these organic molecules come in contact with chlorine, disinfection byproducts can be formed. These disinfection byproducts do have health-based standards and if not monitored and managed effectively, could exceed regulatory Maximum Contaminant Levels. Investigating TOC levels are appropriate management controls when operating a water system.

Therefore, due to the cluster of elevated TOC results found at locations 2133, 2151, 2165, and 2173 Baugh Road and 739, 749, 751, 755, 761, and 763 Anderson Road at a range of 7.22 – 12.6 ppm, DOH is requiring Navy to complete the following investigative procedures within 45 calendar days after amendment of this zone and in chronological order as stated below:

1. Perform a cross-connection survey representing the above cluster of buildings;
2. Sample for TOC at same locations identified above;
3. Sample for free chlorine at same locations identified above;
4. Re-flush according to the building flushing plan;
5. Sample for TOC at same locations identified above; and
6. Sample for free chlorine at same locations identified above.

The Joint Base Pearl Harbor-Hickam Public Water System (PWS No. 360) is subject to all applicable requirements under the Safe Drinking Water Act, in addition to the commitments made within the IDWST for Long Term Monitoring. If new information becomes available that indicates contaminants are present in the drinking water that poses a threat to public health, additional investigations may be required or conducted.

Enclosures: DOH Checklist to Amend the Public Health Advisory in Flushing Zone G1

c: IDWST (w/encls.) [via IDWST@IDWST.onmicrosoft.com]

DOH Checklist to Amend the Public Health Advisory in Flushing Zone G1



Zone G1 Checklist to Amend the Public Health Advisory initiated November 29, 2021 for Joint Base Pearl Harbor-Hickam Public Water System No. 360 HEER Incident Case No.: 20211128-1848

Purpose: This checklist identifies the documentation and review that the Hawaii Department of Health (DOH) conducted to **amend** the Public Health Advisory (Advisory) in each Zone under the *DOH's Guidance on the Approach to Amending the Drinking Water Health Advisory, dated December 30, 2021*. This review was conducted as an oversight role in addition to the review conducted as a part of the Interagency Drinking Water System Team (IDWST).

DOH's priority is to protect the public health and environment of the people of Hawaii. DOH will evaluate the "lines of evidence" that must be met before amending the health advisory and issuing notices that the water can be used for all purposes including drinking. The Navy must also commit to following the long-term monitoring (LTM) of system water quality for this incident under the IDWST Drinking Water Sampling Plan, as amended.

Background: A chemical release of petroleum, which is a hazardous substance, entered the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water distribution system and the Red Hill Shaft. This release triggered an

emergency response and DOH issuance of an Advisory on November 29, 2021 for the entire JBPHH Public Water System No. 360. State and Federal Drinking Water (DW) Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act do not adequately address petroleum contamination of drinking water. DOH has established Environmental Action Levels (EALs) and Incident Specific Parameters (ISPs) to more comprehensively monitor and respond to petroleum contaminated drinking water. Any contaminants that exceed the State and Federal DW MCLs, EALs, or ISPs require additional action prior to amending the Advisory. Satisfaction of the lines of evidence will be achieved by evaluating the data generated during the investigation conducted by the IDWST. The data will be assessed for each Zone of the Drinking Water Distribution System Recovery Plan. All lines of evidence will require documentation.

DOH Project Screening Levels: State and Federal Drinking Water MCLs, specified State EALs, and ISPs are considered in development of Project Screening Levels. The actions for the thresholds for each contaminant are listed in *DOH's Guidance on the Approach to Amending the Drinking Water Health Advisory*.

DOH Checklist to Amend the Public Health Advisory in Flushing Zone G1



Objective 0 - Introduction to Lines of Evidence Under Evaluation / Document Summary

Reference	Status	Documentation
Tab 0	Complete	DOH Checklist to Amend the Drinking Water Health Advisory
Tab 0.1	Complete	<ul style="list-style-type: none"> Executive Summary Memo for Zone G1 Removal Action Report, dated February 24, 2022 Signed statement by the Owner/Operator Representative of the Water System, that asserts that all lines of evidence have been met, including the following statement with a signature: "I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the submitted information is true, accurate, and complete."

Objective 1a – Line of Evidence: Reported sources of contamination are isolated and contained.

Incident Specific Criteria - Contamination from **Red Hill Shaft** is isolated from Navy's water distribution system.

Reference	Status	Documentation
Tab 1a.0	Complete	Executive Summary Memo, dated February 19, 2022.
Tab 1a.1	Complete	Memorandum for Record documenting that the Red Hill Shaft has been physically disconnected from the NAVFAC system, dated 04 January 2022.
Tab 1a.2	Complete	Summary of Operator Logs and SCADA data that Waiawa Shaft is the single source of water for the NAVFAC system since 03 December 2021, dated February 10, 2022.
Tab 1a.3	Complete	Photograph of concrete blocking between air gapped isolation flanges.

Objective 1b – Line of Evidence: The regulated public water system's water quality data is compliant.

Incident Specific Criteria - Data does not exceed Federal DW MCLs, specified State EALs, and ISPs for **Waiawa Shaft (only source of the drinking water)**.

Reference	Status	Documentation
Tab 1b.0	Complete	Executive Summary Memo, dated February 17, 2022.
Tab 1b.1	Complete	<ul style="list-style-type: none"> Sample Results for Waiawa Shaft (the source) taken 1/13/2022 Level 4 Validated Laboratory Report for EPA Methods 8260 (VOCs), 8270 (SVOCs), 8015 (TPH-G, TPH-D, TPH-O) plus Tentatively Identified Compounds (TICs) Sample Results of Waiawa Shaft Entry Point (after treatment) taken 1/11/2022 Level 4 Validated Laboratory Report for Sampling Plan Addendum 1, Table 3a: Distribution Sampling (Step 2b) Summary Drinking Water Analytical Methods, Analytes, Action Levels, and Method Detection Limits

DOH Checklist to Amend the Public Health Advisory in Flushing Zone G1



Objective 1c – Line of Evidence: No additional contamination through the distribution system is occurring.

Incident Specific Criteria - Cross Connection Control investigation shows distribution system is protected, resulting in no additional sources of contamination.

Reference	Status	Documentation
Tab 1c.0	Complete	Executive Summary Memo, dated February 19, 2022.
Tab 1c.1	Complete	Certificate Regarding Cross-Connection Control Review and Confirmation – Zone G1, dated February 19, 2022, verifying that building and service connections with petroleum activities are protected from backflow risks with the following documentation: <ul style="list-style-type: none"> • A “gap analysis” of the petroleum related activities versus appropriate device inventory (i.e., inappropriate device, missing Cross-Connection Control protection, untested device, etc.). • A map that includes: All facilities with petroleum activities; locations of existing backflow prevention devices; and Water system infrastructure. • An inventory database: A list of petroleum-related activities and identified appropriate cross connection control (CCC) devices at these activities, as required, i.e., if there was human consumptive use and where cross connection potential or hazard was identified.
Tab 1c.2	Complete	COMNAVREG HAWAII INSTRUCTION 11330.2D, dated 19 Sep 2016, Backflow Prevention and Cross-Connection Control Program

Objective 2a – Line of Evidence: Water within the distribution system does not exceed State and Federal DW MCLs, specified State EALs, and ISPs.

Incident Specific Criteria –

- Zone flushing plan demonstrates entire distribution system is flushed.
- Sample results show the water in distribution system does not exceed State and Federal DW MCLs, specified State EALs, and ISPs. (Guidance Table 2 and Table 3)
- Drinking water does not show sheen, olfactory evidence, or other qualitative methods of petroleum.

Reference	Status	Documentation
Tab 2a.0	Complete	Executive Summary Memo, dated February 19, 2022.
Tab 2a.1	Complete	Memorandum for the Record of the Distribution System Recovery Plan Addendum – Zone G1 Analysis, dated 25 Jan 2022, which includes: <ul style="list-style-type: none"> • Hydraulic model that exhibits and flushing line map(s) and plan to show that the flushing approach will achieve directional flushing. • A one-page high resolution zonal flushing map should be provided. • Narrative of assumptions in the development of the Navy flushing model inclusive of any simulations that the Navy ran.

DOH Checklist to Amend the Public Health Advisory in Flushing Zone G1



Objective 2a – Line of Evidence: Water within the distribution system does not exceed State and Federal DW MCLs, specified State EALs, and ISPs.

Incident Specific Criteria –

- Zone flushing plan demonstrates entire distribution system is flushed.
- Sample results show the water in distribution system does not exceed State and Federal DW MCLs, specified State EALs, and ISPs. (Guidance Table 2 and Table 3)
- Drinking water does not show sheen, olfactory evidence, or other qualitative methods of petroleum.

Reference	Status	Documentation
Tab 2a.2	Complete	Summary with documentation from Dr. Whelton discussing flushing goals providing validity of volumetric exchange model, dated February 15, 2022.
Tab 2a.3	Complete	Identification of consecutive flushing zones and flushing phasing order. Time based contaminant slug model showing possible migration of contaminant from Red Hill Shaft used to identify zones requiring additional volumetric flushing (Hydraulic Model)
Tab 2a.4	Complete	Table showing volumetric goals and recorded flushing volumes that occurred in the field for the distribution system.
Tab 2a.5	Complete	Certification of Water Storage Facilities and Water Source for Zones A1, A2, A3, B1, C1, C2, C3, D1, D2, D3, D4, G1, E1, F1, F2, H1, H2, H3, and I1, dated February 26, 2022, with: <ul style="list-style-type: none"> • Joint Base Pearl Harbor Hickam Potable Water System Description, dated February 26, 2022 • S1 and S2 Water Storage Tank Flushing Report Memo, dated February 11, 2022 • Inspection, Maintenance, and Cleaning of Potable Water Tanks Memorandum for Record, dated 25 February 2022 • Ford Island/Shipyard Water Transmission Line Status Memorandum for Record, dated 22 February 2022 • JBPHH/Iroquois Point Water Transmission Line Status Memorandum for Record, dated 25 February 2022 • Board of Water Supply Interconnection Status Memorandum for Record, dated 22 February 2022
Tab 2a.6	Complete	<ul style="list-style-type: none"> • Distribution System Exceedance Investigation Summary and Results, dated February 24, 2022. • Drinking Water Distribution System Recovery Plan: Stage 2 Sampling Results for Zone G1, JBPHH, dated 28 January 2022.

DOH Checklist to Amend the Public Health Advisory in Flushing Zone G1



Objective 2b – Line of Evidence: Water in premise plumbing of homes/buildings does not exceed State and Federal DW MCLs, specified State EALs, and ISPs.

Incident Specific Criteria –

- Flushing Plan includes procedures to ensure no service connections will re-contaminate the distribution system.
- Sample Plan includes 72-hour stagnation to account for leaching of contaminants from premise plumbing.
- Sample results show water in premise plumbing of homes/buildings does not exceed State and Federal DW MCLs, specified State EALs, and ISPs.

Reference	Status	Documentation
Tab 2b.0	Complete	Executive Summary Memo, dated February 20, 2022.
Tab 2b.1	Complete	Records of Completed Residential and Non-Residential Flushing Zone G1, dated 28 February 2022, with: <ul style="list-style-type: none"> • EDMS Residential Flushing Records Zone G1 • EDMS Non-Residential Flushing Records Zone G1 • NAVFAC SCADA Data Zone G1 21 Jan 2022 to 25 Jan 2022 (for the Distribution System pressure logs during flushing and confirmation that the 30 psi within the distribution system was maintained).
Tab 2b.2		Sample Results, Level 2 and Level 4 Validated as required by Sampling Plan Section 6.0, report from EDMS, dated February 27, 2022.
Tab 2b.3		Exceedance Investigation Summary and Results Zone G1, dated February 28, 2022.
Tab 2b.4	Complete	Memorandum for Record showing that irrigation flushing is complete, dated February 19, 2022.
Tab 2b.5	Complete	DOH Guidance for Active Irrigation Line Purging and Flushing