



REGION 9

SAN FRANCISCO, CA 94105

December 20, 2023

Sent via electronic mail only

RDML Steve Barnett, USN
Commander, Navy Region Hawaii
850 Ticonderoga St, Ste 110
JBPHH, HI 96860-5101

Subject: EPA Investigation Report on October 2023 Drinking Water Complaints

Dear Rear Admiral Barnett,

On October 19, 2023, the United States Environmental Protection Agency, Region 9 (EPA) conducted an investigation into complaints about the drinking water served by the Joint Base Pearl Harbor Hickam public water system ("System"). Enclosed is EPA's Investigation Report ("Report") for the System. The Report evaluates the System's complaint process to ensure safe drinking water in accordance with the Safe Drinking Water Act (SDWA) and its implementing regulations.

EPA understands that Navy is conducting a premise plumbing investigation in response to the drinking water complaints from October 2023. Please promptly share all data collected (i.e. full laboratory reports) as a result of the premise plumbing investigation with EPA and Hawaii Department of Health.

Upon completion of the premise plumbing investigation, please update the System's drinking water complaint Standard Operating Procedures and send to EPA for review. In addition, EPA would like to see long-term drinking water monitoring continue past February 2024, which is when the Drinking Water Long-Term Monitoring Plan is set to expire. EPA requests Navy to propose a new long-term monitoring plan that incorporates the findings and efforts from the ongoing premise plumbing investigation.

Should you have any technical questions regarding the Report, please feel free to direct them to Christopher Chen at (213) 244-1853.

Sincerely,

AMY MILLER-
BOWEN

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Amy C. Miller-Bowen, Director
Enforcement and Compliance Assurance Division

cc: Karnig Ohannessian, U.S. Navy
Captain Marc Williams, U.S. Navy
Vice Admiral John Wade, Joint Task Force – Red Hill
Kathleen Ho, Hawaii Department of Health
Healani Sonoda-Pale, Red Hill Community Representation Initiative

EPA Drinking Water Complaints Investigation Report

Joint Base Pearl Harbor-Hickam Public Water System

Investigation Date: October 19, 2023

Report Date: December 18, 2023

EPA Inspectors: Christopher Chen (author), Heidi Rausch



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SECTION I – INTRODUCTION

EPA was notified of a number of complaints from residents served by the Joint Base Pearl Harbor-Hickam public water system (System). The System is located in Hawaii on the island of Oahu. I conducted the complaint investigation on October 19, 2023. Heidi Rausch accompanied me on all the home visits. I called all the homes prior to arrival to ensure availability and consent. I attempted to contact a sixth resident but was unable to reach the resident after repeated phone calls.

After conducting the investigation, I notified DOH of all the residents who were interested in drinking water samples in accordance with the Drinking Water Long-Term Monitoring Plan (LTMP).¹ LTMP, effective June 2022 after agreement between Navy and DOH, was developed as a surveillance tool to ensure water served by the System is meeting all state and federal drinking water standards and is free of petroleum. The LTMP became an enforceable document when EPA and Navy signed an Administrative Consent Order on June 2, 2023.²

DOH coordinated with Navy and Navy collected samples at all the identified homes on October 20, 2023. DOH was present to oversee the collection of the LTMP samples. The samples were analyzed for total organic carbons, petroleum hydrocarbons, metals, synthetic organic compounds, volatile organic compounds, and disinfection byproducts. Results are compared to DOH's screening levels and can also be compared to any applicable EPA Maximum Contaminant Levels (MCLs). An MCL is the highest level of a contaminant that is allowed in drinking water and is an enforceable standard.

SECTION II – OBSERVATIONS

Resident #1

A) Concerns

When explaining symptoms, the resident never had migraines until right after the November 2021 incident. The resident stated that the water periodically would have an oily sheen. In the past week, the resident has had drier skin.

B) Emergency Operations Center (EOC) Response

The resident had not contacted the EOC recently as the resident did not think there was any point as the EOC always just says the water is safe. The resident acknowledged that the EOC responded quickly and the Navy representatives were respectful. The resident added that the Navy representatives did not explain what they were sampling for, and the resident was not notified of the results. The resident did not believe the Navy

¹ Weblink to the LTMP: <https://health.hawaii.gov/about/files/2022/08/JBPHH-Drinking-Water-LTM-Plan-FINAL-20220823.pdf>

² Weblink to EPA's Administrative Consent Order: <https://www.epa.gov/red-hill/red-hill-2023-consent-order>. The provision about the LTMP may be found in Section 6.2 of the Statement of Work (pg. 59 of the pdf).

website was very good – it was not intuitive, it lagged a lot, and sometimes did not work.

The resident last contacted the EOC around February 2023 due to an oily sheen in the water.

C) Additional Sampling

I did not inquire with the resident about additional drinking water samples pursuant to the LTMP conducted by Navy as I was not aware this was an option until later in the day, after a phone call with Department of Health (DOH).

Resident #2

A) Concerns

The resident's infant had a severe rash. Resident acknowledged that the infant has eczema but shared that the rash was occurring on top of the eczema. According to the resident, the doctor believed the cause of the rash was different than the eczema but did not know the cause. The resident further explained that the rash seemed to occur after the infant began to routinely take baths with the tap water. The symptoms seemed worse after bathing. The resident also shared that they were aware of a couple other residents who had children with rashes as well.

The resident has periodically observed an oily sheen in the water, which was last observed one week ago. The resident has not noted any odor or taste concerns recently. During the November 2021 incident, the sprinklers smelled like gas.

The resident's partner had back pain during the peak of the November 2021 incident and has had lipomas on the back ever since moving to Hawaii. The resident also shared that they have had stomach issues and allergies that began a couple of years ago as well.

B) EOC Response

The resident called the EOC on 10/17/2023. The EOC responded quickly, sending two Navy representatives out the same day to take a rapid test at two locations within the home. The resident received results after calling the next day. The resident asked for paperwork demonstrating the negative result; EOC instructed the resident to look up the result on Safe Waters website for documentation.

C) Additional Sampling

I asked the resident whether I could share contact information so the Navy could collect more comprehensive drinking water samples pursuant to the LTMP with oversight from DOH. The resident expressed interest in this sampling effort.

The drinking water samples did not detect the presence of petroleum hydrocarbons. There were detects for some metals but levels were far below DOH's screening level and EPA MCLs.

Resident #3

A) Concerns

The resident recently developed a rash on the chest on 10/17/23 and went to the doctor. The doctor prescribed some allergy drugs. The resident also developed headaches the night of 10/18/23. The resident became very sick during the November 2021 incident and stated the development of these symptoms was very similar to the November 2021 incident. The resident was scared of a repeat of what happened in 2021 due to the similarities and wanted to do whatever possible to prevent the same health problems from a couple of years ago.

During the November 2021 incident, the resident also had migraines. Toxicology results showed presence of flame retardant and gasoline. The resident's dog had diarrhea and blood in the stool during the November 2021 incident. In addition, the resident shared that their previous neighbors got tinnitus and digestive issues during the incident and moved off the island because of the issues.

B) EOC Response

The resident called the EOC the morning of my visit. By chance, I was present at the home when the Navy representative visited the home in response to the call. I asked the Navy representative what type of samples would be collected. The representative did not know the answer and called a supervisor. I spoke to the supervisor on the phone about the sampling and also asked about adding this home as a site for more comprehensive drinking water testing pursuant to the LTMP. We agreed that I would coordinate with DOH instead about the addition of any homes for monitoring.

I observed the representative collect two samples of the rapid response test, one from the master bathroom and the other from the kitchen.

Navy collected LTMP samples back on March 29, 2022. Resident showed me the results briefly on the phone. From a glance, the results were non-detect for gasolines but appeared to have some detects on metals (I did not have a chance to observe the details as it was only a quick look when the resident showed it on the phone).

C) Additional Sampling

I asked the resident whether I could share contact information so the Navy could collect LTMP drinking water samples with oversight from DOH. The resident expressed interest in this sampling effort.

The drinking water samples detected the presence of petroleum hydrocarbons as diesel.

Resident #4

A) EOC Response

On 10/11/23, resident called the EOC. Two representatives came the same day and took a rapid response test from the kitchen sink. They tried to take off the aerator prior to sampling but were unable to remove it so took a sample with the aerator on. The resident received an email with the sample result the day of the visit (10/19/23); the result was non-detect. The representatives did not inform the resident what they were testing for and didn't share additional information.

B) Concerns

The family that lived in this home went off island for a long weekend and returned on 10/9/23. The following day, the resident began to wash clothes and dishes. The resident observed an oily film in the water, especially in the hot water setting. The resident had multiple cups in the row with an oily film and took photographs showing the oily film. To test that the cups were not contaminated, the resident poured bottled water into the cups and there was no oily film.

On 10/12/23, Resident #4's partner and child developed diarrhea symptoms. Resident #4 had heartburn and a burning stomach, a symptom that the resident had only ever had during the November 2021 incident and was particularly alarming to the resident. Resident #4 also had a rash on the chest/shoulder area develop the night of 10/18/23, which lasted for a few hours; photographs from the resident are available upon request. Another child in the home had ongoing headaches the past week.

The resident shared that one of the children began screaming after taking a shower on 10/16/23. The child screamed about pain on the bottom portion of the body for 30 minutes although no rash was observable. The adult resident stated that this unexplained screaming after a shower last happened for this child during the November 2021 incident.

I asked the resident to fill a cup of water from the kitchen sink. I noticed a light oily film in the water. The resident stated that the cold water seemed to have less of an oily film. The kitchen and showers all have filters attached.

The resident requested a water heater replacement but was declined. The resident was informed that the water heater would only ever be replaced if the unit was unable to actually heat the water.

C) Additional Sampling

I asked the resident whether I could share contact information so the Navy could collect LTMP drinking water samples with oversight from DOH. The resident expressed interest in this sampling effort.

The drinking water samples detected the presence of petroleum hydrocarbons as diesel.

Resident #5

A) Concerns

The resident has lived at the home since 2021, prior to the November 2021 incident. Resident has had sinus issues and been congested and groggy every morning for approximately the last year. The resident was diligent about preventing exposure to the tap water during the November 2021 incident and continued to limit exposure for at least four months after Navy gave the all-clear.

In the last 2-3 months, resident has had an irritation on the chest area but wasn't sure whether it was a rash since it wasn't very visible. The resident believes that the health problems of the past year are associated with water usage as they only developed after continuous usage of the tap water.

During the 2021 incident, resident observed the water had an oily film and an odor. The resident has not observed these issues with the water recently.

The resident also believed that the contaminated tap water may have killed pet fish. The water for the tank was replaced approximately four months ago using the tap water and all the fish died overnight.

B) EOC Response

This resident has not called the EOC recently. The Navy has never taken samples at the home but the resident believed University of Hawaii may have collected samples once. The resident expressed frustration about Navy claiming the water was safe in the neighborhood (Pearl City peninsula) before everywhere else after only flushing the water with no samples to demonstrate safety. Resident alleged that Navy claimed the Pearl City peninsula was unaffected by the November 2021 incident.

C) Additional Sampling

I asked the resident whether I could share contact information so the Navy could collect LTMP drinking water samples with oversight from DOH. The resident expressed interest in this sampling effort.

The drinking water samples detected the presence of petroleum hydrocarbons as diesel.

Sample Results

Five samples were collected on October 19 and 20, 2023: from the four residences discussed in this report and one from the Waiawa Shaft, the primary groundwater well providing the drinking water for the System.

- A) **Petroleum Hydrocarbons**: Three of the four homes had detections of petroleum hydrocarbons as diesel, ranging from 56 ppb to 71.2 ppb. None of the samples detected petroleum hydrocarbons as gasoline or oil. All petroleum hydrocarbon results were

below DOH's screening level of 266 ppb for total petroleum hydrocarbons. EPA has not set an MCL for petroleum hydrocarbons.

This may indicate the potential for a lingering presence of petroleum hydrocarbons somewhere within the distribution system or premise plumbing. As there were no petroleum hydrocarbons detected from Waiawa Shaft, there was no evidence of petroleum hydrocarbon contamination from the source (Waiawa Shaft is the only active groundwater well for the System at the time of this investigation).

It should be noted that the laboratory's method detection limit (MDL) was 50 ppb. The MDL is the minimum concentration of a substance that can be measured and reported with 99% confidence that the substance concentration is greater than zero. The analytical results are slightly above the MDL, which indicate the presence of the substance but at levels close to what the laboratory can actually quantify and may not be reliable.

- B) Metals: All the residences and Waiawa Shaft had very low-level detections of barium, copper, lead, and selenium. The levels do not likely pose any health risk and may be naturally occurring from the groundwater source due to the similar levels across all samples.
- C) Other Contaminants: There were no detections of synthetic organic compounds, volatile organic compounds, and haloacetic acids. Two homes had low-level detection of trihalomethanes, which are a disinfection byproduct – the levels are not likely to pose any health risk.

SECTION III – AREAS OF CONCERN AND RECOMMENDATIONS

After conducting an investigation into the complaints, I noted the following broader observations and have included recommendations for consideration.

1. The EOC was consistently very prompt at sending representatives to homes, always sending a representative out the same day as a received complaint.
2. The representatives sent by the EOC were always respectful but did not appear to clearly communicate with the residents their purpose or attempt to alleviate concerns.
3. The delivery of results from any rapid response tests was not always timely nor easily accessible to the residents.
4. Four of the residents stated the water had an oily sheen at some point since the November 2021 incident, with three reporting a sheen within the past year. One home had an oily film during my visit.
5. Four of the residents stated that rashes and/or skin irritation as a symptom within the last week. The rashes may have a potential connection with showering/bathing based on residents' descriptions.
6. Sampling results appeared to demonstrate the potential trace presence of petroleum hydrocarbons as diesel in three of the four homes.

Recommendations

1. Ensure that any representatives that engage with residents are trained to clearly communicate their mission and how residents will receive results. Results should be conveyed to the residents within 24-48 hours of Navy's notification of the sample results.
2. A one-page pamphlet may be an effective way for representatives to easily convey a clear and consistent message to all residents. Some information to consider including in a one-page pamphlet:
 - a. What is a rapid response test;
 - b. Why a rapid response test is being collected;
 - c. How and when results will be shared with residents;
 - d. If/when would Navy consider collecting samples in accordance with LTMP;
 - e. EOC contact information and any other relevant contact information; and
 - f. Information about Safe Waters and how to navigate the website to find results.
3. A number of complaints were associated with bathing, which may indicate an issue with water heaters at the homes. Inspection and/or sampling of water heaters and premise plumbing may help identify potential causes. Investigate whether flushing, maintenance and/or replacement of the water heaters at affected homes may resolve symptoms.
4. Further investigation by Navy into the oily film observed in the water and the potential trace presence of petroleum hydrocarbons from the samples is warranted. If the investigation determines it is not related to petroleum hydrocarbons from the public water system, then the investigation should seek to identify the root cause for what may be

producing the oily film and the detection of petroleum hydrocarbons due to the potentially widespread health concerns expressed by residents. Further investigation considerations could include, but are not limited to, petroleum hydrocarbon buildup in water heaters and bacterial contamination of premise plumbing.

5. If Navy's investigations point towards petroleum hydrocarbon contamination in the System's water mains, a full flushing of the distribution system may help clear any lingering contamination.
6. In Navy's complaint investigation procedures, the Navy should continue to investigate a complaint even if the rapid response test is non-detect. If the symptoms are not related to the presence of petroleum hydrocarbons in the drinking water, there may be other issues that need to be identified and resolved so customers are drinking potable water.
7. Navy should consider providing alternative water to any residents that alert the EOC of drinking water concerns, especially if waiting for sampling results or longer investigations.

Should you have any questions regarding this report, please direct them to:

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