Joint Base Pearl Harbor-Hickam (JBPHH) Public Water System No. HI0000360

Drinking Water Distribution System Recovery Plan: *Stage 5 Long-Term Monitoring (LTM) Month 1 Sampling Results Report for Zone D2*

26 May 2022

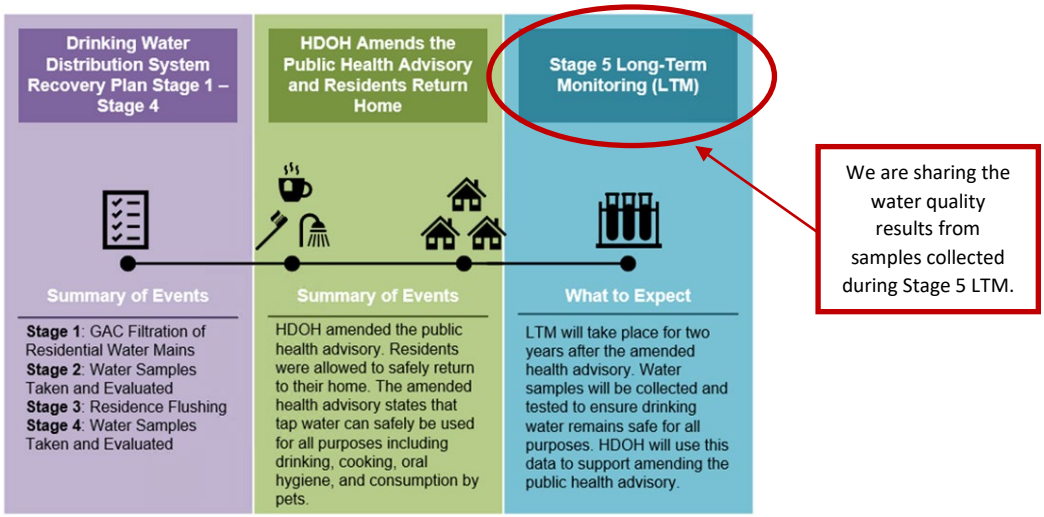
Neighborhoods included in Zone D2: Hickam, Hale Na Koa, Officer Field Area, Onizuka Village

EXECUTIVE SUMMARY FOR ZONE D2

This report documents the results of long-term monitoring (LTM) testing for D2. We are sharing this information with you to keep you updated on your water quality.

This LTM testing was performed after the November 29, 2021 Public Health Advisory for the JBPHH Public Water System for Zone D2 was amended by the Hawaii Department of Health (DOH) on March 13, 2022. The amended health advisory for Zone D2 can be found online at: https://jbphh-safewaters.org. The amended health advisory states that tap water can be used for all purposes including drinking, cooking, oral hygiene, and consumption by pets. The health advisory was amended based on a final review of all sample data and how the Navy water system maintains operations to ensure safe drinking water. Test results that led to the advisory amendment are summarized in the Stage 4 Residential Sampling Report. After the health advisory was amended, residents were informed that they can safely use their water for all purposes.

Zone D2 has been thoroughly flushed, sampled, and tested. This zone has completed each stage (i.e., Stage 1 – Distribution System Flushing through Stage 4 – Building Sampling) outlined in the Drinking Water Distribution System Recovery Plan.[1] Based on the samples collected and tested from water mains (Stage 2) and residences, buildings, schools, and child development centers (Stage 4), this zone meets the U.S. Environmental Protection Agency (EPA) and DOH drinking water standards used during this investigation. Zone D2 is now in the LTM phase (a.k.a., Stage 5), which is described below. For additional information on the Stage 2, Stage 4, and Stage 5 sample results by zone, please visit: https://jbphh-safewaters.org.



[1] The Drinking Water Distribution System Recovery Plan was developed and approved by the Interagency Drinking Water System Team (IDWST). The DOH, EPA, Navy, and Army formed the IDWST to restore safe drinking water to all Navy Water System users. The JBPHH PWS #HI0000360 & ARM PWS #HI0000337 will continue the work of the IDWST by working to restore consumer confidence by ensuring tap water continues to be safe for human consumption (e.g., drinking, cooking, oral hygiene).

Long-Term Monitoring

LTM will be performed as outlined in the Drinking Water Sampling Plan, dated December 2021. LTM will take place for two years after the date of the amended health advisory. The purpose of LTM is to ensure tap water continues to be safe for human consumption (e.g., drinking, cooking, oral hygiene). Residents/occupants will be notified if and when their house/building is scheduled to be sampled. Below is the schedule for LTM in Zone D2.

LTM Schedule for Zone D2

Sampling Event[1]	Summary of Sampling Activities	Completion Date[2]
Month 1	5% of houses/buildings (minimum of 5 houses/building)	March 28 – April 8, 2022
Month 2	5% of houses/buildings (minimum of 5 houses/building)	May 2022
Month 3	5% of houses/buildings (minimum of 5 houses/building)	June 2022
Month 9	10% of houses/buildings (minimum of 15 houses/buildings)	December 2022
Month 15	10% of houses/buildings (minimum of 15 houses/buildings)	June 2023
Month 21	10% of houses/buildings (minimum of 15 houses/buildings)	December 2023
Month 24	10% of houses/buildings (minimum of 15 houses/buildings)	March 2024

Notes:
[1] Sampling events are scheduled based on the amount of time (months) since the DOH health advisory was amended for this zone.
[2] Completion dates are estimated based on the date the DOH health advisory was amended for this zone.

Tables Included in this Stage 5 Sampling Results Report for Zone D2

Table 1-1. Contaminants Detected in Drinking Water Samples Collected from Residences in Zone D2

Contaminant	Typical Source of Contaminant	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	Stage 4 Sampling Summary		Stage 5 LTM Sampling Summary Month 1		Stage 5 LTM Sampling Summary Month 2		Stage 5 LTM Sampling Summary Month 3		Stage 5 LTM Sampling Summary Month 9		Stage 5 LTM Sampling Summary Month 15		Stage 5 LTM Sampling Summary Month 21		Stage 5 LTM Sampling Summary Month 24	
					01/11/22 – 02/18/22		03/28/22 – 04/08/22		May 2022		June 2022		December 2022		June 2023		December 2023		March 2024	
					No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]
Contaminants of Concern[1]																				
Benzene	Discharge from factories; Leaching from gas storage tanks and landfills	ppb[6]	5.0	MCL	0/171	-	0/91	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Ethylbenzene	Discharge from petroleum refineries	ppb	700	MCL	0/171	-	0/91	-												
Toluene	Discharge from petroleum factories	ppb	1,000	MCL	0/171	-	0/91	-												
Xylenes (Total)	Discharge from petroleum factories; Discharge from chemical factories	ppb	10,000	MCL	0/171	-	0/91	-												
1-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also, present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites.	ppb	10	EAL	0/170	-	0/90	-												
2-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also used to make vitamin K; and is present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites	ppb	10	EAL	1/170	ND - 0.0091 (0.0091)	0/90	-												
Naphthalene	Naphthalene is found in coal tar or crude oil and is used in the manufacture of plastics, resins, fuels, and dyes, and as a fumigant	ppb	17	EAL	1/171	ND - 1.1 (1.1)	0/90	-												
Total TPH[4]	TPH is petroleum and can contaminate drinking water through spills and other releases into the environment	ppb	211	ISP	5/171	ND - 191 (69.4)	27/91	ND - 75.4 (58.6)												
Total Organic Carbon (TOC)[5]	Naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources	ppb	4,000	ISP	72/173	ND – 7,720 (1,373)	11/91	ND - 710 (542.7)												
Free Chlorine (Field Test)[8]	Water additive used to control microbes	ppb	4,000	ISP	-	-	78/80	ND - 1000 (489)												
Metals																				
Antimony	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	ppb	6.0	MCL	1/189	ND - 0.11 (0.11)	0/97	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Arsenic	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	ppb	10	MCL	46/189	ND - 1.5 (0.83)	0/97	-												
Barium	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	ppb	2,000	MCL	189/189	1.7 – 3.0 (2.0)	97/97	1.8 - 2.6 (1.9)												

Beryllium	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	ppb	4.0	MCL	1/189	ND – 0.68 (0.68)[9]	1/97	ND - 0.43 (0.43)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Cadmium	By-product of drinking water disinfection	ppb	5.0	MCL	3/189	ND - 0.14 (0.084)	1/97	ND - 0.2 (0.2)						
Chromium	Discharge from steel and pulp mills; Erosion of natural deposits	ppb	100	MCL	188/189	ND - 2.5 (1.7)	97/97	1.4 - 6.3 (1.8)						
Copper	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	1,300	MCL	189/189	4.0 - 360 (49.3)	97/97	2.3 - 128 (42.3)						
Lead	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	15	MCL	146/189	ND - 5.5 (0.34)	60/97	ND - 3.3 (0.39)[10]						
Mercury	Erosion of natural deposits; Discharge from refineries and factories; Runoff from landfills; Runoff from cropland	ppb	2.0	MCL	6/189	ND - 0.093 (0.074)	0/97	-						
Selenium	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines	ppb	50	MCL	29/189	ND - 1.7 (0.83)	6/97	ND - 0.39 (0.34)						
Thallium	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories	ppb	2.0	MCL	15/189	ND - 0.10 (0.081)	7/97	ND - 0.67 (0.15)						
Volatile Organic Compounds (VOCs)														
Total Haloacetic acids (sum of mono-, di-, trichloroacetic acids and mono- and dibromo acetic acids)	By-product of drinking water disinfection	ppb	60	MCL	-	-	1/91	ND - 1 (1)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
1,4-Dichlorobenzene	Discharge from industrial chemical factories	ppb	75	MCL	1/171	ND - 0.66 (0.66)	0/91	-						
Total trihalomethanes (sum of chloroform, bromoform, bromodichloromethane, and di-bromochloromethane)	By-product of drinking water disinfection	ppb	80	MCL	-	-	13/91	ND - 4.2 (1.9)						
Synthetic Organic Compounds (SOCs) or Semi-Volatile Organic Compounds (SVOCs) – ND														

Notes:

1. These contaminants are listed whether detected or non-detect (ND) because these are incident specific. All other contaminants are only listed if detected.
2. The DOH uses multiple criteria to assess the safety of the drinking water including maximum contaminant levels (MCLs), previously established environmental action levels (EALs) and incident specific parameters (ISPs).
3. These numbers are the minimum and maximum values from all the sample test results. The average (or mathematical mean) includes all sample test results with a detectable contaminant. An average is the sum of the results (excluding non-detects) divided by the total number results with detection only. Acronyms and explanation of terms used in this table are presented on the following pages.
4. For more information regarding Total Petroleum Hydrocarbons, refer to the FACT SHEET What Are Petroleum Hydrocarbons?, available online at: https://health.hawaii.gov/about/files/2021/12/21.12.16_What-Are-Petroleum-Hydrocarbons.pdf.
5. Total Organic Carbon (TOC) test results report any constituent containing carbon, many of which are naturally occurring and some of which may be man-made. The DOH selected a TOC project screening level of 4,000 ppb for Stage 5. Each exceedance was investigated by reviewing the associated water quality data (e.g., BTEX results, TPH) and the LTM Drinking Water Team determined that all TOC exceedances are not associated hydrocarbons. DOH amended the December 2021 Drinking Water Sampling Plan on February 25, 2022. As part of the amendment, DOH revised the TOC screening level to 4,000 ppb (previously 2,000). As a result, the Stage 4 sampling results for TOC are no longer identified as an exceedance based on the revised screening level.
6. Parts per billion (ppb) refers to the amount (or concentration) of a contaminant in the water.
7. Cells highlighted in green indicate the water sample results were below DOH Screening Levels.
8. On January 30 and February 25, 2022, DOH revised the LTM requirements to include the analysis of free chlorine. Chlorine is typically used as an additive to drinking water for disinfection purposes.
9. This does not include the January 15, 2022 (initial) beryllium results from 504 Signer Boulevard (Field Sample Number: 220115-D2-IT04). This does include the resampled results from 504 Signer Boulevard as described below:
   a) The sample result taken at 504 Signer Boulevard on January 15, 2022 was 8.4 parts per billion (ppb) for beryllium. This exceeded the MCL of 4.0 ppb. This type of exceedance had been encountered before in other zones. 504 Signer Boulevard is an eight-unit complex. The IDWST reviewed the test results of all sample locations and determined that although it was likely to be a premise plumbing issue, further investigation was warranted through additional sampling and flushing. The entire complex was sampled, flushed and resampled. The re-samples were all non-detects.
10. This does not include the March 28, 2022 (initial) lead results from 276 Lewa Hia Way (Field Sample Number: D2-TW-0008225-22072-3-N). This does include the resampled results from 276 Lewa Hia Way. This exceedance was associated with Premise Plumbing and is not associated with the JBPHH water distribution system. Therefore, it was not included in this table. See section "What was found?" in the main text of this report for a complete discussion of this exceedance.
    a) The sample result taken at 276 Lewa Hia Way on March 28, 2022 was 15.5 parts per billion (ppb) for lead. This exceeded the action level of 15 ppb. All faucets in the residence were resampled on April 7, 2022. The validated results show lead was detected in the resample (D2-TW-0008225-22072-N-R1) at an estimated concentration of 0.430 J ppb and concentrations ranged from non-detect to 0.830 ppb in the additional samples (D2-TW-0008225-22072-N-1 to 5). All detected concentrations were below the action level of 15 ppb.

Table 1-2. Contaminants Detected in Drinking Water Samples Collected from Schools in Zone D2

Contaminant	Typical Source of Contaminant	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	Stage 4 Sampling Summary		Stage 5 LTM Sampling Summary Month 1		Stage 5 LTM Sampling Summary Month 2		Stage 5 LTM Sampling Summary Month 3		Stage 5 LTM Sampling Summary Month 9		Stage 5 LTM Sampling Summary Month 15		Stage 5 LTM Sampling Summary Month 21		Stage 5 LTM Sampling Summary Month 24	
					01/14/22		03/29/22		May 2022		June 2022		December 2022		June 2023		December 2023		March 2024	
					No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum - Maximum (Average)[3]
Contaminants of Concern[1]																				
Benzene	Discharge from factories; Leaching from gas storage tanks and landfills	ppb[6]	5.0	MCL	0/5	-	0/5	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Ethylbenzene	Discharge from petroleum refineries	ppb	700	MCL	0/5	-	0/5	-												
Toluene	Discharge from petroleum factories	ppb	1,000	MCL	0/5	-	0/5	-												
Xylenes (Total)	Discharge from petroleum factories; Discharge from chemical factories	ppb	10,000	MCL	0/5	-	0/5	-												
1-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also, present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites.	ppb	10	EAL	0/5	-	0/5	-												
2-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also used to make vitamin K; and is present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites	ppb	10	EAL	0/5	-	0/5	-												
Naphthalene	Naphthalene is found in coal tar or crude oil and is used in the manufacture of plastics, resins, fuels, and dyes, and as a fumigant	ppb	17	EAL	0/5	-	0/5	-												
Total TPH[4]	TPH is petroleum and can contaminate drinking water through spills and other releases into the environment	ppb	211	ISP	0/5	-	1/5	ND - 56 (56)												
Total Organic Carbon (TOC)[5]	Naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources	ppb	4,000	ISP	5/5	1,840 – 2,700 (2,380)	0/5	-												
Free Chlorine (Field Test)[8]	Water additive used to control microbes	ppb	4,000	ISP	-	-	5/5	60 – 710 (404)												
Metals																				
Barium	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	ppb	2,000	MCL	5/5	2.0 - 2.3 (2.1)	5/5	1.8 – 2.0 (1.9)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Beryllium	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	ppb	4.0	MCL	1/5	ND - 0.17 (0.17)	0/5	-												

Chromium	Discharge from steel and pulp mills; Erosion of natural deposits	ppb	100	MCL	5/5	0.91 - 1.9 (1.7)	5/5	1.7 – 2.0 (1.8)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Copper	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	1,300	MCL	5/5	50 - 570 (217)	5/5	42 - 375 (171)						
Lead	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	15	MCL	5/5	0.13 - 0.35 (0.22)	4/5	ND - 1.7 (0.75)						
Selenium	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines	ppb	50	MCL	4/5	ND – 1.0 (0.57)	3/5	ND - 0.48 (0.40)						
Thallium	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories	ppb	2.0	MCL	2/5	ND - 0.099 (0.077)	0/5	-						
Volatile Organic Compounds (VOCs)														
Total trihalomethanes (sum of chloroform, bromoform, bromodichloromethane, and di-bromochloromethane)	By-product of drinking water disinfection	ppb	80	MCL	-	-	1/5	ND - 0.80 (0.80)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Synthetic Organic Compounds (SOCs) or Semi-Volatile Organic Compounds (SVOCs) – ND														

Notes:

1. These contaminants are listed whether detected or non-detect (ND) because these are incident specific. All other contaminants are only listed if detected.
2. The DOH uses multiple criteria to assess the safety of the drinking water including maximum contaminant levels (MCLs), previously established environmental action levels (EALs) and incident specific parameters (ISPs).
3. These numbers are the minimum and maximum values from all the sample test results. The average (or mathematical mean) includes all sample test results with a detectable contaminant. An average is the sum of the results (excluding non-detects) divided by the total number results with detection only. Acronyms and explanation of terms used in this table are presented on the following pages.
4. For more information regarding Total Petroleum Hydrocarbons, refer to the FACT SHEET What Are Petroleum Hydrocarbons?, available online at: https://health.hawaii.gov/about/files/2021/12/21.12.16_What-Are-Petroleum-Hydrocarbons.pdf.
5. Total Organic Carbon (TOC) test results report any constituent containing carbon, many of which are naturally occurring and some of which may be man-made. The DOH selected a TOC project screening level of 4,000 ppb for Stage 5. Each exceedance was investigated by reviewing the associated water quality data (e.g., BTEX results, TPH) and the LTM Drinking Water Team determined that all TOC exceedances are not associated hydrocarbons. DOH amended the December 2021 Drinking Water Sampling Plan on February 25, 2022. As part of the amendment, DOH revised the TOC screening level to 4,000 ppb (previously 2,000). As a result, the Stage 4 sampling results for TOC are no longer identified as an exceedance based on the revised screening level.
6. Parts per billion (ppb) refers to the amount (or concentration) of a contaminant in the water.
7. Cells highlighted in green indicate the water sample results were below DOH Screening Levels.
8. On January 30 and February 25, 2022, DOH revised the LTM requirements to include the analysis of free chlorine. Chlorine is typically used as an additive to drinking water for disinfection purposes.

Table 1-3. Contaminants Detected in Drinking Water Samples Collected from Child Development Centers in Zone D2

Contaminant	Typical Source of Contaminant	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	Stage 4 Sampling Summary		Stage 5 LTM Sampling Summary Month 1		Stage 5 LTM Sampling Summary Month 2		Stage 5 LTM Sampling Summary Month 3		Stage 5 LTM Sampling Summary Month 9		Stage 5 LTM Sampling Summary Month 15		Stage 5 LTM Sampling Summary Month 21		Stage 5 LTM Sampling Summary Month 24	
					01/12/22		04/06/22		May 2022		June 2022		December 2022		June 2023		December 2023		March 2024	
					No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]
Contaminants of Concern[1]																				
Benzene	Discharge from factories; Leaching from gas storage tanks and landfills	ppb[6]	5.0	MCL	0/2	-	0/3	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Ethylbenzene	Discharge from petroleum refineries	ppb	700	MCL	0/2	-	0/3	-												
Toluene	Discharge from petroleum factories	ppb	1,000	MCL	0/2	-	0/3	-												
Xylenes (Total)	Discharge from petroleum factories; Discharge from chemical factories	ppb	10,000	MCL	0/2	-	0/3	-												
1-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also, present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites.	ppb	10	EAL	0/2	-	0/3	-												
2-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also used to make vitamin K; and is present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites	ppb	10	EAL	0/2	-	0/3	-												
Naphthalene	Naphthalene is found in coal tar or crude oil and is used in the manufacture of plastics, resins, fuels, and dyes, and as a fumigant	ppb	17	EAL	0/2	-	0/3	-												
Total TPH[4]	TPH is petroleum and can contaminate drinking water through spills and other releases into the environment	ppb	211	ISP	2/2	49 – 52 (51)	0/3	-												
Total Organic Carbon (TOC)[5]	Naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources	ppb	4,000	ISP	2/2	338 – 440 (389)	1/3	ND - 610 (610)												
Free Chlorine (Field Test)[8]	Water additive used to control microbes	ppb	4,000	ISP	-	-	2/2	280 – 420 (350)												
Metals																				
Barium	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	ppb	2,000	MCL	2/2	1.8 – 2.3 (2.1)	3/3	1.8 - 2.1 (1.9)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Chromium	Discharge from steel and pulp mills; Erosion of natural deposits	ppb	100	MCL	2/2	1.6 – 1.7 (1.7)	3/3	1.8 - 1.9 (1.8)												
Copper	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	1,300	MCL	2/2	22 – 26 (24)	3/3	14.9 - 30 (23)												

Lead	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	15	MCL	2/2	0.12 – 0.16 (0.14)	1/3	ND - 0.19 (0.19)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Volatile Organic Compounds (VOCs)														
Total trihalomethanes (sum of chloroform, bromoform, bromodichloromethane, and di-bromochloromethane)	By-product of drinking water disinfection	ppb	80	MCL	-	-	1/3	ND – 2.0 (2.0)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Synthetic Organic Compounds (SOCs) or Semi-Volatile Organic Compounds (SVOCs) – ND														

Notes:

1. These contaminants are listed whether detected or non-detect (ND) because these are incident specific. All other contaminants are only listed if detected.
2. The DOH uses multiple criteria to assess the safety of the drinking water including maximum contaminant levels (MCLs), previously established environmental action levels (EALs) and incident specific parameters (ISPs).
3. These numbers are the minimum and maximum values from all the sample test results. The average (or mathematical mean) includes all sample test results with a detectable contaminant. An average is the sum of the results (excluding non-detects) divided by the total number results with detection only. Acronyms and explanation of terms used in this table are presented on the following pages.
4. For more information regarding Total Petroleum Hydrocarbons, refer to the FACT SHEET What Are Petroleum Hydrocarbons?, available online at: https://health.hawaii.gov/about/files/2021/12/21.12.16_What-Are-Petroleum-Hydrocarbons.pdf.
5. Total Organic Carbon (TOC) test results report any constituent containing carbon, many of which are naturally occurring and some of which may be man-made. The DOH selected a TOC project screening level of 4,000 ppb for Stage 5. Each exceedance was investigated by reviewing the associated water quality data (e.g., BTEX results, TPH) and the LTM Drinking Water Team determined that all TOC exceedances are not associated hydrocarbons. DOH amended the December 2021 Drinking Water Sampling Plan on February 25, 2022. As part of the amendment, DOH revised the TOC screening level to 4,000 ppb (previously 2,000). As a result, the Stage 4 sampling results for TOC are no longer identified as an exceedance based on the revised screening level.
6. Parts per billion (ppb) refers to the amount (or concentration) of a contaminant in the water.
7. Cells highlighted in green indicate the water sample results were below DOH Screening Levels.
8. On January 30 and February 25, 2022, DOH revised the LTM requirements to include the analysis of free chlorine. Chlorine is typically used as an additive to drinking water for disinfection purposes.

Table 1-4. Contaminants Detected in Drinking Water Samples Collected from Other Buildings in Zone D2

Contaminant	Typical Source of Contaminant	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	Stage 4 Sampling Summary		Stage 5 LTM Sampling Summary Month 1		Stage 5 LTM Sampling Summary Month 2		Stage 5 LTM Sampling Summary Month 3		Stage 5 LTM Sampling Summary Month 9		Stage 5 LTM Sampling Summary Month 15		Stage 5 LTM Sampling Summary Month 21		Stage 5 LTM Sampling Summary Month 24	
					01/16/22 – 01/18/22		03/28/22 – 03/30/22		May 2022		June 2022		December 2022		June 2023		December 2023		March 2024	
					No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]
Contaminants of Concern[1]																				
Benzene	Discharge from factories; Leaching from gas storage tanks and landfills	ppb[6]	5.0	MCL	0/31	-	0/15	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Ethylbenzene	Discharge from petroleum refineries	ppb	700	MCL	0/31	-	0/15	-												
Toluene	Discharge from petroleum factories	ppb	1,000	MCL	0/31	-	0/15	-												
Xylenes (total)	Discharge from petroleum factories; Discharge from chemical factories	ppb	10,000	MCL	0/31	-	0/15	-												
1-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also, present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites.	ppb	10	EAL	0/31	-	0/15	-												
2-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also used to make vitamin K; and is present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites	ppb	10	EAL	0/31	-	0/15	-												
Naphthalene	Naphthalene is found in coal tar or crude oil and is used in the manufacture of plastics, resins, fuels, and dyes, and as a fumigant	ppb	17	EAL	0/31	-	0/15	-												
Total TPH[4]	TPH is petroleum and can contaminate drinking water through spills and other releases into the environment	ppb	211	ISP	0/31	-	5/15	ND - 68 (61)												
Total Organic Carbon (TOC)[5]	Naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources	ppb	4,000	ISP	9/31	ND – 3,220 (2,274)	0/15	-												
Free Chlorine (Field Test)[8]	Water additive used to control microbes	ppb	4,000	ISP	-	-	13/14	ND – 1,150 (435)												
Metals																				
Antimony	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder	ppb	6.0	MCL	2/31	ND – 0.30 (0.28)	0/15	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Arsenic	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	ppb	10	MCL	1/31	ND – 0.52 (0.52)	0/15	-												
Barium	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	ppb	2,000	MCL	30/31	ND – 2.7 (2.1)	14/15	ND - 2.6 (2.0)												

Chromium	Discharge from steel and pulp mills; Erosion of natural deposits	ppb	100	MCL	31/31	0.99 – 2.4 (1.6)	15/15	1.5 - 1.8 (1.7)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Copper	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	1,300	MCL	31/31	2.4 – 210 (84)	15/15	15 - 181 (63)						
Lead	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	15	MCL	22/31	ND – 1.3 (0.39)	12/15	ND - 4.9 (0.88)						
Selenium	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines	ppb	50	MCL	4/31	ND – 1.2 (0.56)	2/15	ND - 0.30 (0.30)						
Thallium	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories	ppb	2.0	MCL	4/31	ND – 0.10 (0.072)	2/15	ND - 0.10 (0.077)						
Volatile Organic Compounds (VOCs)														
Chlorobenzene	Discharge from chemical and agricultural chemical factories	ppb	100	MCL	1/31	ND - 0.75 (0.75)	0/15	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Methylene chloride	Discharge from pharmaceutical and chemical factories	ppb	5.0	MCL	2/31	ND - 186 (108)[9]	0/15	-						
Total trihalomethanes (sum of chloroform, bromoform, bromodichloromethane, and di-bromochloromethane)	By-product of drinking water disinfection	ppb	80	MCL	-	-	4/15	ND - 24 (13)						
Synthetic Organic Compounds (SOCs) or Semi-Volatile Organic Compounds (SVOCs)														
Bis(2-ethylhexyl)phthalate	Discharge from rubber and chemical factories	ppb	6.0	MCL	1/31	ND - 0.97 (0.97)	0/14	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.

Notes:

1. These contaminants are listed whether detected or non-detect (ND) because these are incident specific. All other contaminants are only listed if detected.
2. The DOH uses multiple criteria to assess the safety of the drinking water including maximum contaminant levels (MCLs), previously established environmental action levels (EALs) and incident specific parameters (ISPs).
3. These numbers are the minimum and maximum values from all the sample test results. The average (or mathematical mean) includes all sample test results with a detectable contaminant. An average is the sum of the results (excluding non-detects) divided by the total number results with detection only. Acronyms and explanation of terms used in this table are presented on the following pages.
4. For more information regarding Total Petroleum Hydrocarbons, refer to the FACT SHEET What Are Petroleum Hydrocarbons?, available online at: https://health.hawaii.gov/about/files/2021/12/21.12.16_What-Are-Petroleum-Hydrocarbons.pdf.
5. Total Organic Carbon (TOC) test results report any constituent containing carbon, many of which are naturally occurring and some of which may be man-made. The DOH selected a TOC project screening level of 4,000 ppb for Stage 5. Each exceedance was investigated by reviewing the associated water quality data (e.g., BTEX results, TPH) and the LTM Drinking Water Team determined that all TOC exceedances are not associated hydrocarbons. DOH amended the December 2021 Drinking Water Sampling Plan on February 25, 2022. As part of the amendment, DOH revised the TOC screening level to 4,000 ppb (previously 2,000). As a result, the Stage 4 sampling results for TOC are no longer identified as an exceedance based on the revised screening level.
6. Parts per billion (ppb) refers to the amount (or concentration) of a contaminant in the water.
7. Cells highlighted in green indicate the water sample results were below DOH Screening Levels.
8. On January 30 and February 25, 2022, DOH revised the LTM requirements to include the analysis of free chlorine. Chlorine is typically used as an additive to drinking water for disinfection purposes.
9. Methylene chloride (also referred to as dichloromethane) was detected from Building B901H (Hickam Officer's Club). The sample results were 29.4 parts per billion (ppb) and 186 ppm (Field Sample Numbers: 220116-D2-HT05, 220118-D2-LT01). This is an exceedance of the MCL of 5.0 ppb. The building is closed for future renovations. The IDWST reviewed the information and determined that isolation of the facility from the distribution system through a backflow preventer or by securing a valve was needed to ensure that the source of contamination could not impact the rest of the public water system. The building's water will be sampled and the test results provided to DOH prior to removing any restrictions on the use of water at this facility.

Table 1-5. Contaminants Detected in Drinking Water Samples Collected from Fire Hydrants in Zone D2

Contaminant	Typical Source of Contaminant	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	Stage 4 Sampling Summary		Stage 5 LTM Sampling Summary Month 1		Stage 5 LTM Sampling Summary Month 2		Stage 5 LTM Sampling Summary Month 3		Stage 5 LTM Sampling Summary Month 9		Stage 5 LTM Sampling Summary Month 15		Stage 5 LTM Sampling Summary Month 21		Stage 5 LTM Sampling Summary Month 24	
					01/01/22 - 02/16/22		03/29/22 – 04/06/22		May 2022		June 2022		December 2022		June 2023		December 2023		March 2024	
					No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]	No. of Detects out of Samples	Minimum – Maximum (Average)[3]
Contaminants of Concern[1]																				
Benzene	Discharge from factories; Leaching from gas storage tanks and landfills	ppb[6]	5.0	MCL	0/12	–	0/13	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Ethylbenzene	Discharge from petroleum refineries	ppb	700	MCL	0/12	–	0/13	-												
Toluene	Discharge from petroleum factories	ppb	1,000	MCL	0/12	–	0/13	-												
Xylenes (Total)	Discharge from petroleum factories; Discharge from chemical factories	ppb	10,000	MCL	0/12	–	0/13	-												
1-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also, present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites.	ppb	10	EAL	0/11	–	0/13	-												
2-Methylnaphthalene	Used to make other chemicals such as dyes, and resins; also used to make vitamin K; and is present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites	ppb	10	EAL	0/11	–	0/13	-												
Naphthalene	Naphthalene is found in coal tar or crude oil and is used in the manufacture of plastics, resins, fuels, and dyes, and as a fumigant	ppb	17	EAL	0/11	–	0/13	-												
Total TPH[4]	TPH is petroleum and can contaminate drinking water through spills and other releases into the environment	ppb	211	ISP	0/14	–[9]	3/13	ND - 63 (58)												
Total Organic Carbon (TOC)[5]	Naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources	ppb	4,000	ISP	7/11	ND – 3,690 (2,260)	0/13	-												
Free Chlorine (Field Test)[8]	Water additive used to control microbes	ppb	4,000	ISP	–	–	11/11	140 - 570 (404)												
Metals																				
Arsenic	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production wastes	ppb	10	MCL	7/12	ND – 0.45 (0.37)	0/13	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.		These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.		These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.		These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.		These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.		These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.	
Barium	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits	ppb	2,000	MCL	12/12	1.8 – 4.3 (2.2)	13/13	1.9 - 9.7 (2.8)												
Beryllium	Discharge from metal refineries and coal-burning factories; Discharge from electrical, aerospace, and defense industries	ppb	4.0	MCL	0/12	-	1/13	ND - 3.4 (3.4)												

Chromium	Discharge from steel and pulp mills; Erosion of natural deposits	ppb	100	MCL	12/12	0.83 – 1.9 (1.3)	13/13	1.4 - 2.1 (1.7)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Copper	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	1,300	MCL	12/12	1.3 – 7.1 (3.3)	13/13	1.1 - 8.4 (2.8)						
Lead	Corrosion of household plumbing systems; Erosion of natural deposits	ppb	15	MCL	12/12	0.15 – 6.1 (0.99)	12/13	ND - 7.4 (0.92)						
Selenium	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines	ppb	50	MCL	10/12	ND – 1.8 (1.2)	1/13	ND - 0.30 (0.30)						
Thallium	Leaching from ore-processing sites; Discharge from electronics, glass, and drug factories	ppb	2.0	MCL	1/12	ND – 0.047 (0.047)	1/13	ND - 0.18 (0.18)						
Volatile Organic Compounds (VOCs)														
Total Haloacetic acids (sum of mono-, di-, trichloroacetic acids and mono- and dibromo acetic acids)	By-product of drinking water disinfection	ppb	60	MCL	-	-	1/13	ND - 1.3 (1.3)	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.
Total trihalomethanes (sum of chloroform, bromoform, bromodichloromethane, and di-bromochloromethane)	By-product of drinking water disinfection	ppb	80	MCL	-	-	4/13	ND - 9.4 (6.1)						
Synthetic Organic Compounds (SOCs) or Semi-Volatile Organic Compounds (SVOCs) – ND														
Benzo(a)pyrene	01/01/22 – 02/16/22	ppb	0.20	MCL	1/10	ND – 0.02 (0.02)	0/13	-	These samples will be collected 2 months after the health advisory was amended. Results will be reported in a LTM Month 2 Sampling Results Report.	These samples will be collected 3 months after the health advisory was amended. Results will be reported in a LTM Month 3 Sampling Results Report.	These samples will be collected 9 months after the health advisory was amended. Results will be reported in a LTM Month 9 Sampling Results Report.	These samples will be collected 15 months after the health advisory was amended. Results will be reported in a LTM Month 15 Sampling Results Report.	These samples will be collected 21 months after the health advisory was amended. Results will be reported in a LTM Month 21 Sampling Results Report.	These samples will be collected 24 months after the health advisory was amended. Results will be reported in a LTM Month 24 Sampling Results Report.

Notes:

1. These contaminants are listed whether detected or non-detect (ND) because these are incident specific. All other contaminants are only listed if detected.
2. The DOH uses multiple criteria to assess the safety of the drinking water including maximum contaminant levels (MCLs), previously established environmental action levels (EALs) and incident specific parameters (ISPs).
3. These numbers are the minimum and maximum values from all the sample test results. The average (or mathematical mean) includes all sample test results with a detectable contaminant. An average is the sum of the results (excluding non-detects) divided by the total number results with detection only. Acronyms and explanation of terms used in this table are presented on the following pages.
4. For more information regarding Total Petroleum Hydrocarbons, refer to the FACT SHEET What Are Petroleum Hydrocarbons?, available online at: https://health.hawaii.gov/about/files/2021/12/21.12.16_What-Are-Petroleum-Hydrocarbons.pdf.
5. Total Organic Carbon (TOC) test results report any constituent containing carbon, many of which are naturally occurring and some of which may be man-made. The DOH selected a TOC project screening level of 4,000 ppb for Stage 5. Each exceedance was investigated by reviewing the associated water quality data (e.g., BTEX results, TPH) and the LTM Drinking Water Team determined that all TOC exceedances are not associated hydrocarbons. DOH amended the December 2021 Drinking Water Sampling Plan on February 25, 2022. As part of the amendment, DOH revised the TOC screening level to 4,000 ppb (previously 2,000). As a result, the Stage 4 sampling results for TOC are no longer identified as an exceedance based on the revised screening level.
6. Parts per billion (ppb) refers to the amount (or concentration) of a contaminant in the water.
7. Cells highlighted in green indicate the water sample results were below DOH Screening Levels.
8. On January 30 and February 25, 2022, DOH revised the LTM requirements to include the analysis of free chlorine. Chlorine is typically used as an additive to drinking water for disinfection purposes.
9. This does not include the January 14, 2022 (initial) TPH results collected from Fire Hydrant 509 and Fire Hydrant 519 (Field Sample Numbers: 220114-D2-WT03, 220114-D2-WT04). This does include the resampled results from Fire Hydrant 509 and Fire Hydrant 519 as described below:
   a. The sample results take from Fire Hydrant 509 and Fire Hydrant 519 on January 14, 2022 were 120 parts per billion (ppb) and 260 ppb, respectively, for TPH. This exceeded the ISP of 211 ppb. Investigation into this matter determined this exceedance was a localized issue that was most likely attributable to premise plumbing. The IDWST members directed that the hydrants be sampled again to confirm the exceedance was localized and not a widespread issue. All TPH results from the re-sampling were non-detects. This investigation is documented in detail in the Removal Action Report for Zone D2.

Table 1-6. Contaminants Detected in Drinking Water Samples Collected from JBPHH's Source Water (Waiawa Shaft – Post Chlorination)

Contaminant	Sampling Period	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	No. of Detects out of No. of Samples	Level Detected	Meets DOH Screening Level? (Yes / No)	Typical Source of Contaminant
Contaminants of Concern[1]								
Benzene	01/11/2022	ppb[4]	5.0	MCL	0/1	--	**Yes**	Discharge from factories; Leaching from gas storage tanks and landfills
Ethylbenzene	01/11/2022	ppb	700	MCL	0/1	--	**Yes**	Discharge from petroleum refineries
Toluene	01/11/2022	ppb	1,000	MCL	0/1	--	**Yes**	Discharge from petroleum factories
m,p,o-Xylenes	01/11/2022	ppb	10,000	MCL	0/1	--	**Yes**	Discharge from petroleum factories; Discharge from chemical factories
1-Methylnaphthalene	01/11/2022	ppb	10	ISP	0/1	--	**Yes**	Used to make other chemicals such as dyes, and resins; also, present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites
2-Methylnaphthalene	01/11/2022	ppb	10	ISP	0/1	--	**Yes**	Used to make other chemicals such as dyes, and resins; also used to make vitamin K; and is present in cigarette smoke, wood smoke, tar, asphalt, and at some hazardous waste sites
Naphthalene	01/11/2022	ppb	17	ISP	0/1	--	**Yes**	Naphthalene is found in coal tar or crude oil and is used in the manufacture of plastics, resins, fuels, and dyes, and as a fumigant
Lead	01/11/2022	ppb	15	EAL	1/1	0.27	**Yes**	Corrosion of household plumbing systems; Erosion of natural deposits
Total Petroleum Hydrocarbons (TPHs)	01/11/2022	ppb	211	ISP	0/1	--	**Yes**[3]	TPH is petroleum and can contaminate drinking water through spills and other releases into the environment
Total Organic Carbon (TOC)	01/11/2022	ppb	2,000	ISP	0/1	--	**Yes**	Naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources
Metals								
Antimony	01/11/2022	ppb	6.0	MCL	1/1	0.092	**Yes**	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	01/11/2022	ppb	10	MCL	1/1	0.027	**Yes**	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production waste
Barium	01/11/2022	ppb	2,000	MCL	1/1	1.7	**Yes**	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	01/11/2022	ppb	100	MCL	1/1	1.5	**Yes**	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints

Contaminant	Sampling Period	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	No. of Detects out of No. of Samples	Level Detected	Meets DOH Screening Level? (Yes / No)	Typical Source of Contaminant
Copper	01/11/2022	ppb	1,300	EAL	1/1	21	**Yes**	Corrosion of household plumbing systems; Erosion of natural deposits
Selenium	01/11/2022	ppb	50	MCL	1/1	0.70	**Yes**	Discharge from petroleum and metal refineries; Erosion of natural deposits; Discharge from mines
Volatile Organic Compounds – ND								
Synthetic Organic Compounds (SOCs) or Semi-Volatile Organic Compounds (SVOCs) – ND								

Notes:

1. These contaminants are listed whether detected or non-detect (ND) because these are incident specific. All other contaminants are only listed if detected.
2. The DOH uses multiple criteria to assess the safety of the drinking water including maximum contaminant levels (MCLs), previously established environmental action levels (EALs) and incident specific parameters (ISPs).
3. For more information regarding Total Petroleum Hydrocarbons, refer to the FACT SHEET What Are Petroleum Hydrocarbons?, available online at: https://health.hawaii.gov/about/files/2021/12/21.12.16_What-Are-Petroleum-Hydrocarbons.pdf.
4. Parts per billion (ppb) refers to the amount (or concentration) of a contaminant in the water.

Drinking Water Distribution System Recovery Plan: Stage 5 LTM Month 1 Sampling Results Report for Zone D2

What is the purpose of this Stage 5 LTM Month 1 Sampling Results Report?

This progress report presents the testing results from drinking water samples that have been collected from residences, buildings, schools, and Child Development Centers. These samples were collected after the health advisory had been amended and DOH determined drinking water was safe for human consumption. The health advisory was amended after the first four stages of the Drinking Water Distribution System Recovery Plan were completed in your zone. The JBPHH PWS #HI0000360 is committed to ensuring tap water is safe for human consumption after residents have returned home.

We are sharing this information with you to keep you updated on your community's water quality.

What was found?

The tables on the previous pages present all contaminants that were detected in drinking water samples that have been collected from residences, schools, Child Development Centers, and other buildings in your zone during Stage 5 LTM Month 1. The DOH used multiple standards/criteria (called DOH Project Screening Levels) to assess the safety of the drinking water to include:

- EPA and Hawaii DOH Maximum Contaminant Levels (MCLs) standards for drinking water;
- Previously established Environmental Action Levels (EALs); and
- Incident Specific Parameters (ISPs).

This report together with the data demonstrates that the drinking water in your area (Zone D2) meets U.S. EPA and DOH standards that are applicable to the Navy Water System Incident.

All exceedances of DOH Project Screening Levels are thoroughly reviewed and investigated by the Navy, Army, and DOH, to (1) determine if the exceedance is associated with the JBPHH water distribution system or if it is associated with premise plumbing (i.e., it is localized to a specific faucet) and (2) determine the appropriate course of action to address the exceedance (e.g., re-flushing, replacing a faucet).

The Following Premise Plumbing Exceedances were detected (and were investigated/addressed) in Zone D2 during LTM Month 1:

Exceedance Location	Plumbing Fixture	Contaminant	Initial Result	Action Taken	Final Result
276 Lewa Hia Way[1]	Residence Faucet	Lead	15.5 ppb	All Fixtures Flushed	0.43 ppb

1. 276 Lewa Hia Way (Premise Plumbing Exceedance)

    - The sample result collected from 276 Lewa Hia Way on March 28, 2022 was 15.5 for lead (Field Sample Number: D2-TW-0008225-22072-3-N). This exceeded the action level of 15 ppb. Investigation into this exceedance determined that although it was likely to be a premise plumbing issue, further investigation was warranted through additional sampling. All faucets at the residence were flushed and re-sampled. The re-samples were collected on April 7, 2022 and all were below the action level (D2-TW-0008225-22072-N-R1). The resident was notified on April 6, 2022 of the initial exceedance. The resident was provided bottled water until results of the re-sampling were received.

Total Organic Carbon (TOC) test results report any constituent containing carbon, many of which are naturally occurring and some of which may be man-made. The DOH selected a TOC project screening level of 4,000 parts per billion (ppb) for long term monitoring. Each potential exceedance is investigated by reviewing the associated water quality data (e.g., Disinfection Byproducts and TPH results) for association with petroleum hydrocarbons. No TOC exceedances occurred in LTM Month 1 for Zone D2.

What contaminants were tested?

Drinking water, including bottled water, can contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. More information about contaminants tested can be obtained by calling the Hawaii DOH Safe Drinking Water Branch at 808-586-4258.

In order to ensure that drinking water is safe to drink, EPA and Hawaii DOH regulate the amount of certain contaminants in water provided by public water systems. For this incident, the primary categories of monitored contaminants include volatile organic compounds (VOCs), synthetic organic chemicals (SOCs)/semi-volatile organic compounds (SVOCs), metals, Total Petroleum Hydrocarbons (TPH), and Total Organic Carbon (TOC). A description of these contaminant categories can be found under *Explanation of Terms* located at the end of this report. The full list of contaminants that were tested for this zone are presented in the laboratory reports that are located at: https://jbphh-safewaters.org. For complete information on the interagency response, please visit: https://www.cpf.navy.mil/JBPHH-Water-Updates/.

What happened leading up to the public health advisory being issued?

The Red Hill Bulk Fuel Storage Facility jet fuel spill event was reported to have taken place on November 20, 2021. Subsequent reporting of fuel-like smell or visual sheen in addition to complaints of health issues from ingestion or dermal contact with the Navy and Army system water were received by the Navy and DOH. On November 28, 2021, the Navy reported that a chemical release of petroleum, which is a hazardous substance, entered the JBPHH drinking water distribution system from the Red Hill Shaft source. This release triggered an emergency response and DOH issuance of a public health advisory on November 29, 2021, for the entire JBPHH Public Water System No. HI0000360 (JBPHH System) and the consecutive Aliamanu Military Reservation Public Water System No. HI0000337 (AMR System).

The Hawaii DOH, EPA, Navy, and Army formed the Interagency Drinking Water System Team (IDWST) to work on a coordinated effort to restore safe drinking water to all Navy Water System users.

Has the public health advisory been amended or lifted?

The health advisory for Zone D2 was amended on March 13, 2022 but has not been lifted for the entire JBPHH System. The amendment to the health advisory was based on the results of extensive flushing, sampling (10% of buildings), and testing activities performed in Zone D2. The IDWST evaluated multiple lines of evidence to determine whether or not drinking water was safe for consumption. DOH determine that the water in Zone D2 was safe and residents/occupants could use their tap water for all purposes include drinking, cooking, oral hygiene, and consumption by pets. LTM of drinking water will be performed to ensure drinking water remains safe for all residents and occupants of JBPHH. If new information becomes available that indicates contaminants are present in the drinking water that poses a threat to public health, additional investigation may be required.

Where does our water come from?

The source of water for the Navy Water System now comes from the Navy Waiawa Shaft, which was not impacted by the release of Jet Fuel (JP-5) that occurred at Red Hill in late November 2021. The Waiawa Shaft has been sampled, and EPA and the DOH confirmed that it meets all federal and state drinking water standards. The Waiawa Shaft will be sampled (in subsequent months during LTM) in accordance with EPA and the DOH requirements.

What has the IDWST done to clean the drinking water distribution system?

The IDWST evaluated multiple options for cleaning the Navy drinking water distribution system and determined that high-volume flushing of the Navy drinking water distribution

system (all water mains/laterals/buildings) with 3 to 5 volumes of clean water from the Waiawa Shaft, followed by extensive testing to confirm that flushing worked, would restore safe drinking water to all Navy Water System users.

When was Long-Term Monitoring (LTM) water quality sampling conducted in Zone D2?

Between March 28, 2022 and April 8, 2022, drinking water samples were collected from residences, schools, Child Development Centers, other buildings, and hydrants in Zone D2.

Where were samples taken?

Per the IDWST approved sampling plan, five percent (5%) of all homes and buildings within Zone D2 were sampled with a minimum of 5 homes/buildings sampled. These houses/buildings will be geographically distributed throughout the area to provide spatial coverage along the water supply line. In addition, the list of houses/buildings may be augmented based on additional information (e.g., houses/buildings where occupants reported specific health impacts, houses/buildings that are referred to the team by medical providers) may also be sampled.

Where can I get more information about the potential health effects associated with these contaminants?

Hawaii Department of Health (DOH)
https://health.hawaii.gov/about/navy-water-system-quality-updates/.
Call the DOH Safe Drinking Water Branch at 808-586-4258

US Environmental Protection Agency (EPA)
https://www.epa.gov/ground-water-and-drinking-water/forms/online-form-epas-office-ground-water-and-drinking-water.
Call EPA Region 9's Environmental Information Center at 1-866-372-9378

Explanation of Terms and Acronyms used in this Report

Action Level (AL). This AL is for Lead and Copper. The AL is a measure of the effectiveness of the corrosion control treatment in water systems. The AL is not a standard for establishing a safe level of lead or copper. The AL is the point at which certain provisions of the proposed standards must be initiated.

Contaminant. Contaminant is any physical, chemical, biological, or radiological substance or matter in water, and can be either healthy or unhealthy, depending on the particular substance and concentration. It could also be a physical parameter monitored such as pH or temperature.

DOH. Hawaii Department of Health

EPA. U.S. Environmental Protection Agency

Incident Specific Parameter (ISP). To more comprehensively monitor and respond to this specific petroleum contamination of drinking water, the DOH identified contaminants that require additional action prior to amending the Health Advisory. The ISPs are used as a line of evidence to evaluate the data generated in each zone during the investigation conducted by the IDWST.

Maximum Contaminant Level (MCL). An MCL is the maximum permissible level of a contaminant in water which is delivered to any user of a public water system. The MCL is set to protect the public from acute and chronic health risks associated with consuming water containing these contaminants.

Metals. Metals are not derived from living sources and in general do not contain carbon. Metals include antimony, arsenic, asbestos, barium, beryllium, cadmium, chromium, copper, cyanide, fluoride, lead, mercury, nitrate, nitrite, selenium, and thallium. These contaminants get into drinking water supplies through industrial discharge or spills, erosion of natural deposits, corrosion, sewage discharge, fertilizer runoff, and other sources.

ND. Non-Detect

Project Specific Screening Level. DOH uses multiple criteria to assess the safety of the drinking water including maximum contaminant levels (MCLs) previously established environmental action levels (EALs) and incident specific parameters (ISPs).

Synthetic Organic Compounds (SOCs)/Semi-Volatile Organic Compounds (SVOCs). SOCs and SVOCs may be used interchangeably and are man-made, organic (carbon-based) chemicals that are less volatile than Volatile Organic

Contaminants (VOCs). They are used as pesticides, defoliants, fuel additives, and as ingredients for other organic chemicals.

DOH Environmental Action Level (EAL). The DOH Environmental Action Levels (EALs) are concentrations of contaminants in drinking water and other media (e.g., soil, soil gas, and groundwater) below which the contaminants are assumed to not pose a significant threat to human health or the environment. Exceeding these EAL does not necessarily indicate that contamination at the site poses environmental hazards but generally warrants additional investigation.

Total Petroleum Hydrocarbons (TPH). TPH is a term used to describe a large family of several hundred chemical compounds that come from crude oil. Crude oil is used to make petroleum products, which can contaminate the environment. TPH is comprised of detected results from TPH-Gasoline, TPH-Diesel, and TPH-Oil.

Total Organic Carbon (TOC). TOC is naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources.

Free Chlorine. Chlorine is added to drinking water as part of the treatment process. Adding chlorine is the most common way to disinfect drinking water. Disinfection kills bacteria, viruses, and other microorganisms that could cause disease or illness. Chlorine is effective and continues to keep the water safe as it travels from the treatment plant to the consumer's tap. Chlorine measurements provide another line-of-evidence for evaluating drinking water quality.

Total Trihalomethanes (TTHM). TTHM is the sum of the concentration in milligrams per liter of the trihalomethane compounds (trichloromethane [chloroform], dibromochloromethane, bromodichloromethane and tribromomethane [bromoform]).

Units. A unit is the concentration of contaminant found in the water. For this report, the units are expressed in U.S. Standard Units.

U.S. Standard Unit (Name)	Acronym	Equivalent International System of Units (Name)	Acronym
parts per billion	ppb	micrograms per Liter	μg/L

Volatile Organic Compounds (VOCs). VOCs are a class of chemicals that contain carbon and evaporate, or volatilize, easily into air at room temperature. VOCs are found in a variety of commercial, industrial, and residential products, including gasoline, solvents, cleaners and degreasers, paints, inks and dyes, and pesticides.