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CITY AND COUNTY OF HONOLULU
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July 19, 2018

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Dr. Bruce S. Anderson
Director
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801-3378

Dear Dr. Anderson:

Subject: United States Navy (Navy) Calendar Year 2017 Fourth Quarter
(2017 Q4) Groundwater Monitoring Well Test Results - Department of
Health (DOH) Letter dated June 18, 2018

Thank you for your June 18, 2018 letter (DOH, 2018) in response to our letter dated April 26, 2018 (Lau, 2018). The subject of these letters is the Department of the Navy (Navy) 2017 4th Quarter (Q4) groundwater monitoring results from monitoring wells in and around the Red Hill Bulk Fuel Storage Facility (RHBFSF). The Q4 results show the level of total petroleum hydrocarbon as diesel (TPH-d) in Red Hill Monitoring Well No. 2 (RHMW02) increased to 1,600 parts per billion (ppb) compared to the previous quarter. Increases in TPH-d levels were also recorded in RHMW03 (210 ppb) and Red Hill Shaft (65 ppb) in addition to the oily waste disposal facility monitoring well No. 1 (OWDFMW01) site (110 ppb). Red Hill Shaft sample designation is RHMW2254-01.

In your letter dated June 18, 2018, the DOH stated “the concentration of TPH-d detected at Red Hill Shaft of 65 ppb in October 2017 does not meet or exceed the DOH environmental action level or federal drinking water standards. In addition, a duplicate groundwater sample was collected from this source at the sampling event and TPH-d was not detectable with a 25 ppb minimum detection limit. Therefore, the DOH is not requiring additional action from the Navy at this time.”

The Honolulu Board of Water Supply (BWS) has reviewed the analytical results from the primary and the duplicate groundwater samples collected from Red Hill Shaft during Q4. The tables indicate the primary and duplicate samples (designated as ERH409 and ERH 410, respectively) were both collected on October 24, 2017. The Navy stated in their report “The field duplicate imprecision indicate that sampling bias may exist in the collected sample volumes, but that the exact nature of the bias (high or low) cannot be determined due to the nature of the Relative Percent Difference (RPD) exceedance

(RPD = 200%). Due to this imprecision, there is uncertainty in the true concentrations of the TPH-d for this sample." (Navy, 2018). The Navy provided further comments in the DOH letter, stating the 2018 Q1 results for Red Hill Shaft were also non-detects (DOH, 2018).

The BWS strongly recommends collecting and testing additional samples to resolve the sampling bias, imprecision and uncertainty issues expressed by the Navy. The collection and testing of additional samples is a best practice for reconciling the presence or absence of contaminants. If those subsequent tests confirm the contaminant is present, then increasing the testing frequency is prudent (i.e. monthly) to track any long-term changes in the values.

The Navy's fourth quarter 2017 cumulative groundwater results show past detections of TPH-d in Red Hill Shaft. On June 28, 2005, three samples were collected and recorded TPH-d levels of 43 ppb, 67 ppb and 58 ppb. On September 8, 2005, 43 ppb was detected. On December 6, 2005, two samples detected 38 and 24 ppb respectively. On January 20, 2016, 20 ppb was detected. We believe these historical detections warrant monthly testing given Red Hill Shaft is an important drinking water source to Joint Base Pearl Harbor Hickam (JBPHH). On December 13, 2016, the BWS sent a letter to DOH transmitting the results of two independent studies the BWS commissioned to determine screening levels for TPH-d in drinking water. Both studies calculated values that were very consistent with DOH's TPH-d gross contamination (taste and odor threshold) environmental action limit (EAL) of 100 ppb and TPH-d Drinking Water Toxicity EAL of 160 ppb. In Fall 2017, the DOH relaxed these EALs by raising them to 500 ppb and 400 ppb, respectively. The BWS would like to know the detailed basis DOH used to relax the EAL standard and receive a copy of the data used to make its decision. The BWS believes the previous DOH EALs were protective of the environment, and human health and relaxing the EALs is a backsliding that is not in the best interest of our community. The BWS urges the DOH to reconsider and reinstate the 100 ppb and 160 ppb EAL values.

Finally, the Navy's 2018 Consumer Confidence Report (CCR) for JBPHH reports 65 ppb as the highest level of TPH-d detected in Red Hill Shaft for voluntary testing performed in 2017, on page 4 of the CCR (copy enclosed for reference). Where did the 65 ppb value come from? Did it come from the duplicate sample collected on October 24, 2017? This is the only detection recorded in calendar year 2017 based on the Navy's fourth quarter 2017 cumulative groundwater results shown on the DOH website. However, the Navy states, "there is uncertainty in the true concentrations of the TPH-d for this sample." (Navy, 2018). If so, then why does a Navy CCR report imprecise results to the Navy's customers? If not, is the Navy reporting a precise 65 ppb result in its CCR that was not included in the Navy's fourth quarter 2017 cumulative groundwater results report? Can you please clarify?

Dr. Bruce Anderson
July 19, 2018
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Thank you for the opportunity to comment. If you have any questions, please call Mr. 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
Mr. Stephen Anthony, United States Geological Survey
Mr. Mark Manfredi, NAVFAC Hawaii, Red Hill Regional Program Director/Project Coordinator

Enclosure

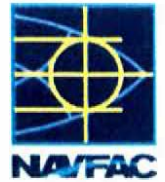
References

Board of Water Supply (BWS). 2018. United State Navy (Navy) Calendar Year 2017 Fourth Quarter (2017 Q4) Groundwater Monitoring Well Test Results available on the Department of Health (DOH) Web Site dated January 19, 2018. Letter from Mr. Ernest Y.W. Lau to Dr. Virginia Pressler, M.D. April 26.

Department of Health (DOH). 2018. U.S. Navy, 2017 Fourth Quarter Groundwater Monitoring Well Test Results. Letter from Dr. Bruce S. Anderson, Director of Health to Mr. Ernest Y.W. Lau. June 18.

Department of the Navy (Navy). 2018. Final Fourth Quarter 2017 – Quarterly Groundwater Monitoring Report, Red Hill Bulk Fuel Storage Facility. Joint Base Pearl Harbor-Hickam, O'ahu, Hawai'i, DOH Facility ID No.: 9-102271; DOH Release ID Nos.: 990051, 010011, 020028, and 140010. Naval Facilities Engineering Command Hawaii (NAVFAC Hawaii). Contract Number N62742-12-D-1829, CTO 0053. January.

Kriebel, David; Tickner, Joel; Epstein, Paul; Lemons, John; Levins, Richard; Loechler, Edward L.; Quinn, Margaret; Rudel, Ruthann; Schettler, Ted; and Stoto, Michael (Kriebel et al.). 2001. *The Precautionary Principle in Environmental Science*. Environmental Health Perspectives. Volume 109. Number 9. September.



Water Quality Report

Joint Base Pearl Harbor-Hickam Water System

(Waiawa, Halawa & Red Hill Sources)

This report meets federal and state requirements for Consumer Confidence Reports. This report is updated annually and reflects monitoring data collected up to Dec. 31, 2017.

The Navy is pleased to provide you with this year's annual Water Quality Report for the Joint Base Pearl Harbor-Hickam Water System.

This pamphlet provides information about the water that has been delivered to you over the past year. It describes where your water comes from, what it contains, and how it compares to standards for safe drinking water.

Our goal is, and always has been, to provide you safe and dependable drinking water.

Water Provider

The Naval Facilities Engineering Command (NAVFAC) Hawaii owns and operates the water system servicing your area. As the Navy water provider in the state, NAVFAC Hawaii primarily supplies water to military housing and installations.

Drinking Water Standards

The Environmental Protection Agency (EPA) and State of Hawaii regulations require us to test your water for contaminants on a regular basis, making sure it is safe to drink, and to report our results accordingly.

To ensure that tap water is safe to drink, EPA prescribes regulations which limit the amount of certain contaminants in water provided by public water systems. The Food and Drug Administration does the same for bottled water.

In the latest compliance monitoring period, we conducted tests for over 70 contaminants that have potential for being found in your drinking water. Tables 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, 1-7, and 1-8 show the levels of concentrations of regulated contaminants found in your water. In all cases, the levels measured met both EPA and State requirements for safe drinking water.

We are continually working to protect your drinking water from contaminants. The State of Hawaii's Department of Health completed the Source Water Assessment in 2004. This document

identifies the susceptibility of your water supply to contamination. The source water assessment is available for review by contacting NAVFAC Hawaii, Public Affairs, at 808-471-7300.

Source of Water

Your drinking water comes from three ground water sources: Waiawa, Halawa, and Red Hill. Ground water is naturally filtered as it travels from the surface to the aquifer below ground. The water is pumped up from the aquifer, disinfected, fluoridated, and piped into the distribution system.

The Radford Terrace Eastern Housing was temporarily supplemented with water from the Honolulu Board of Water Supply's (BWS) Kaluaao Wells and Punanani Wells for a brief portion of the year.

The Manana housing area is supplemented with water from the Honolulu Board of Water Supply's (BWS) Pearl City Shaft and Well 1.

Possible Source of Contaminants

The sources of drinking water (both tap water and bottled water) include: rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally-occurring minerals. It can also pick up other substances resulting from the presence of animals or human activity. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk.

More information about contaminants and potential health effects can be obtained by calling the EPA's Safe Drinking Water Hotline at 1-800-426-4791.

Potential Contaminants

Contaminants that may be present in your source water include:

Microbial contaminants – such as viruses and bacteria, which may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.

Inorganic contaminants – such as salts and metals, which can be naturally-occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.

Pesticides and herbicides – which may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.

Organic chemical contaminants – including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, and septic systems.

Radionuclide contaminants – which can be naturally-occurring or be the result of oil and gas production and mining activities.

Lead – If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. NAVFAC Hawaii is responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components.

When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to two minutes before using water for drinking or cooking. If you are concerned about lead in your water, you may wish to have your water tested.

Information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the Safe Drinking Water Hotline or at: <http://www.epa.gov/safewater/lead>.

Navy Water Requirements

In accordance with Navy policy, we add chlorine and fluoride to your water supply. These items are added to your drinking water after it is pumped from the ground. We try to maintain the Navy's recommended concentration of approximately 0.7 ppm for fluoride and 0.2 ppm for chlorine throughout the distribution system.

In January 2014, a fuel release from Tank #5 at the Red Hill Underground Fuel Storage Facility was reported. As a proactive measure, we have been conducting testing at the Red Hill Drinking Water Shaft above what is required by regulation for several years. Table 1-8 shows the levels of concentrations that were detected at the Red Hill Drinking Water Shaft and groundwater monitoring well for 2017. All concentrations are below applicable EPA and State regulatory and action levels and the drinking water is safe. We continue to conduct this voluntary testing and our data will be included in future Water Quality Reports.

Concerns/Additional Copies

NAVFAC Hawaii does not have routine meetings about the water system. For questions, information about the water system, or additional copies, please contact the NAVFAC Hawaii Public Affairs (808-471-7300).

Please share this information with all other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, schools, and businesses).

Owner of Water System

Naval Facilities Engineering Command, Hawaii
400 Marshall Road, JBPHH HI 96860-3139

Printed June 2018

Water Quality Data Table

The following tables list contaminants which were detected during the latest round of sampling required by EPA and State of Hawaii regulations. The water samples were collected from either the source water or distribution system and analyzed by the State, BWS and/or NAVFAC Hawaii. The presence of contaminants does not necessarily indicate that the water poses a health risk. You may obtain more information about contaminants and potential health effects by calling the EPA's Safe Drinking Water Hotline 1-800-426-4791 or the State of Hawaii's Department of Health at 808-586-4258.

Contaminants in the Navy's Source Water

Table 1-1

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Inorganic Contaminants							
Chromium (total) (ppb)	100	100	2.1	nd – 2.1	2017	Naturally-occurring	No
Fluoride (ppm)	4	4	0.86	nd – 0.86	2017	Erosion of natural deposits; water additive which promotes strong teeth	No
Nitrate (ppm)	10	10	2.5	nd – 2.5	2017	Runoff from fertilizer use; Erosion of natural deposits	No
Barium (ppm)	2	2	0.02	nd – 0.02	2017	Erosion of natural deposits	No
Organic Contaminants							
Heptachlor epoxide (ppt)	200	0	20	nd – 20	2017	Breakdown of heptachlor (banned pesticide)	No
Chlordane (ppb)	2	0	0.36	nd – 0.36	2017	Residue of banned termiticide	No
Unregulated Contaminants²							
1,4-dioxane (ppb)	n/a	n/a	0.35	nd – 0.35	2013 ¹	Synthetic industrial chemical	n/a
Chlorate (ppb)	n/a	n/a	37	nd - 37	2013 ¹	Byproduct of drinking water disinfection	n/a
Chromium-6 (ppb)	n/a	n/a	2.3	0.93 – 2.3	2013 ¹	Naturally-occurring	n/a
Dieldrin (ppb)	n/a	n/a	0.05	nd – 0.05	2017	Residue of banned insecticide	n/a
Sodium (ppm)	n/a	n/a	124	26 – 124	2017	Naturally-occurring	n/a
Strontium (ppb)	n/a	n/a	260	40 - 260	2013 ¹	Naturally-occurring	n/a
Sulfate (ppm)	250	n/a	48	nd – 48	2017	Naturally-occurring	n/a
Vanadium (ppb)	n/a	n/a	32	14 – 32	2013 ¹	Naturally-occurring	n/a

Contaminants in the BWS' Source Water (serving Radford Terrace)

Table 1-2

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Regulated Contaminants							
Barium (ppm)	2	2	0.011	0.009 – 0.011	2017	Erosion of natural deposits	No
Chromium (ppb)	100	100	1.5	1.1 – 1.6	2017	Naturally-occurring	No
Nitrate (ppm)	10	10	0.45	0.34 – 0.45	2017	Runoff from fertilizer use; Erosion of natural deposits	No
Fluoride (ppm)	4	4	0.059	0.059 – 0.059	2017	Erosion of natural deposits; water additive which promotes strong teeth	No
Unregulated Contaminants²							
Chloride (ppm)	n/a	n/a	94	90 - 94	2017	Naturally-occurring	n/a
Chlorate (ppb)	n/a	n/a	40	37 – 40	2017	Byproduct of the disinfection process	n/a
Chromium, hexavalent (ppb)	n/a	n/a	1.5	1.3 – 1.5	2017	Naturally-occurring	n/a
Sodium (ppm)	n/a	n/a	34	33 – 34	2017	Naturally-occurring	n/a
Strontium (ppb)	n/a	n/a	140	140 – 140	2017	Naturally-occurring	n/a
Sulfate (ppm)	250	n/a	13	13	2017	Naturally-occurring	n/a
Vanadium (ppb)	n/a	n/a	12	10 – 12	2017	Naturally-occurring	n/a

Contaminants in the BWS' Source Water (serving Manana Housing)

Table 1-3

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Regulated Contaminants							
1,2,3-Trichloropropane (ppb)	0.6	0	0.05	0.04 – 0.06	2017	Fumigant previously used in agriculture.	No
Barium (ppm)	2	2	0.004	0.004 – 0.004	2017	Erosion of natural deposits	No
Chromium (ppb)	100	100	1.5	1.2 – 1.5	2017	Naturally-occurring	No
Nitrate (ppm)	10	10	0.9	0.7 – 0.9	2017	Runoff from fertilizer use; Erosion of natural deposits	No
Fluoride (ppm)	4	4	0.08	0.07 – 0.08	2017	Erosion of natural deposits; water additive which promotes strong teeth	No
Unregulated Contaminants²							
Chloride (ppm)	n/a	n/a	64	38 - 64	2017	Naturally-occurring	n/a
Chlorate (ppb)	n/a	n/a	33	22 – 33	2017	Byproduct of the disinfection process	n/a
Chromium, hexavalent (ppb)	n/a	n/a	1.3	1.2 – 1.3	2017	Naturally-occurring	n/a
Dieldrin (ppb)	n/a	n/a	0.014	0.011 – 0.020	2017	Residue of banned pesticide	n/a
Sodium (ppm)	n/a	n/a	40	40	2017	Naturally-occurring	n/a
Strontium (ppb)	n/a	n/a	85	58 – 85	2017	Naturally-occurring	n/a
Sulfate (ppm)	250	n/a	14	9.8 - 14	2017	Naturally-occurring	n/a
Vanadium (ppb)	n/a	n/a	15	14 – 15	2017	Naturally-occurring	n/a

Contaminants in the BWS' Source Water (serving Navy Red Hill Housing)

Table 1-4

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Regulated Contaminants							
Barium (ppm)	2	2	0.012	0.012 – 0.012	2017	Erosion of natural deposits	No
Chromium (ppb)	100	100	1.9	1.8 – 2.0	2017	Naturally-occurring	No
Nitrate (ppm)	10	10	0.54	0.54 – 0.54	2017	Runoff from fertilizer use; Erosion of natural deposits	No
Fluoride (ppm)	4	4	0.058	0.058 – 0.058	2017	Erosion of natural deposits; water additive which promotes strong teeth	No
Unregulated Contaminants²							
Chloride (ppm)	n/a	n/a	110	110 – 110	2017	Naturally-occurring	n/a
Chlorate (ppb)	n/a	n/a	21	21 – 21	2017	Byproduct of the disinfection process	n/a
Chromium, hexavalent (ppb)	n/a	n/a	1.8	1.8 – 1.8	2017	Naturally-occurring	n/a
Sodium (ppm)	n/a	n/a	36	36 – 36	2017	Naturally-occurring	n/a
Strontium (ppb)	n/a	n/a	180	180 – 180	2017	Naturally-occurring	n/a
Sulfate (ppm)	250	n/a	25	25 – 25	2017	Naturally-occurring	n/a
Vanadium (ppb)	n/a	n/a	11	11 – 11	2017	Naturally-occurring	n/a

Contaminants in the Distribution System

Table 1-5

Contaminants (units)	Action Level	90 th Percentile Value	No. of Samples Above Action Level	Year of Sample	Typical Sources of Contaminants	Violation
Copper (ppm)	1.3	0.09	0	2016 ¹	Corrosion of household plumbing systems; erosion of natural deposits	No

Disinfection Agent

Table 1-6

Contaminants (units)	MRDL (Allowed)	MRDLG (Goal)	Highest Average	Range of Monthly Average	Year of Sample	Typical Sources of Contaminants	Violation
Residual Chlorine (ppm)	4	4	0.5 ³	0.4 – 0.6	2017	Water additive used to control microbes	No

Disinfection Byproducts

Table 1-7

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	Highest Level Detected	Range of Detection	Year of Sample	Typical Sources of Contaminants	Violation
Total Haloacetic Acids (ppb)	60	n/a	1.2	nd – 1.2	2017	By-product of drinking water disinfection	No
Total Trihalomethanes (ppb)	80	n/a	8.6	2.2 – 8.6	2017	By-product of drinking water disinfection	No

Red Hill Shaft – 2017 Voluntary Testing

Table 1-8

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	DOH EAL	Highest Level Detected	Range of Detection	Violation
Lead (ppb)	AL = 15	0	15	1.3	nd – 1.3	No
TPH-d (ppb)	n/a	n/a	100	65	nd – 65	No

Table Definitions:

- AL** Action Level. The concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
- DOH EAL** Department of Health Environmental Action Level. Risk-based levels published by DOH for compounds that do not have promulgated MCL values.
- MCL** Maximum Contaminant Level. The highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
- MCLG** Maximum Contaminant Level Goal. The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.
- MRDL** Maximum Residual Disinfectant Level. The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.
- MRDLG** Maximum Residual Disinfectant Level Goal. The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contamination.
- TPH-d** Total Petroleum Hydrocarbons as diesel fuel.

Table Abbreviations:

- n/a not applicable.
- ppb parts per billion or micrograms per liter.
- ppt parts per trillion or nanograms per liter.
- nd not detectable at testing limits.
- ppm parts per million or milligrams per liter.

Table Notes:

- The State and EPA require us to monitor for certain contaminants less than once per year because the concentrations of these contaminants are not expected to vary significantly from year to year. The date of the oldest sample collected is as indicated.
- These results are for informational purposes. There are no set standards. EPA will use this data to help determine where certain contaminants occur and whether it needs to regulate these contaminants. At this time, these contaminants do not have MCLs or MCLGs.
- After each quarter, a running average is calculated using the preceding 12 months of data. The posted amount is the highest running average for the year.
- Only one sample collected.

Note: Some people may be more vulnerable to contaminants in drinking water than the general population. Immunocompromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. EPA/CDC guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the EPA's Safe Drinking Water Hotline 1-800-426-4791.