Documentation to Amend Drinking Water Health Advisory in Zone H3

Joint Base Pearl Harbor Hickam (JBPHH)
O‘ahu, Hawai‘i

Interagency Drinking Water System Team
Zone H3 Removal Action Report
March 2022

TABLE OF CONTENTS

Note: Department of Defense critical infrastructure security information (DCRIT) is not included

Interagency Drinking Water System Team
Zone H3 Removal Action Report
March 2022

Line of Evidence 0

Introduction

Zone H3 Checklist to Amend the Public Health Advisory initiated November 29, 2021 for Joint Base Pearl Harbor -Hickam Public Water System No. 360
HEER Incident Case No.: 20211128-1848

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

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

Background: A chemical release of petroleum, which is a hazardous substance, entered the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water distribution system and the Red Hill Shaft. This release triggered an emergency response and DOH issuance of an Advisory on November 29, 2021 for the entire JBPHH Public Water System No. 360. State and Federal Drinking Water (DW) Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act do not adequately address petroleum contamination of drinking water. DOH has established Environmental Action Levels (EALs) and Incident Specific Parameters (ISPs) to more comprehensively monitor and respond to petroleum contaminated drinking water. Any contaminants that exceed the State and Federal DW MCLs, EALs, or ISPs require additional action prior to amending the Advisory. Satisfaction of the lines of evidence will be achieved by evaluating the data generated during the investigation conducted by the IDWST. The data will be assessed for each Zone of the Drinking Water Distribution System Recovery Plan. All lines of evidence will require documentation.

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

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

Reference	Status	Documentation
Tab 0	Complete	DOH Checklist to Amend the Drinking Water Health Advisory.
Tab 0.1	Complete	• Executive Summary Memo for Zone H3 Removal Action Report • Signed statement by the Owner/Operator Representative of the Water System, that asserts that all lines of evidence have been met, including the following statement with a signature: "I certify under penalty of law that I have personally examined and am familiar with the information submitted and believe the submitted information is true, accurate, and complete."

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

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

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

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

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

Reference	Status	Documentation
Tab 1b.0	Complete	Executive Summary Memo.
Tab 1b.1	Complete	• Sample Results for Waiawa Shaft (the source) taken 1/13/2022 Level 4 Validated Laboratory Report for EPA Methods 8260 (VOCs), 8270 (SVOCs), 8015 (TPH-G, TPH-D, TPH-O) plus Tentatively Identified Compounds (TICs) • Level 4 Validated Laboratory Report for EPA Methods 8260 (VOCs), 8270 (SVOCs), 8015 (TPH-G, TPH-D, TPH-O) plus Tentatively Identified Compounds (TICs) • Sample Results of Waiawa Shaft Entry Point (after treatment) taken 1/11/2022 Level 4 Validated Laboratory Report for Sampling Plan Addendum 1, Table 3a: Distribution Sampling (Step 2b) Summary Drinking Water Analytical Methods, Analytes, Action Levels, and Method Detection Limits • Level 4 Validated Laboratory Report for Sampling Plan Addendum 1, Table 3a: Distribution Sampling (Step 2b) Summary Drinking Water Analytical Methods, Analytes, Action Levels, and Method Detection Limits

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

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

Reference	Status	Documentation
Tab 1c.0	Complete	Executive Summary Memo.
Tab 1c.1	Complete	Certificate Regarding Cross-Connection Control Review and Confirmation – Zone H3, verifying that building and service connections with petroleum activities are protected from backflow risks with the following documentation: • A "gap analysis" of the petroleum related activities versus appropriate device inventory (i.e., inappropriate device, missing Cross-Connection Control protection, untested device, etc.). • A map that includes: All facilities with petroleum activities; locations of existing backflow prevention devices; and Water system infrastructure. • An inventory database: A list of petroleum-related activities and identified appropriate cross connection control (CCC) devices at these activities, as required, i.e., if there was human consumptive use and where cross connection potential or hazard was identified.
Tab 1c.2	Complete	COMNAVREG HAWAII INSTRUCTION 11330.2D, dated 19 Sep 2016, Backflow Prevention and Cross-Connection Control Program

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

Incident Specific Criteria –

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

Reference	Status	Documentation
Tab 2a.0	Complete	Executive Summary Memo.
Tab 2a.1	Complete	Memorandum for the Record of the Distribution System Recovery Plan Addendum – Zone H3 Analysis which includes: • Hydraulic model that exhibits and flushing line map(s) and plan to show that the flushing approach will achieve directional flushing. • A one-page high resolution zonal flushing map should be provided. • Narrative of assumptions in the development of their flushing model inclusive of any simulations that they ran.
Tab 2a.2	Complete	Summary with documentation from Dr. Whelton discussing flushing goals providing validity of volumetric exchange model.

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

Incident Specific Criteria –

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

Reference	Status	Documentation
Tab 2a.3	Complete	Identification of consecutive flushing zones and flushing phasing order. Time based contaminant slug model showing possible migration of contaminant from Red Hill Shaft used to identify zones requiring additional volumetric flushing (Hydraulic Model)
Tab 2a.4	Complete	Table showing volumetric goals and recorded flushing volumes that occurred in the field for the distribution system.
Tab 2a.5	Complete	Certification of Water Storage Facilities and Water Source for Zone H3 with Water Storage Tanks S1 and S2 Flushing Report.
Tab 2a.6	Complete	• Distribution System Exceedance Investigation Summary and Results. • Drinking Water Distribution System Recovery Plan: Stage 2 Sampling Results for Zone H3, JBPHH.

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

Incident Specific Criteria –

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

Reference	Status	Documentation
Tab 2b.0	Complete	Executive Summary Memo.
Tab 2b.1	Complete	Records of Completed Residential and Non-Residential Flushing Zone H3 with: • EDMS Residential Flushing Records Zone H3 • EDMS Non-Residential Flushing Records Zone H3 • NAVFAC SCADA Data Zone H3 28 Dec 2021 to 12 Jan 2022 (for the Distribution System pressure logs during flushing and confirmation that the 30 psi within the distribution system was maintained).
Tab 2b.2	Complete	Sample Results, Level 2 and Level 4 Validated as required by Sampling Plan Section 6.0, report from EDMS.
Tab 2b.3	Complete	Exceedance Investigation Summary and Results Zone H3.
Tab 2b.4	Complete	Memorandum for Record showing that irrigation flushing is complete.

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

Incident Specific Criteria –

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

Reference	Status	Documentation
Tab 2b.5	Complete	DOH Guidance for Active Irrigation Line Purging and Flushing

February 22, 2022

From: US Army Representative, IDWS Team To: Interagency Drinking Water System Team

SUBJ: ZONES H1, H2, H3 REMOVAL ACTION REPORT

Ref: (a) Drinking Water Sampling Plan, December 2021
(b) Drinking Water Distribution System Recovery Plan, December 2021
(c) Single Family Home Flushing Plan Checklist and Standard Operating Procedures, December 23, 2021
(d) Non-Residential Facility Flushing Plan Checklist and Standard Operating Procedures, January 4, 2022
(e) DOH's Guidance on the Approach to Amending the Drinking Water Health Advisory, December 30, 2021; HEER Incident Case No.: 20211128-1848
(f) DOH Checklist to Amend the Drinking Water Health Advisory in Zone XX

Encl: (1) Zones H1, H2, H3 Removal Action Report

1. The enclosed report documents completion of the requirements outlined in references (a) through (f). This is in response to HEER Incident Case No.: 20211128-1848 involving the Joint Base Pearl Harbor Hickam (JBPHH) Public Water System No. 360.

2. On the 20th of November, a spill of jet fuel, specifically JP-5 jet fuel, occurred at the Red Hill Bulk Fuel Storage Facility in an access tunnel that provides fire suppression and service lines for the facility. The fuel spill was cleaned up. On the 23rd of November, Admiral Paparo directed an independent investigation of the spill event and ordered the investigating officer to determine any connection between the 20 November event and the spill that occurred on the 6th of May. The results of the investigation are pending public release.

On the 27th of November, the Commander, Navy Region Hawaii, RDML Tim Kott, met with the Fleet Logistics Center Commander, who operates The Red Hill Fuel Storage Facility for the Navy, and they jointly made the decision to stop Red Hill Tank fuel transfer operations based on the ongoing investigation into the recent spills.

On Sunday, the 28th of November, the JBPHH HQs and Hawaii Department of Health (HDOH) began receiving phone calls from military residents reporting a chemical or petroleum taste and smell to the water in the Navy's drinking water system. As more calls were received, it became clear that the reports were clustered around neighborhoods fed by the Red Hill Shaft Well. On the evening of the 28th of November, the Navy shut down that well and stood up the Region's Emergency Operations Center to handle the issue. More reports of contaminated water continued to come in over the next 24 hours. Admiral Paparo, as the senior Navy commander in Hawaii, ordered the establishment of a Joint Crisis Action Team on the 29th of November and the Navy immediately began flushing its potable water distribution system.

On the 8th of December, 2021, HDOH issued Direction One which provided requirements for flushing of the Navy Water System. The Navy began working with HDOH and the U.S. Environmental Protection Agency (EPA) to meet the requirements of this directive and resume flushing of the potable water system.

On the 14th of December, 2021 HDOH, the U.S. Navy, the U.S. Army, and the EPA signed the Joint Drinking Water Sampling Plan. On the 17th of December, 2021, HDOH, the U.S. Navy, the U.S. Army and EPA established an Interagency Drinking Water System (IDWS) Team to restore safe drinking water to affected JBPHH housing communities. The working group was established to ensure that the agencies were coordinated in actions to restore safe drinking water to Navy water system users and that they had a clear, coordinated source of information as work continued to restore safe drinking water. On the same day, the U.S. Navy, U.S. Army, HDOH, and the EPA jointly signed the Water Distribution System Recovery Plan agreement.

The flushing of the water distribution lines resumed on the 20th of December, 2021. Residential and non-residential facilities were flushed and sampled after the completion of flushing and testing of the distribution system of a specific Zone. This report specifically documents the requirements outlined in references (a) through (f) for Zone H1, H2 & H3.

3. The removal action report (RAR) for Zone H1, H2 & H3 documents two specific lines of evidence necessary to amend the drinking water health advisory for Zone H1, H2 & H3 as provided by HDOH. The two lines of evidence under evaluation include:

i. Ensure no contamination is entering the water system.
ii. Ensure no contamination remains in the system and water chemistry concerns are addressed.

Each line of evidence has several objectives with specific lines of evidence and incident specific criteria required to be met. Achievement of the criteria will be described and supported with documentation in the subsequent sections of the RAR.

4. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

2/22/2022

X Nisit A. Gainey

Signed by: GAINEY.NISIT.ANTHONY.1067651371

Nisit A. Gainey
Director
Public Works, USAG-HI

Interagency Drinking Water System Team
Zone H3 Removal Action Report
March 2022

Line of Evidence 1a

All Reported Sources of Contamination Are Isolated and Contained

Table 1: Lines of Evidence Under Evaluation – Ensure no contamination is entering the water system.

Objective 1a - All reported sources of contamination are isolated and contained.

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

Lines of Evidence	Completion Status	Outstanding Items
Navy confirmation that Red Hill Shaft is isolated from the Navy's water distribution system.	Complete.	• None.

February 19, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: SUMMARY OF LINE OF EVIDENCE OBJECTIVE 1A – ALL REPORTED SOURCES OF CONTAMINATION ARE ISOLATED AND CONTAINED

Encl: (1) 1a.1 Memorandum for Record with Isolation Date
(2) 1a.2 Summary of Operator Logs and SCADA Data
(3) 1a.3 Photograph of Concrete Blocking Between Air Gapped Isolation Flanges

1. Enclosures (1), (2), and (3) document completion of Line of Evidence objective 1a, all reported sources of contamination are isolated and contained. On the evening of November 28, 2021, the Red Hill Shaft was secured from operation and all pumping operations ceased. The Aiea/Halawa shaft briefly served as the secondary source starting on November 28, 2021, but it was shut down on December 3, 2021 to prevent potential westward contaminant migration in the aquifer and because there were concerns over high chloride concentrations caused by saltwater intrusion. Since December 3, 2021, the Waiawa Shaft has been the sole water source providing potable water to the distribution network. It is located 5.5 miles west of the Red Hill Fuel Facility, and testing has not detected any water quality issues at this source. The Red Hill Shaft discharge pipes were physically re-arranged and encased in concrete on December 24, 2021 as shown in Enclosure (1) and (3), thereby isolating the system as required by Line of Evidence 1a. The Supervisory Control and Data Acquisition (SCADA) data in Enclosure (2) shows the previous statement to be true. All reported sources of contamination are isolated and contained.

2. The Red Hill Shaft pumps are now being used to control the spread of contamination by creating a capture zone in the aquifer by pumping to a 5 million gallons/day Granular Activated Carbon (GAC) system which discharges into the Halawa Stream. The new piping from the pumps to the GAC treatment came from the 20” header where the 20x24 reducer was removed on 24 DEC 2021. A thrust block was poured at this location around the existing blinded wye fitting as shown in Enclosure (3).

3. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and I believe the submitted information is true, accurate, and complete.

WETZEL.CHRISTOPHER.JAMES.1540194862
Digitally signed by WETZEL.CHRISTOPHER.JAMES.1540194862
Date: 2022.02.19 12:23:47 -08'00'

C. J. Wetzel
LT, CEC, USN

04 JANUARY 2022

MEMORANDUM FOR RECORD

SUBJECT: Red Hill Potable Water Pumping Station

ENC: (1) Red Hill Pump Station Photographs, Post Pump Isolation dated 12/26/2021
(2) JBPHH Potable Water LOTO Log

1. This Memorandum For Record (MFR) is to document the Red Hill Shaft pump status in relation to the Joint Base Pearl Harbor Hickam Potable Water System.

2. In response to fuel contaminants found in the Red Hill Shaft aquifer/development tunnel, the main Red Hill Pumping Station pumps were secured from the Potable Water system. On 3 December 2021, all four Red Hill pumps were electrically Locked Out, Tagged Out (LOTO), see Enclosure (2). (Note: Pump #1 was LOTO on 10 June 2020 due to an unrelated pump issue, and is still out of service, LOTO.) After initially being shut down operationally, and LOTO electrically, the Red Hill pumps were physically isolated from the Potable Water system on 24 December 2021.

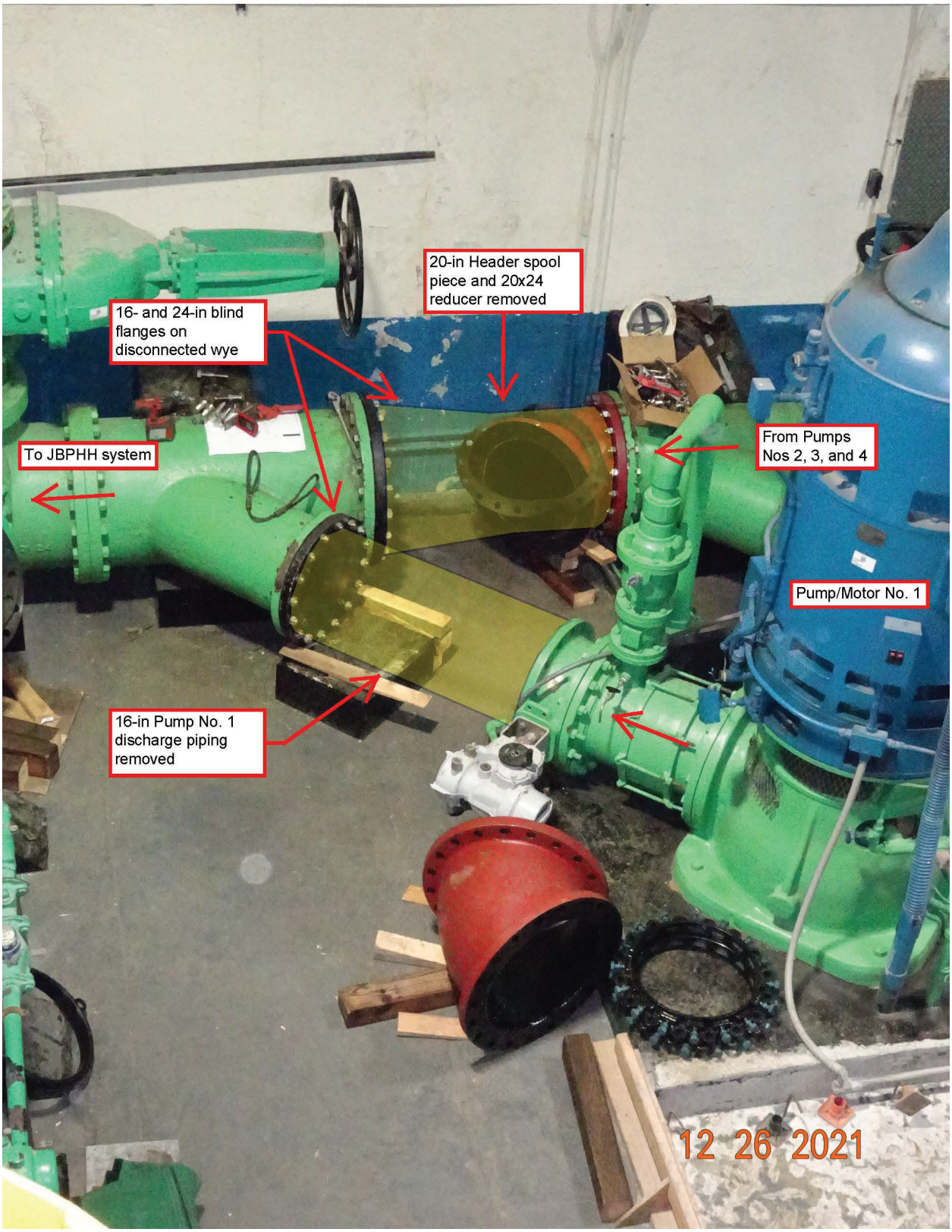
3. Physical isolation was performed with in-house NAVFAC forces, with a completion date of 24 December 2021. This work was performed by isolating the system from the pumps at the "wye" fitting adjacent to Red Hill Pump #1. The wye fitting is shown on Enclosure (1). A blind flange was placed on the main header and the wye branch.

4. The 24" blind flange on the main header physically air-gapped and isolated Red Hill pumps #2, #3, and #4. The 16" blind flange in the wye branch physically air-gapped and isolated Red Hill pump #1. This work is shown on Enclosure 1.

5. The work the NAVFAC in-house forces performed removed any source or pathway from the Red Hill aquifer to the JBPHH Potable Water system.

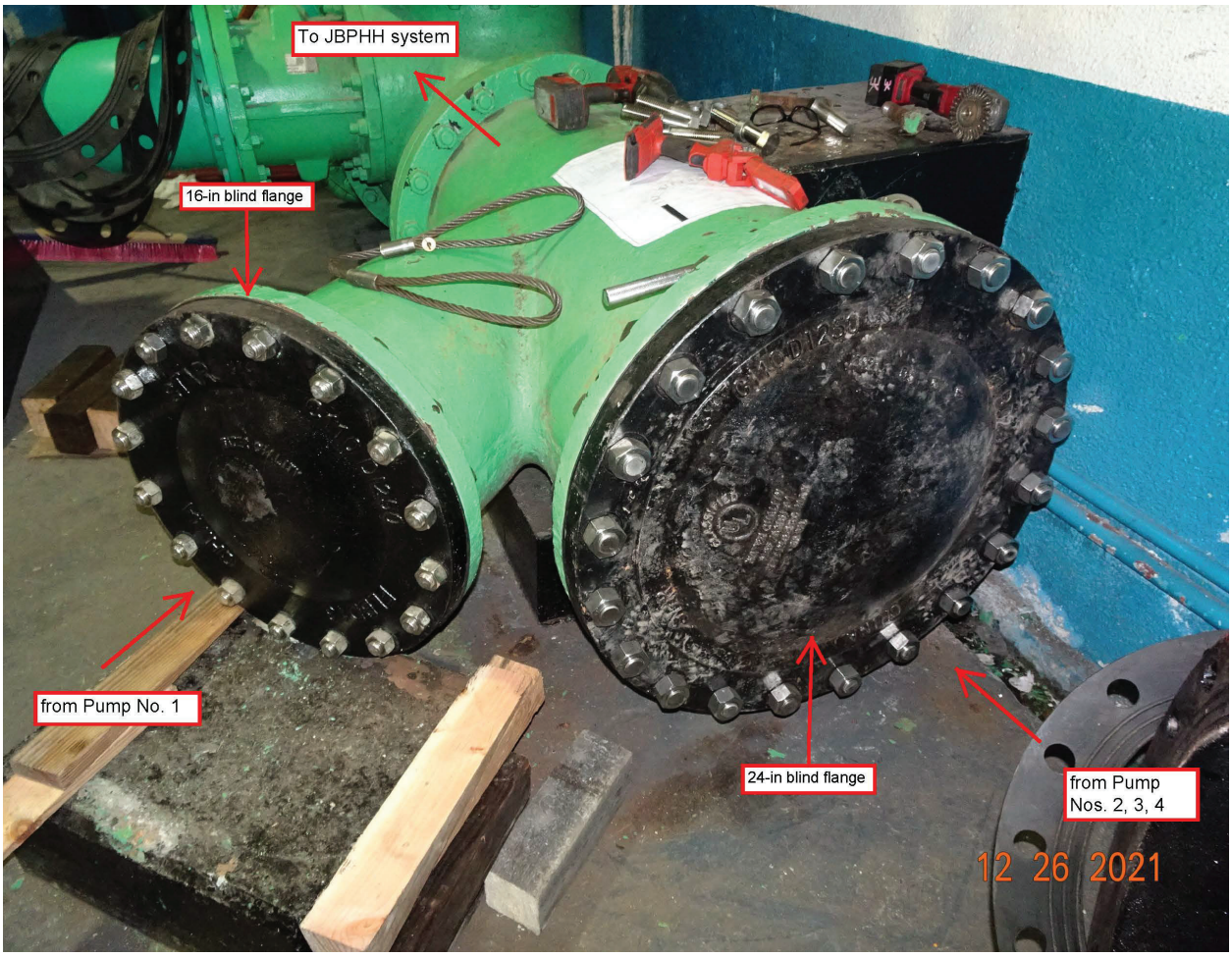
MITCHELL.JEREMY.W.1395400700
Digitally signed by MITCHELL.JEREMY.W.1395400700
Date: 2022.01.04 07:56:02 -10'00'

J. MITCHELL
Deputy Public Works Officer
Joint Base Pearl Harbor Hickam


20-in Header spool piece and 20x24 reducer removed
16- and 24-in blind flanges on disconnected wye
To JBPHH system
From Pumps Nos 2, 3, and 4
Pump/Motor No. 1
16-in Pump No. 1 discharge piping removed
12 26 2021

Red Hill Pump Station Photographs
Post Pump Isolation dated 12/26/2021

Enclosure (1)



NAVFAC Hawaii - Potable Water Utilities
Lock Out Tag Out (LOTO) Form

Locked Out		Back in Service		Location	Circuit / Equipment being LOTO	Reason for LOTO	Lock No.	Tag No.	Authorized Employee
Date	Time	Date	Time						
12 MAR 20	0930			REDHILL	MP#1	PUMP OVERHAUL		010	[illegible]
5 JUN 20		20 MAY 21	1200	WAIAWA	CB #2B	FAULT IN BREAKER		1	
10 JUN 20	0900			REDHILL	PUMP CONTROL MP#1	PUMP OVERHAUL		011	[illegible]
10 JUN 20	0900			REDHILL	MCC MP#1	PUMP OVERHAUL		012	[illegible]
16 JUN 20	0945			WAIAWA	CB #4B	FAULT-PUMP CONTROLS		2	An
10 MAY 21				HALAWA	MCC#1	MOTOR FAULT		3	An
2 JUN 21	0800			WAIAWA	CB# 8B	FAULT PUMP CONTROLS		5	An
2 JUN 21	0800	30 JUN 21	2030	WAIAWA	CB# 10B	HECO OUTAGE		4	An
2 JUN 21	0900			HALAWA	MCC #2	PUMP REMOVED		6	An
30 JUN 21	2330	7 JUL 21	1300	WAIAWA	CB#1B	FAIL TO CLOSE		8	An
19 JUL 21	0745	19 JUL	0900	HALAWA	EXHAUST FAN	REPLACE BELT			DS
17 NOV 21	1230			MANANA	PUMP #1	PUMP FAIL			An
17 NOV 21	1230			MANANA	PUMP #2	MOTOR FAIL			An
3 DEC 21	0925			REDHILL	MCC MP#2	COMMAND INTEREST WORK IN WELL			An

NAVFAC

NAVFAC

Locked Out		Back in Service		Location	Circuit / Equipment being LOTO	Reason for LOTO	Lock No.	Tag No.	Authorized Employee
Date	Time	Date	Time						
3DEC21	0920			REDHILL	MCC MP #3	COMMAND INTEREST WORK IN WELL			AH
3DEC21	0927			REDHILL	MCC MP #4	COMMAND INTEREST WORK IN WELL			AH
3DEC21				HALAWA	MCC #3	COMMAND INTEREST ISOLATE 3/STEEM			AH

February 10, 2022

SUMMARY OF OPERATOR LOGS AND SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) DATA

1. OBJECTIVE: Provide a description of water sources that supplied the Joint Base Pearl Harbor Hickam (JBPHH) potable water system (system) prior-to and after the fuel contamination incident that occurred in late November 2021.

2. BACKGROUND:

2.1. Portions of the Navy water distribution system serving JBPHH and surrounding areas were exposed to low levels of fuel contamination with initial indications in the form of smell reports occurring on or about 28 November 2021.

2.2. Prior to the aquifer contamination incident, water users connected to the Navy's system were supplied by three Navy owned water sources, Red Hill Shaft, Aiea/Halawa Shaft and Waiawa Shaft. In the time period prior to the incident, Waiawa Shaft was the main water source supplying water to the JBPHH system with at least one pump operating full time (100%). A single Red Hill Shaft pump was operated intermittently as a secondary source to the system. The Aiea/Halawa shaft was not being operated due to concerns over high chloride concentrations caused by saltwater intrusion into the aquifer.

2.3. On the evening of 28 November 2021, the Red Hill Shaft was secured and all pumping operations ceased. The Aiea/Halawa shaft briefly served as the secondary source starting on 28 November 2021 but was shut down on 03 December 2021 to prevent westward contaminant migration in the aquifer.

2.4. Since 03 December 2021, Waiawa Shaft has been the sole water source providing potable water to the distribution network. It is located 5.5 miles west of the Red Hill Fuel Facility and testing has not found any water quality issues at this source.

3. DATA INTERPERETATION: The Supervisory Control and Data Acquisition (SCADA) data provided in reference (a) includes tabular and graphical depictions of flow from the three source pump stations, aquifer water surface elevations above mean sea level (MSL) and the water level in the 6 million gallon (MG) S1 and S2 water storage tanks. The data was provided as a daily average (i.e. data was averaged over the 24 hours of each day from 00:00 to 23:59) and ranges from 01 November 2021 to 08 January 2022.

3.1 WAIAWA SHAFT/PUMP STATION: Prior to 28 November, The Waiawa Pump Station (PS) was supplying an average of 16.6 million gallons per day (MGD) of potable water to the system. After 28 November, demand reductions from turning off irrigation and smaller residential demand reduced the water supplied by the Waiawa PS to an average of 15.5 MGD. This was 76% of the 22 MGD total system demand prior to 28 November 2021.

There was an inverse correlation between the aquifer water surface elevation and water pumped out of the aquifer. When Waiawa PS was pumping between 16 and 18 MGD, the aquifer water surface elevation dropped to between 8.0 and 10.0 feet MSL. When pumping was reduced between 15 and 16 MGD, the aquifer water surface was raised to between 15.0 and 17.0 feet

above MSL. See Figure 1 below for a graphical depiction of the daily average aquifer water surface elevation and pumps flows from Waiawa Shaft.

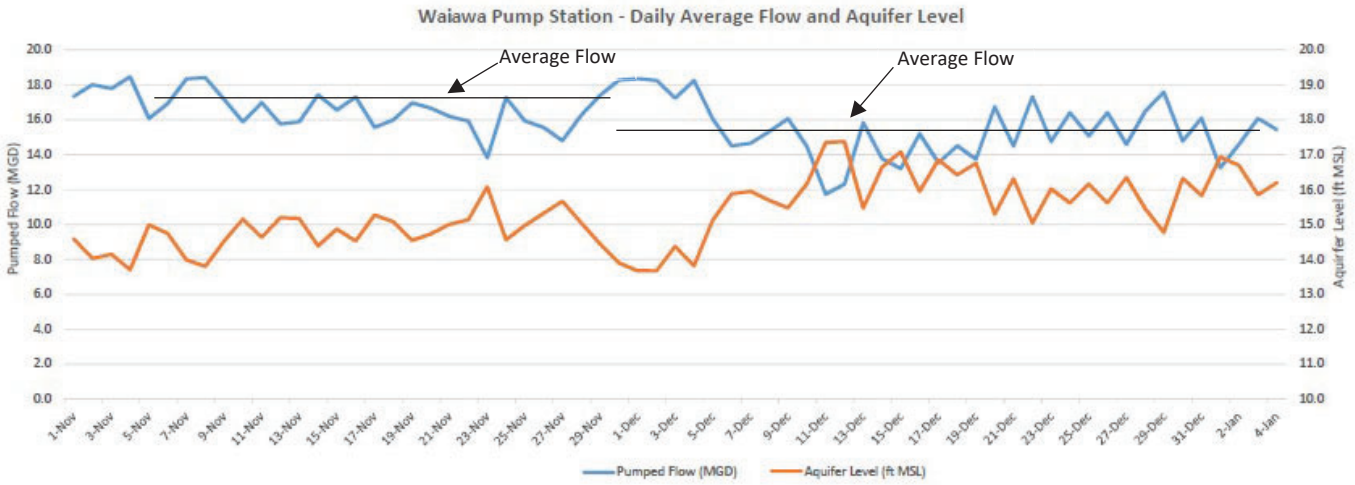


Figure 1. Waiawa Shaft Daily Average Flows and Aquifer Water Surface Elevation

3.2 RED HILL SHAFT/PUMP STATION: Prior to being shut down on 28 November 2021, the Red Hill PS was supplying an average of 5.3 MGD to the system. The represented 24% of the 22 MGD total system demand. A shown in Figure 2, the Red Hill Pump Station has not been operated since 28 November 2021.

Since pumping ceased, the aquifer water surface elevation has raised from approximately 2 ft MSL to almost 6 ft MSL

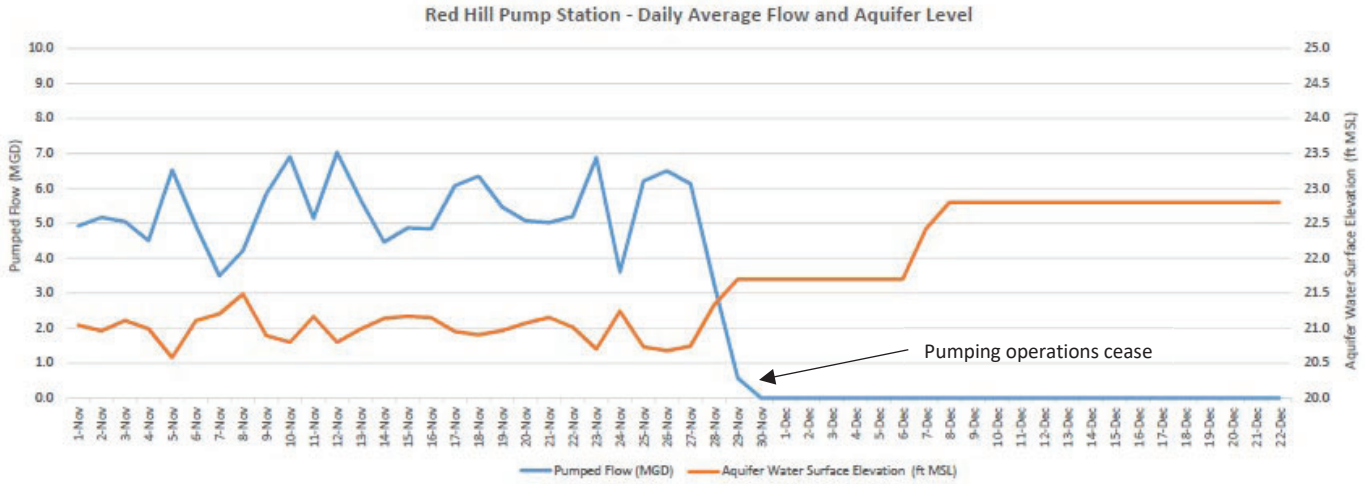


Figure 2. Red Hill Shaft Daily Average Flows and Aquifer Water Surface Elevation

3.3 HALAWA/AIEA SHAFT/PUMP STATION: Halawa Shaft was briefly operated from 28 November to 03 December 2021. The reasons for shutdown are as follows:

1. Demand reductions made it so that Waiawa Shaft could supply 100% of the water to the system,

2. there were concerns over westward plume migration from Red Hill if Halawa remained active,
3. water system operators had advised that high chloride concentrations in the Halawa/Aiea Shaft had caused water quality problems in the past.

The aquifer water surface elevation was around 12.0 ft MSL prior to turning the pumps on at the Halawa/Aiea PS. After the pumping ceased, the aquifer recovered to around 12.8 ft MSL.

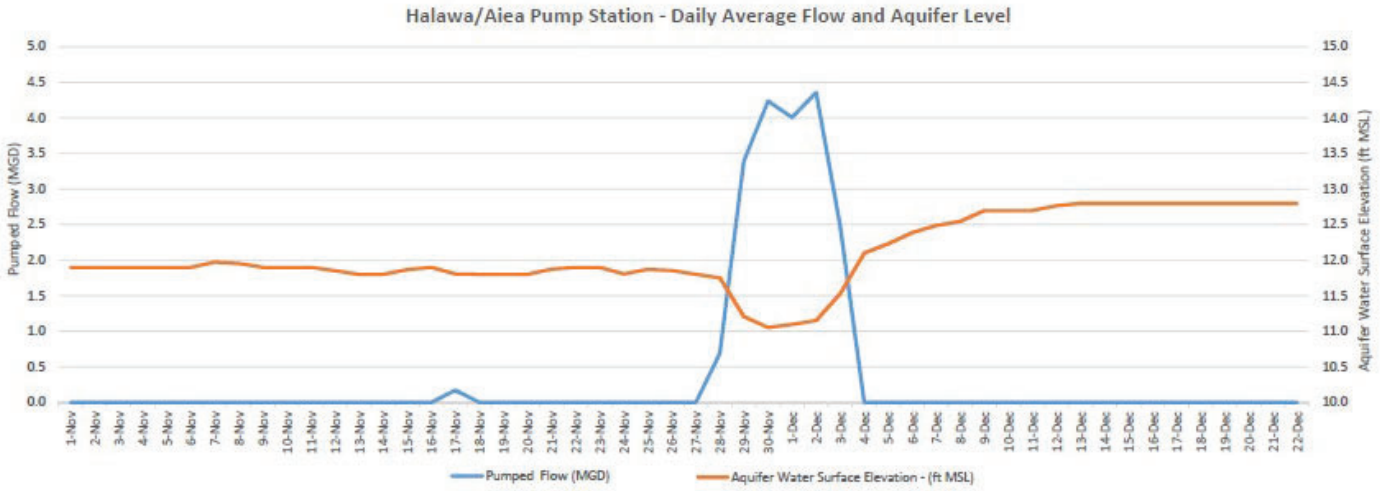


Figure 2. Halawa/Aiea Shaft Daily Average Flows and Aquifer Water Surface Elevation

Photograph of Concrete Blocking Between Air Gapped Isolation Flange

Interagency Drinking Water System Team
Zone H3 Removal Action Report
March 2022

Line of Evidence 1b

Regulated Public Water System's Water Quality Data is Compliant

Table 1: Lines of Evidence Under Evaluation – Ensure no contamination is entering the water system.

Objective 1b - The regulated public water system's water quality data is compliant.

Incident Specific Criteria - Data does not exceed Federal DW MCLs, specified State EALs, and ISPs for **Waiawa Shaft**.

Lines of Evidence	Completion Status	Outstanding Items
Date Sample Taken at Step 0 of the Sampling Plan Addendum 1	Complete	• None.
Date Sample Taken at Entry Point to Distribution	Complete	• None.

February 17, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: SUMMARY OF LINE OF EVIDENCE OBJECTIVE 1B – THE REGULATED PUBLIC WATER SYSTEM'S WATER QUALITY IS COMPLIANT

Encl: (1) 1b.1 Source Water and Entry Point of Distribution Sample

1. Enclosure (1) documents completion of Line of Evidence 1b, the regulated public water system's water quality is compliant. On the evening of November 28, 2021, the Red Hill Shaft was secured from operation and all pumping operations ceased. The Aiea/Halawa shaft briefly served as the secondary source starting on November 28, 2021, but it was shut down on December 3, 2021 to prevent potential westward contaminant migration in the aquifer and because there were concerns over high chloride concentrations caused by saltwater intrusion. Since December 3, 2021, the Waiawa Shaft has been the sole water source providing potable water to the distribution network. It is located 5.5 miles west of the Red Hill Fuel Facility, and testing has not detected any water quality issues at this source.

2. On January 11, 2022, water from the Waiawa shaft was sampled at the entry point to the distribution system (EPD). The results of the analysis are presented in Enclosure (1), Field Sample ID 20111-WS-ZT01. On January 13, 2022, additional samples were taken at the Waiawa shaft source. The results of these samples are also presented in Enclosure (1), Field Sample IDs 220113-WS-ZT01 and 220113-WS-ZT03. This data shows that the water from the Waiawa shaft does not exceed State of Hawaii and Federal Drinking Water standards, Maximum Contaminate Levels, Environmental Action Levels and Incident Specific Parameters, and the regulated public water system's water quality is complaint.

3. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and I believe the submitted information is true, accurate, and complete.

RODRIGUEZ.ALBERTO.MAURICIO.1396316168

Digitally signed by RODRIGUEZ.ALBERTO.MAURICIO.1396316168
Date: 2022.02.19 17:19:01 -10'00'

A. M. Rodriguez
LT, CEC, USN

1b.1 Source Water and Entry Point of Distribution Sample
Well Shaft Sampling
Chemistry Results

Drinking Water Sampling, JBPHH, Oahu Hawaii

		EPD	Shaft	Shaft
Location ID:		I1-SHFTWAIA	I1-SHFTWAIA	I1-SHFTWAIA
Location Type:		Well	Well	Well
Residence:		Waiawa Shaft	Waiawa Shaft	Waiawa Shaft
Field Sample ID:		220111-WS-ZT01	220113-WS-ZT01	220113-WS-ZT03
Sample Date:		2022-01-11	2022-01-13	2022-01-13
Sample Type:		N (PostChlorination Sample)	N (PreChlorination Sample)	N (PreChlorination Sample)
GENCHEM (mg/L)	**Incident Specific Parameters**	**Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 2A12046**		**SDG: 810121191**
Total Organic Carbon	2	None	None	None	0.190 U	--	0.250 U
HC (µg/L)	**Incident Specific Parameters**	**Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801092421**	**SDG: 5801092721**	**SDG: 5801092711**
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	90.0 U	91.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	180 U	180 U
HERB (µg/L)	**Incident Specific Parameters**	**Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**			**SDG: 980559**
Pentachlorophenol	None	None	None	None	--	--	0.0200 U
HG (µg/L)	**Incident Specific Parameters**	**Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 2A12046**		
Mercury	0.025	0.025	2	2	0.0170 U	--	--
METAL (µg/L)	**Incident Specific Parameters**	**Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 2A12046**		**SDG: 980559**
Antimony	6	6	6	6	**0.0915 J**	--	0.110 U
Arsenic	10	10	10	10	**0.207 J**	--	0.210 U
Barium	220	220	2000	2000	**1.72**	--	**1.80 J**
Beryllium	0.66	0.66	4	4	0.0624 U	--	0.0910 U
Cadmium	3	3	5	5	0.0416 U	--	0.0290 U
Chromium	11	11	100	100	**1.46**	--	**1.50**
Copper	2.9	2.9	1300	1300	**21.2**	--	**46.0**
Lead	15	5.6	15	15	**0.265**	--	**0.0630 J**
Selenium	5	5	50	50	**0.704**	--	**0.350 J**
Thallium	2	2	2	2	0.0210 U	--	0.0410 U
SVOC (µg/L)	**Incident Specific Parameters**	**Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 2A12046**	**SDG: 5801092721**	**SDG: 810121191**

1b.1 Source Water and Entry Point of Distribution Sample
Well Shaft Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

					EPD	Shaft	Shaft
1,2,4-Trichlorobenzene	70	70	70	70	--	0.0930 U	--
1,2-Dichlorobenzene	10	10	600	600	--	0.0520 U	--
1,3-Dichlorobenzene	None	None	None	None	--	0.0410 U	--
1,4-Dichlorobenzene	5	5	75	None	--	0.0410 U	--
1-Methylnaphthalene	2.1	10	None	None	0.00801 U	--	0.0190 U
2,4,5-Trichlorophenol	None	None	None	None	--	0.100 U	--
2,4,6-Trichlorophenol	None	None	None	None	--	0.100 U	--
2,4-Dichlorophenol	None	None	None	None	--	0.210 U	--
2,4-Dimethylphenol	None	None	None	None	--	0.170 U	--
2,4-Dinitrophenol	None	None	None	None	--	1.70 U	--
2,4-Dinitrotoluene	None	None	None	None	--	0.100 U	--
2,6-Dinitrotoluene	None	None	None	None	--	0.100 U	--
2-Chloronaphthalene	None	None	None	None	--	0.0720 U	--
2-Chlorophenol	None	None	None	None	--	0.0520 U	--
2-Ethylhexyl adipate	None	None	None	None	0.00962 U	--	--
2-Methylnaphthalene	4.7	10	None	None	0.00904 U	--	0.0190 U
2-Methylphenol (o-Cresol)	None	None	None	None	--	0.0520 U	--
2-Nitroaniline	None	None	None	None	--	0.100 U	--
3,3'-Dichlorobenzidine	None	None	None	None	--	0.270 U	--
3-Nitroaniline	None	None	None	None	--	0.170 U	--
4,6-Dinitro-2-methylphenol	None	None	None	None	--	0.570 U	--
4-Bromophenyl phenyl ether	None	None	None	None	--	0.0620 U	--
4-Chloro-3-methylphenol	None	None	None	None	--	0.130 U	--
4-Chloroaniline	None	None	None	None	--	0.610 U	--
4-Chlorophenyl phenyl ether	None	None	None	None	--	0.0520 U	--
4-Nitroaniline	None	None	None	None	--	0.220 U	--
4-Nitrophenol	None	None	None	None	--	1.80 U	--
Acenaphthene	None	None	None	None	--	0.0520 U	--
Acenaphthylene	None	None	None	None	--	0.0620 U	--
Alachlor	None	None	None	None	0.0110 U	--	0.0480 U
Anthracene	None	None	None	None	--	0.0520 U	--
Atrazine	None	None	None	None	0.00734 U	--	0.0290 U
Benzo(a)anthracene	None	None	None	None	--	0.0520 U	--
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0117 UJ	0.0410 U	0.00960 U
Benzo(b)fluoranthene	None	None	None	None	--	0.0410 U	--
Benzo(g,h,i)perylene	None	None	None	None	--	0.0410 U	--
Benzo(k)fluoranthene	None	None	None	None	--	0.0520 U	--
Benzyl butyl phthalate	None	None	None	None	--	0.280 U	--
Bis(2-chloroethoxy)methane	None	None	None	None	--	0.0520 U	--
Bis(2-chloroethyl) ether (2-Chloroethy ether)	None	None	None	None	--	0.0310 U	--
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.437 U	0.770 U	0.580 U
Carbazole	None	None	None	None	--	0.100 U	--
Chlordane	None	None	None	None	0.0669 U	--	0.0320 U
Chrysene	None	None	None	None	--	0.0410 U	--

1b.1 Source Water and Entry Point of Distribution Sample
Well Shaft Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

					EPD	Shaft	Shaft
Cresols, m- & p-	None	None	None	None	--	0.100 U	--
Dibenz(a,h)anthracene	None	None	None	None	--	0.0720 U	--
Dibenzofuran	None	None	None	None	--	0.100 U	--
Diethyl phthalate	None	None	None	None	--	0.160 U	--
Dimethyl phthalate	None	None	None	None	--	0.0620 U	--
Di-n-butyl phthalate	None	None	None	None	--	0.200 U	--
di-n-Octyl phthalate	None	None	None	None	--	0.130 U	--
Dioctyl adipate	None	None	None	None	--	--	0.580 U
Endrin	None	None	None	None	0.00991 U	--	0.00500 U
Fluoranthene	None	None	None	None	--	0.0620 U	--
Fluorene	None	None	None	None	--	0.0520 U	--
gamma-BHC (Lindane)	None	None	None	None	0.00633 U	--	0.00700 U
Heptachlor	None	None	None	None	0.00965 U	--	0.00300 U
Heptachlor epoxide	None	None	None	None	0.0122 U	--	0.00500 U
Hexachlorobenzene	0.0003	0.0003	1	1	0.0980 U	0.0410 U	0.00960 U
Hexachlorobutadiene	None	None	None	None	--	0.0620 U	--
Hexachlorocyclopentadiene	50	None	50	50	0.00594 U	0.140 U	0.00960 U
Hexachloroethane	None	None	None	None	--	0.0520 U	--
Indeno(1,2,3-c,d)pyrene	None	None	None	None	--	0.130 U	--
Isophorone	None	None	None	None	--	0.100 U	--
Methoxychlor	None	None	None	None	0.00863 U	--	0.0320 U
Naphthalene	12	17	None	None	0.0103 U	0.170 U	0.0190 U
Nitrobenzene	None	None	None	None	--	0.0410 U	--
N-Nitrosodi-n-propylamine	None	None	None	None	--	0.0620 UJ	--
N-Nitrosodiphenylamine	None	None	None	None	--	0.0720 U	--
PCB, Total	None	None	None	None	0.100 U	--	--
PCB-1016 (Aroclor 1016)	None	None	None	None	0.0157 U	--	0.0220 U
PCB-1221 (Aroclor 1221)	None	None	None	None	0.0436 U	--	0.0790 U
PCB-1232 (Aroclor 1232)	None	None	None	None	0.0102 U	--	0.0850 U
PCB-1242 (Aroclor 1242)	None	None	None	None	0.0737 U	--	0.0720 U
PCB-1248 (Aroclor 1248)	None	None	None	None	0.0941 U	--	0.0230 U
PCB-1254 (Aroclor 1254)	None	None	None	None	0.0869 U	--	0.0350 U
PCB-1260 (Aroclor 1260)	None	None	None	None	0.0379 U	--	0.0330 U
Pentachlorophenol	None	None	None	None	0.0242 U	0.530 U	--
Phenanthrene	None	None	None	None	--	0.120 U	--
Phenol	None	None	None	None	--	0.370 U	--
Pyrene	None	None	None	None	--	0.0410 U	--
Simazine	None	None	None	None	0.00734 U	--	0.0290 U

VOC (µg/L)	Incident Specific Parameters	Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 2A12046	SDG: 5801092721	SDG: C22A017REV1
1,1,1-Trichloroethane	11	11	200	200	0.256 U	0.390 U	0.119 U
1,1,2,2-Tetrachloroethane	None	None	None	None	--	0.520 U	--
1,1,2-Trichloroethane	5	5	3	5	0.190 U	0.240 U	0.288 U

1b.1 Source Water and Entry Point of Distribution Sample
Well Shaft Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

					EPD	Shaft	Shaft
1,1-Dichloroethane	None	None	None	None	--	0.220 U	--
1,1-Dichloroethene	7	7	7	7	0.160 U	0.280 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.170 U	--	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.190 U	--	0.272 U
1,2-Dichloroethane	5	5	5	5	0.243 U	0.420 U	0.0884 U
1,2-Dichloroethene	None	None	None	None	--	0.390 U	--
1,2-Dichloropropane	5	5	5	5	0.130 U	0.180 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.180 U	--	0.245 U
2-Butanone (MEK)	None	None	None	None	--	4.70 U	--
2-Hexanone	None	None	None	None	--	4.00 U	--
4-Methyl-2-pentanone (MIBK)	None	None	None	None	--	2.50 U	--
Acetone	None	None	None	None	--	3.20 U	--
Benzene	5	5	5	5	0.150 U	0.240 U	0.0846 U
Bromodichloromethane	None	None	None	None	--	0.290 U	--
Bromoform	None	None	None	None	--	0.510 U	--
Bromomethane	None	None	None	None	--	0.210 U	--
Carbon disulfide	None	None	None	None	--	0.530 U	--
Carbon Tetrachloride	5	5	5	5	0.270 U	0.300 U	0.165 U
Chlorobenzene	25	25	100	100	0.150 U	0.440 U	0.146 U
Chloroethane	None	None	None	None	--	0.350 U	--
Chloroform	None	None	None	None	--	0.260 U	--
Chloromethane	None	None	None	None	--	0.280 U	--
cis-1,2-Dichloroethene	70	70	70	70	0.250 U	0.350 U	0.0570 U
cis-1,3-Dichloropropene	None	None	None	None	--	0.200 U	--
Dibromochloromethane	None	None	None	None	--	0.430 U	--
Ethylbenzene	700	7.3	700	700	0.210 U	0.500 U	0.141 U
m,p-Xylene	10000	13	None	None	0.330 U	0.530 U	0.317 U
Methylene chloride	5	5	5	5	0.303 U	1.40 U	2.15 U
o-Xylene	10000	13	None	None	0.200 U	0.390 U	0.157 U
Styrene	10	10	100	100	0.190 U	0.530 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.180 U	0.410 U	0.125 U
Toluene	1000	9.8	1000	1000	0.294 U	0.390 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.259 U	0.390 U	0.0958 U
trans-1,3-Dichloropropene	None	None	None	None	--	0.410 U	--
Trichloroethene (TCE)	5	5	5	5	0.180 U	0.260 U	0.0574 U
Vinyl chloride	2	2	2	2	0.180 U	0.220 U	0.611 U
Xylenes, Total	10000	13	10000	10000	--	0.530 U	--

Section 1b.1 Source Water and Entry Point of Distribution Sample

Notes:

-- indicates that the sample was Not Analyzed for the analyte

Results highlighted yellow exceed the ISP
Results in purple font also exceed the EALs
Results in green font also exceed the DOH MCL
Results in blue font also exceed the EPA MCL

µg/L = Micrograms per Liter

Interagency Drinking Water System Team
Zone H3 Removal Action Report
March 2022

Line of Evidence 1c

No Additional Contamination through the Distribution System is Occurring

Table 1: Lines of Evidence Under Evaluation – Ensure no contamination is entering the water system.

Objective 1c - No additional contamination through the distribution system is occurring**.**

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

Lines of Evidence	Completion Status	Outstanding Items
No contamination of the distribution system is occurring from cross-connections with other petroleum sources during this incident	Complete	• None.
Cross Connection Control/Backflow Program-related documents	Complete	• None.

February 19, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: SUMMARY OF LINE OF EVIDENCE OBJECTIVE 1C – NO ADDITIONAL CONTAMINATION THROUGH THE DISTRIBUTION SYSTEM IS OCCURRING

Encl: (1) 1c.1 Certification of Inventory and Petroleum Facility Locations with Associated Backflow Preventers.
(2) 1c.2 Backflow Prevention and Cross-Connection Control Program Instruction

1. Enclosures (1) and (2) document completion of Line of Evidence 1c, no additional contamination through the distribution system is occurring. On the evening of November 28, 2021, the Red Hill Shaft was secured from operation and all pumping operations ceased. The Aiea/Halawa shaft briefly served as the secondary source starting on November 28, 2021, but it was shut down on December 3, 2021 to prevent potential westward contaminant migration in the aquifer and because there were concerns over high chloride concentrations caused by saltwater intrusion. Since December 3, 2021, the Waiawa Shaft has been the sole water source providing potable water to the distribution network. It is located 5.5 miles west of the Red Hill Fuel Facility, and testing has not detected any water quality issues at this source.

2. Enclosure (1) identifies all water service connections where petroleum activities exist and documents adequate backflow prevention devices installed at those petroleum service activities. Enclosure (2) provides the governing instructions for backflow prevention devices referenced in Enclosure (1). This data shows that no additional contamination through the water distribution system is occurring.

3. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and I believe the submitted information is true, accurate, and complete.

RODRIGUEZ.ALBERTO.MAURICIO.1396316168
Digitally signed by RODRIGUEZ.ALBERTO.MAURICIO.1396316168
Date: 2022.02.19 17:24:22 -10'00'

A. M. Rodriguez
LT, CEC, USN

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

February 18, 2022

Director of the State of Hawaii
Department of Health (DOH)

Dear DOH Director:

SUBJECT: CERTIFICATE REGARDING CROSS CONNECTION CONTROL REVIEW AND CONFIRMATION – ZONE H3

Enclosure: [1] ZONE H3: Backflow Prevention Devices

[2] ZONE H3: POL Activities Map

[3] TABLE 1: LIST OF PETROLEUM RELATED ACTIVITES AND BACKFLOW DEVICES ON AMR (Zone I1, H1, H2, & H3)

[4] AR 200-1

On behalf of the United States Department of the Army, operator of the Aliamanu Community Water System (PWS ID No. 337 Water System), and in connection with and pursuant to the removal action required by the DOH Hazard Evaluation and Emergency Response Office Incident Case No. 20211128-1848, the undersigned certifies that the Army has made the necessary inquiry into their Water System and represents and warrants as set forth below.

Inventory of Backflow devices in the Water System, **Zone H3**, are identified in Enclosure [1], "Zone H3: Backflow Prevention Devices." Petroleum related activities include, but are not limited to, operating or having gas stations, fuel storage, facilities with aboveground or underground storage tanks (>100-gallon capacity), fuel transfer, motor pools, vehicle maintenance facilities, fuel recovery pits, waste oil collection facilities or systems.

All service connections where petroleum activities exist, have adequate backflow protection if required by and in accordance with the Safe Drinking Water Act Amendments of 1986, Hawaii Administrative Rules 11-21, U.S. Army Regulation (AR) 200-1, Department of Army (DA) Pamphlet 40-11, AR 420-1, DA Technical Bulletin Medical (TB MED) 576, and Unified Facilities Criteria (UFC) 3-230-02. Adequate backflow protection includes installation of devices appropriate to the identified hazard condition, correct design and installation of the device, timely testing by a certified tester, and regular maintenance/repair/replacement. All facilities identified with adequate backflow protection have had their assemblies tested by a DOH approved certified tester in accordance with Hawaii Administrative Rules, Title 11-21-8(b) Maintenance requirements.

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

SUBJECT: CERTIFICATE REGARDING CROSS CONNECTION CONTROL REVIEW AND CONFIRMATION – ZONE H3

The undersigned has due authority to deliver to DOH this Certification on behalf of the Army.

Sincerely,

2/18/2022

X Nisit A. Gainey

Signed by: GAINEY.NISIT.ANTHONY.1067651371
NISIT A. GAINEY
Director, Public Works

Section 1c.1 Certification of Inventory and Petroleum Facility Locations with Associated Backflow Preventers

Post	Facility	EID	Make	Model	Type	Size (")	Serial Number	Owner	ZONE	Installation Date	Changed (Replacement Date)	Last Tested Date	Last Repaired Date
AMR	248	BF01	Wilkins	975XL2	RP	0.75	4011897	Aqua	H3	N/A	N/A	7/28/2021	N/A
AMR	900	BF01	Wilkins	975XL	RP	1.25	4079052	Aqua	H3	N/A	N/A	7/28/2021	N/A
AMR	900	BF02	Watts		RP	0.75	542504	Aqua	H3	N/A	N/A	7/28/2021	N/A
AMR	103 Koa Pl	BF01	Febco	860	RP	2	H19871	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	108 Shower Pl.	BF01	Febco	860	RP	2	H17188	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	115 Olive Pl.	BF01	Febco	860	RP	2	H18095	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	120 Orig Pl.	BF01	Febco	825Y	RP	2	J035285	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	137 Octopus Ln.	BF01	Febco	825Y	RP	2	J031491	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	174 Poinciana Pl.	BF01	Febco	860	RP	2	H21300	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	1901 Point	BF01	Febco	860	RP	2	H18084	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	199 Justicia	BF01	Febco	860	RP	2	H21307	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	589 Valley view	BF01	Febco	860	RP	2	J10803	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	766 Hibiscus	BF01	Febco	860	RP	2	H21304	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	Blackhaw Lp.	BF01	Febco	860	RP	2	H16968	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	123 Cocos Pl	BF01	Febco	860	RP	2	H19855	IPC	H3	N/A	N/A	11/12/2020	N/A
AMR	Red Hill Marque on	BF01	Wilkins	R975XL	RP	1.5	3803274	IPC	H3	N/A	N/A	11/12/2020	N/A

ENCL (1)

Section 1c.1 Certification of Inventory and Petroleum Facility Locations with Associated Backflow Preventers

ENCL (2)

Installation	faciltyNumber$_1$	Zone	fuelType	Tank Capacity (gal)	TANK USE	TENANT/ OWNER	Compliance Status (CCC Program)
AMR	142	H1	DieselFuel	4,000	Generator: WW: main tank	Aqua South	AMR 142 has three (3) BFPAs: 2 (SN:3940345 & 3984492) - Appropriate protection installed and device testing up to date 1 (SN: 682681) - Protection installed, but not an appropriate device. The device is a double check and should be a reduced pressure. Testing is up-to-date. Existing double-check will be replaced with an appropriately sized reduce pressure principle assembly as funding becomes available. Newly installed device will be tested and verified upon installation. There is no potential backflow hazard associated with any fuel related system to include the backup generator or above-ground storage tanks.
AMR		H1	DieselFuel	275	Generator: WW: main tank	Aqua South	
AMR		H1	DieselFuel	200	WW Diesel Fired Pump: main tank	Aqua South	
AMR	880	H1	Gasoline	6,000	Product: dispensing	AAFES	One existing 6,000 gallon UST for 87-Octane One existing 6,000 gallon UST for 92-Octane One existing 10,000 gallon UST for 87-Octane This facility does not have nor require a backflow prevention device. USAG-HI Staff confirmed no high hazard cross connections. There are no cross connections between fuel activites and potable water. There is no potential backflow hazard associated with the fuel dispensers or underground storage tanks.
AMR		H1	Gasoline	6,000	Product: dispensing	AAFES	
AMR		H1	Gasoline	10,000	Product: dispensing	AAFES	
AMR	S1/S2	H2	DieselFuel	451	Genset: DW Pump	DPW	Protection not needed.
AMR	Mainscape 1 Crater Rim Rd	H2	Gasoline	N/A	N/A	Mainscape	Fuel usage is limited to gasoline carnisters for maintenance equipment. No backflow prevention device required.
AMR	IPC 14	H2	Gasoline	110	Genset	IPC	IPC 14 has one (1) BFPA for Fire Suppression: Protection installed, but not an appropriate device (Note: this device is overprotective of the hazard) For service to building:
AMR	186	H3	DieselFuel	693	Genset	NEC/SPAWAR	Protection not needed.
AMR	248	H3	DieselFuel	126	Genset: WW	Aqua South	AMR 248 has one (1) BFPA: Appropriate protection installed and device testing up to date
AMR	900	H3	DieselFuel	1,000	Generator: WW: main tank	Aqua South	AMR 900 has two (2) BFPAs: Appropriate protection installed and device testing up to date
AMR		H3	DieselFuel	200	Generator: WW: main tank	Aqua South	
AMR		H3	DieselFuel	97	Generator: WW: main tank	Aqua South	
AMR	2001	I1	DieselFuel	1,000	Generator: WW: main tank	Aqua South	AMR 2001 has two (2) BFPAs: 1 (SN:4090404) - Appropriate protection installed and device testing up to date 1 (SN:4481229) - Protection installed, but not an appropriate device. Device is a double-check should be a reduced pressure.Testing is up-to-date. Existing double-check will be replaced with an appropriately sized reduce pressure principle assembly as funding becomes available. Newly installed device will be tested and verified upon installation. There are no cross connections between fuel activites and potable water. There is no potential backflow hazard associated with any fuel related system to include the backup generator or above-ground storage tanks.
AMR		I1	DieselFuel	200	Generator: WW: main tank	Aqua South	

Army Regulation 200–1

Environmental Quality

Environmental Protection and Enhancement

Headquarters
Department of the Army
Washington, DC
13 December 2007

UNCLASSIFIED

SUMMARY of CHANGE

AR 200–1
Environmental Protection and Enhancement

This administrative revision, dated 13 December 2007--

- Updates the policy regarding Army Program Guidance Memorandum (para 15-1).

- Corrects typographical errors throughout the publication.

Headquarters
Department of the Army
Washington, DC
13 December 2007

*Army Regulation 200–1

Effective 27 December 2007

Environmental Quality

Environmental Protection and Enhancement

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the Secretary of the Army

History. This publication is an administrative revision. The portions affected by this administrative revision are listed in the summary of change.

Summary. This regulation covers environmental protection and enhancement and provides the framework for the Army Environmental Management System.

Applicability. This regulation addresses environmental responsibilities of all Army organizations and agencies. Specifically, this regulation applies to—
(a) Active Army, Army National Guard/Army National Guard of the United States, and United States Army Reserve.
(b) Tenants, contractors, and lessees performing functions on real property under jurisdiction of the Department of the Army (for example, Army and Air Force Exchange Service (AAFES), Defense Commissary Agency (DECA)).
(c) Activities and operations under the purview of the Army even when performed off of installations.
(d) Formerly used defense sites (FUDS) and other excess properties managed by the Army. As used throughout this regulation, the term Army National Guard includes the Army National Guard of the United States.

Installations and facilities in foreign countries will comply with requirements of this regulation that specifically prescribe overseas requirements.

Contracts to operate Government-owned facilities will reference this regulation and will designate by specific citation the applicable provisions.

This regulation does not apply to civil works (CW) functions under the jurisdiction of the U.S. Army Corps of Engineers (USACE).

The terms "Army environmental programs" and "Army Environmental Program" must be read in context. All Army organizations, regardless of their organizational level or chain of command, have environmental responsibilities as part of their functions; these environmental responsibilities must be incorporated into the planning, programming, budgeting, and execution of their respective missions. The Assistant Chief of Staff for Installation Management, working through the Director of Environmental Programs (see Responsibilities, para 1–13x), has specific and more narrowly defined responsibilities that are planned, programmed, budgeted, and executed via assigned accounts. These accounts resource specifically prescribed and focused environmental efforts. Each organization must program and fund its environmental activities from the appropriate account of the proponent's operating budget, not necessarily an environmental account. Being mindful of the context in which requirements are articulated will help define the scope of the "program" being addressed and will preclude inappropriate resourcing decisions or expectations.

Proponent and exception authority. The proponent of this regulation is the Assistant Chief of Staff for Installation Management. The proponent has the authority to approve exceptions or waivers to this regulation that are consistent with law and regulations. The proponent may delegate this approval authority, in writing, to a division chief within the proponent agency or its direct reporting unit or field operating agency, in the grade of colonel or the civilian equivalent. Activities may request a waiver to this regulation by providing justification that includes a full analysis of the expected benefits and must include formal review by the activity's senior legal officer. All waiver requests will be endorsed by the commander or senior leader of the requesting activity and forwarded through their higher headquarters to the policy proponent. Refer to AR 25–30 for specific guidance.

Army management control process. This regulation contains management control provisions and identifies key management controls that must be evaluated.

Supplementation. Supplementation of this regulation and establishment of command or local forms are prohibited without prior approval from Assistant Chief of Staff for Installation Management, 600 Army Pentagon, Washington, DC 20310–0600.

Suggested improvements. Users are invited to send comments and suggested improvements on DA Form 2028 (Recommended Changes to Publications and Blank Forms) through the chain of command to HQDA, DAIM–ED, 600 Army Pentagon, Washington, DC 20310–0600.

Distribution. This publication is available in electronic media only and is intended for command levels C, D, and E for the Active Army, the Army National Guard/Army National Guard of the United States and the United States Army Reserve.

*This regulation supersedes AR 200–1, dated 28 August 2007.

Contents (Listed by paragraph and page number)

Contents—Continued

Contents—Continued

Appendixes

Table List

Contents—Continued

Figure List

Glossary

Index

and Recovery Act of 1976 (RCRA), as amended); the Energy Policy Act of 2005; applicable State and local requirements; or country-specific FGS requirements.

c. Major program goal. Achieve and maintain air quality standards to protect human health and the environment, while minimizing mission impacts.

d. Program requirements.

(1) Assess the need for and obtain necessary CAA Title V Operating Permits and all other applicable permits. (LD: 40 CFR 71.1)

(2) Update existing or obtain new permits as needed when planning to modify, construct, install, or remove from service an emissions source that is, or should be, regulated under a Title V or other permit. (LD: 40 CFR 71.6)

(3) Perform air emissions inventories as required by statute, regulation, permit, or country-specific FGS. (LD: 40 CFR 51; 40 CFR 70.6; 40 CFR 71.6; FGS)

(4) Determine the need to comply with New Source Performance Standards, New Source Review for Non-attainment, or for Prevention of Significant Deterioration (PSD). In addition, determine the need to perform a Conformity Determination. (LD: 40 CFR 51.307)

(5) Cooperate with Federal, State, and local authorities to achieve the goals of implementation plans. (LD: 40 CFR 51)

(6) Perform technology, permitting, and preconstruction assessments as required before beginning construction or reconstruction of air emissions sources. (LD: 40 CFR 51.160 and related State regulations)

(7) Establish a Risk Management Program and develop and maintain a risk management plan (RMP) when required under Section 112(r) of the CAA. (LD: 40 CFR 68.150–195)

(8) Implement and maintain plans to eliminate dependency on commercial acquisition of Class I ODS. (LD: 40 CFR 82)

(9) Reduce all ODS use to zero as cost-effective substitutes that meet applicable standards become available. (LD: 40 CFR 82)

(10) Recovered Class I ODS cannot be bartered, sold, or traded. Return recovered ODS that are excess to installation needs to the DOD ODS Reserve. (LD: 40 CFR 82)

(11) Coordinate natural resources activities having potential air quality impacts (for example, prescribed burning) with appropriate State and local officials.

(12) Comply with applicable Standards of Performance for New Stationary Sources and corresponding monitoring requirements. (LD: 40 CFR 60)

(13) Comply with all air toxics regulations, to include, but not limited to, applicable National Emission Standards for Hazardous Air Pollutants (NESHAP) maximum achievable control technology (MACT) requirements for regulated sources of hazardous air pollutants (HAPs). (LD: 40 CFR 63)

(14) Overseas installations will comply with permits obtained on their behalf in accordance with the FGS.

4–2. Water resources

a. General policy.

(1) Comply with applicable Federal, State, and local laws and regulations regarding water resources management and permitting. Overseas, the Army will comply with country-specific FGS requirements.

(2) Obtain and comply with all required Federal, State, and local Clean Water Act (CWA), Coastal Zone Management Act (CZMA), and Safe Drinking Water Act (SDWA) permits (includes wastewater and storm water permits, operational permits for drinking water systems, groundwater discharge permits, wetland 404/401 permits, septic system permits, underground injection control, and so forth).

(3) Overseas installations will comply with permits obtained on their behalf in accordance with the FGS.

(4) Identify and implement pollution prevention initiatives.

(5) Participate with regional authorities in the development and implementation of water resource initiatives and plans.

(6) Mitigation wetlands are wetlands that replace the functions performed by drained, filled, or degraded wetlands on installation project sites. They should, whenever possible, be sited within the same watershed as the affected installation wetlands and outside installation boundaries so installations can retain maximum land-use flexibility.

b. Recreational waters. Management of recreational waters at military installations will be in accordance with AR 40–5, TB MED 575, and TM 5–662.

c. Water resource protection and management.

(1) All Army organizations and activities will comply with legally applicable Federal, State, and local regulations, executive orders (EOs), and FGS to conserve, protect and restore surface water resources (including wetlands, estuaries, streams, lakes and so forth), and groundwater (wells and aquifers).

(2) Executive Order 11988 and EO 11990 address the actions Federal agencies take to identify and protect flood plains and wetlands, respectively.

(3) The CZMA requires that activities within the coastal zone of any state must be consistent with the state's coastal zone management plan.

d. Watershed management.

(1) *Policy.* Installations use a watershed management approach when evaluating projects and programs to satisfy environmental regulations, facility projects, and master planning that may impact the quality of water resources. Using a watershed approach means that installations should develop a framework or plan for coordinating, integrating and managing their mission activities that impact the quality of water resources located on (and those that migrate off) their installation. This approach also requires a strong commitment to involving stakeholders, both internal and external, in the management of these water resources. To implement applicable total maximum daily load (TMDL) regulations, all Army facilities will:

(a) Initiate and maintain contact with Federal and State water regulators concerning the process of setting TMDLs and allocations for water bodies located on or passing through Army installations.

(b) Integrate all aspects of CWA requirements, programs and available information (for example, the National Pollutant Discharge Elimination System (NPDES) program, 404 wetlands program, wellhead protection, storm water plans/projects, storm water construction permits, spill prevention, control, and countermeasures (SPCC) plans/projects, State CWA 319 requirements (State plans & strategies for reducing non-point source runoff)) with TMDL development and future planning. Ensure all of these programs are consistent with, and work together to attain compliance under, TMDL allocations once they are set by states.

(c) Ensure that activities required to meet other environmental legal requirements, like RCRA, that impact water quality in an impaired water or are impacted by an impaired water (for example, Chapter 35, Title 16, United States Code (16 USC Chapter 35)) are informed of CWA requirements. These non-CWA activities should be integrated into the management plan.

(d) Ensure other programs that are or may have their activities affected by identification of impaired waters and new TMDL allocations are informed of the impacts and requirements (for example, facilities construction, master planning, National Environmental Policy Act (NEPA) requirements).

(e) Ensure that watershed assessments and management plans are integrated with the installation master plan, integrated natural resources management plan (INRMP), and other plans as appropriate.

(f) Establish and integrate environmental education and participation programs required by CWA/SDWA/the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/ESA and so forth for all Army personnel and their families based on watershed concepts and requirements to restore impaired waters and maintain designated uses of local water bodies.

(g) Ensure that mission and non-mission activities and construction designs utilize best management practices (BMPs) to minimize TMDL impacts.

(2) *Legal and other requirements.* The principal applicable laws governing water resource protection and management are the CWA, SDWA, and related Federal, State, and local implementing regulations; and for overseas installations, the country-specific FGS requirements.

(3) *Major program goal.* Implement the "Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management". (PD: Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management, 65 FR 62565–62572, 18 October 2000).

(4) *Program requirements.*

(a) Assess installation watershed impacts as appropriate, considering upstream and downstream water quality data or other background levels, proximity to potentially designated impaired waters, and any effects on mission activities. (PD: Unified Federal Policy for a Watershed Approach to Federal Land and Resource Management, 65 FR 62565–62572, 18 October 2000)

(b) Carry out Army activities consistent with EPA/State approved plans/strategies to restore impaired or threatened water bodies to their designated use. (LD: 40 CFR 130.12)

(c) Control soil erosion in accordance with applicable and appropriate Federal, State, or local requirements. (LD: 40 CFR 122.26)

(d) Comply with all applicable and appropriate State Source Water Assessment and Protection Program requirements as they relate to ground water (for example, wellhead protection plans) (LD: SDWAA 1996, PL 104–182, Sections 1428 and 1453); (LD: 40 CFR 144–148); and (LD: 40 CFR 149).

e. Wastewater and stormwater.

(1) *Policy.*

(a) Comply with facilities policy concerning use of wastewater collection/treatment systems that are owned and operated by public or private entities when economically feasible and when security is not compromised.

(b) Comply with all requirements, substantive and procedural, for control and abatement of water pollution, as outlined in the CWA that require Army compliance.

(c) Control or eliminate sources of pollutants and contaminants to protect water bodies and groundwater.

(d) Employ abatement measures for non-point source runoff from construction, facility operations, and land management activities.

(e) Encourage reuse or recycling of wastewater, sewage sludge, wash rack sediment, greases or oils, and other wastes whenever economically feasible and environmentally beneficial.

(2) *Legal and other requirements.* Applicable laws are Chapter 26, Title 33, United States Code (33 USC Chapter 26, as amended; Section 108 of Section 6961, Title 42, United States Code (42 USC 6961); Section 1401, et seq., Title 33, United States Code (33 USC 1401); Section 2701, Title 33, United States Code (33 USC 2701); and State and local laws; and for overseas installations, the country-specific FGS requirements.

(3) *Major program goals.* The Army's wastewater and stormwater management goals are to reduce the pollutant loadings in point source and non-point source discharges and to ensure efficient water reuse.

(4) *Program requirements.*

(a) Obtain and comply with NPDES and/or State discharge permits, to include all required plans. (LD: 40 CFR 122)

(b) Ensure that discharges from industrial activities to Federally-owned Treatment Works (FOTWs) and Publicly-owned Treatment Works (POTWs) comply with the substantive pretreatment requirements applicable to POTWs under the CWA. (LD: 40 CFR 403)

(c) Develop pretreatment programs as required to ensure FOTWs meet NPDES permit requirements and to improve opportunities for reuse of wastewater effluent and sewage sludge. (LD: 40 CFR 403)

(d) Develop and implement a stormwater management plan for a regulated Municipal Separate Stormwater Sewer System (MS4) as required in accordance with the installation's general permit. (LD: 40 CFR 122.26)

(e) Develop and implement a Stormwater Pollution Prevention Plan(s) (SWPPP) as required, in accordance with the installation's industrial, construction, or Municipal Separate Storm Sewer (MS4) storm water permit(s). (LD: 40 CFR 122.26)

(f) Develop and implement a spill prevention, control, and countermeasures plan (SPCCP), as required. (LD: CWA Section 311(j), 40 CFR 112.3)

(g) Perform shipboard or shore-side oil/water separation before the discharge of ballast water from watercraft. Effluent limitations from watercraft are prescribed by the U.S. Coast Guard (USCG) (LD: 33 CFR 151–158) EPA; (LD: 40 CFR 110); individual states; and TB 55–1900–206–14.

(h) Coordinate proposed military activities involving the discharge of fill material into waters of the United States, including wetlands, with, and if necessary, secure a permit from the local U.S. Army Corps of Engineers (USACE) district and appropriate State agency. (LD: 33 CFR 323; 40 CFR 230)

(i) Ensure that operators of wastewater (including industrial) treatment plants and wastewater collection systems have necessary training and certification. (LD: 42 USC 300g-8)

(j) Use analytical laboratories that are certified per applicable Federal, State, local or host nation (HN) requirements, as appropriate. (LD: 40 CFR 136; 40 CFR 141.28)

(k) Follow State approved plans and local permit requirements for non-point source water pollution control where applicable. (LD: 40 CFR 123)

f. Drinking water.

(1) *Policy.*

(a) Provide drinking water to fixed facilities in accordance with the requirements of the SDWA and applicable State and local regulations. Overseas, all Army organizations and activities will comply with country-specific FGS.

(b) Comply with Army facilities policy to transfer ownership and operation of water supply treatment systems to public and private entities when economically feasible and when security is not compromised.

(2) *Legal and other requirements.* Applicable laws are the SDWA, as amended; PL 109–58 (Energy Policy Act of 2005); and State and local laws; and for overseas installations, the country-specific FGS requirements.

(3) *Major program goals.* The Army's drinking water resource management goals are to consistently provide safe, aesthetically pleasing drinking water at adequate pressures and quantities to protect the health and quality of life of people living and working on our installations, and to better manage the cost of drinking water programs.

(4) *Program requirements.*

(a) Obtain and comply with all necessary water appropriation and use permits, National Pollutant Discharge Elimination System (NPDES) permits for wastewater discharges from drinking water treatment plants, or other permits that are required for operation of drinking water treatment systems at both fixed and field facilities. (LD: 40 CFR 122; 40 CFR 141–143)

(b) Comply with the provisions of the SDWA as implemented by State and local regulations which include, but are not limited to the following: (LD: 42 USC 300g-8; 40 CFR 136; 40 CFR 141.28)

1. Primary and Secondary drinking water standards.

2. Training and operator certification requirements.

3. Lead contamination control act requirements.

4. Public notification and consumer confidence reporting requirements.

5. Water system vulnerability assessment and emergency response plan requirements.

6. Certified laboratory requirements.

(c) Provide copies of annual Consumer Confidence Reports (CCRs) to the Installation Management Command (IMCOM) and State Adjutants General (where appropriate) by the end of each fiscal year.

(d) Perform a lifecycle cost analysis whenever the upgrade or construction of a new water supply facility is considered. Guidelines for military installations to perform the cost analysis are contained in AR 420–49, section 4–1.

(e) Monitor and upgrade Army water supply, treatment, distribution, and storage systems as needed to comply with environmental requirements. Routine operation, maintenance, and repair of Army water systems will be in accordance with AR 40–5; AR 420–49; AR 700–136; TB MED 576; TB MED 577; UFC 3–230–02; TM 5–810–5; TM 5–813–1 through TM 5–813–9; and USACHPPM TG 179.

(f) After consultation with supporting legal counsel, comply with applicable additional State and local drinking water regulations not covered under the SDWA.

4–3. Land resources

Land resources are the ranges, cantonment areas, and associated natural resources (to include soils and the biota they support).

a. Policy.

(1) Comply with applicable Federal, State, and local regulations regarding land resources management and permitting where applicable. Overseas, all Army organizations and activities will comply with applicable country-specific FGS.

(2) Provide for the conservation and rehabilitation of natural resources on Army lands.

(3) Integrate training and testing range operations and support activities within the installation environmental management system (EMS).

(4) Ensure that all management plans address range operations and activities as appropriate.

(5) Quantify environmental encroachment vulnerabilities and assess the feasibility of using external buffer zones to enhance testing and training capabilities. Where warranted, work with private landowners and eligible entities through the Army Compatible Use Buffer (ACUB) process.

(6) The management and conservation of natural and cultural resources under Army control, including planning, implementation, and enforcement functions, are inherently governmental functions that will not be contracted. Components that have contractor-operated installations or facilities will ensure that contract instruments clearly address contractor and government functions as they relate to natural and cultural resources.

b. Legal and other requirements. Principal statutes, regulations, and guidance applicable to the Army Natural Resources Management Program include:

(1) 16 USC 670a and 670b.

(2) 16 USC 35.

(3) 50 CFR 401–453, implementing regulations of the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) - Fisheries.

(4) Sections 1801–1882, et seq., Title 16, United States Code (16 USC 1801–1882).

(5) 10 USC 2665.

(6) 10 USC 2667(d).

(7) Section 2671, Title 10, United States Code (10 USC 2671).

(8) Section 2684a, Title 10, United States Code (10 USC 2684a).

(9) Section 2694a, Title 10, United States Code (10 USC 2694a).

(10) Sections 1361–1407, Title 16, United States Code (16 USC 1361–1407).

(11) Sections 4701–4751, et seq., Title 16, United States Code (16 USC 4701–4751).

(12) Sections 661–667d, United States Code (16 USC 661–667d).

(13) Section 701, Title 16, United States Code (16 USC 701).

(14) Sections 703–712, Title 16, United States Code (16 USC 703–712).

(15) Sections 3371–3378, Title 16, United States Code (16 USC 3371–3378).

(16) Part 13, Title 50, Code of Federal Regulations (50 CFR 13).

(17) Part 21, Title 50, Code of Federal Regulations (50 CFR 21).

(18) Part 190, Title 32, Code of Federal Regulations (32 CFR 190).

(19) Parts 10–16, Title 50, Code of Federal Regulations (50 CFR 10–16).

(20) EO 13186.

(21) EO 13112.

(22) EO 13423.

(23) EO 11990.

(24) PL 108–136, sections 312, 319.

(25) DODD 4715.1E.

DEPARTMENT OF THE ARMY
US ARMY INSTALLATION MANAGEMENT COMMAND, PACIFIC REGION
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
745 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5000

REPLY TO ATTENTION OF:

IMHW-PW

MAY 21 2015

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Program for Cross-Connection and Backflow Control

1. References.

a. United States Environmental Protection Agency, Cross Connection Control Manual, EPA 816-R-03-002, February 2003.

b. State of Hawaii, Hawaii Administrative Rules, Title 11, Department of Health, Chapter 21, Cross-Connection and Backflow Control, 16 December 2005.

c. AR 40-5, Preventive Medicine, 25 May 2007.

d. AR 420-1 Army Facilities Management, 12 February 2008.

e. DA PAM 40-11, Preventive Medicine, 22 July 2005.

f. TM 5-813-5, Water Supply, Water Distribution, November 1986.

g. TB MED 576, Sanitary Control and Surveillance of Water Supplies at Fixed Installations, 15 March 1982.

h. Air Force Instruction 32-1066, Backflow Prevention Program, 17 October 2007.

i. Unified Facilities Criteria (UFC) 3-230-02 Operation and Maintenance: Water Supply Systems, 10 July 2001.

j. American Water Works Association (AWWA) Recommended Practices for Backflow Prevention and Cross-Connection Control, M14, Third Edition, 2004.

k. Uniform Plumbing Code (UPC), 2006 Edition.

l. University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCHR) Cross-Connection Control Manual, Tenth Edition, October 2009.

m. Water System Standards with Amendments, State of Hawaii, 2002.

2. Acronyms, Abbreviation and Special Terms. See Enclosure 2

3. Program Objectives.

a. All utility systems have inherent dangers. Of all the utility systems in Hawaii, the potable water system has the greatest potential for widespread disruption and casualties from a single incident. Despite decades of effort, cross-connection and backflow incidents continue to occur in this country. The goal of this program is to establish the necessary framework for a safe and secure potable water system.

b. To accomplish this, the Directorate of Public Works (DPW) will establish and maintain a continuing program of cross-connection and backflow control, in accordance with AR 420-1, 23-23 j. This will allow for the elimination, removal, control, testing and monitoring of all existing cross-connections between the potable and non-potable water systems, plumbing fixtures, industrial piping and recycled water systems in our facilities.

c. The DPW will work closely with the United States Army Corps of Engineers (USACE) and any entity working or causing any work involving the potable water system to prevent the installation of new cross-connections on the potable water system. Where this is not possible, USACE or the entity will identify the location and type of cross-connection and install hazard appropriate controls. All data, including applicable test results, regarding new cross-connections will be reported promptly to the DPW.

d. The consumer is both the first line of defense and a significant threat to the potable water system. With this in mind, the DPW will assist Preventive Medicine Service (PVNTMED) in educating our consumers on the hazards of cross-connection and backflow. The DPW will implement a system of containment, the isolation of individual facilities from the potable water system. The consumer is responsible for the internal protection of their facilities.

e. Recycled water is officially classified as unsafe for human consumption, in order to safeguard the potable water supply, no direct or indirect cross-connections are allowed at any time between the potable water system and any recycled water system. An air gap separation is the only device approved for use to supply water from a potable water system to a recycled water system.

f. In order to defend the potable water system, breaches of this document will result in the immediate termination of water service without prior notification and may subject the offending party to civil and criminal penalties. Additionally, the Director may, at the consumer's expense, order the necessary tests, repairs or work required to bring a system back into compliance with this document.

4. Scope/Applicability. The provisions of this program apply to any civilian, military, government or contractor personnel, sections, directorates, operations and activities on all United States Army installations utilizing water provided by the Directorate of Public Works (DPW) in the State of Hawaii.

5. Inventories.

a. The DPW, through the use of surveys, DD 1354s and historical data, develop and maintain an inventory of all cross-connections with the potable water system. These inventories will be used to develop inspection and testing schedules.

b. Cross-Connection and Backflow Control Survey

(1) Every five (5) years with the, assistance of PVNTMED, approved DPW personnel and/or contractors shall survey all existing facilities and water systems within the United States Army Installation Management Command, Pacific Region. Alternately, an annual survey of twenty (20) per cent of all existing facilities and water systems may be performed. An annual survey program must ensure that no facility or system goes longer than five (5) years without being surveyed. Surveys will include detailed locations of backflow prevention devices and cross-connection hazards, an identification of backflow prevention devices (size, type of device, manufacturer, model, serial number and type of system it services), identification of cross-connections, description of water usage, classification of hazard and type of approved device recommended (Table 2 of Enclosure 3). Surveys may include photographs, longitudinal and latitudinal coordinates, sketches and any information deemed useful by the surveyor. Additional information may be requested by PVNTMED or the DPW.

(2) All consumers will cooperate fully with the personnel conducting these surveys.

(3) A survey will be conducted on all new facilities and systems upon completion and prior to acceptance.

(4) Surveyors must be approved by the Director and must have satisfactorily completed a training program such as:

a. A survey course addressing federal and state regulations, cross-connection identification, types and uses of backflow prevention devices recognized by the State of Hawaii.

b. A survey course addressing federal and state regulations, cross-connection identification, types and uses of backflow prevention devices sponsored by a nationally

or internationally recognized professional organization with written and performance examinations.

c. Graduation from an appropriate Bachelor-level engineering program approve by the Accreditation Board for Engineering and Technology, along with backflow training.

(5) Surveys will be conducted during normal duty hours and reasonable efforts will be taken to minimize disruptions to consumer operations.

(6) Copies of surveys will be provided to the DPW. The DPW has the responsibility to maintain all survey data. Using this data the DPW will initiate actions to eliminate the hazards identified. The data will also be used by the DPW to formulate inspection and testing schedules for all testable BFPAs. All testable BFPAs will be assigned and labeled with a control number.

(7) Residences in family housing areas are excluded from surveys. Underground irrigation systems, offices, maintenance facilities (non-residential facilities) in housing areas are not excluded.

c. New Construction and Renovation Projects.

(1) New construction and renovation projects will report all new cross-connections to the DPW. This will include the location, description of water usage, classification of hazard and type of approved device used (Table 2 of Enclosure 3). Identify the location, manufacturer, model, serial number and test results of any BFPAs used to control a cross-connection.

(2) Failure to comply with survey requirements will result in termination of water service to the consumer. Failure to comply with survey requirements may result in rescission of the permit to supply public potable water.

6. Inspection and Performance Testing of Backflow Prevention Devices

a. As both the administrative authority and the water purveyor the DPW will develop and maintain schedules that ensure all backflow prevention devices are inspected and tested annually. The DPW will track and schedule the point of service connection for facilities that are not maintained by the DPW (containment). Annual inspection and testing of internal backflow prevention devices for these facilities are the responsibility of the consumer. More frequent testing may be required by the Director in those instances where the hazard is deemed great.

b. All consumers are responsible for the annual inspection and testing backflow prevention devices on or within their facilities. All consumers will cooperate fully with the personnel conducting inspections and performance testing of backflow prevention devices.

c. Annual Inspection. A certified tester shall inspect identified cross-connection locations to ensure that:

(1) Proper air gaps are maintained.

(2) Backflow prevention devices are fully functional, in good condition and readily accessible.

(3) All devices are properly installed, meet the installation criteria of this document and are free of debris that could interfere with their testing or operation.

(4) All backflow prevention assemblies on all installations shall be inspected and tested at least annually. More frequent testing may be required by the Director in those instances where the hazard is deemed great. Testing will be in accordance with the current edition of the USCFCCCHR.

d. Backflow prevention assemblies (BFPAs) on all installations shall also be inspected and tested:

(1) Prior to the initiation of water service.

(2) Immediately after replacement or repair.

(3) Testers must be approved by the director and must have a current backflow prevention assembly tester's certification recognized by the State of Hawaii for the assembly being tested.

(4) All gauges used to test BFPAs will be tested and certified for accuracy at least annually.

(5) Inspection and test results will be reported to and maintained by the DPW as the water purveyor and be made available to applicable external agencies where required.

(6) The DPW will maintain records of inventories, inspection, testing, maintenance and repair for all BFPAs under its jurisdiction. These records will be provided to applicable external agencies where required.

(7) The DPW will maintain records of inventories, inspection, testing, maintenance and repair for all service connection BFPAs where the DPW is acting only as the water purveyor. These records will be provided to applicable external agencies where required.

(8) BFPAs under the jurisdiction of the DPW Operations and Maintenance (O & M) Division will be inspected and tested according to the latest approved testing schedule and test form. Necessary repair, identified during testing, will be performed as soon as practicable. The assembly will be re-tested immediately after repair is completed.

(9) As the water purveyor the DPW will act as the administrative authority for consumer BFPAs not under the jurisdiction of the DPW O & M Division. These consumers are responsible for inspecting all backflow prevention devices and the annual testing of all BFPAs in their facilities. More frequent testing may be required by the Director in those instances where the hazard is deemed great. The DPW will notify consumers sixty (60) days before the due date of each service connection BFPA in their facility. The test form is attached as enclosure 4 and will be made available online. Testing of these BFPAs will be done at the consumer's expense. Necessary repair, identified during testing, will be performed as soon as practicable. The assembly will be re-tested immediately after repair is completed. A listing of contractors with certified BFPA testers may be obtained from the Honolulu Board of Water Supply. The use of this listing is not an endorsement by the United States Government, the Department of Defense, the Department of the Army, the United States Army Garrison-Hawaii or the Directorate of Public Works.

e. Failure to comply with inspection and testing requirements will result in termination of water service to the consumer. Alternatively, the director may, at the consumer's expense, order the performance of the necessary test, needed repairs and replacements.

7. Installation of Backflow Prevention Devices.

a. Engineering solutions to eliminate cross-connections must be the first consideration in the design of water systems. If this is not feasible, the installation of an approved backflow prevention device appropriate to the hazard class (Table 2 of Enclosure 3) must be installed. Double Check Valve (DC), Double Check Detector (DCDA) and Double Check Detector-Type II (DCDA-II) Assemblies are allowed for use by the DPW only on fire sprinkler systems. *Air gap separations are the only approved device to supply potable water to a recycled water or sewer system.*

b. The safety and security of devices must be considered. Devices need to be located or protected from adverse conditions (electrical panels, traffic, temperature

extremes, etc.). Enclosures or supervisory controls should be used to protect devices serving facilities deemed critical to force protection. These controls should be designed to prevent the accidental or malicious tampering of devices. Experience has shown that locking ball valves and the use of padlocks and chain are more reliable and cost-effective than

c. New backflow prevention devices will be designed and installed in accordance with the manufacturer's specifications. Backflow prevention assemblies will be listed in the current edition of approved devices published by the USCFCCCHR and installed only in approved orientations.

d. Adequate drainage will be provided to prevent the submersion of the device. If the discharge of water during the operation of the relief valve in a RP may cause damage to its surroundings an air gap drain will be installed. The air gap drain must be properly sized and approved by the manufacturer of the RP. Drain piping must be correctly sized, installed, secured and directed to a location appropriate to the amount of water flow anticipated.

e. The primary potable water service connection to a facility will be provided with properly sized, approved BFPAs installed in parallel (manifold assembly) to allow for testing, maintenance and repair without the need for a loss of water service. Existing single BFPAs may be retrofitted with bypass assemblies with hazard appropriate BFPAs only in those instances where the bypass will maintain sufficient flow to meet the consumer's needs.

f. New backflow prevention assemblies will be designed and installed to be readily accessible and conform to the specifications in Table 1 of Enclosure 3.

g. Installations elevated more than five (5) feet (1524 mm) above the floor or grade shall be provided with a permanent platform capable of supporting a tester or maintenance personnel.

h. A backflow prevention device shall not be installed in a concealed ceiling space, underground or in a vault.

i. All backflow prevention assemblies must be tested prior to initiation of water service.

j. Backflow Prevention Assemblies will be painted as follows. Care must be exercised avoid painting over operational orifices such as vacuum reliefs, air inlets or threaded inlets.

(1) Recycled Water BFPAs will be painted purple, Pantone 522.

(2) Fire Sprinkler BFPAs will be painted "Safety Red", PPG V70-5.

(3) All other BFPAs will be painted "Cordovan Brown", PPG V70-640.

(4) Temporary water service connections are not required to be painted.

8. Hose Bibs. Non-removable hose bibb vacuum breakers shall be installed on all hose bibbs supplied with potable water. Hose bibb vacuum breakers will meet ASSE Standard 1011-2004, Performance Requirements for Hose Connection Vacuum Breakers.

9. Water-Based Fire Suppression Systems.

a. For cross-connection control purposes, fire suppression systems will be classified on the basis of water source and the arrangement of supplies as follows.

(1) Class 1. Direct connections from potable water mains only; no pumps, tanks or reservoirs; no physical connection from other water supplies; no antifreeze or other additives of any kind; sprinkler drains discharging to atmosphere, dry wells or other safe outlets.

(2) Class 2. Identical to Class 1, except booster pumps may be installed in the connections from the potable water mains. Booster pumps do not affect the potability of the system however, it is necessary to avoid drafting so much water that the pressure in the water main is reduced below fifteen (15) psi residual.

(3) Class 3. Direct connections from potable water mains plus one or more of the following; elevated storage tanks, fire pumps taking suction from above-ground covered reservoirs or tanks, and pressure tanks. All storage facilities are filled by or connected only to potable water systems, the water in the tanks must be maintained in a potable condition.

(4) Class 4. Directly supplied from potable water mains where antifreeze or other additives such as Aqueous Firefighting Foam (AFFF) are used.

(5) The use of auxiliary or industrial water interconnected with the potable water system is no longer acceptable.

b. All new fire suppression systems that use potable water will have a backflow prevention assembly installed. The type of assembly selected will be in accordance with Table 3 of Enclosure 3.

c. All existing class 1 and class 2 fire suppression systems are exempted from the installation of a new backflow prevention assembly. These systems will install the appropriate type of assembly, as specified in Table 3 of Enclosure 3, at the next major system renovation.

d. All existing class 3 and class 4 fire suppression systems will be retrofitted or upgraded as soon as practicable to the appropriate type of assembly as specified in Table 3 of Enclosure 3.

e. When backflow prevention assemblies are to be retroactively installed or upgraded on existing systems, a thorough hydraulic analysis, including revised hydraulic calculations, new fire flow data, and all necessary system modifications for the additional friction loss, shall be completed as part of the installation. A registered Professional Engineer (PE), preferably a Fire Protection Engineer (FPE), must approve the design and all submittals for any additions or changes to the existing fire suppression system.

10. Irrigation Systems.

a. Atmospheric vacuum breakers (AVB) shall be installed after the last control valve of each sprinkler circuit and at a minimum of six (6) inches above the highest irrigation head. The AVB shall be installed only on irrigation circuits that will not return any pressure in the circuit when the circuit control valve is closed (No valves downstream of the AVB). An AVB is designed for intermittent use and will not be operated more than 12 hours in any 24 hour period.

b. Pressure vacuum breakers (PVB) shall be installed at the beginning of each irrigation circuit and at a minimum of twelve (12) inches above the highest irrigation head on the circuit. Individual irrigation circuits having quick coupling valves or other similar type heads that will permit pressure to be retained in the circuit shall have a PVB installed as a minimum requirement for each circuit. Irrigation systems using subsurface drip method shall have a PVB in each circuit. A PVB may not be installed where a reduced pressure principle backflow prevention assembly (RP), or air gap separation is required.

c. A reduced pressure principle backflow prevention assembly (RP) may be installed to serve multiple irrigation circuits in lieu of vacuum breakers on each individual circuit.

d. Double check valve assemblies (DC) of any type are no longer allowed to be used in irrigation systems.

11. Temporary Water Services.

a. All applications for temporary water service connections will follow the provisions of the United States Army Garrison, Hawaii (USAG-HI Regulation Number 420-2, Standard for Temporary Water Service (enclosure 5).

(1) A temporary water meter shall be installed by the Directorate of Public Works, Utilities Division.

(2) A reduced pressure principle backflow prevention assembly (RP) shall be provided, installed and tested by the requestor.

(3) Testing will be conducted by a certified backflow prevention assembly tester acceptable to the Director and qualified to test a reduced pressure principle backflow prevention assembly (RP). Testing will be completed immediately after installation and prior to initiation of temporary service. Any repairs identified during testing must be completed prior to initiation of temporary service. Test results shall be provided to the Directorate of Public Works, Utilities Division no later than the following business day.

12. Recycled Water Systems. The use of recycled water poses a real and significant threat to our potable water supply. Serious incidents throughout the country illustrate the need to strictly adhere to the guidelines outlined in this section and throughout this document.

a. Recycled water piping will be colored in purple, Pantone 522, and will be clearly and continuously marked "CAUTION: RECYCLED WATER-DO NOT DRINK".

b. At no time will pipe marked and colored for recycled water use be used for any reason, on any portion of a potable water system.

c. At no time will unmarked or non-purple colored pipe be used for any reason, on any portion of a recycled water system.

d. All valve box covers on recycled water systems in order to prevent interchange with potable valve covers:

(1) Will be colored purple, Pantone 522.

(2) Will be triangular in shape, such as D & L Foundry M9009 or M9019.

(3) Cast with the inscription "RECYCLED WATER".

e. At no time will any cross-connection be allowed between a potable water supply and any recycled water system.

f. An air gap separation is the only backflow prevention device that will be allowed to supply potable water to a recycled water system.

g. Hazard appropriate (Table 2 of Enclosure 3) backflow prevention devices are allowed for use from a recycled water system to a recycled water system of the same classification.

(1) All backflow prevention devices on a recycled water system will meet the installation requirements in section 5 of this document.

(2) All backflow prevention devices on a recycled water system will be colored purple, Pantone 522, and be clearly marked "CAUTION: RECYCLED WATER-DO NOT DRINK"

(3) All backflow prevention devices on a recycled water system are subject to the inspection and testing requirements in section 4 of this document.

(4) All testers of BFPAs on recycled water systems must meet the standards outlined in section 4 of this document.

(5) Test equipment used to test BFPAs on recycled water systems will never be used to test BFPAs on potable water systems.

13. Point of contact for the content of this document is Mr. Monte Martin, Chief, Operation and Maintenance Division, DPW, USAG-HI, telephone number, (808) 655-0591, or e-mail: monte.l.martin.civ@mail.mil.

Encl
as

STEVEN M. RAYMOND
Director of Public Works

1. Acronyms, Abbreviation and Special Terms

- **Administrative Authority.** The term "Administrative Authority" shall mean the United States Army Garrison, Hawaii, Directorate of Public Works vested with the authority and responsibility to administer, enforce and maintain the provisions of this cross-connection control program.

- **Air Gap.** The term "air gap" shall mean the physical separation between the free flowing discharge end of a potable water supply pipeline and an open or non-pressure receiving vessel. An "approved air gap" shall be at least double the diameter of the supply pipe measured vertically above the overflow rim of the vessel and in no case shall the gap be less than 1 inch (2.54 cm).

- **Approved.** The term "approved" shall mean accepted by the State of Hawaii, Department of Health and the United States Army Garrison, Hawaii, Directorate of Public Works as meeting the applicable specifications or as suitable for the proposed purpose.

- **Approved Device.** The term "approved device" shall mean a backflow prevention assembly, device or method acceptable to the United States Army Garrison, Hawaii, Directorate of Public Works and approved by recognized independent agencies such as the American National Standards Institute (ANSI), American Society of Safety Engineers (ASSE), International Association of Plumbing and Mechanical Officials (IAPMO), Underwriters Laboratories, Inc. (UL), Uniform Plumbing Code (UPC), University of Southern California Foundation for Cross-Connection Control and Hydraulic Research (USCFCCCHR).

- **Atmospheric Vacuum Breaker Backsiphonage Prevention Assembly (AVB).** The term "atmospheric vacuum breaker backsiphonage prevention assembly" shall mean an assembly containing an air inlet valve, a check seat and an air inlet port(s). The flow of water into the body causes the air inlet valve to close the air inlet port(s). When the flow of water stops, the air inlet valve falls and forms a check valve against backsiphonage. At the same time it opens the air inlet port(s) allowing air to enter and satisfy the vacuum. A shutoff valve immediately upstream may be an integral part of the assembly, but the assembly shall not be subjected to operating pressure for more than twelve (12) hours in any twenty-four (24) hour period. This assembly is designed to protect against pollutant and contaminant hazards under a backsiphonage condition only. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Backflow.** The term "backflow" shall mean the undesirable reversal of flow of water and other liquids, gases or other substances into the distribution pipes of a potable supply of water from any source or sources. See terms **Backpressure** and **Backsiphonage**.

- **Backflow Prevention Assembly - Approved (BPA, BFPA).** The term "approved backflow prevention assembly" shall mean an assembly that has been investigated and approved by the administrative authority. The backflow prevention assembly shall be manufactured in full conformance with the standards established by the AWWA –C506-78 and have completely met the laboratory and field performance specification of the USCFCCCHR. The director may accept standards and testing results from other acceptable laboratories when it becomes necessary. The current types of approved backflow prevention assemblies are:
  - Atmospheric Vacuum Breaker (AVB).
  - Double Check Valve Backflow Prevention Assembly (DC).
  - Double Check - Detector Backflow Prevention Assembly (DCDA).
  - Double Check - Detector Backflow Prevention Assembly-Type II (DCDA-II).
  - Pressure Vacuum Breaker (PVB).
  - Reduced Pressure Principle Backflow Prevention Assembly (RP, RPZ).
  - Reduced Pressure Principle - Detector Backflow Prevention Assembly (RPDA).
  - Reduced Pressure Principle - Detector Backflow Prevention Assembly-Type II (RPDA-II).
  - Spill - Resistant Pressure Vacuum Breaker Backsiphonage Prevention Assembly (SVB).
- **Backflow Prevention Device.** The term "backflow prevention device" shall mean a device, method or construction used to prevent backflow into a potable water system. These include but are not limited to Air Gaps, Barometric Loops, Check Valves (CV) and BFPAs.
- **Backpressure.** The term "backpressure" shall mean any elevation of pressure in the downstream piping system above the supply pressure which would cause a reversal of the normal direction of flow.
- **Backsiphonage.** The term "backsiphonage" shall mean a form of backflow due to a reduction in supply pressure which causes a sub-atmospheric pressure to exist at a site in the water system.
- **Certified Tester** The term "certified tester" shall mean any of two classes of testers.

- General Tester. An individual, who has been trained, qualified and certified by an approved organization to perform inspection, testing and repairs on all backflow prevention assemblies.

- Limited Tester. An individual, who has been trained, qualified and certified by an approved organization to perform inspection, testing and repairs on the specific devices contained within a specific facility.

- All testers must be approved by the Director and must have a current backflow prevention assembly tester's certification recognized by the State of Hawaii.

- **Check Valve.** The term "check valve" shall mean any self-closing device which is designed to permit flow in one direction only.

  - An approved check valve is a check valve that is drip tight in the normal direction of flow when the inlet pressure is at least one (1) psi (pound per square inch) and the outlet pressure is zero. It shall not permit leakage in a direction reverse to the normal flow. The closure element shall be internally loaded to promote rapid and positive closure.

- **Consumer.** The term "consumer" shall mean any individual, section, directorate, operation or activity using or receiving water from the DPW.

- **Containment.** See **Service Protection**.

- **Contamination.** The term "contamination" shall mean an impairment of water quality which creates an actual hazard to public health through the introduction of biological, chemical or nuclear agents.

- **Critical Level.** The term "critical level" shall mean the marking (C-L or C/L) on AVBs, PVBs and SVBs that determines the minimum elevation above the flood level rim of the fixture or receptacle served, as well as downstream piping and water uses, at which the assembly may be installed. When an AVB, PVB or SVB does not bear a critical level marking the bottom of the assembly shall constitute the critical level.

- **Cross-Connection.** The term "cross-connection" shall mean any unprotected actual or potential connection or structural arrangement between a potable water supply and any source through which backflow may occur and introduce any substance other than the intended potable water into the potable water system. The two types of cross-connections are:

  - Direct cross-connections which are subject to backpressure and backsiphonage.

- Indirect cross-connections which are subject to backsiphonage only.

- **(the) Director.** The term "Director" shall mean the Director of the Directorate of Public Works, United States Army Garrison, Hawaii, or a duly authorized representative.

- **Double Check Valve Backflow Prevention Assembly (DC).** The term "double check valve backflow prevention assembly" shall mean an approved assembly composed of two independently acting, approved check valves, tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks. This assembly shall only be used to protect against pollutant (non-health) hazards under backpressure and backsiphonage conditions. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Double Check - Detector Backflow Prevention Assembly (DCDA).** The term "double check - detector backflow prevention assembly" shall mean a specially designed assembly composed of a line sized approved DC with a bypass containing a specific water meter and an approved DC. The meter shall measure accurately for rates of flow up to two (2) GPM (gallons per minute) and shall show a registration for all rates of flow. This assembly shall only be used to protect against pollutant (non-health) hazards under backpressure and backsiphonage conditions. The DCDA is used primarily on fire sprinkler systems. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Double Check - Detector Backflow Prevention Assembly-Type II (DCDA-II).** The term "double check - detector backflow prevention assembly-type II" shall mean a specially designed assembly composed of a line sized approved DC with a bypass around the second check containing a specific water meter and a check valve. The meter shall measure accurately for only very low rates of flow up to two (2) GPM (gallons per minute) and shall show a registration for all rates of flow. This assembly shall only be used to protect against pollutant (non-health) hazards under backpressure and backsiphonage conditions. The DCDA is used primarily on fire sprinkler systems. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Hazard – Degree of.** The term "degree of hazard" shall mean either a pollutant (non-heath) or a contaminant (health) hazard and is derived from the evaluation of conditions within a system (Table 2 of enclosure 3).

- **Hazard - Health.** See **Contamination**.

- **Hazard - Non-health.** See **Pollution**.

- **Hazard - System.** The term "system hazard" shall mean an actual or potential threat of severe danger to the physical properties of the public or consumer's potable water system or of a pollution or contamination which would have a protracted effect on the quality of the potable water in the system.

- **Industrial Piping System – Consumer's.** The term "consumer's industrial piping system" shall mean any system used by the consumer for transmission of or to confine or store any fluid, solid or gaseous substance other than approved water supply. Such a system would include all pipes, conduits, tanks, receptacles fixtures, equipment and appurtenances used to produce, convey or store substances which are or may be polluted or contaminated.

- **Internal Protection.** The term "internal protection" shall mean the employment of the appropriate backflow prevention device within the consumer's potable water system at the point of use, commensurate with the degree of hazard.

- **Isolation.** See **Internal Protection**.

- **Manifold Assembly.** The term "manifold assembly" shall mean an assembly comprised of two (2) or more backflow prevention assemblies in parallel with a single inlet and outlet connection. The size of the manifold assembly shall be determined by the inlet and outlet connections. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Pollution.** The term "pollution" shall mean an impairment of water quality to a degree which does not create a hazard to the public health but which does adversely and unreasonably affect the aesthetic qualities of such water for domestic use.

- **Pressure Vacuum Breaker Backsiphonage Prevention Assembly (PVB).** The term "pressure vacuum breaker backsiphonage prevention assembly" shall mean an approved assembly containing an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks. This assembly is designed to protect against pollutant and contaminant hazards, under a backsiphonage condition only. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Reclaimed (Recycled, Reused) Water.** The terms "reclaimed, recycled or reused water" shall mean water which, as a result of treatment of wastewater, is suitable for

a direct beneficial use or a controlled use that would not otherwise occur, and is not safe for human consumption.

- **Reduced Pressure Principle Backflow Prevention Assembly (RP, RPZ).** The term "reduced pressure principle backflow prevention assembly" shall mean an approved assembly composed of two independently acting, approved check valves, together with a hydraulically operating, mechanically independent pressure differential relief valve located between the check valves and at the same time below the first check valve. The assembly shall include tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with properly located resilient seated test cocks. This assembly is designed to protect against pollutant and contaminant hazards under backpressure and backsiphonage conditions. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Reduced Pressure Principle-Detector Backflow Prevention Assembly (RPDA).** The term "reduced pressure principle-detector backflow prevention assembly" shall mean a specially designed approved assembly composed of a line sized approved RP with a bypass containing a specific water meter and an approved RP. The meter shall measure accurately for rates of flow up to two (2) GPM (gallons per minute) and shall show a registration for all rates of flow. This assembly is designed to protect against pollutant and contaminant hazards under backpressure and backsiphonage conditions. The RPDA is used primarily on fire sprinkler systems. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Reduced Pressure Principle-Detector Backflow Prevention Assembly-Type II (RPDA-II).** The term "reduced pressure principle-detector backflow prevention assembly-type II" shall mean a specially designed assembly composed of a line sized approved RP with a specific bypass around the second check valve containing a specific water meter and an approved check valve. The meter shall measure accurately for rates of flow up to two (2) GPM (gallons per minute) and shall show a registration for all rates of flow. This assembly is designed to protect against pollutant and contaminant hazards under backpressure and backsiphonage conditions. The RPDA-II is used primarily on fire sprinkler systems. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Service Connection.** The term "service connection" shall mean the terminal end of a service connection from the public potable water system. If a water meter is installed at the end of the service connection, then the service connection shall mean the downstream end of the water meter.

- **Service Protection.** The term "service protection" shall mean the protection of the public water system by the installation of the appropriate backflow prevention device

at the service connection to the consumer. The type of device will be based on the degree of hazard posed by that consumer.

- **Spill-Resistant Pressure Vacuum Breaker Backsiphonage Prevention Assembly (SVB).** The term "spill-resistant pressure vacuum breaker backsiphonage prevention assembly" shall mean an approved assembly containing an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve. The assembly is to be equipped with tightly closing resilient seated shutoff valves attached at each end of the assembly and fitted with a properly located resilient seated test cock and a properly located bleed/vent valve. This assembly is designed to protect against pollutant and contaminant hazards under a backsiphonage condition only. See Specifications, Section 10 of the Current USCFCCCHR Manual for additional details.

- **Water – Potable.** The term "potable water" shall mean water from any source which has been investigated by the health agency having jurisdiction, and which has been approved for human consumption.

- **Water Purveyor.** The term "water purveyor" shall mean the owner or operator of the potable system supplying an approved water supply to Department of the Army facilities. In this instance, United States Army Garrison, Hawaii, Directorate of Public Works.

- **Water Supply – Auxiliary.** The term "auxiliary water supply" shall mean any water supply on or available to the consumer's premises other than the water purveyor's approved public potable water supply.

- **Water System(s) – Consumer's.** The term "consumer's water system" shall mean any water system located on the consumer's premises whether supplied by a public potable water system or an auxiliary water supply.

Tables

Table 1 Backflow Prevention Assembly Installation Clearance Guidelines			
Minimum Distance From the Floor or Grade Level to the Bottom of the Assembly	Maximum Distance From Floor or Grade Level to the Centerline of the Assembly	Minimum Distance on One Side of the Assembly to Allow for Maintenance and Testing	Minimum Distance to Surrounding Obstructions
18"	60"	24"	12"
Installations elevated more than five (5) feet (1524 mm) above the floor or grade shall be provided with a permanent platform capable of supporting a tester or maintenance person.			

Table 2 Backflow Prevention Assembly General Application Guidelines						
	Pollutant (Non-Health)		Contaminant (Health)		Sewage and Recycled Water Systems	
	Backsiphonage	Backpressure	Backsiphonage	Backpressure	Backsiphonage	Backpressure
Air Gap	X	X	X	X	X	X
RP	X	X	X	X		
RPDA	X	X	X	X		
RPDA-II	X	X	X	X		
DC	**Fire Sprinklers Systems Classes 1, 2 and 3 Only!**					
DCDA						
DCDA-II						
PVB	X		X			
SVB	X		X			
AVB	X		X			

Table 3 Required Protection by Fire Suppression Class				
	Class 1	Class 2	Class 3	Class 4
DC	X	X		
DCDA All Types	X	X		
RP	X	X	X	X
RPDA All Types	X	X	X	X

Directorate of Public Works Backflow Prevention Assembly Test Report

Installation:		Facility:		Size (in):		Type:	
Manufacturer:		Model:		Serial Number:			

INITIAL TEST

By:		Tester #		Date:	

Reduced Pressure Principle Assembly			Line Pressure:		psi
Double Check Valve Assembly		Differential Relief Valve	Pressure Vacuum Breaker		
Check Valve #1	Check Valve #2		Air Inlet	Check Valve	
Held Tight at _____ psid	Held Tight at _____ psid	Opened at _____ psid	Opened at _____ psid	Held Tight at _____ psid	
Leaked ____	Leaked ____	Did Not Open ____ Leaked ____	Did Not Open ____	Leaked ____	

Repairs By:		Date:	

C-Cleaned R-Replaced

Item	C/R	Item	C/R	Item	C/R	Item	C/R	Item	C/R
Module		Module		Module		Module		Module	
Disc		Disc		Disc		Disc		Disc	
Spring		Spring		Spring		Spring		Spring	
Guide		Guide		Guide		Float		Guide	
Seat		Seat		Seat		Poppet		Seat	
Other		Other		Diaphragms		Other		Other	
				Other					

FINAL TEST

By:		Tester #		Date:	

Reduced Pressure Principle Assembly			Line Pressure:		psi
Double Check Valve Assembly		Differential Relief Valve	Pressure Vacuum Breaker		
Check Valve #1	Check Valve #2		Air Inlet	Check Valve	
Held Tight at _____ psid	Held Tight at _____ psid	Opened at _____ psid	Opened at _____ psid	Held Tight at _____ psid	

Function:		Does this assembly isolate the facility?	

Notes:

Signature of Final Tester and Date:

Interagency Drinking Water System Team
Zone H3 Removal Action Report
March 2022

Line of Evidence 2a

Water within the Distribution System does not exceed State and Federal Drinking Water MCLs, Specified State EALs, and ISPs

Table 1: Lines of Evidence Under Evaluation – Ensure no contamination remains in the system and water chemistry concerns are addressed.

Objective 2a - Water within the distribution system does not exceed State and Federal DW MCLs, specified State EALs, and ISPs.

Incident Specific Criteria –

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

Lines of Evidence	Completion Status	Outstanding Items
JBPHH water system's approach to flushing and their metrics for success.	Complete	• None.
Validity of the volumetric exchange model	Complete	• None.
Verification that the entire distribution system is flushed volumetrically.	Complete	• None.
Residential Sampling Report for Flushing Zone (Risk Management Summary)	Complete	• None.

February 19, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: SUMMARY OF LINE OF EVIDENCE OBJECTIVE 2A – WATER WITHIN THE DISTRIBUTION SYSTEM DOES NOT EXCEED STATE AND FEDERAL DW MCLs, SPECIFIED STATE EALs, AND ISPs

Encl: (1) 2a.1 Memorandum for Record
(2) 2a.2 Validity and Application of Volumetric Exchange Method
(3) 2a.3 Hydraulic Model
(4) 2a.4 Records of Completed Volumetric Exchanges
(5) 2a.5 Water Source and Water Storage Facilities
(6) 2a.6 Distribution System Exceedance Investigation Summary and Resample Results

1. Enclosures (1) through (6) document completion of Line of Evidence 2a, that water within the Zone H3 distribution system does not exceed State of Hawaii and Federal Drinking Water standards, Maximum Contaminate Levels, Environmental Action Levels and Incident Specific Parameters. On the evening of November 28, 2021, the Red Hill Shaft was secured from operation and all pumping operations ceased. The Aiea/Halawa shaft briefly served as the secondary source starting on November 28, 2021, but it was shut down on December 3, 2021 to prevent potential westward contaminant migration in the aquifer and because there were concerns over high chloride concentrations caused by saltwater intrusion. Since December 3, 2021, the Waiawa Shaft has been the sole water source providing potable water to the Joint Base Pearl Harbor-Hickam (JBPHH) distribution network. Zone H3 is part of the JBPHH Drinking Water system that is operated and maintained by the United States Navy. Flushing operations for Zone H3 are summarized in Enclosure (1), signed by LCDR Carl Chase, team lead for the Drinking Water Distribution System Recovery Team.

2. Details on the drinking water system and flushing operations and protocols are provided in Enclosures (1), (3), and (5). The guidance provided by Dr. Whelton on the recommended volume exchanges to be flushed in the distribution system is provided in Enclosure (2).

3. The records of the distribution system volumetric exchanges flushed are provided in Enclosure (4). Level 2 sampling data collected after distribution flushing is summarized in Enclosure (6).

4. Sample results with analyte detections exceeding the prescribed MCL, EAL, or ISP are documented in Enclosure (6). The follow-on investigation summary and additional sampling results are also documented in Enclosure (6).

5. The information provided in Section 2a, including the flushing process followed and the subsequent sampling results, demonstrate that water within the Zone H3 distribution system does not exceed State of Hawaii and Federal Drinking Water standards, Maximum Contaminate Levels, Environmental Action Levels and Incident Specific Parameters.

6. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and I believe the submitted information is true, accurate, and complete.

WETZEL.CHRISTOPHER.JAMES.1540194862

Digitally signed by WETZEL.CHRISTOPHER.JAMES.1540194862
Date: 2022.02.19 19:37:51 -08'00'

C. J. Wetzel
LT, CEC, USN

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

AMIM-HWP 22 February 2022

MEMORANDUM FOR Interagency Drinking Water System Team (IDSWT) Building C27, Nanumea Road, Naval Station Pearl Harbor, Joint Base Pearl Harbor-Hickam, Hawaii 96818

SUBJECT: Army Flushing Report for **Zone H3**

ENCL: (1) WATER STORAGE FACILITIES AND WATER SOURCE FOR ZONE H3

1. OBJECTIVE. This addendum provides additional technical information to document the system flushing methodology and engineering approach used to restore Flushing Zone H3 (Alimanau Military Reservation Housing) to service as requested by the State of Hawaii Department of Health (HI DoH). This memorandum and associated technical document (see Hydraulic Model (Zone H3) fully support the Drinking Water Distribution System Recovery Plan (DWDSRP) which was signed by the Interagency Working Group (IDWST) on 17 December 2021.

2. BACKGROUND.

2.1. Portions of the water distribution system serving Joint Base Pearl Harbor Hickam (JBPHH) and surrounding areas were exposed to low levels of fuel contamination with initial indications in the form of smell reports occurring on or about 28 November 2021.

2.2. Prior to the aquifer contamination incident, water users connected to the JBPHH system were supplied by three Navy owned water sources, Red Hill Shaft, Aiea/Halawa Shaft and Waiawa Shaft. In the time period prior to the incident, Waiawa Shaft was the main water source supplying approximately 16 million gallons per day (MGD) to the JBPHH system with at least one pump operating full time (100%). A single Red Hill Shaft pump was operated intermittently as a secondary source to supply approximately 5.5 MGD to the system. The Aiea/Halawa shaft was not being operated due to concerns over high chloride concentrations caused by saltwater intrusion into the aquifer.

2.3. On the evening of 28 November 2021, the Red Hill Shaft was secured and all pumping operations ceased. The Aiea/Halawa shaft briefly served as the secondary source starting on 28 November 2021 but was shut down on 03 December 2021 to prevent westward contaminant migration in the aquifer.

2.4. Since 03 December 2021, Waiawa Shaft has been the sole water source providing potable water to the distribution network. It is located 5.5 miles west of the Red Hill Fuel Facility and testing has not found any water quality issues at this source.

2.5. The Army owns and operates the AMR Community Water System (public water system ID: HI0000337) which is a consecutive system of the JBPHH water distribution system and was impacted by the incident. AMR is a residential community water system located in Oahu South area in the Aliamanu volcanic crater.

2.6. This memorandum is specific to Aliamanu Military Reservation (AMR) Housing, Zone H2. Water is supplied to AMR Housing by the JBPHH water system via the S1/S2 water tanks and gravity fed to consumers.

3. Engineering Analysis and Tools. US Army Garrison-Hawaii (USAG-HI) utilized engineering judgement informed by existing tools and data sources such as ArcGIS, Supervisory Control and Data Acquisition (SCADA) system historic and current data, water system hydraulic model, and input from water system infrastructure contamination subject matter experts (e.g., USAEC, USACE, NAVFAC) to develop water system flushing methodologies. Below expand on said tools.

3.1. ArcGIS was the primary tool used for mapping, volumetric calculations, and spatial analysis of the utility systems.

3.2. System flows were measured by meters at key points within the distribution system. Data was recorded and stored by the Navy's SCADA system historian. SCADA is also monitored 24/7 by water system operators.

3.3. A hydraulic model of Army assets has been developed and iteratively refined over the last 3 years. However, model calibration is not possible as data requirements are not available, e.g., water meters on residences, c-factors. Therefore, the model is skeletonized depicting major transmission lines to many areas of the base. The model was considered to be of limited use in determining the effectiveness of system flushing.

3.4 Pressure data loggers were used to at strategic locations in the distribution system to monitor flushing operations. The Unified Facilities Criteria (UFC) 3-230-02 cites that systems pressure should not drop below 30 psi and fire hydrants recommended static pressure of 35 psi. The UFC 3-230-02 guides the reader to industry standards, manuals of practice, training guides, handbooks, and miscellaneous documents published by the American Water Works Association (AWWA) and other authorities in the water supply and treatment field.

4. CONSTRANTS. The following constraints were considered during development of the plan:

4.1. Waiawa Shaft pumps are capable of pumping 19 million gallons day (MGD) with 2 pumps. There are 4 pumps at Waiawa Shaft, 2 are operational, one is standby, and one is down for maintenance. Average daily demand at JBPHH since the incident, and after water conservation measures were implemented, has ranged from 12 to 17 MGD. Maximum potable water system flushing flows were limited to 5 MGD to avoid excessive drawdown of the S1/S2 tanks and stay within the capacity of Waiawa Shaft pumps.

4.2. The two 6 million gallon (each) tanks, S1 and S2 could not be drawn down below the 28-foot level. This constraint was imposed by the water system operators who wanted to avoid low water system pressures that would be caused by S1/S2 drawdown below 28-feet.

4.3. Water service was required to be maintained for residents. Many families have remained in their homes and mission essential Government activities require continuous water service.

4.4. JBPHH and USAG-HI did not have an established unidirectional flushing plan developed prior to the incident. Unidirectional flushing typically involves inducing one-way flow through each pipe segment in a water distribution system by closing mainline isolation valves and opening hydrants for a short period of time. The number of hydrants required would be determined by the pipe size and the minimum water velocity required to flush sediments and

other contaminants from the pipe segment. True unidirectional flushing of the system was determined not to be a feasible method for flushing the potable water system for the following reasons:

4.4.1. The distribution system was to be recovered with critical urgency. Additionally, SMEs advised that the longer contaminants remained in the system, the more likely it was that they would migrate into plastics, gaskets, sediments, etc. A unidirectional flushing program would take several months to develop and implement and the timeline was not considered feasible for a return to service.

4.4.2. Water system operators indicated that many mainline isolation valves would not properly close and could not be relied upon to isolate pipe segments.

4.4.3. A single short duration flush of higher velocity flow through each pipe segment may be effective at removal of sediments from a single pipe segment. However, the method was considered to be less effective at system-wide removal of aqueous phase fuel contaminants than other options.

4.5. Flushing zones with higher risk of contamination were identified and prioritized using water user complaint history, testing results, the hydraulic model, and the hydraulic proximity to Red Hill Shaft. A factor of safety was applied to the highest priority zones by specifying a minimum of five (5) volumetric turnovers. All Army Zones were flushed with this safety factor.

5. Flushing Operations. All flushing plans are designed with a directional flush of the distribution system starting from the clean water source and moving systematically through the entire system. The limited water source capacity at Waiawa Shaft and disposal constraints required that the system be broken down into smaller flush zones. 4 total zones were established that could be independently flushed without adverse hydraulic or water quality impacts to previously flushed zones.

6. Flushing Zones. Detailed information, i.e., maps, calculations, data, are included in the Hydraulic Model (Zone H3).

6.1. Flushing Zone Commonalities.

6.1.1. Army Tank Volumes were cycled prior to flushing.
6.1.2. All Flushing started at a Hydrant and discharged into a sanitary sewer manhole.
6.1.3. 5 volume exchanges of the distribution pipes.
6.1.4. Systematic Directional flow without operating valves.
6.1.5. Higher Velocities required more hydrants and shorter runs of pipe to be flushed.
6.1.6. Every effort was made to account for elevation when flushing hydrants.
6.1.7. Flow most hydrants at 500 gallons per minute (gpm). Some hydrants limited to 150 & 200 gpm.

6.2. Specific Limitations. Sewer capacities were limited in Zone H3 Hibiscus neighborhood, due to wet well size and pump capacity. Two Hydrants were flushed at a time due to sewer capacity and City and County of Honolulu Temporary discharge permit allowance.

6.3. Water Users. Residential housing represents the dominant water user in all Army flushing zones. In addition to residential housing, there are other small non-residential facilities located within AMR housing, Zone H3.

6.4. Volume. In consultations with professionals a recommendation of three volumetric turnovers for impacted pipe networks was established. A factor of safety was applied to the

highest priority zones by specifying a minimum of five volumetric turnovers. The same volume was used for Flush 1 and Flush 2.

Zone H3 = 125,200 (gals), 5 volumes = 626,000 (gals)

6.5. Priority. For water distribution Flush 1, Zones H1, H2, and H3 were flushed in that order with Zone I1 flushed concurrently. In the Flush 2 only H1, H2, and H3 were flushed. In Flush 2 the flushing order was changed and started with H2 then H1 and H3. Started with H2 first since that zone had a Total Petroleum Hydrocarbon (TPH) detection after Flush 1.

6.6 Date. For distribution flushing the Flush 1 for Zone H3 occurred 23-25 December 2021. The distribution flushing for Flush 2 for Zone H3 occurred 11-12 January 2022.

7.0. Water Storage Tanks. Zone H3 has the Army's 182 water storage tank (North Tank), which serves homes on the outer northern perimeter of the Aliumanu Military Reservation (AMR) crater. The Army's North tank water is delivered by booster pumps located at the Army's 2070 water storage tank (Middle Tank). The booster pumps draw water from the Middle Tank, which draws its water from JBPHH's water distribution system, which is currently fed by the Waiawa Shaft water supply source and water stored in the Halawa S-1 tank since the Halawa S-2 tank has been taken offline for maintenance. Water being distributed in the system and being stored in water storage tanks that feed Zone H3 have been flushed in accordance with the Drinking Water Distribution System Recovery Plan, December 2021. The Volume of the storage tank flushed was not documented. The Enclosure 1, certifies that the tank was flushed.

8.0. Residential Flushing. Residential flushing in Zone H3 has been conducted in accordance with the IDWST Drinking Water Distribution System Recovery Plan. Residential flushing started 24 January and ended 3 February. A total of 379 residential homes were flushed in Zone H3. A pressure reading of the home was taken and documented prior to flushing. The Residential flushing is considered complete. The records of residential flushing have been uploaded into EDMS the database of record.

9.0. Non-Residential Flushing. Non-residential flushing has been conducted in accordance with the IDWST Non-Residential Facility Flushing Plan checklist and standard operating procedure. A total of 4 non-residential buildings were flushed in Zone H3. The Navy flushed the AMR-88 COSA and Construction sites in Zone H3. The records of non-residential flushing have been uploaded into EDMS the database of record.

10.0. Water Quality Data. Sample data collected comply with parameters identified by the IDWST and are provided in the Drinking Water Sampling Plan December 2021. Samples collected for Zone H3 have not exceeded the Department of Health Groundwater Action Levels, Department of Health Safe Drinking Water Act Regulatory Constituents and the US Environmental Protection Agency Maximum Contaminate Levels (MCLs) for drinking water.

11.0 Re-flushing. The distribution system for H3 was re-flushed in January 2022 following the same protocol as flush 1 and in accordance with IDWST guidance.

12.0 Point of Contact. Please refer any questions regarding this memorandum to the undersigned.

2/22/2022

X Nisit A. Gainey

Signed by: GAINEY.NISIT.ANTHONY.1067651371

Nisit A. Gainey
Director
Public Works, USAG-HI

February 22, 2022

From: US Army Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: WATER STORAGE FACILITIES AND WATER SOURCE FOR ZONE H3

Ref: (a) Drinking Water Sampling Plan, December 2021
(b) Drinking Water Distribution System Recovery Plan, December 2021

Encl: (1) Joint Base Pearl Harbor Hickam Potable Water System Description
(2) S1 and S2 Water Storage Tank Flushing Report Memo

1. This letter and associated enclosures describes and documents the flushing of the water storage facilities that serve the Joint Base Pearl Harbor Hickam (JBPHH) potable water system. The flushing of the JBPHH water storage facilities and distribution system was completed in accordance with reference (a) and (b). Enclosure (1) describes the JBPHH Potable Water System and storage tanks associated with the system. Page 8 of reference (a) has the flushing zones and water storage facilities located in each zone. The flushing of each zone identified in phase 1 of reference (a) included five volumetric turnovers. The volumetric turnover requirement included the water tank storage and distribution system volume for each zone. The water testing of the distribution system after flushing a zone's water storage tank and distribution system was the confirmation that contamination was removed from the system and that the water tanks was not a source of contamination. Enclosure (2) documents the Hawaii Department of Health's approved change from reference (a) for the flushing of Halawa S-1 and Halawa S-2.

2. Zone H3 has the Army's 182 water storage tank (North Tank), which serves homes on the outer northern perimeter of the Aliumanu Military Reservation (AMR) crater. The Army's North tank water is delivered by booster pumps located at the Army's 2070 water storage tank (Middle Tank). The booster pumps draw water from the Middle Tank, which draws its water from JBPHH's water distribution system, which is currently fed by the Waiawa Shaft water supply source and water stored in the Halawa S-1 tank since the Halawa S-2 tank has been taken offline for maintenance as documented in enclosure (2). Water being distributed in the system and being stored in water storage tanks that feed Zone H3 have been flushed in accordance with reference (b) and the distribution system tested in accordance with reference (a).

3. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

2/22/2022

X Nisit A. Gainey

Signed by: GAINEY.NISIT.ANTHONY.1067651371

Nisit A. Gainey
Director
Public Works, USAG-HI

February 26, 2022

Joint Base Pearl Harbor Hickam (JBPHH) Potable Water Description

Major components of the JBPHH potable water system include:

- Supply sources
  - Waiawa Shaft/Pumping Station
  - Red Hill Shaft/Pumping Station
  - Halawa Shaft/Pumping Station
  - Emergency Interconnections (2 locations)
- Water storage facilities
- 2-6,000,000 gallon steel storage tanks at Halawa
  - 2-200,000 gallon concrete storage tanks at Camp Smith
  - 1-250,000 gallon glass-fused steel storage tank at Camp Smith with a usable storage capacity of 140,000 gallons
  - 2-250,000 gallon glass-fused steel storage tank at Red Hill
- Distribution system
  - Camp Smith Booster Pump (to convey water to the Camp Smith water system)
  - Red Hill Booster Pumps (to convey water to the storage tank)
  - Moanalua Terrace Booster Pumps (to pressurize the water system serving the
  - Moanalua Terrace Housing area)
  - Boneyard Booster Pumps (to pressurize the water system serving the upper elevation of Moanalua Terrace Housing area)
  - Manana Booster Pumps (to pressurize the water system servingthe Manana Housing area)
  - A network of pipes, meters, valves, and hydrants for distribution and fire protection

Water Storage Facilities:

Fresh water storage facilities store water for normal, fire, and maximum demand use, and serve to maintain relatively constant pressure in the water system. The JBPHH water system is equipped with two welded steel tanks, each with a storage capacity of six million gallons. These tanks are identified as the Halawa storage tanks S-1 and S-2. Both of these tanks are located adjacent to the Aliamanu Military Reservation at a ground elevation of 140 feet. The diameter of the tanks are 164 feet each, with a nominal height of 48 feet. The spillway elevations of the S-1 and S-2 tanks are 178.5 feet. The tanks are interconnected by a 10-inch line. Water from each of the tanks discharges through separate 24-inch mains and combines to a single 30-inch transmission main.

Other water storage tanks in the JBPHH system include the three tanks at Camp Smith, a storage tank serving the Red Hill Housing area, and three storage tanks serving the Army's Aliamanu Housing area. The Red Hill and Aliamanu tanks are supplied by separate booster pump stations located at the Red Hill Water Pumping Station and the Halawa Storage Tanks, respectively. These tanks are dedicated to serving these two non-Navy housing areas.

February 11, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: S1 AND S2 WATER STORAGE TANK FLUSHING REPORT

Ref: (a) Drinking Water Distribution System Recovery Plan, December 2021

1. This letter documents the current status of the S1 and S2 water storage tanks. In accordance with reference (a), the S1 and S2 water storage tanks were part of the Zone F1 flushing plan. The flushing plan for Zone F1 included both water storage tanks in the five volumetric turnover calculations. The calculated turnover volume was 61.35 million gallons of water. The S1 tank was flushed by cycling the water tank for five volumetric flushes. In order to conserve the amount of water being used in the flushing of Zone F1, the S2 water storage tank was taken out of service and remains out of service to date. This decision resulted in the conservation of approximately 25 million gallons of water. The Hawaii Department of Health (HDOH) was notified of the Navy's modified flushing plan and provided concurrence. The S2 water storage tank is being scheduled for cleaning and maintenance. The Navy will provide details to HDOH on the method and procedures for cleaning and maintenance of the S2 water storage tank prior to the start of work. The Navy will notify the HDOH upon completion of the work and the tank being placed back into service.

2. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

MENO.MICHAEL.WAYNE.JR.1088310035
Digitally signed by MENO.MICHAEL.WAYNE.JR.1088310035
Date: 2022.02.12 14:33:42 -10'00'

M. W. Meno
Captain, U.S. Navy Civil Engineer Corps

February 15, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: VALIDITY AND APPLICATION OF VOLUMETRIC EXCHANGE METHOD

Ref: (a) Drinking Water Distribution System Recovery Plan, December 2021

Encl: (1) Dr. Whelton email documenting volumetric exchange method dtd 08 JAN 22

1. This letter documents the basis of the volumetric exchange method used in the development of reference (a). The basis of the flushing method was based on two key recommendations from Dr. Whelton, who served as the Navy's consultant in the early stages of the incident. Enclosure (1) documents key recommendations from Dr. Whelton which included flushing from a clean source, systematically moving through the entire system, and flushing at least three times the pipe volume. Rules of three is what Dr. Whelton generally recommends.

2. Reference (a) incorporated the recommendations from Dr. Whelton by creating a flushing sequence that began with clean water from the Waiawa shaft and flushing systematically through the entire system. The volumetric exchanges for each zone and zone flushing sequence plan was developed by Navy engineers. This is outlined in table 2.4, Distribution System Recovery Plan Diagram, and section 2.5, Flushing Plan Phasing, of reference (a). A safety factor was applied to the rule of three to obtain five volumetric turnovers for the phase 1 zone areas. Phase 2 zone areas had three volumetric turnovers. Phase 3 zone area had two volumetric turnovers and phase 4 zone areas had one volumetric turnover. The phase 3 and phase 4 zone volumetric turnover determinations were made after considering the up-gradient zone flushing volumes and the non-potable use of water in the zones.

3. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

MENO.MICHAEL.WAYNE.JR.1088310035
Digitally signed by MENO.MICHAEL.WAYNE.JR.1088310035
Date: 2022.02.15 07:17:55 -10'00'

M. W. Meno
Captain, U.S. Navy Civil Engineer Corps

Phone numbers have been redacted

From: Whelton, Andrew J <[redacted]>
Sent: Saturday, January 8, 2022 4:58 AM
To: Lee, Andre K (NAVFAC HI BD) CIV USN NAVFAC HAWAII PEARL (USA) <[redacted]>
Cc: Isaacson, Kristofer P <[redacted]>; Proctor, Caitlin Rose <[redacted]>
Subject: [URL Verdict: Neutral][Non-DoD Source] RE: Cross Connection Control Plan and Flushing Plan documentation requirements for DoH

LCDR Daly,

I am free to talk later this afternoon today if you want. I'm Mountain Standard Time.
Below is some information.

Andy
[redacted]

FEEDBACK

1. You applied unidirectional flushing and if you opened hydrants fully you likely maximized velocity in the pipes you were flushing. The issue they seem to be getting at is scouring velocity which you identify. This is used for removing sediment (typical cleaning of water pipes) as you know. There is no SOP for water contamination response and recovery, so you applied standard water distribution system maintenance practice of unidirectional flushing. This is good. The state I think invoked water main disinfection standard which, to my knowledge isn't applicable here unless you conducted shock disinfection.
    a. For perspective, per a Water Research Foundation study: Microbial Control Strategies for Main Breaks and Depressurization, Project 4307. Published 2014. Denver, Colorado.
        1. Scouring velocity helps removed sediment from water mains/pipes. To achieve 2.5 to 3 log removal of sand particles for 4-to-16-inch diameter PVC pipes, 3 ft/s is needed.
        2. In that report, to achieve this removal for a 6-inch diameter PVC pipe, Q was 308 GPM
        3. In that report, to achieve this removal for 4-inch diameter PVC pipe, Q was 137 GPM
    b. We recommended starting flushing from the clean water source and moving systematically through the entire system in a unidirectional way. If you all did this, be sure to explain that. That helps minimize the change residual "old" water gets untouched, or is left in the system.
    c. You could calculate scouring velocities in each of the areas. If any are lower than desired you can go back and just keep repeat flushing giving an added level of safely.
    d. The state's interest in scouring velocity may be of concern that (JP-5?) free product adsorbed to sediment/scales and they want to be certain it got scoured out. If it didn't, it could dissolve it's constituents into water over time.
    e. Dead-ends are really important. You need to specifically address how you will get that water out. In West Virginia, many weeks after the spill and utility had flushed out the black-licorice smelling contaminated water out someone in a distal part of the system complained about odor. To my recollection the utility thought it was psychological, but it turned out there was a dead-end they didn't flush. Somehow that contaminated water got drawn into a nearby home and someone was exposed.

f. Question: How long was each hydrant open typically?
g. I think we mentioned flushing 3 times the pipe volume. Rules of three is what I often recommend. Flushing velocity is certainly important. I vaguely remember NAVFAC had contracted a consultant to create the flushing plan.

2. JP-5 isn't a single contaminant which we've talked about before. It's a mixture of 100s-1000s of individual chemicals. Even if JP-5 itself is hydrophobic and primarily found in emulsions or floating on the surface, some of these constituents will still diffuse into the water itself. The question they are likely after is how do you know you removed all parts of JP-5 that may have gotten entrained in the water system? This goes back to what chemicals are you testing for in the water distribution system. JP-5 constituents have different water solubility and octanol-water partitioning coefficients (Log Kow = How much they like to be in biofilm and plastics, not water). Additionally, the different materials (Metal vs PVC vs HDPE vs. gaskets) may be more prone to soaking up some JP-5 contaminants and not others depending on their characteristics. For example, PVC has been shown to be less susceptible to soaking up some crude oil-based contaminants than HDPE pipes (Huang et al. study with Whelton). Ultimately, the fate of the chemicals in the drinking water system will not be the same for all JP-5 constituents. Remember the drawing I drew on the whiteboard when meeting with CDR Chase, NAVFAC, COE, and Army? It showed different constituents may be in different parts of the water system. That's what DOH is likely after. Question to you: What wide screen testing have you done in the water distribution system since December 22? This can help you hunt down that the contaminants are present or gone.

3. Escalation should be based on how much flushing you are okay with trying. If you want to remove and replace infrastructure (that has sometimes happened after other contamination events on the mainland and overseas), it's a viable but laborious option. As an extreme example, following the Camp Fire it was estimated it would take over a year of continuous flushing to return some contaminanted pipes to safe use, so for some conditions they removed and replaced pipes. However, this flushing timeline will vary significantly depending on the water distribution systems and water testing results – AND chemicals or individual JP-5 constituents present. If I knew what the chemicals were still being found and what was done to try to get rid of them, I could give a more informed opinion. Food grade surfactants were used in Israel after a drinking water contamination incident…BUT using surfactants is not trivial and can cause all sorts of damage to water system components and leave residual. This probably isn't an email, but more discussion. Happy to talk. If you decide you want to go this way we should be more engaged technically in what this means. It's not likely an email response/effort, but more involved.

4. Here's a paper where we reviewed petroleum (and other material) drinking water distribution and plumbing contamination incidents and flushing Decontaminating chemically contaminated residential premise plumbing systems by flushing - Environmental Science: Water Research & Technology (RSC Publishing) DOI:10.1039/C5EW00118H. Unfortunately, when we went to

review the underlying evidence of each incident, often the utility and state didn't document much. Even incidents overseas had little documentation. It seems groups simply tried something, it did or didn't work, and they moved on. They also didn't sample much and rarely it an entire water distribution system that was affected.

Again, I can get on a zoom call or phone this afternoon MST to connect. I was called into the Colorado wildfires to help the communities identify and design water sampling and recovery plans. We're getting data every day and meeting with state and federal agencies. This is the Marshall Fire and Middle Fork Fire. I apologize for the delayed response.

Andy

Cell/text: [redacted]

**Link to Dr.Whelton's Paper: https://pubs.rsc.org/en/content/articlelanding/2015/ew/c5ew00118h

ARMY FLUSHING REPORT FOR ALIUMANU MILITARY RESERVATION HOUSING AREA ZONE H3

February 2022

TABLE OF CONTENTS

DRINKING WATER SYSTEM-BACKGROUND

The Army-owned Aliamanu Community Water System (public water system ID: HI0000337) is a consecutive system of the U.S. Navy Pearl Harbor water distribution system. The Aliamanu water system has a population served of 6,406 and average daily potable water consumption is approximately 1,136,000 gallons. Drinking water for Red Hill Housing & Aliamanu Military Reservation (AMR) is supplied by the Pearl Harbor Water System. The drinking water was obtained from three groundwater sources: Waiawa Shaft, Red Hill Tunnel, and Halawa Shaft. Since 03 December 2021, the Waiawa Shaft has been the sole water source providing potable water to the distribution network. It is located 5.5 miles west of the Red Hill Fuel Facility and testing has not found any water quality issues at this source. Two 6-million gallon finished water storage tanks (Halawa Storage Tanks) serve as the water source.

The Aliamanu Community Water System is broken into 4 Zones: Red Hill Housing (Zone I1), and AMR Housing (Zone H1, H2, and H3). This flush report focuses only on Aliamanu Military Reservation (AMR) housing in **Zone H3**.

The water is chlorinated and fluoridated at the Pearl Harbor water treatment plant. There is no further treatment before the water is distributed to the Aliamanu and Red Hill residents.

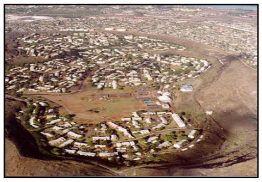
Groundwater is currently pumped from the Waiawa shaft to supply the drinking water for AMR housing in Zone H3. The treated groundwater is pumped to two Six (6) Million Gallon Storage tanks (S1 & S2) and gravity feed to the distribution system to supply consumers in Zone H3. The Storage tank S2 has been taken offline for maintenance.

2021 CONSUMER CONFIDENCE REPORT (2020 SAMPLING DATA) FOR AMR COMMUNITY WATER SYSTEM

2021 Annual Water Quality Report (for water quality in 2020)

U.S. ARMY GARRISON—HAWAII

Aliamanu Military Reservation



The Safe Drinking Water Act requires all community water systems to provide an annual Consumer Confidence Report (CCR) to their customers. CCRs provide drinking water quality information, including information on the origin of the drinking water and any detected contaminants.

U.S. Army Garrison-Hawaii is providing this report as a service to the community in conjunction with this Safe Drinking Water Act requirement.

How does the CCR work? An essential part of the CCR is the water quality table on page 3 showing the level of each substance detected during 2020. There are three columns on the table which should be given special attention: the maximum contaminant level (MCL), the level detected, and whether a violation occurred. The Environmental Protection Agency (EPA) set MCLs for a number of substances which may be found in drinking water. All of the substances listed in the table are below the MCLs set by the EPA. U.S. Army Garrison-Hawaii continues to provide some of the cleanest and safest drinking water available in Hawaii.

What is the source of the water? Drinking water for Aliamanu Military Reservation (AMR) is supplied by the Joint Base Pearl Harbor Hickam Water System. The drinking water is obtained from three ground water sources: Waiawa Shaft, Red Hill Tunnel, and Halawa Shaft.

The ground water filters naturally as it travels from the surface to an aquifer located below the ground. Once the water is pumped back up from the aquifer, it is chlorinated and fluoridated. Both additives are required under Army standards. Chlorine is used as a disinfectant and fluoride is used to promote strong teeth in children. The water is then piped into the distribution system.

The susceptibility of the AMR water system to contamination has been evaluated under the Hawaii Source Water Assessment Program. The results of the Assessment, dated March 2004, are available for review by contacting the Directorate of Public Works, Environmental Division at (808) 656-3107.

In order to ensure that tap water is safe to drink, the EPA prescribes regulations that limit the amount of specific contaminants in water provided by public water systems. Food and Drug Administration (FDA) regulations establish limits for the contaminants in bottled water, which must provide the same protection for public health as tap water.

Red Hill Information:
In January 2014, a fuel release from Tank #5 at the Red Hill Bulk Fuel Storage Facility was reported. As a proactive measure, the Navy has been conducting testing at the Red Hill Shaft above what is required by regulation for several years. The table on page 4 shows the levels of concentrations of detected contaminants at Red Hill Shaft for 2020. All concentrations are below applicable EPA MCLs and the drinking water is considered safe under regulatory guidelines. The Navy will continue to conduct this voluntary testing and data will be included in future Water Quality Reports.

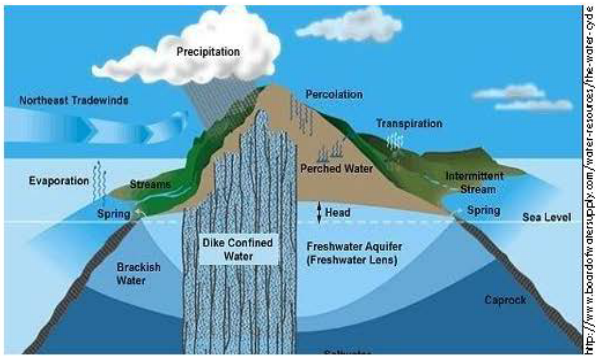
THE FOLLOWING PAGES WILL DESCRIBE THE CONTAMINANTS AND THE RESULTS OF THE DRINKING WATER SAMPLING THAT OCCURRED IN 2020.

Inside this Report:

2021 Annual Water Quality Report (for water quality in 2020)

Where Do Potential Ground Water Quality Problems Come From?

As water percolates through the ground, it dissolves naturally-occurring minerals. Substances resulting from the presence of animal or human activity can also be introduced to the ground water or the distribution system. 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 water poses a health risk. More information about contaminants and potential health effects can be obtained by calling the EPA Safe Drinking Water Hotline (1-800-426-4791) or submitting a request through their online form at https://www.epa.gov/ground-water-and-drinking-water/safe-drinking-water-information.



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, the water dissolves naturally occurring minerals and, in some cases, radioactive material. The water can also pick up substances resulting from the presence of animals or from human activity as indicated in the contaminant summary below.

Contaminant Categories

Microbial contaminants, such as viruses and bacteria, that 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 storm water 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 storm water runoff, and residential uses.

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

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

Lead Facts

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. The Aliamanu water system 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 2 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.

Important Health Information

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised 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/Center for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the Safe Drinking Water Hotline (1-800-426-4791). Please share this information with all the other people who drink this water, especially those who may not have received this notice directly (for example, people in apartments, nursing homes, schools, and businesses.) You can do this by posting this notice in a public place or distributing copies by hand or mail.

Water Quality Table for Aliamanu Military Reservation

The tables below list all of the drinking water contaminants detected during calendar year 2020 unless otherwise indicated. The EPA allows us to monitor for some contaminants less than once per year because the concentrations of these contaminants do not vary significantly from year to year, or our system is not considered vulnerable to this type of contamination. Some of our data, though representative, are more than one year old. Results of samples in the tables below identify low levels of contaminants detected below EPA limits. The presence of these contaminants does not necessarily indicate that the water poses a health risk.

Contaminants in the Distribution System (units of measurement)	MCL	MCLG	Average Level Detected	Range of Detection (multiple samples)	Likely Source of Contaminant	Violation
Inorganic						
Copper (ppm)	AL=1.3	1.3	NQ[1]	0[2]	Corrosion of household plumbing systems; erosion of natural deposits	NO
Lead (ppb)	AL= 15	0	ND[1]	0[2]	Corrosion of household plumbing systems; Erosion of natural deposits	NO
Fluoride[3] (ppm)	4	4	0.56	0.18- 0.85	Erosion of natural deposits; water additive to promote strong teeth	NO
Disinfectant & Disinfection Byproducts						
Residual Chlorine (ppm)	MRDL=4	MRDLG=4	0.59	0.26-0.92	Water additive used to control microbes	NO
Total Trihalomethanes (ppb)	80	N/A	8.2	No Range	By-product of drinking water chlorination	NO
Total Haloacetic Acids (ppb)	60	N/A	1.3	No Range	By-Product of Disinfection	NO

Contaminants in the Plant Water (units of measurement)	MCL	MCLG	Highest Level Detected	Range of Detection (multiple samples)	Likely Source of Contaminant	Violation
Inorganic						
Barium[4] (ppm)	2	2	0.02 (2017)	ND - 0.02	Erosion of natural deposits	NO
Chromium[4] (Total) (ppb)	100	100	2.1 (2017)	ND - 2.1	Naturally-occurring	NO
Lead[4] (ppb)	15	0	10.1 (2019)	ND - 10.1	Corrosion of household plumbing systems; Erosion of natural deposits	NO
Fluoride (ppm)	4	4	0.77	ND - 0.77	Erosion of natural deposits; water additive to promote strong teeth	NO
Nitrate (ppm)	10	10	2.0	0.52-2.0	Runoff from fertilizer use; erosion of natural deposits	NO
Organic						
Chlordane[4] (ppb)	2	0	0.36 (2017)	ND - 0.36	Residue of banned insecticide	N/A
Heptachlor epoxide[4] (ppt)	200	0	20 (2017)	ND - 20	Residue of banned insecticide	N/A
Unregulated[5]						
Bromide[4] (ppb)	N/A	N/A	765 (2018)	124 - 765	Naturally-occurring	N/A
Chloride (ppm)	250[6]	N/A	235	34-235	Naturally-occurring	N/A
Dieldrin[4] (ppb)	N/A	N/A	0.05 (2017)	ND - 0.05	Residue of banned insecticide	N/A
Manganese[4] (ppb)	N/A	N/A	1.20 (2018)	ND - 1.20	Naturally-occurring	N/A
Sodium[4] (ppm)	N/A	N/A	124 (2017)	26 - 124	Naturally-occurring	N/A
Sulfate (ppm)	250[6]	N/A	46	ND - 46	Naturally-occurring	N/A

Red Hill Shaft - 2020 Voluntary Testing

Contaminants (units)	MCL (Allowed)	MCLG (Goal)	DOH EAL	Highest Level Detected	Range of Detection	Violation
Total Petroleum Hydrocarbons-Diesel (C8-C18) (ppb)	N/A	N/A	400	490*	ND - 490	NO
Lead (ppb)	AL=15	0	15	0.66	ND - 0.66	NO
Dissolved Organic Carbon (ppm)	N/A	N/A	N/A	1.4	ND - 1.4	N/A

*One Total Petroleum Hydrocarbons-Diesel (TPH-d) (C8-C18) EAL exceedance occurred during 2020 testing on a post-chlorination sample. Pre-chlorination samples are believed to be more representative of any potential contact with fuels stored at the Red Hill Bulk Fuel Storage Facility and TPH-d (C8-C18) was not detectable at testing limits for all 2020 pre-chlorination samples. Hawaii Department of Health (HDOH) and the Navy will continue to conduct testing and include results in future Water Quality Reports.

Table Definitions, Abbreviations, and Notes

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.

Table Abbreviations:

ppb -parts per billion or micrograms per liter (µg/L)

ppm - parts per million or milligrams per liter (mg/L)

ppt - parts per trillion or nanograms per liter (ng/L)

N/A - not applicable.

ND - not detected at testing limits.

NQ - not quantifiable at test limits.

Table Notes:

1. In accordance with EPA and State regulations, this number represents the 90th percentile value of the samples collected.
2. The number of samples above the action level.
3. Fluoride is added to the water system to help promote healthy teeth in children. The target level is 0.7 ppm.
4. The state and EPA require water systems to monitor certain contaminants less than once per year because the concentration is not expected to vary significantly from year to year. The date of the last sample collected is as indicated.
5. The purpose of unregulated contaminant monitoring is to assist EPA in determining the occurrence of unregulated contaminants in drinking water and whether future regulation is warranted.
6. This is a Secondary Maximum Contaminant Level (SMCL). It is not enforced by the EPA and is not considered a risk to human health at SMCL.

Summary of Results

A number of different water samples are collected and analyzed for various contaminants throughout the year. The number and frequency of sampling events depends upon federal and state requirements. The water quality table on page 3 and 4 lists all of the drinking water contaminants detected during calendar year 2020. All of the substances listed in the table are below the MCLs set by the EPA. Contaminants not present in the drinking water or analyzed below detection limits are not included in the table. Remember, the presence of contaminants does not necessarily indicate that the water poses a health risk.

This CCR is posted on the web at:

https://home.army.mil/hawaii/index.php/water-quality-report-amr

THE DIRECTORATE OF PUBLIC WORKS DOES NOT HAVE ROUTINE PUBLIC MEETINGS ABOUT THE WATER SYSTEM. IF YOU HAVE QUESTIONS REGARDING THE WATER SYSTEM OR WATER QUALITY PLEASE CONTACT THE DPW ENVIRONMENTAL DIVISION, SAFE DRINKING WATER PROGRAM AT (808) 656-3107.

United States Army Garrison – Hawaii
DPW Environmental Division (IMHW-PWE)
947 Wright Avenue,
Wheeler Army Airfield
Schofield Barracks, HI
96857
(808) 656-3107

Tripler Army Medical Center
Preventive Medicine
1 Jarrett White Road
Honolulu, Hawaii
96859-5000
(808) 433-9938

WATER STORAGE TANKS

Zone H3 has the Army's 182 water storage tank (North Tank), which serves homes on the outer northern perimeter of the Aliumanu Military Reservation (AMR) crater. The Army's North tank water is delivered by booster pumps located at the Army's 2070 water storage tank (Middle Tank). The booster pumps draw water from the Middle Tank, which draws its water from JBPHH's water distribution system, which is currently fed by the Waiawa Shaft water supply source and water stored in the Halawa S-1 tank since the Halawa S-2 tank has been taken offline for maintenance. Water being distributed in the system and being stored in water storage tanks that feed Zone H3 have been flushed in accordance with the Drinking Water Distribution System Recovery Plan, December 2021.

HYDRANT FLUSHING NARRATIVES ZONE H2

ZONE H3:

U.S. Army Garrison-Hawaii (USAG-HI) utilized engineering judgement informed by existing tools and data sources such as ArcGIS, Supervisory Control and Data Acquisition (SCADA) system historic/current data, hydraulic models, and input from water system infrastructure contamination subject matter experts to include U.S. Army Environmental Command (USAEC), US Army Corps of Engineers (USACE), and Naval Facilities Engineering Systems Command (NAVFAC) to develop water system flushing methodologies.

There are two flushing events for the distribution system in Zone H3. For distribution flushing the Flush 1 for Zone H2 occurred 23-25 December 2021. The distribution flushing for Flush 2 for Zone H2 occurred 11-12 January 2022.

FIGURE 1: HYDRANTS FLUSHED ZONE H3

WATER MAINS HYDRANT FLUSHING (ZONE H3):

This section summarizes flush records for distribution system flushing in Zone H2 Flush 1 (December 2022) and Flush 2 (January 2022). The Table 1 flushing log contains the flow rates for Zone H3 during flush 1. The Table 2 flushing log contains the flow rates for Zone H3 during flush 2.

In consultations with professionals a recommendation of three volumetric turnovers for impacted pipe networks was established. A factor of safety was applied to the highest priority zones by specifying a minimum of five volumetric turnovers. The same volume was used for Flush 1 and Flush 2.

Zone H3 = 125,200 (gals), 5 volumes = 626,000 (gals)

HYDRANT FLUSHING STANDARD OPERATING PROCEDURE:

Water SOP

Thursday, December 2, 2021

Notify FED Fire that all the alarms will be going off with the drop of pressure
Notify community of the flushing of this water

Start from Source (tanks) to clear

1. Overflow 3 volumes of north tank (expected to take 7 hours)
2. Overflow 3 volumes of south tank (expected to take 7 hours)
3. Overflow/drain middle tank 3 volumes
    a. Middle tank doesn't have much control - gravity fed from north tank
    b. Assume valves don't work for all tanks - difficult to isolate
    c. Possible options for middle tank:
        i. VAC truck top of tank with approx. 100 ft. hose. When tank is full
        ii. To shoot down tank walls with fire hose when tank is drained
        iii. Possible service contract to clean inside tank when it's drained

Next Flush pipes

1. Flush 4 sections
    a. 3-5 hydrants per section
    b. Flush 15-20 hydrants total
    c. Map 1
        i.

592,814 gallons	9.88	hours

    d. Map 2
        i.

444,136 gallons	7.40	hours

    e. Map 3a

volume(gal)	time (h)
78,239	1.30

    f. Map 3b
        i.

volume(gal)	time (h)
317,234	5.28

Total volume of pipes
1,432,423 gallons

TABLE 1: ALIAMANU MILITARY RESERVATION FLUSH LOG ZONE H3 FLOW RATES (FLUSH 1)

ZONE H3 - NORTH TANK - TOTAL 5 VOLUME TARGET FLUSH = 626.27 KGAL

ARMY FLUSH LOG FOR SYSTEM FLUSH #1

DATE	DISCHARGE LOCATION / MANHOLE ID	POTABLE WATER TANK SUPPLY	START TIME	END TIME	DURATION (hr-min)	DURATION (Min)	FLOW RATE (GPM)	GALLONS DISCHARGED (KGALS)	CUM DISCHARGED (KGAL)
12/23/2021	AMR #42	H3	23:50	1:20	1:30	90	170	15.3	15.3
	AMR #43	H3	1:05	2:05	1:00	60	250	15.0	30.3
	AMR #44	H3	2:10	3:10	1:00	60	250	15.0	45.3
	AMR #45	H3	2:40	3:00	0:20	20	250	5.0	50.3
	AMR #46	H3	3:45	4:05	0:20	20	250	5.0	55.3
	AMR #47	H3	3:30	3:50	0:20	20	250	5.0	60.3
	AMR #48	H3	5:05	5:25	0:20	20	250	5.0	65.3
	AMR #49	H3	4:50	5:25	0:35	35	150	5.3	70.6
	AMR #50	H3	6:00	6:35	0:35	35	150	5.3	75.8
	AMR #51	H3	7:25	8:00	0:35	35	150	5.3	81.1
	AMR #52	H3	9:00	9:35	0:35	35	150	5.3	86.3
	AMR #53	H3	9:30	9:55	0:25	25	150	3.75	90.1
	AMR #54	H3	10:05	10:35	0:30	30	170	5.10	95.2
	AMR #55	H3	10:15	10:40	0:25	25	200	5.00	100.2
	AMR #56	H3	11:10	11:35	0:25	25	200	5.00	105.2
	AMR #57	H3	11:45	12:10	0:25	25	200	5.00	110.2
							DAILY TOTAL:	**110.2**	
12/24/2021	AMR #44	H3	21:25	24:00	2:35	155	374	58.0	168.1
	AMR #47	H3	21:25	24:00	2:35	155	374	58.0	226.1
							DAILY TOTAL:	**115.9**	
12/25/2021	AMR #44	H3	0:00	10:00	6:00	600	374	224.4	450.5
	AMR #47	H3	0:00	10:14	6:14	614	374	229.6	680.1
							DAILY TOTAL:	**454.0**	

TABLE 2: ALIAMANU MILITARY RESERVATION FLUSH LOG ZONE H3 FLOW RATES (FLUSH 2)

ZONE H3 - NORTH TANK - TOTAL 5 VOLUME + DEAD ENDS TARGET FLUSH = 632.35 KGAL

ARMY FLUSH LOG FOR SYSTEM FLUSH #2

DATE	DISCHARGE LOCATION / MANHOLE ID	POTABLE WATER TANK SUPPLY	START TIME	END TIME	DURATION (hr-min)	DURATION (Min)	METER READ START (gal)	METER READ END (gal)	GALLONS DISCHARGED (Kgal)	TARGET VOLUME (Kgal)	FLOW RATE (GPM)	CUM DISCHARGED (Kgal)
1/11/2022	AMR #49	H3	5:52	9:00	3:08	188	4877500	4914900	37.4	37	198.9	37.4
	AMR #50	H3	7:20	10:02	2:42	162	3827300	3864400	37.1	37	229.0	74.5
	AMR #50a	H3	10:30	11:10	0:40	40	0	0	0.2	0.2	5	74.7
	AMR #51	H3	9:45	12:10	2:25	145	4914900	4874100	40.8	37	281.4	115.5
	AMR #52	H3	12:12	13:43	1:31	91	3864400	3903600	39.2	37	430.8	154.7
	AMR #53	H3	12:46	15:20	2:34	154	4874100	4911200	37.1	37	240.9	191.8
	AMR #54	H3	13:59	15:58	1:59	119	3903600	3940900	37.3	37	313.4	229.1
	AMR #55	H3	16:10	19:15	3:05	185	4911200	4948300	37.1	37	200.5	266.2
	AMR #55a	H3	19:30	19:50	0:20	20	0	0	0.10	0.10	5.0	266.3
	AMR #55b	H3	19:52	20:07	0:15	15	0	0	0.08	0.08	5.0	266.4
	AMR #56	H3	16:29	18:41	2:12	132	3940900	3978100	37.2	37	281.8	303.6
	AMR #57	H3	19:08	20:43	1:35	95	3978100	4015700	37.6	37	395.8	341.2
	AMR #58	H3	21:25	22:49	1:24	84	4015700	4054300	38.6	37	459.5	379.8
	AMR #58a	H3	21:39	21:54	0:15	15	0	0	0.08	0.08	5.0	379.9
	AMR #60	H3	20:39	23:52	3:13	193	4948300	4985300	37.0	37	191.7	416.9
	AMR #59	H3	23:05	0:00	0:55	55	4054300	4077700	23.4	23.0	425.5	440.3
	AMR #59a	H3	23:15	0:00	0:45	45	0	0	0.23	0.23	5.0	440.5
								DAILY TOTAL:	**440.5**	431		
1/12/2022	AMR #59	H3	0:00	0:35	0:35	35	4077700	4092600	14.9	14.0	425.7	455.4
	AMR #59a	H3	0:00	0:15	0:15	15	0	0	0.08	0.08	5.0	455.5
	AMR #61	H3	0:36	3:14	2:38	158	4985300	5002300	17.0	16	107.6	472.5
	AMR #62	H3	3:53	7:08	3:15	195	5002300	5018400	16.1	16	82.6	488.6
	AMR #63	H3	7:25	10:04	2:39	159	5018400	5035400	17.0	16	106.9	505.6
	AMR #63a	H3	8:06	8:26	0:20	20	0	0	0.1	0.1	5.0	505.7
	AMR #64	H3	10:15	12:48	2:33	153	5035400	5053500	18.1	16	118.3	523.8
	AMR #65	H3	1:24	3:47	2:23	143	4093100	4117100	24.0	24	167.8	547.8
	AMR #66	H3	4:25	6:41	2:16	136	4117100	4141700	24.6	24	180.9	572.4
	AMR #66a	H3	4:40	6:20	1:40	100	0	0	0.5	0.5	5.0	572.9
	AMR #67	H3	7:13	9:21	2:08	128	4141700	4166900	25.2	24	196.9	598.1
	AMR #68	H3	9:50	12:15	2:25	145	4166900	4191000	24.1	24	166.2	622.2
	AMR #69	H3	13:00	13:57	0:57	57	4191000	4207000	16.0	16	280.7	638.2
								DAILY TOTAL:	**197.7**	191		638.2
									638.2			
											CUM VOL:	**638.2**
											TARGET VOL	**632.35**

RESIDENTIAL FLUSHING RED HILL (ZONE H3):

Residential flushing in Aliamanu Military Housing (AMR) Zone H3 has been conducted in accordance with the IDWST Drinking Water Distribution System Recovery Plan. Residential flushing started 27 January and ended 3 February. A total of 379 residential homes were flushed in Zone H3. Residential flushing is considered complete. The records of residential flushing have been uploaded into EDMS the database of record. If a current or future resident request a copy of the flushing check-list that will be provided. Island Palm Community (IPC) will maintain the records for residential flushing.

During residential flushing the Army owned North Tank water level was monitored to ensure Zone H3 had adequate water during the flushing event.

FIGURE 1: SUMMARY OF RESIDENTIAL FLUSHING for ALIAMANU MILITARY RESERVATION (Zone H3)

NON-RESIDENTIAL FLUSHING ALIAMANU MILITARY RESERVATION (Zone H3):

Non-residential flushing has been conducted in accordance with the IDWST Non-Residential Facility Flushing Plan checklist and standard operating procedure. A total of 4 non-residential buildings were flushed in Zone H3. The Navy flushed the AMR-88 COSA and Construction sites in Zone H3. The records of non-residential flushing have been uploaded into EDMS the database of record.

NON-RESIDENTIAL FLUSHING STANDARD OPERATING PROCEDURE (SOP):

https://health.hawaii.gov/about/files/2022/01/20220104-FINAL-NON-RESIDENTIAL-FLUSHING-SOP.pdf

IRRIGATION FLUSHING (Zone H3):

Irrigation flushing for the Aliamanu Military Reservation (AMR), Zone H2 area was conducted 15-16 February 2022. The Army developed an irrigation line flushing plan (February 2022) in accordance with Hawaii Department of Health guidance that was followed during irrigation flushing of the AMR Zone H2 housing area. Any current or future resident of AMR housing can request a copy of the irrigation flushing check-list. These documents are being maintained by Island Palms Community housing.

IRRIGATION FLUSHING AMR RESIDENCE NOTIFICATION

From: Island Palm Communities
To: Winner, Keeolani
Subject: Task Force Ohana - AMR Irrigation System Flush (2/15 & 2/16)
Date: Tuesday, February 15, 2022 12:02:07 AM

Message From: Island Palm Communities

Aloha Valued Residents of Hibiscus, Red Hill Makai, Valley View, and Point Welcome,

On behalf of Task Force Ohana, please see an important message below regarding the irrigation system flush that will take place in your housing area Tuesday and Wednesday, Feb. 15th and 16th.

Island Palm Communities personnel will flush the irrigation lines in your front yard flower beds and the sprinkler systems in common areas within your communities. These sprinkler systems are located at the entry signage of each community, all playgrounds, and in select common areas. Below are reference points for the common area irrigation systems in each community:

Hibiscus: Entry features at both entrances of Aliamanu Drive on to Hibiscus Street; Entry feature at the entrance from Aliamanu Drive on to Halawa View Loop; Playground at the intersection of Hibiscus Street and Clarey Place; Playground at the intersection of Hibiscus Street and Eucalyptus Place; Playground at the intersection of Halawa View Loop and Halawa View Court.

Red Hill Makai: Entry feature on Sassafras Drive prior to the entrance of Point Welcome Place; Playground located at the end of Blackhaw Place.

Valley View: Entry feature at the entrance of Aliamanu Drive and Olive Place; Entry feature at the entrance of Aliamanu Drive and Shower Place, and a combined entry feature and playground located at the entrance of Aliamanu Drive and Valley View Loop.

Point Welcome: Irrigation systems in the common areas and courtyards around the homes.

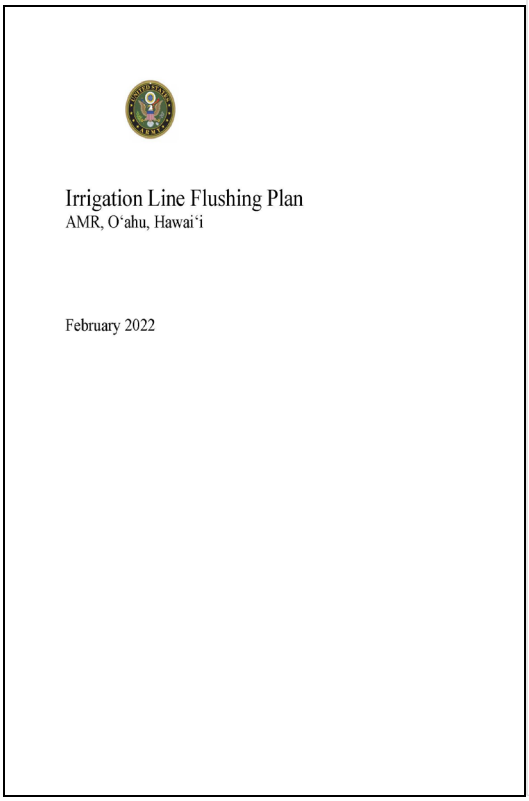
We will begin Tuesday at 8a.m.; flushing will take between 15-30 minutes per location. Once complete, technicians will mark each common area and post an information card to the front door of each home.

Out of an abundance of caution, and in accordance with Hawaii Department of Health guidance, please avoid all irrigated areas for 24 hours after the flush is complete.

Mahalo!

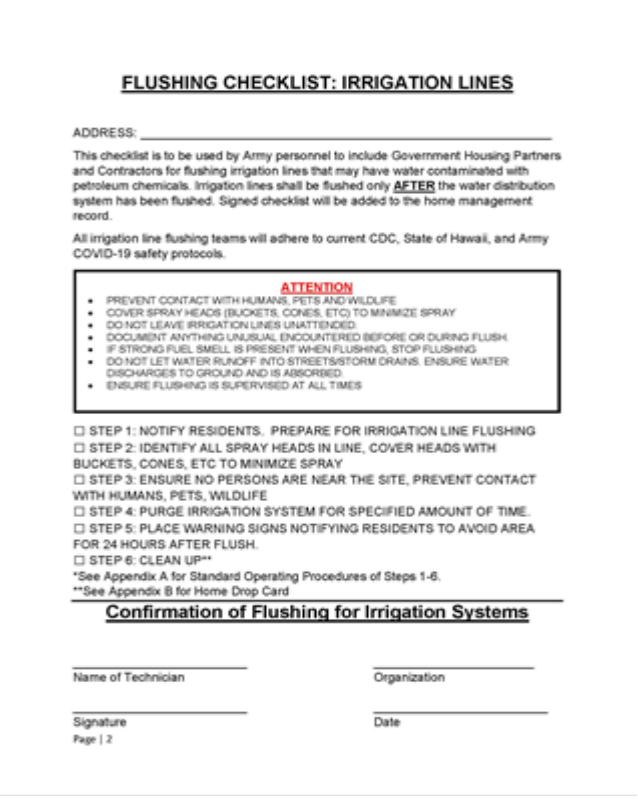
Please contact us with questions www.islandpalmcommunities.com

IRRIGATION FLUSHING PLAN



Irrigation Line Flushing Plan
AMR, O'ahu, Hawai'i

February 2022



FLUSHING CHECKLIST: IRRIGATION LINES

ADDRESS: _____

This checklist is to be used by Army personnel to include Government Housing Partners and Contractors for flushing irrigation lines that may have water contaminated with petroleum chemicals. Irrigation lines shall be flushed only **AFTER** the water distribution system has been flushed. Signed checklist will be added to the home management record.

All irrigation line flushing teams will adhere to current CDC, State of Hawaii, and Army COVID-19 safety protocols.

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.
- ENSURE FLUSHING IS SUPERVISED AT ALL TIMES

☐ STEP 1: NOTIFY RESIDENTS. PREPARE FOR IRRIGATION LINE FLUSHING
☐ STEP 2: IDENTIFY ALL SPRAY HEADS IN LINE, COVER HEADS WITH BUCKETS, CONES, ETC TO MINIMIZE SPRAY
☐ STEP 3: ENSURE NO PERSONS ARE NEAR THE SITE, PREVENT CONTACT WITH HUMANS, PETS, WILDLIFE
☐ STEP 4: PURGE IRRIGATION SYSTEM FOR SPECIFIED AMOUNT OF TIME.
☐ STEP 5: PLACE WARNING SIGNS NOTIFYING RESIDENTS TO AVOID AREA FOR 24 HOURS AFTER FLUSH.
☐ STEP 6: CLEAN UP**
*See Appendix A for Standard Operating Procedures of Steps 1-6.
**See Appendix B for Home Drop Card

Confirmation of Flushing for Irrigation Systems

_____ Name of Technician
_____ Organization
_____ Signature
_____ Date

Page | 2

APPENDIX A: FLUSHING STANDARD OPERATING PROCEDURES: Irrigation Systems

Team Supplies Needed

- Cones, buckets or other device to cover spray heads
- Nitrile or Latex gloves
- Warning Signs

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED.
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.
- ENSURE FLUSHING IS SUPERVISED AT ALL TIMES

STEP 1. NOTIFY RESIDENTS. PREPARE FOR IRRIGATION LINE FLUSHING

☐ Confirm that resident notification is complete.
☐ Determine irrigation system pipe size
☐ Calculate the approximate amount of time needed to complete 3 volumetric turnovers. If unknown, run for 30 minutes or 2 minutes per spray head, whichever is longer
☐ For drip irrigation lines, flush for 15 minutes.
☐ Assess how long each line will need to be purged/flushed based on the above calculation

STEP 2: IDENTIFY ALL SPRAY HEADS IN LINE, COVER HEADS WITH BUCKETS, CONES, ETC TO MINIMIZE SPRAY

☐ Confirm the number of spray heads based on site drawings or IPC knowledge of home configuration.
☐ Cover all spray heads with a traffic cone or bucket
☐ To the maximum extent ensure the largest portion of the bucket or cone is over grass
☐ For drip irrigation lines, remove the flush cap or crimp at the end of the line, ensure the line discharges to soil or grass

STEP 3. ENSURE NO PERSONS ARE NEAR THE SITE, PREVENT CONTACT WITH HUMANS, PETS, WILDLIFE

☐ Verify that no people are outside the home.
☐ Confirm that no pets or other animals are outside the home.
☐ If pets are outside the home and cannot be relocated by the resident. Note the address and move to the next location.

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED.
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.
- ENSURE FLUSHING IS SUPERVISED AT ALL TIMES

STEP 4. PURGE IRRIGATION SYSTEM FOR SPECIFIED AMOUNT OF TIME.

☐ Turn on the irrigation system and run for 30 minutes or 2 minutes per spray head, whichever is longer.
☐ Turn on the drip irrigation system and run for 15 minutes.
☐ Discontinue flushing if irrigation water runs off of / along the pavement and toward or into a storm drain.
☐ Following the flush, shut off the irrigation system and return the system to its normal configuration.

STEP 5. PLACE WARNING SIGNS NOTIFYING RESIDENTS TO AVOID AREA FOR 24 HOURS AFTER FLUSH.

☐ Place warning signs at either end or the irrigation line along pathways that residents are likely to use to approach (i.e. sidewalks, driveways, etc.)

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED.
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.

STEP 6. CLEAN UP**

☐ Return the irrigation system to its previous configuration.

☐ Ensure drip irrigation is capped / crimped as it was previously.
☐ Verify that water is not absorbed into surrounding soil and not running into storm drains.
☐ Confirm removal of buckets/cones from the irrigation system.
☐ Do one last walkthrough to ensure all water is secured, trash is removed.
☐ Place the DROP CARD at the front door of the residence.

NOTES TO IDENTIFY DISCREPCIENCES OR MAINTANENCE ISSUES

1.

2.

3.

CROSS CONNECTION PLAN & BACKFLOW RECORDS

This section summarizes the cross-connection program and backflow devices in Zone H3. Cross-connections are the links through which it is possible for contaminating materials to enter a potable water supply. The contaminant enters the potable water system when the pressure of the polluted source exceeds the pressure of the potable source. The action may be called backsiphonage or backflow. To reduce the risk a backflow device is placed on the distribution system.

USAG Hawaii-Department of Public Works (DPW) has developed a cross-connection control program. This program includes taking an inventory of the location of the devices. The program also includes annual inspection of the devices by a Department of Health (DOH)-Hawaii approved certified tester to ensure the devices are working and protective of the drinking water system.

As part of this incidence response the DoH-Hawaii is requesting the location of all, “petroleum related activities”.

The DoH-Hawaii is defining petroleum related activities as:

Petroleum-related activities have been defined as: gas stations, fuel storage, facilities with aboveground or USTs, fuel transfer, motor pools, maintenance facilities, fuel recovery pits and any other related activities.

USAG Hawaii DPW developed a list of “petroleum related activities” and verified cross connection controls (if required) are in-place for these facilities. A location of “petroleum related facilities” and inventory of Backflow devices have been provided to DOH-Hawaii.

INDUSTRIAL WASTEWATER DISCHARGE PERMIT FOR TEMPORARY DISCHARGE INTO THE CITY SEWER SYSTEM-FLUSH RECORDS

The section summarizes the discharge records taken to ensure compliance with the temporary discharge permit into the sanitary system. The USAG Hawaii-Environmental staff was responsible for ensuring compliance with the permit 21TU008R3 and maintaining the discharge documentation from the flushing events.

PERMIT NUMBER 21TU008R3

Director, Department of Environmental Services City and County of Honolulu
1000 Uluohia Street, Suite 303
Kapolei, Hawaii 96707

OFFICIAL CITY USE ONLY (Rev. 03/05/20)
Permit No.: 21TU008R3
Authorization: [signature] Date: 12/22/21

Subject: Industrial Wastewater Discharge Permit for Temporary Discharge into the City Sewer System

Project Title: Aliamanu Military Reservation Water Main Flushing and Red Hill (Coast Guard Makai and Mauka)

Location or Address of Discharge to City Sewers Jarrett White Road and SMH #680048

Discharge Type: ☒ Chlorinated Water ☐ Grey Water ☐ Cooling Tower Water ☒ Other (contaminated Potable Water)

We, the undersigned, hereby agree to the following:

1. That we shall indemnify and hold the City and County of Honolulu's Department of Environmental Services (ENV) free and harmless from all suits and actions resulting from our operations.
2. That we shall provide the appropriate pretreatment methods and/or devices to remove pollutants, as indicated in our application, such that the effluent complies with the Revised Ordinances of Honolulu (ROH) 14-1.9, as amended, applicable City, State and Federal regulations. In addition, for the discharge of chlorinated water, the discharge level of chlorine residual shall not exceed 5 ppm.
3. That we understand that we are responsible for ensuring that anyone working under this permit understands all the permit terms and conditions. We understand that failure to comply with the terms and conditions of this approval may subject us to additional civil and/or criminal penalties under City, State, and Federal laws. We understand that the responsibility for this permit and its conditions are non-transferable, without the written consent of the director.
4. That we have investigated all other legal means of discharging the effluent, including landscaping, watering, storm drain, etc. as indicated in the Temporary Industrial Wastewater Discharge Permit Application.
5. That we understand that we may be required to conduct effluent analysis as directed by any City, State or Federal official and subject to monitoring of scheduled discharges or unannounced site visits. Analysis requests and onsite inspections may be conducted if there are indications that the effluent may cause a problem to the sewer collection system and/or treatment plant operations, non-compliance with discharge limits, if the effluent presents a public health or environmental hazard, or other concerns regarding discharge activities.
6. That we shall cease and desist all discharge activities immediately should sewer collection system problems occur, if there are violations of the permit conditions, if there are any hazardous conditions to the general public, or as directed by City, State or Federal officials. In the event that problems occur we will notify a Division of Environmental Quality (DEQ) representative by phone at 768- 3271, or 768-4108 with details of occurrence. We will not resume discharge activities without approval from DEQ. We will follow proper notification requirements for hazardous waste discharge in accordance with ROH 14-5.12(1) In the event that hazardous waste is discharged into the sewer system, the industrial user shall notify, in writing, the director, DOH, and EPA. Notification shall include, but is not limited to, the name of the hazardous waste, as set forth in 40 CFR Part 261; EPA hazardous waste number; and the type of discharge (continuous, batch or other).
7. That we shall contact the City's Department of Environmental Services, DEQ at 768-3271, or 768-4108 at least (4) four business days prior to the requested discharge date(s). We will provide a verbal request and will not discharge till we receive approval to proceed with the discharge request.
8. That we shall submit, within (20) twenty calendar days of the completion of the discharge event, a certified self-monitoring report on a monthly basis confirming the flow rate of discharge, the exact time and date(s) of discharge, the duration of discharge and total volume of discharge. All discharges total should not exceed the total approved volume listed in permit condition #12.
9. That we shall be assessed a user charge upon notification of the discharge event, based upon the approved volume, maximum discharge per day, and/or duration of the discharge event. The fee will be assessed in accordance with our sewer rate schedule.

OFFICIAL CITY (ENV/DEQ) USE ONLY

10. That we shall not discharge the effluent water above the maximum allowable flow rate of see special conditions gpm. If multiple discharge locations are used, the total combined flow rate must not exceed the maximum allowable.
11. That we shall not exceed the maximum allowable discharge per day of see special conditions gallons.
12. That we shall not exceed the total approved volume of see special conditions gallons.
13. That we shall discharge only between the hours of see special conditions.
14. That we shall conduct sampling analysis for the following pollutants see special conditions for review and approval by the City.
15. This permit will take effect on the date of the authorized approval. This permit will expire at midnight 12/21/2023 or when deemed necessary by the Director or his/her authorized representative.
16. Contractor to monitor downstream manholes to ensure no sewer overflows.

* SEE ADDITIONAL CONDITIONS ON PAGE 2 ATTACHED

APPROVAL RECOMMENDED:

for LS [signature] (LTA) 12/21/21
Chief, Division of Environmental Quality Date
RJ 12/22/21

APPROVAL:

for [signature] (LTA) 12/21/21
Director, Department of Environmental Services Date
RJ 12/22/21

Thank you,

GAINEY.NISIT.ANTHONY.1067651371 Digitally signed by GAINEY.NISIT.ANTHONY.1067651371 Date: 2021.12.03 21:15:30 -10'00'

3 December 2021
Signature of Applicant Date

Print Name: Nisit A. Gainey

Title: Director of Public Works
Name of Company or Owner: U.S. Army Garrison Hawaii
Telephone Number: 808-656-3056

ADDITIONAL CONDITIONS FOR TEMPORARY DISCHARGE PERMIT

17. That we will cease all discharge operations during a rain event, inclement weather conditions and/or public notification of the following watches, warnings, or advisories:

Flash Flood Watch
Issued generally when there is the possibility of flash flooding or urban flooding over an area within the next 36 hours. *Prepare to secure the discharge site to prevent storm water from entering the collection system.

Flash Flood Warning
Issued when flash flooding is imminent, generally within the next 1 to 3 hours. Usually issued based on observed heavy rainfall (measured or radar estimated), but may also be issued for significant dam breaks that have occurred or are imminent. *Secure the discharge site to prevent storm water from entering the collection system.

Flood Watch
Issued when there is the possibility of widespread general flooding over an area within the next 36 hours. *Prepare to secure the discharge site to prevent storm water from entering the collection system.

Flood Warning / or *River Forecast Point*
Issued when a river gauge has exceeded, or is forecast to exceed, a predetermined flood stage. *Secure the discharge site to prevent storm water from entering the collection system.

Flood Advisory
Issued when flooding is imminent or occurring, generally within the next 1 to 3 hours, but is not expected to substantially threaten life and property. *Secure the discharge site to prevent storm water from entering the collection system.

That we will notify a Division of Environmental Quality (DEQ) representative by phone at 768-3271, or 768-4108 to confirm that all temporary discharge operations to the City sewer system has ceased and future scheduled discharges will be suspended. We must also submit by fax at 768-1597 or email at envpermits@honolulu.gov a NO INDUSTRIAL WASTEWATER DISCHARGE CERTIFICATION form to reconfirm that there were no discharges to the City sewers. We understand that discharge operations may not resume until we must notify DEQ with a new request and undergo the required 4-day notification period as required for all discharge requests.

18. That we understand that we are held to the same standards of discharge quality as any other sewer user. These standards are listed in the Revised Ordinances of Honolulu (ROH). See ROH Section 14-1.9 Use of public sewers-Restrictions-Violations.

19. That we understand that regarding spills:
    a. Any spills occurring during discharge are to be cleaned, debris removed and disinfected.
    b. Any spills of any size that reach surface waters or storm drains require notification of the DOH Clean Water Branch 586-4309 or after hours call State Hospital Operator (SHO) at 247-2191.
    c. Any spills of more than 50 gals that go to ground or spills with potential to harm human life require notification of the DOH Clean Water Branch 586-4309 or after hours call SHO.

20. That we understand that the City reserves the right to require self-monitoring, sampling/reporting of pollutant levels, and review any other requested documentation (Temporary Industrial Discharge Monitoring Log, other related permits, spill reports, etc.). Refusal to provide samples to verify water quality or documentation could result in the denial of discharge and suspension or termination of permit.

21. That we understand this discharge is limited to the scope of work, discharge limitations and discharge type as stated in the permit. This permit is not to be used for any other discharge conditions not covered by this permit including exceeding the maximum flow rate, total volume of discharge allowed or change in type of water and water characteristic (quality) to be discharged. This permit is not to be used as a means to discharge during any emergency situation that may occur (e.g. sea water, runoff, etc.). Should any type of discharge other than what is permitted enter into the City sewer collection system we will notify a Division of Environmental Quality (DEQ) representative by phone at 768-3271, or 768-4108.

22. That we understand that this permit if approved is issued for up to two (2) years before it expires. It is the responsibility of the permit holder to submit a renewal application in a timely manner before the expiration date. There will be no extensions for temporary discharge permits. A permit will terminate if there is no discharge activity within three months of the effective date of the permit or if there is no discharge activity in three (3) consecutive months.

23. That we shall inform the City when a temporary discharge permit is no longer needed.

24. OTHER:

_____

_____

Temporary Industrial Wastewater Discharge Permit (TIWDP) No: 21TU008R3

Permittee: US Army Garrison Hawaii

Project: Aliamanu Military Reservation and Red Hill (Coast Guard Mauka and Makai) Water Line Flushing Discharge

Special Conditions:

1. The special permit conditions set forth herein are based on information provided by the permittee at the time the TIWDP was issued. All conditions are subject to change based on new information submitted by the permittee.
2. The Permittee shall use uncontaminated potable water only in the flushing of its water lines to be discharged to the City sanitary sewer.
3. The scope of this permit is limited to the flushing of water lines from the following areas and as indicated in the attached map:
    a. Aliamanu Military Reservation (AMR)
    b. Coast Guard/Red Hill Makai
    c. Coast Guard/Red Hill Mauka
4. The maximum combined approved volume of uncontaminated potable water discharge from the water line flushing for the three areas is **80,640,000 gallons total or 2,880,000 gallons per day for twenty-eight (28) days, with the first day starting from the effective date of this revised permit.**
5. The bypass force main from Fort Shafter Flats Wastewater Pump Station (WWPS) connecting to the City sanitary sewer at City Sewer Manhole (SMH) #240110 as indicated in the attached map shall not be used and must be kept inactive for the duration of this permit.
6. The water line flushing from the AMR area shall not exceed **1,000 gpm or 1,440,000 gallons per day** at the AMR #1 Pump Station. All discharges from the AMR #1 Pump Station must not cause any sanitary sewer overflow in the Military or City sanitary sewer assets downstream of the AMR #1 Pump Station leading up the Fort Shafter WWPS.
7. The water line flushing from the Coast Guard/Red Hill Makai and Coast Guard/Red Hill Mauka areas discharging to City SMH #680048 as indicated in the attached map must comply with the following flow restrictions at and after the point of connection to City SMH #680048:

SMH #680048	
Maximum Allowable Flow Rate	**1,000 gallons per minute (gpm)**
Maximum Allowable Daily Discharge	**1,440,000 gallons per day**
Allowable Discharge Hours	**12:00 AM – 12:00 AM (24 hours)**

8. The permittee shall conduct sampling for the following parameters in the beginning and end of the entire flushing period and must comply with applicable limits:

Parameter	Limit
pH	5.5 – 11.0
Total Petroleum Hydrocarbons	100 mg/L daily maximum
BTEX (ug/L)	No limit; monitor and report only
Closed cup flashpoint	140 degrees Fahrenheit instantaneous minimum
Napthalene	No limit; monitor and report only
Chlorine Residual	5 ppm

Results from the sampling to include the complete report from the laboratory performing the analysis must be provided to the City as soon as they're available or no more than 30 calendar days following the sampling event. The permittee may be required to conduct additional effluent analysis between the beginning and the end of the flushing period if needed.

9. The permittee shall submit on a **daily basis** a self-monitoring report (SMR) confirming the flow rate of discharge, exact time and date(s) of discharge, the duration of discharge, and total volume of discharge, for each location of discharge, using the SMR forms attached. All discharges should not exceed the approved volumes and flow rates listed above.

10. The permittee must comply with the following as it relates to flushing and spills:
    On flushing notification:
    a. The Permittee shall contact Ross Tanimoto at (808) 520-5561 prior to initiating flushing activity and when the flushing activity has ended.
    On spills:
    a. The Permittee shall ensure no spill occurs resulting from the flushing activity.
    b. However, in the event of a spill, the Permittee shall respond to the spill and contact the following:
        a. During business hours (Mondays to Fridays 0700 hrs – 1530 hrs, except holidays) Albert Kim at (808) 351-3603 or if unavailable, Kurt Williams at (808) 351-3604.
        b. Outside business hours, the Permittee shall contact the City's sewer trouble call number at (808) 768-7272.

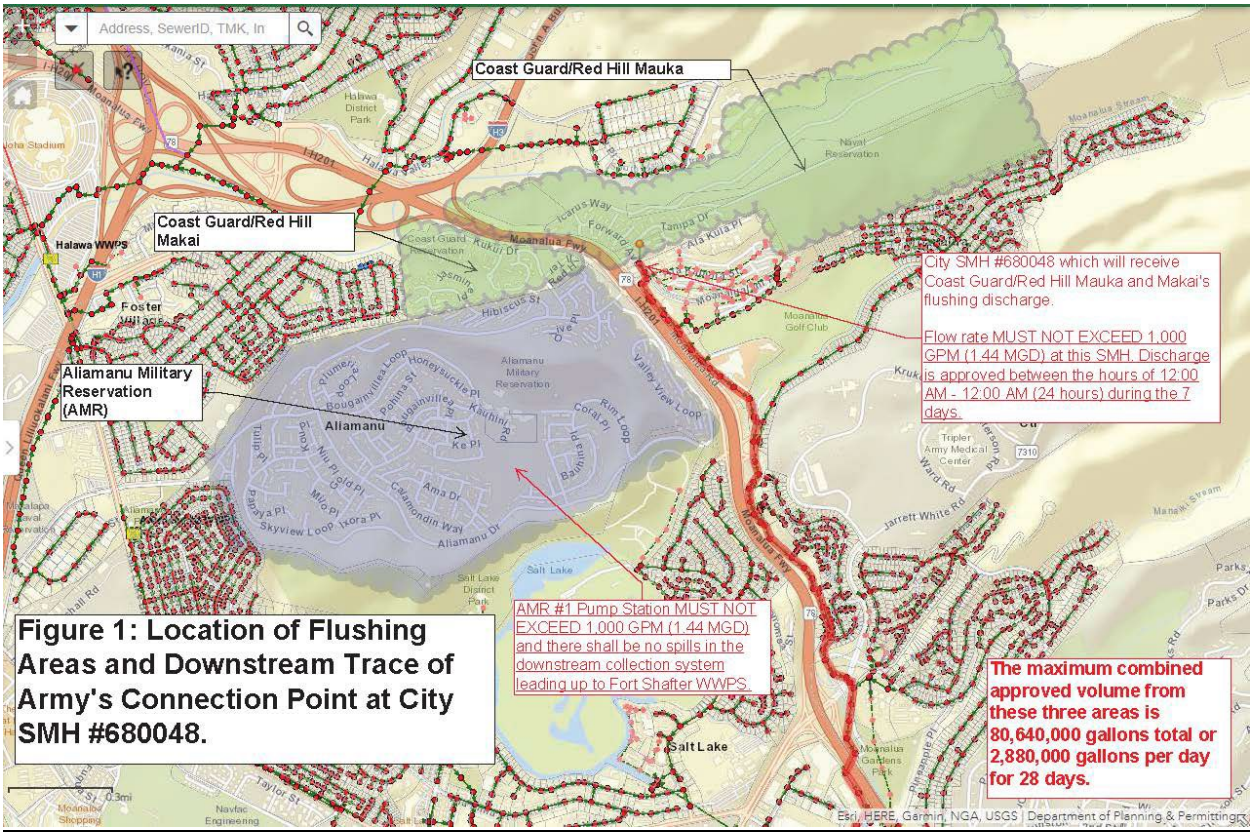


Figure 1: Location of Flushing Areas and Downstream Trace of Army's Connection Point at City SMH #680048.

ARMY SAMPLING DATA

Sampling was conducted following the sampling plan prepared by the Navy, Army, State of Hawaii Department of Health, and the United States Environmental Protection Agency.

The samples were collected by AECOM personnel and were analyzed at Eurofins TestAmerica, in Seattle, Washington, for volatile organic compounds (VOCs) by EPA Method 8260D, semivolatile organic compounds (SVOCs) by EPA Method 8270E, and/or total petroleum hydrocarbons (TPHs) by EPA Method 8260/CALUFT (gasoline-range, C6-C12 hydrocarbons) and EPA Method 8015D (diesel range, C9-C25 hydrocarbons, and motor oil range, C24-C40 hydrocarbons). The analyses were performed in general accordance with the methods specified in EPA's Test Methods for Evaluating Solid Waste (SW-846).

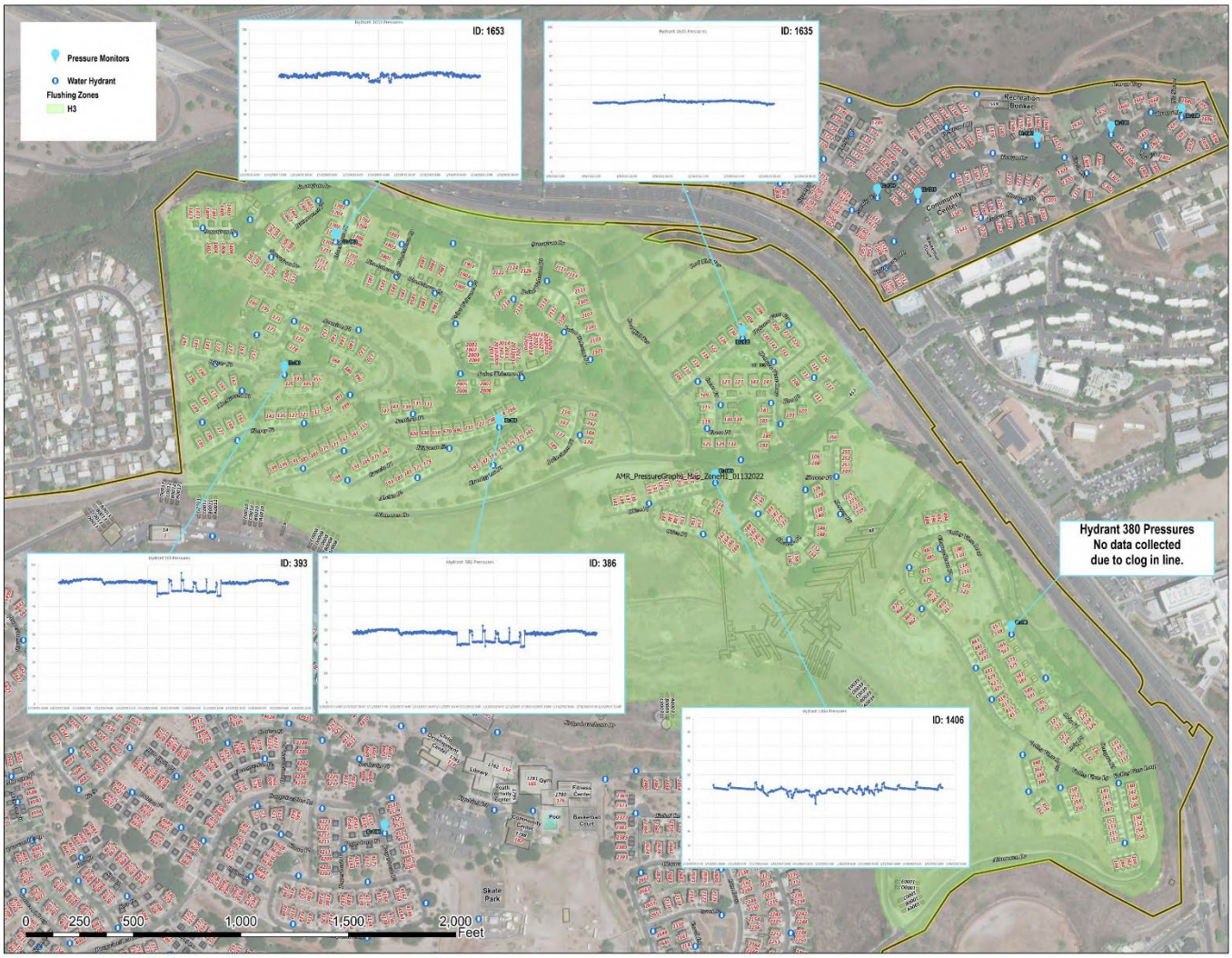
All sampling data collected and validated for Zone H3 can be found in EDMS the database of record for sampling data. See Section 2b.2 – Residential Sampling Report for Flushing Zone for sampling data.

FLUSHING MAP WITH PRESSURE GRAPH Zone H3

Figure 1 summarizes of the data the Army was able to collect with pressure data loggers placed on Hydrants during flushing events. The pressure changes are related to the flushing event, but pressure remained within acceptable ranges. The distribution pressure was monitored on site using pressure gauges while flushing homes to ensure that the pressure did not drop below 30 psi (Uniformed Facilities Guide 3-230-02).

During residential flushing the pressure was verified at every house prior to flushing. The residential pressure data is retained with the residential flush data in EDMS. The residential check-list is not included in the printed copy of the report, Department of Defense critical infrastructure security information (DCRIT).

FIGURE 1: DISTRIBUTION FLUSHING PRESSURE DATA (January 2022) Zone H3



2a.4 RECORDS OF COMPLETED VOLUMETRIC EXCHANGES (ZONE H3)

In consultations with professionals a recommendation of three volumetric turnovers for impacted pipe networks was established. A factor of safety was applied to the highest priority zones by specifying a minimum of five volumetric turnovers. The same volume was used for Flush 1 and Flush 2.

Zone H3 = 125,200 (gals), 5 volumes = 626,000 (gals)

ZONE H3 - NORTH TANK - TOTAL 5 VOLUME TARGET FLUSH = 626.27 KGAL

ARMY FLUSH LOG FOR SYSTEM FLUSH #1

DATE	DISCHARGE LOCATION / MANHOLE ID	POTABLE WATER TANK SUPPLY	START TIME	END TIME	DURATION (hr-min)	DURATION (Min)	FLOW RATE (GPM)	GALLONS DISCHARGED (KGALS)	CUM DISCHARGED (KGAL)
12/23/2021	AMR #42	H3	23:50	1:20	1:30	90	170	15.3	15.3
	AMR #43	H3	1:05	2:05	1:00	60	250	15.0	30.3
	AMR #44	H3	2:10	3:10	1:00	60	250	15.0	45.3
	AMR #45	H3	2:40	3:00	0:20	20	250	5.0	50.3
	AMR #46	H3	3:45	4:05	0:20	20	250	5.0	55.3
	AMR #47	H3	3:30	3:50	0:20	20	250	5.0	60.3
	AMR #48	H3	5:05	5:25	0:20	20	250	5.0	65.3
	AMR #49	H3	4:50	5:25	0:35	35	150	5.3	70.6
	AMR #50	H3	6:00	6:35	0:35	35	150	5.3	75.8
	AMR #51	H3	7:25	8:00	0:35	35	150	5.3	81.1
	AMR #52	H3	9:00	9:35	0:35	35	150	5.3	86.3
	AMR #53	H3	9:30	9:55	0:25	25	150	3.75	90.1
	AMR #54	H3	10:05	10:35	0:30	30	170	5.10	95.2
	AMR #55	H3	10:15	10:40	0:25	25	200	5.00	100.2
	AMR #56	H3	11:10	11:35	0:25	25	200	5.00	105.2
	AMR #57	H3	11:45	12:10	0:25	25	200	5.00	110.2
							DAILY TOTAL:	**110.2**	
12/24/2021	AMR #44	H3	21:25	24:00	2:35	155	374	58.0	168.1
	AMR #47	H3	21:25	24:00	2:35	155	374	58.0	226.1
							DAILY TOTAL:	**115.9**	
12/25/2021	AMR #44	H3	0:00	10:00	6:00	600	374	224.4	450.5
	AMR #47	H3	0:00	10:14	6:14	614	374	229.6	680.1
							DAILY TOTAL:	**454.0**	

ZONE H3 - NORTH TANK - TOTAL 5 VOLUME + DEAD ENDS TARGET FLUSH = 632.35 KGAL

ARMY FLUSH LOG FOR SYSTEM FLUSH #2

DATE	DISCHARGE LOCATION / MANHOLE ID	POTABLE WATER TANK SUPPLY	START TIME	END TIME	DURATION (hr-min)	DURATION (Min)	METER READ START (gal)	METER READ END (gal)	GALLONS DISCHARGED (Kgal)	TARGET VOLUME (Kgal)	FLOW RATE (GPM)	CUM DISCHARGED (Kgal)
1/11/2022	AMR #49	H3	5:52	9:00	3:08	188	4877500	4914900	37.4	37	198.9	37.4
	AMR #50	H3	7:20	10:02	2:42	162	3827300	3864400	37.1	37	229.0	74.5
	AMR #50a	H3	10:30	11:10	0:40	40	0	0	0.2	0.2	5	74.7
	AMR #51	H3	9:45	12:10	2:25	145	4914900	4874100	40.8	37	281.4	115.5
	AMR #52	H3	12:12	13:43	1:31	91	3864400	3903600	39.2	37	430.8	154.7
	AMR #53	H3	12:46	15:20	2:34	154	4874100	4911200	37.1	37	240.9	191.8
	AMR #54	H3	13:59	15:58	1:59	119	3903600	3940900	37.3	37	313.4	229.1
	AMR #55	H3	16:10	19:15	3:05	185	4911200	4948300	37.1	37	200.5	266.2
	AMR #55a	H3	19:30	19:50	0:20	20	0	0	0.10	0.10	5.0	266.3
	AMR #55b	H3	19:52	20:07	0:15	15	0	0	0.08	0.08	5.0	266.4
	AMR #56	H3	16:29	18:41	2:12	132	3940900	3978100	37.2	37	281.8	303.6
	AMR #57	H3	19:08	20:43	1:35	95	3978100	4015700	37.6	37	395.8	341.2
	AMR #58	H3	21:25	22:49	1:24	84	4015700	4054300	38.6	37	459.5	379.8
	AMR #58a	H3	21:39	21:54	0:15	15	0	0	0.08	0.08	5.0	379.9
	AMR #60	H3	20:39	23:52	3:13	193	4948300	4985300	37.0	37	191.7	416.9
	AMR #59	H3	23:05	0:00	0:55	55	4054300	4077700	23.4	23.0	425.5	440.3
	AMR #59a	H3	23:15	0:00	0:45	45	0	0	0.23	0.23	5.0	440.5
								DAILY TOTAL:	**440.5**	431		
1/12/2022	AMR #59	H3	0:00	0:35	0:35	35	4077700	4092600	14.9	14.0	425.7	455.4
	AMR #59a	H3	0:00	0:15	0:15	15	0	0	0.08	0.08	5.0	455.5
	AMR #61	H3	0:36	3:14	2:38	158	4985300	5002300	17.0	16	107.6	472.5
	AMR #62	H3	3:53	7:08	3:15	195	5002300	5018400	16.1	16	82.6	488.6
	AMR #63	H3	7:25	10:04	2:39	159	5018400	5035400	17.0	16	106.9	505.6
	AMR #63a	H3	8:06	8:26	0:20	20	0	0	0.1	0.1	5.0	505.7
	AMR #64	H3	10:15	12:48	2:33	153	5035400	5053500	18.1	16	118.3	523.8
	AMR #65	H3	1:24	3:47	2:23	143	4093100	4117100	24.0	24	167.8	547.8
	AMR #66	H3	4:25	6:41	2:16	136	4117100	4141700	24.6	24	180.9	572.4
	AMR #66a	H3	4:40	6:20	1:40	100	0	0	0.5	0.5	5.0	572.9
	AMR #67	H3	7:13	9:21	2:08	128	4141700	4166900	25.2	24	196.9	598.1
	AMR #68	H3	9:50	12:15	2:25	145	4166900	4191000	24.1	24	166.2	622.2
	AMR #69	H3	13:00	13:57	0:57	57	4191000	4207000	16.0	16	280.7	638.2
								DAILY TOTAL:	**197.7**	191		638.2
									638.2			
											CUM VOL:	**638.2**
											TARGET VOL	**632.35**

February 26, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: WATER STORAGE FACILITIES AND WATER SOURCE FOR ZONES A1, A2, A3, B1, C1, C2, C3, D1, D2, D3, D4, G1, E1, F1, F2, H1, H2, H3, AND I1

Ref: (a) Drinking Water Sampling Plan, December 2021
(b) Drinking Water Distribution System Recovery Plan, December 2021

Encl: (1) Joint Base Pearl Harbor Hickam Potable Water System Description
(2) S1 and S2 Water Storage Tank Flushing Report Memo
(3) Inspection, Maintenance, and Cleaning of Potable Water Tanks Memo
(4) Ford Island/Shipyard Water Transmission Line Status
(5) JBPHH/Iroquois Point Water Transmission Line Status
(6) Board of Water Supply Interconnection Status
(7) MFR Inspection of Potable Water Storage Tanks within Zones H1, H2, H3

1. This letter and associated enclosures describes and documents the flushing of the water storage facilities that serve the Joint Base Pearl Harbor Hickam (JBPHH) public water system (PWS No. 360). The flushing of the JBPHH water storage facilities and distribution system was completed in accordance with reference (a) and (b). Enclosure (1) describes the JBPHH public water system and storage tanks associated with the system. Page 8 of reference (a) has the flushing zones and water storage facilities located in each zone. The flushing of each zone identified in phase 1 of reference (a) included five volumetric turnovers. The volumetric turnover requirement included the water tank storage and distribution system volume for each zone. The water testing of the distribution system after flushing a zone's water storage tank and distribution system was the confirmation that contamination was removed from the system and that the water tanks was not a source of contamination. Enclosure (2) documents the Hawaii Department of Health's approved change from reference (a) for the flushing of Halawa S-1 and Halawa S-2.

2. Zones A1, A2, A3, B1, C1, C2, C3, D1, D2, D3, D4, G1, E1, F1, F2, H1, H2, H3 and I1 are currently fed by the Waiawa Shaft water supply source. The pumps from the shafts generally run continuous and range from 6,000 to 14,000 gallons per minute based on the demand of the JBPHH potable water system. The pressure throughout the JBPHH distribution system is aided by the two Halawa water storage tanks. The Halawa S-1 tank is currently in service and the Halawa S-2 tank has been taken offline for maintenance as documented in enclosure (2). Enclosure (3) documents the planned timeline associated with the inspection, maintenance and cleaning of the Navy owned water storage tanks. The planned work is scheduled to be completed before the end of this calendar year. The inspection of the water storage tanks will be conducted in accordance with American Water Works Association (AWWA) Standard for Inspecting and Repairing Steel Water Tanks, Standpipes, Reservoirs, and Elevated Tanks by personnel with the requisite qualifications outlined in this AWWA standard. Zone I1 (Red Hill) is served by Navy owned water storage tanks. The Army operates the consecutive Aliamanu public water system (PWS No. 337) which receives its water from the JBPHH public water

system. The Army's public water system serves the Aliamanu Military Reservation (AMR). The AMR area was subdivided into three flushing zones which included Zones H1, H2, and H3. The planned timeline associated with the inspection, maintenance, and cleaning of the Army owned water storage tanks will be submitted as part of the removal action reports for Zones H1, H2, H3.

3. At this time, there are two water transmission lines that are not in operation. The water transmission line between Ford Island and the Shipyard was offline at the time of the incident as described in Enclosure (3) and is currently going through repairs. The valves at each end of the underwater water transmission line between JBPHH and Iroquois Point were closed on December 5, 2021 and the valves have remained closed since that date as documented in Enclosure (4). Enclosure (5) documents the method for reopening the underwater water transmission line between JBPHH and Iroquois Point to prevent potential contamination and adverse water quality issues. The Navy will notify the Hawaii Department of Health prior to reopening the underwater water transmission line the between JBPHH and Iroquois Point. Additional interconnections with Board of Water Supply (BWS) are described in Enclosure (6). Water being distributed in the system and being stored in water storage tanks that maintain pressure in Zones A1, A2, A3, B1, C1, C2, C3, D1, D2, D3, D4, G1, E1, F1, and F2 have been flushed in accordance with reference (b) and the distribution system tested in accordance with reference (a). The removal action reports for Zones H1, H2, H3, and I1 document the flushing of the water storage tanks that specifically serve those zones.

4. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

MENO.MICHAEL.WAYNE.JR.1088310035

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M. W. Meno
CAPT, CEC, USN

February 26, 2022

Joint Base Pearl Harbor Hickam (JBPHH) Potable Water Description

Major components of the JBPHH potable water system include:

- Supply sources
  - Waiawa Shaft/Pumping Station
  - Red Hill Shaft/Pumping Station
  - Halawa Shaft/Pumping Station
  - Emergency Interconnections (2 locations)
- Water storage facilities
- 2-6,000,000 gallon steel storage tanks at Halawa
  - 2-200,000 gallon concrete storage tanks at Camp Smith
  - 1-250,000 gallon glass-fused steel storage tank at Camp Smith with a usable storage capacity of 140,000 gallons
  - 2-250,000 gallon glass-fused steel storage tank at Red Hill
- Distribution system
  - Camp Smith Booster Pump (to convey water to the Camp Smith water system)
  - Red Hill Booster Pumps (to convey water to the storage tank)
  - Moanalua Terrace Booster Pumps (to pressurize the water system serving the
  - Moanalua Terrace Housing area)
  - Boneyard Booster Pumps (to pressurize the water system serving the upper elevation of Moanalua Terrace Housing area)
  - Manana Booster Pumps (to pressurize the water system servingthe Manana Housing area)
  - A network of pipes, meters, valves, and hydrants for distribution and fire protection

Water Storage Facilities:

Fresh water storage facilities store water for normal, fire, and maximum demand use, and serve to maintain relatively constant pressure in the water system. The JBPHH water system is equipped with two welded steel tanks, each with a storage capacity of six million gallons. These tanks are identified as the Halawa storage tanks S-1 and S-2. Both of these tanks are located adjacent to the Aliamanu Military Reservation at a ground elevation of 140 feet. The diameter of the tanks are 164 feet each, with a nominal height of 48 feet. The spillway elevations of the S-1 and S-2 tanks are 178.5 feet. The tanks are interconnected by a 10-inch line. Water from each of the tanks discharges through separate 24-inch mains and combines to a single 30-inch transmission main.

Other water storage tanks in the JBPHH system include the three tanks at Camp Smith, a storage tank serving the Red Hill Housing area, and three storage tanks serving the Army's Aliamanu Housing area. The Red Hill and Aliamanu tanks are supplied by separate booster pump stations located at the Red Hill Water Pumping Station and the Halawa Storage Tanks, respectively. These tanks are dedicated to serving these two non-Navy housing areas.

February 11, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: S1 AND S2 WATER STORAGE TANK FLUSHING REPORT

Ref: (a) Drinking Water Distribution System Recovery Plan, December 2021

1. This letter documents the current status of the S1 and S2 water storage tanks. In accordance with reference (a), the S1 and S2 water storage tanks were part of the Zone F1 flushing plan. The flushing plan for Zone F1 included both water storage tanks in the five volumetric turnover calculations. The calculated turnover volume was 61.35 million gallons of water. The S1 tank was flushed by cycling the water tank for five volumetric flushes. In order to conserve the amount of water being used in the flushing of Zone F1, the S2 water storage tank was taken out of service and remains out of service to date. This decision resulted in the conservation of approximately 25 million gallons of water. The Hawaii Department of Health (HDOH) was notified of the Navy's modified flushing plan and provided concurrence. The S2 water storage tank is being scheduled for cleaning and maintenance. The Navy will provide details to HDOH on the method and procedures for cleaning and maintenance of the S2 water storage tank prior to the start of work. The Navy will notify the HDOH upon completion of the work and the tank being placed back into service.

2. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

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Date: 2022.02.12 14:33:42 -10'00'

M. W. Meno
Captain, U.S. Navy Civil Engineer Corps

ENCL(2)

25 February 2022

MEMORANDUM FOR RECORD

SUBJECT: Inspection, Maintenance, and Cleaning of Potable Water Tanks

1. This Memorandum for Record (MFR) is to document the summary processes for inspection, maintaining, and cleaning storage tanks within the Joint Base Pearl Harbor-Hickam potable water system. There are seven potable water storage tanks. Each tank holds water that is consistently in flux – rising and falling according to the dynamic demands for water under certain pressures at specific times. As such, the tanks are continually cycling fresh water recently pumped from the well and chlorinated at the treatment plant. JBPH-H does not drain and clean the tanks per a schedule, however the following records indicate recent cleaning. Tank cleaning follows AWWA M42 - Steel Water Storage Tanks.
    a. S1 tank inspected and cleaned in 2010, cleaned by in-house EV remediation shop, mainly to remove sediment from the tank floor.
    b. S2 tank inspected and cleaned 2007, cleaned by in-house remediation shop, mainly to remove sediment from the tank floor.
    c. Red Hill tank No. 685 was inspected in 2013, via remote camera vehicle
    d. Red Hill tank No. 316 was installed in 2017 and has not yet been inspected
    e. Camp Smith tanks (3) were inspected and cleaned in 2013.

2. As the seven tanks have not been inspected a group for several years, the Public Works Department shall funds and contract a complete inspection and cleaning for all tanks in accordance with AWWA standards by then end CY 2022.

3. Tanks are monitored and operated using a Supervisory Control and Data Acquisition (SCADA) system to ensure that they are at the right levels and pumps and valves are operating at prescribed times and speeds, overseen by Utilities staff 24/7. Our field team is regularly physically engaged with these tanks to ensure functionality, condition, and security of the tanks. There are frequent field actions near and connected to the tanks – they are routinely inspected per the requirements to manage the system.

4. As the tank hardware ages and requires repair and replacement, a tank may be isolated, drained and taken out of service to conduct this work. At these times, when work involved the interior of the tank, a full cleaning and refilling is conducted. This is typically done with a contract.

5. The S2 tank, a 6 MG tank that, with the S1 tank, provides the ability to keep pressurized water in the system for firefighting while serving the domestic demand, has been secured from the rest of the system since December 22, 2021. The water in the tank has been sampled and the results have shown a non-detect for TPH. Public work will make repairs and clean this tank within the next 90 days. The process to flush, clean and return the tank to the system is as follows:
    a. Repair S1/S2 overflow 24” drain line with Cured-in-Place Pipe
    b. Drain S2 tank via existing drain line, leading to the city storm drainage system
    c. Clean and Disinfect S2 tank (Following ANSI/AWWA C652-02: Disinfection of Water-Storage Facilities)
    d. Perform bacteriological and TPH sampling and testing
    e. Return S2 tank to service

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CAPT R. Harmeyer
Public Works Officer
Joint Base Pearl Harbor Hickam

22 February 2022

MEMORANDUM FOR RECORD

SUBJECT: Ford Island/Shipyard Water Transmission Line Status

1. This Memorandum for Record (MFR) is to document the status of the underwater crossing water transmission line (pipe) that connects the Ford Island and Shipyard areas of the Joint Base Pearl Harbor-Hickam Potable Water System.

2. As part of the P-209 Dry Dock 3 Replacement design effort, a contractor was performing soil borings at Hospital Point near the Shipyard. The contractor damaged the 24-inch underwater crossing during one of their borings on 15 June 21, by drilling through the casing and pipe.

3. JBPHH has begun plans for repairing or replacing this damaged line. A Design consultant is scheduled to start the design on the repairs in March of 2022. Construction funds for the repair are allocated for Fiscal Year 2023.

4. The water transmission line was secured from the JBPHH system via an isolation valve on the Ford Island side, and physical pipe removal on the Shipyard side. Enclosure [1] is a picture taken on 22 January 2022 of the physical pipe removal at Hospital Point.

5. The Ford Island isolation valve is less than 5 years old, and PWD personnel have verified in the field that there are no indications of leak-by, via audible tests and noting the lack of vibrations.

6. a pitot-style flow meter that has been sending false readings is located in the currently isolated section is, as there is no water flow in this not-in-service piping. Isolation was performed with in-house NAVFAC forces on 5 Dec 2021. PWD has not explored the root cause of the false reading, as the piping is isolated, and the meter is not used for any other purposes. Possible cause of the flow readings may be air trapped in the lines that shows pressure differentials as tide changes.

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CAPT R. Harmeyer
Public Works Officer
Joint Base Pearl Harbor Hickam

ENCL(4)

25 February 2022

MEMORANDUM FOR RECORD

SUBJECT: Joint Base Pearl Harbor-Hickam – Iroquois Point Water Connection

ENCL.: (1) Interconnection line drainage schematic

1. This Memorandum for Record (MFR) is to document the process to reopen and flush the 24" potable water system interconnection line between Iroquois Point and Bishop Point on Joint Base Pearl Harbor-Hickam.

2. Like most looped systems, the water in this interconnection flows in both directions depending on demand. On work days, when residents are typically not on Iroquois Point and the Joint Base is operating, water typically flows from west to east. On nights and weekends, the water may flow from east to west, depending on if the Kapilina Homes in Iroquois Point is operating the irrigation system, and similarly, what the demand is on the Joint Base proper from housing communities near Bishop Point. The long-term closure of the line is possible because each zone has multiple feeds. The presence of these looped interconnections allows redundancy – if one feed goes off-line for maintenance or unexpectedly, the area has a redundant feed to continue service.

3. The interconnection was secured on 05 Dec. 2021 by closing the gate valve on each end (shore) of the interconnection. The water between these valves has not moved since then. When we bring this section back online, the process will be as follows, and according to the diagram in Enclosure (1).

    a. Secure two additional valves (126 and 130 at West Loch). See Enclosure (1).
    b. Open valve 128 (currently shut) at West Loch
    c. Open valve at Hickam that is currently shut
    d. Open and flush from hydrant no. 64 at West Loch, located between valves 126 and 128.
    e. Flush transmission line for 6-8 hours to the sanitary sewer.
    f. Flushing, chlorination and testing of the transmission main will follow ANSI/AWWA C651-05: Disinfecting Water Mains.
    g. Collect first sample for bacteriological testing after flushing.
    h. Collect second sample (at least 24 hours after first sample) for bacteriological testing.
    i. Open valves 126 and 130 and valves on Bishop Point, completing the loop.

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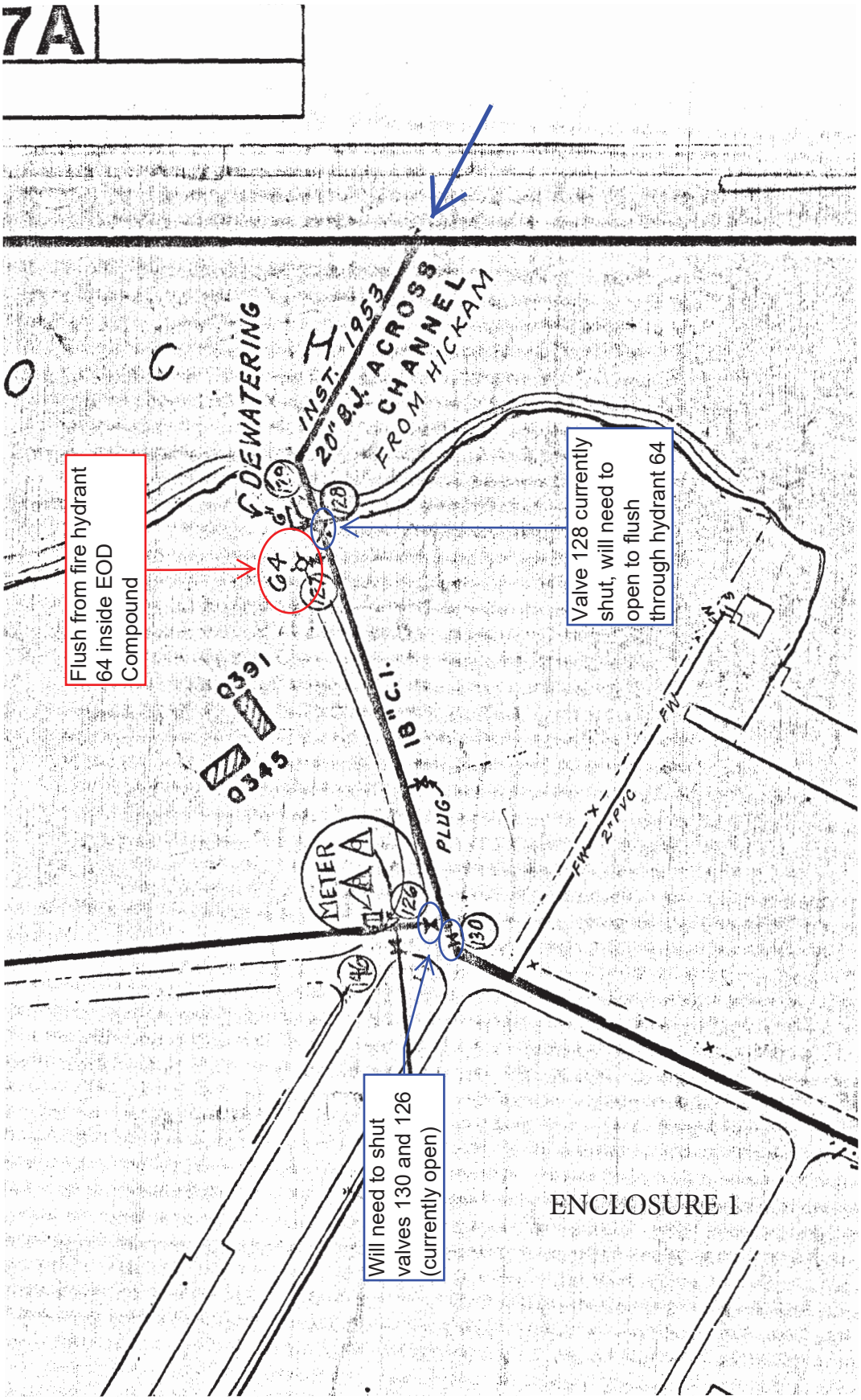
CAPT R. Harmeyer
Public Works Officer
Joint Base Pearl Harbor Hickam


7A
INST. 1953
20" B.J. ACROSS
CHANNEL
FROM HICKAM
DEWATERING
Flush from fire hydrant
64 inside EOD
Compound
Valve 128 currently
shut, will need to
open to flush
through hydrant 64
Will need to shut
valves 130 and 126
(currently open)
ENCLOSURE 1

22 February 2022

MEMORANDUM FOR RECORD

SUBJECT: Board of Water Supply Interconnection Status

Ref: [1] Management Inquiry Into Manana Booster/BWS dtd 29 Dec 2021

1. This Memorandum for Record (MFR) is to document the status of the Board of Water Supply (BWS) interconnections with the Joint Base Pearl Harbor Hickam Potable Water System. The JBPHH system has four interconnection points with BWS: (1) Puuloa Road, (2) Halawa Heights Road, (3) Manana Housing, and (4) Red Hill.

2. BWS physically removed the meters from two of the interconnections, creating an "air gap" between the BWS system and the Navy system at both the Puuloa Road location and the Halawa Heights Road location. BWS performed that work on or around 10 December 2021. PWD personnel confirmed that the meters were removed on 14 December 2021.

3. Red Hill and Manana Housing BWS interconnections are still physically connected. The Red Hill interconnection is isolated on both the BWS side and Navy side of the connection. Manana interconnection was opened on 16 November 2021, and is feeding Manana housing. Isolation valves have been secured from the Navy supply to Manana, to isolate Manana Housing from the JBPHH System (Reference [1]).

4. Prior to December 2017, there was a fifth BWS interconnection with the JBPHH system, located at Geiger Road. The Kalaeloa area of the JBPHH water system was transferred from Navy to the Kalaeloa Water Company in December 2017. The BWS interconnection was included in the transfer. Shortly after the transfer, PWD Utilities personnel physically removed the connection from West Loch to Geiger Road piping, "air gapping" the KWC system and the JBPHH system.

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CAPT R. Harmeyer
Public Works Officer
Joint Base Pearl Harbor Hickam

ENCL(6)

27 February 2022

MEMORANDUM FOR RECORD

SUBJECT: Inspection of Potable Water Storage Tanks within Zones H1, H2, H3

1. This Memorandum for Record (MFR) is to supplement the MFR documenting the summary processes for inspection, maintenance, and cleaning storage tanks within the Joint Base Pearl Harbor-Hickam potable water systems (dated February 2022).

2. There are three potable water storage tanks that supplies water to the Zone H1, H2, and H3 distribution systems, and are located within the Aliamanu Military Reservation. The tanks are filled with water from the Navy's S1 and S2 tanks. All three storage tanks had a Sanitary Survey completed/conducted by the State of Hawaii Department of Health (DOH) in 2021, and all deficiencies have been corrected.

3. The three tanks supplying water to Zones H1, H2, and H3 will be inspected following industry American Water Works Association (AWWA) standards prior to December 31, 2022, or the next sanitary survey, whichever occurs first. The inspection will take into account the chemical contamination event of 2021. The inspection report will be submitted to the DOH within 45 calendar days of the inspection.

4. The potable water storage tank inspection will include quality videotapes or pictures of the facility and a written report describing all the inspection finding(s). The written report will be detailed and describe all conditions discovered during the inspection, in addition to the deficiencies, and not imply that anything not mentioned in the report is in good condition. The report will provide enough information on any deficiencies found that the DOH can make informed decisions as to actions that must be taken and their timeliness.

5. The inspection will be completed by a person who has an understanding of potable water storage tanks and AWWA standards. The report will include the inspector's professional evaluation of the general conditions and specific deficiencies found and recommend actions for correcting the deficiencies. Any sanitary defect, contamination, cross-connection, safety hazard or serious structural damage found will be identified in the written report.

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NISIT A. GAINEY
Director, Directorate of Public Works
U.S. Army Garrison Hawaii

March 8, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: ZONE H3 DISTRIBUTION SYSTEM EXCEEDANCE INVESTIGATION SUMMARY AND RESAMPLE RESULTS

Encl: (1) Zone H3 Stage 2 Distribution Sampling Report
(2) Zone H3 Distribution System Sampling Report
(3) Laboratory Report, SDG 580-109289-1, Level 2, Revision 1, Eurofins FGS, Seattle, 2022-02-09
(4) AECOM Technical Review of BCEE in sample results dtd 5 MAR 2022
(5) Eurofins Corrective Action Memo for AECOM bis (2-Chloroethyl) ether false positives
(6) DoH's Guidance on the Approach to Amending the Public Health Advisory, Addendum 1 dtd 12 FEB 2022
(7) DoH SVOC Sample Results for Zone H3 Distribution System
(8) DoH TPH Sample Results for Zone H3 Distribution System and Residences

1. The Zone H3 Distribution System sampling results are listed in enclosures (1) and (2). Enclosure (1) contains the initial distribution system sample results for Zone H3. Enclosure (2) documents additional distribution samples that were taken in Zone H3. The samples of the distribution system were taken at the hydrants. The categories of the results are broken down into non-detect, detect below limit levels, and exceedance. A non-detect occurs when the laboratory does not detect a measurable amount of an analyte. A detect below limit levels occurs when the laboratory detects a measurable amount of an analyte below Incident Specific Parameters (ISPs), Department of Health (DoH) Environmental Action Levels (EALs) or Maximum Contaminant Levels (MCLs), or Environmental Protection Agency (EPA) MCLs. An exceedance occurs when the laboratory detects a chemical and the amount detected is higher than established acceptable thresholds. All chemical and metal detections are shown in enclosures (1) and (2). The various agency limits are listed for reference and the result along with the location of the exceedance sample is listed in tabular form. Results highlighted in yellow exceed the ISP. Results in purple font also exceed the EAL. Results in green font also exceed the DOH MCL. Results in blue font also exceed the EPA MCL.

2. Bis (2-chloroethyl) ether (BCEE) was detected in the Zone H3 screening samples taken on January 12, 2022 as shown in enclosure (1). The detection of this compound seemed to be an anomaly. As a result of this possibility, AECOM conducted a technical review of the lab procedure and found an error that resulted in a false detect. AECOM notified the laboratory of their technical review. On page 3 of enclosure (3), the laboratory states that:

"02/07/2022: The report has been revised to report the 8270E analyte Bis (2-chloroethyl) ether as ND after further review of the data. Samples were initially reported to contain Bis (2-chloroethyl) ether above the reporting limit. Upon further review, these results do contain ions 93

and 95 in adequate ratios and at a satisfactory retention time; however, the results do not contain ion 63 at an adequate ratio, nor does the overall fragmentation pattern match that of Bis (2-chloroethyl) ether. Therefore, these detections have been identified as false positives and the status of Bis (2-chloroethyl) ether has been revised as non-detect."

As a precaution, the Navy took samples at the three hydrants that were previously taken and the results were non-detect for BCEE. This is fully documented in enclosure (2) which reflects the corrected BCEE sample results for the screening samples taken on January 12, 2022. Enclosure (2) shows the resamples taken on February 4, 2022 were non-detect for BCEE. Enclosure (4) documents the technical review conducted by AECOM. The EPA stated in IDWST deliberations their concurrence with the conclusion of a false detect after independent review from the Region 9 laboratory and contractor resources. Enclosure (5) provides amplifying information from Eurofins Laboratory regarding the false detection of BCEE. Based upon the amplifying information from Eurofins Laboratory and discussion among the IDWST, it was concluded that neither BCEE nor the misidentified by-products of chlorine and the stabilizer of the lab's extraction agent, 2-methyl-2-butene (amylene), were in the sampled water. A reaction of normal chlorination in the water and the stabilizer of the lab's extraction agent caused the formation of a polychlorinated amylene that was misidentified as BCEE. This compound could not form in the distribution system in the presence of chlorine because the stabilizer in the lab's extraction agent would not be present to cause that reaction.

3. Enclosure (6) sets the DOH project screening level for copper at the action level of 1,300 parts per billion (ppb). Enclosure (7) and enclosure (8) are the test results for samples taken by DoH. There were no exceedances above the MCL and no exceedances of ISPs that required further action. Based on all of the information presented above, no further action was required regarding the distribution system for Zone H3. The laboratory reports for all of Zone H3 will be made publicly available at https://jbphh-safewaters.org/ upon amendment of the health advisory for Zone H3.

4. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

MENO.MICHAEL.WAYNE.JR.1088310035 Digitally signed by MENO.MICHAEL.WAYNE.JR.1088310035 Date: 2022.03.08 09:29:47 -10'00'

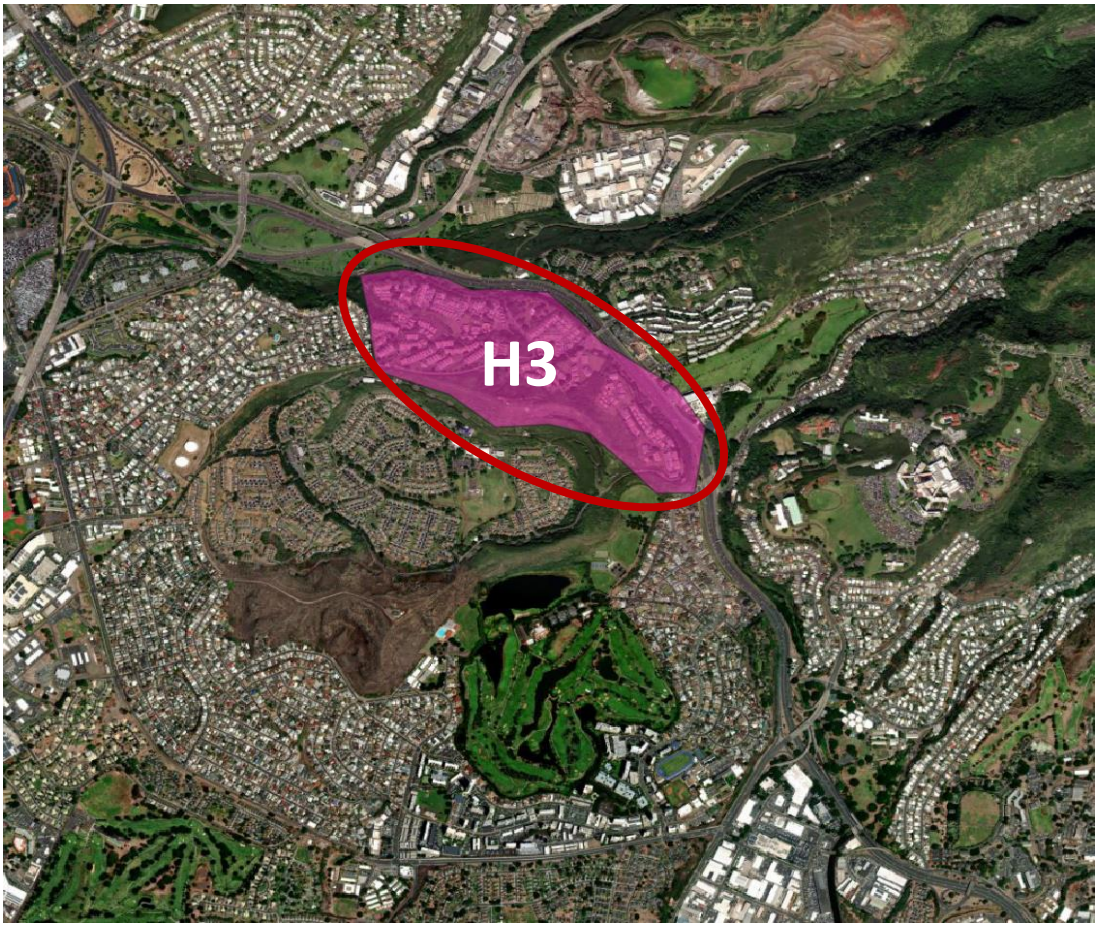
M. W. Meno
CAPT, CEC, USN

Interagency Drinking Water System Team

Drinking Water Distribution System Recovery Plan: *Stage 2 Sampling Results for Zone H3*

Joint Base Pearl Harbor-Hickam (JBPHH)

03 February 2022



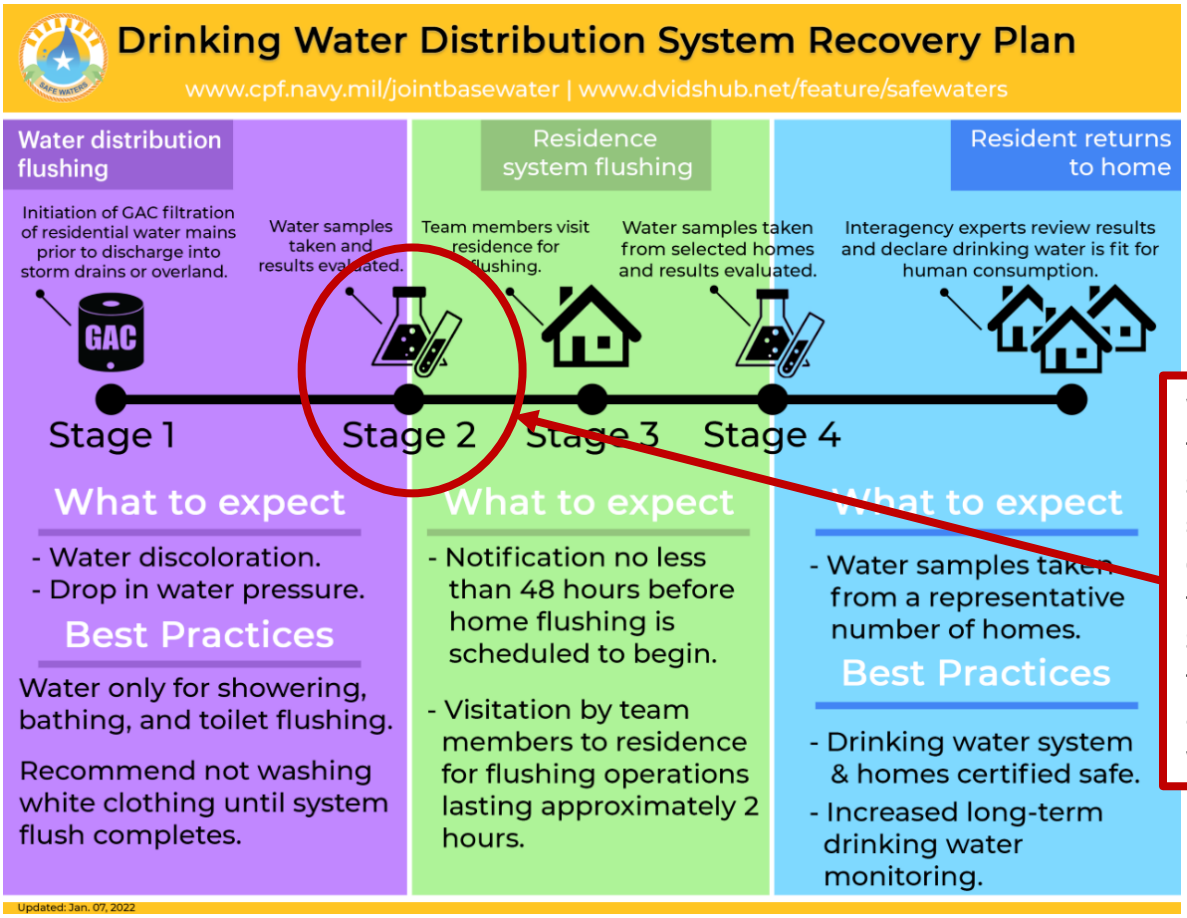
Neighborhoods included in Zone H3: Red Hill Housing

EXECUTIVE SUMMARY FOR ZONE H3

The State of Hawaii Department of Health's (DOH) November 29, 2021 Public Health Advisory for the JPBHH Public Water System for Zone H3 remains in effect. DOH recommends all Navy water system users should avoid using the water for drinking, cooking, or oral hygiene. This includes consumption by pets. Navy water system users who detect a fuel-like odor from their water should also avoid using the water for bathing, dishwashing or laundry.

We have thoroughly flushed, sampled, and tested the water distribution system lines (Water Mains) in Zone H3. This Zone has moved to Stage 3–Building Flushing/Stage 4-Building Sampling, in the Drinking Water Distribution System Recovery Plan (see the Figure below). Based on the samples collected and tested, to date, this water meets all U.S. Environmental Protection Agency (EPA) and State of Hawaii Department of Health (DOH) standards that are applicable to the Navy Water System Incident.

No final conclusions or recommendations can be made at this time for the drinking water in your zone because more drinking water samples are being collected and tested from Water Mains, residences, buildings, schools, and child development centers (after they have been flushed). We are sharing this information to keep you updated on our progress towards restoring the water supply being provided to your community.



For additional information, please visit: https://www.cpf.navy.mil/JBPHH-Water-Updates/.

Table 1. Contaminants Detected in Drinking Water Samples Collected from Water Mains in Zone H3

Contaminant	Sampling Date	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	Highest Level Detected	Meets DOH Screening Level? (Yes / No)	Typical Source of Contaminant
Contaminants of Concern[1]							
Benzene	01//12/2022	ppb	5	MCL	ND	**Yes**	Discharge from factories; Leaching from gas storage tanks and landfills
Ethylbenzene	01//12/2022	ppb	700	MCL	ND	**Yes**	Discharge from petroleum refineries
Toluene	01//12/2022	ppb	1000	MCL	ND	**Yes**	Discharge from petroleum factories
m,p-Xylenes	01//12/2022	ppb	10000	MCL	ND	**Yes**	Discharge from petroleum factories; Discharge from chemical factories
o-Xylenes	01//12/2022	ppb	10000	MCL	ND	**Yes**	
1-Methylnaphthalene	01//12/2022	ppb	2.1	ISP	ND	**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//12/2022	ppb	4.7	ISP	ND	**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//12/2022	ppb	12	ISP	ND	**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//12/2022	ppb	15	ISP	2.18	**Yes**	Corrosion of household plumbing systems; Erosion of natural deposits
Total Petroleum Hydrocarbons (TPH)-Gasoline (C6-C12)	01//12/2022	ppb	200	ISP	ND	**Yes**	Gasoline is a petroleum product that can contaminate drinking water through spills and other releases into the environment
TPH-Diesel (C9-C25)	01//12/2022	ppb	200	ISP	99	**Yes**	Diesel is a petroleum product that can contaminate drinking water through spills and other releases into the environment
TPH-Oil (C24-C40)	01//12/2022	ppb	200	ISP	ND	**Yes**	Oil is a petroleum product that can contaminate drinking water through spills and other releases into the environment
Total Organic Carbon (TOC)	01//12/2022	ppb	2000	ISP	265	**Yes**	Naturally present in the environment, but also can be an indicator of contamination, including petroleum or other sources

Contaminant	Sampling Date	Units	DOH Project Screening Level	Basis of DOH Screening Level[2]	Highest Level Detected	Meets DOH Screening Level? (Yes / No)	Typical Source of Contaminant
Metals							
Antimony	01/12/2022	ppb	6	MCL	0.193	**Yes**	Discharge from petroleum refineries; fire retardants; ceramics; electronics; solder
Arsenic	01/12/2022	ppb	10	MCL	0.454	**Yes**	Erosion of natural deposits; Runoff from orchards; runoff from glass and electronics production wastes
Barium	01/12/2022	ppb	2000	MCL	2.52	**Yes**	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	01/12/2022	ppb	100	MCL	1.58	**Yes**	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints
Copper	01/12/2022	ppb	1300	AL	14.5	**Yes**	Corrosion of household plumbing systems; Erosion of natural deposits
Selenium	01/12/2022	ppb	50	MCL	2.20	**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)							
Bis(2-Chloroethy)ether	01/12/2022	ppb	0.014	EAL	2.4	**No[5]**	Man-made intermediate chemical used in other compounds or pesticides; It can also be used as a solvent, cleaner, component of paint and varnish, and rust inhibitor; Enters the environment as the result of manufacture and use
Butyl benzyl phthalate (BBP)	01/12/2022	ppb	–	–	1.0	**Yes**	Used as a plasticizer mainly in adhesives and sealants, floor coverings, and paints and coatings
Di(2-ethylhexyl) adipate (aka bis(2- ethylhexyl) adipate)	01/12/2022	ppb	400	MCL	0.192	**Yes**	Discharge from chemical factories/widely used plasticizer and prevalent environmental contaminant.

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. *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. *Acronyms and explanation of terms used in this table are presented on the following pages. For assistance in understanding and interpreting information in this table, refer to FACT SHEET, Understanding You Water Quality Summary Table, available online at: https://www.cpf.navy.mil/JBPHH-Water-Updates/.*
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. *In addition to testing drinking water for contaminants regulated under the Safe Drinking Water Act, we also tested for some contaminants that are not regulated. Unregulated contaminants do not have legal limits for drinking water (i.e., they do not have MCLs) but may have a screening level (e.g., Tier 1 EAL). Tier 1 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 the Tier 1 EAL does not necessarily indicate that contamination at the site poses environmental hazards and may be set at levels that are impossible for water systems to meet (for example, large-scale treatment technology may not exist for a given contaminant). Per DOH's 12/30/2021 DOH's Guidance on the Approach to Amending the Drinking Water Health Advisory, if the Tier 1 EAL is exceeded, the Navy shall investigate the source(s) of the contamination under direction of the DOH. The DOH EAL is based on the EPA tapwater Regional Screening Level for Bis(2-Chloroethyl)ether (https://semspub.epa.gov/src/document/HQ/401655). Bis(2-Chloroethyl)ether (BCEE) was not detected in JP-5 product samples from the Red Hill Shaft. "In the past, BCEE has been used as a solvent for fats, waxes, greases, and esters (Schrenk et al. 1933). It has also been used as a constituent of paints and varnishes, as a cleaning fluid for textiles, in the purification of oils and gasoline, in the manufacture of medicines and pharmaceuticals, as an intermediate in the synthesis of other chemicals, and as an insecticide and a soil fumigant (Browning 1965; Hake and Rowe 1963; HSDB 1988; Verschueren 1977; Windholz 1983)." See the following link for more information: https://www.atsdr.cdc.gov/toxprofiles/tp127.pdf.

Drinking Water Distribution System Recovery Plan: Stage 2 Sampling Results for Zone H3

What is the purpose of this Stage 2 Sampling Results Report?

This is a progress report and presents the testing results from drinking water distribution system samples that have been collected, to date, from the water distribution system lines (Water Mains) in your Zone. These samples were collected after extensive flushing of the distribution system was performed using clean water from the Navy Waiawa Shaft. This is Stage 2 of the 4-Stage process described in the Drinking Water Distribution System Recovery Plan.

No final conclusions or recommendations can be made at this time for the drinking water in your zone because more drinking water samples are being collected and tested from Water Mains, residences, buildings, schools, and child development centers. We are sharing this information to keep you updated on our progress towards restoring the water supply being provided to your community.

What was found?

The table presented above (Table 1) presents all contaminants that were detected in drinking water samples that have been collected, to date, from the Water Mains in your Zone during Stage 2. Hawaii 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).

Based on these data, this Zone moved to Stage 3–Building/Home Flushing, in the Drinking Water Distribution System Recovery Plan.

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. 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), Total Organic Carbon (TOC) chlorine and pH. 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 are

presented in the laboratory reports are located at: https://www.cpf.navy.mil/JBPHH-Water-Updates/.

What happened leading up to Public Health Advisory being issued?

After receiving reports of a fuel-like smell or visual sheen in the drinking water from residents of Joint Base Pearl Harbor – Hickam (JBPHH) on November 28, 2021, the Navy immediately stopped using water from the Red Hill Shaft. Out of abundance of caution, the Navy also stopped using water from the Navy Aiea Halawa Shaft. The Navy's water system provides drinking water to JBPHH, including the Army, Air Force, Marine Corps, and Hawaii residents in some neighborhoods close to JBPHH. The Hawaii DOH issued a Public Health Advisory on November 29, 2021. The Hawaii DOH, the United States Environmental Protection Agency (EPA), Navy, and Marine Corps Public Health Center, 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?

No. Please continue to follow the Public Health Advisory for Navy Water System users and only use your drinking water for non-consumptive purposes as long as your water does not have a visible sheen and remains odor free. Your service may have provided more restrictive guidance. As stated above, we are at Stage 2 of the 4-Stage process described in the Drinking Water System Recovery Plan and the Public Health Advisory will be re-evaluated by Hawaii DOH after Stage 4 in the process.

Where does our water come from?

The source of all water for all Navy Water System users now comes only 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 DOH confirmed that it meets all federal and state drinking water standards and it will continue to be sampled in accordance with EPHA and DOH requirements.

What is the IDWST doing 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 Water Main flushing conducted in Zone H3?

The final round of distribution water main flushing in Zone H3 was completed on January 12, 2022.

How much water was flushed through the water distribution system in Zone H3?

From January 10 – 12, 2022, a total of 0.6 million gallons was flushed through Zone H3.

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

See the FACT SHEET, Understanding Your Water Quality Summary Table, available online at: https://www.cpf.navy.mil/JBPHH-Water-Updates/.

Acronyms used in the Table

AL	Action Level (for Lead and Copper)
DOH	Hawaii Department of Health
EAL	Environmental Action Level
EPA	U.S. Environmental Protection Agency
ISP	Incident Specific Parameter
MCL	Maximum Contaminant Level
ND	Non-Detect
ppb	parts per billion (or ug/L)
SDWA	Safe Drinking Water Act
SOCs	Synthetic Organic Compounds (also known as SVOCs)
SVOCs	Semi-Volatile Organic Compounds (same as SOCs)
TPH	Total Petroleum Hydrocarbons
TOC	Total Organic Carbon
ug/L	micrograms per liter (or ppb)
VOCs	Volatile Organic Compounds

Explanation of Terms 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 like pH or temperature.

Incident Specific Parameters (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 ISP is 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 chemicals that 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.

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.

Tier 1 Environmental Action Level (EAL). Tier 1 Environmental Action Levels (Tier 1 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 the Tier 1 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 grouped by 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.

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 million	ppm*	milligrams per Liter	mg/L
parts per billion	ppb*	micrograms per Liter	ug/L

*One (1) part per million (ppm) is 1,000 parts per billion (ppb).

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.

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1651A	H3-HYD1651A	H3-HYD1651A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1651	Hyrdrant 1651	Hyrdrant 1651
Field Sample ID:					220112-H3-ZT09	220112-H3-ZT11	220204H3IT01-1	220204H3IT02	220204H3IT02-1	220112-H3-ZT13	220112-H3-ZT15	220204H3IT03
Sample Date:					2022-01-12	2022-01-12	2022-02-04	2022-02-04	2022-02-04	2022-01-12	2022-01-12	2022-02-04
Sample Type:					N	N	N	N	N	N	N	N
GENCHEM (mg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**		**SDG: 2A13026**					**SDG: 2A13026**	
Total Organic Carbon	2	None	None	None	--	0.190 U	--	--	--	--	**0.265 J**	--
HC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801092891_Rev1**	**SDG: 5801092871**				**SDG: 5801092891_Rev1**	**SDG: 5801092871**	
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	90.0 U	91.0 UJ	--	--	--	**99.0 J**	90.0 UJ	--
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	31.0 U	--	--	--	31.0 U	31.0 U	--
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	180 UJ	--	--	--	180 U	180 UJ	--
HG (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**		**SDG: 2A13026**					**SDG: 2A13026**	
Mercury	0.025	0.025	2	2	--	0.0170 U	--	--	--	--	0.0170 U	--
METAL (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**		**SDG: 2A13026**					**SDG: 2A13026**	
Antimony	6	6	6	6	--	0.0889 U	--	--	--	--	**0.193 J**	--
Arsenic	10	10	10	10	--	**0.352 J**	--	--	--	--	**0.302 J**	--
Barium	220	220	2000	2000	--	**2.52**	--	--	--	--	**2.45**	--
Beryllium	0.66	0.66	4	4	--	0.0624 U	--	--	--	--	0.0624 U	--
Cadmium	3	3	5	5	--	0.0416 U	--	--	--	--	0.0416 U	--
Chromium	11	11	100	100	--	**1.51**	--	--	--	--	**1.52**	--
Copper	2.9	2.9	1300	1300	--	**10.5**	--	--	--	--	**14.5**	--
Lead	15	5.6	15	15	--	**2.18**	--	--	--	--	**1.23**	--
Selenium	5	5	50	50	--	**2.01**	--	--	--	--	**1.51**	--
Thallium	2	2	2	2	--	0.0210 U	--	--	--	--	0.0210 U	--
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**
1,2,4-Trichlorobenzene	70	70	70	70	0.0940 U	--	0.0920 U	0.0860 U	0.0910 U	0.0940 U	--	0.0860 U
1,2-Dichlorobenzene	10	10	600	600	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
1,3-Dichlorobenzene	None	None	None	None	0.0420 U	--	0.0410 U	0.0380 U	0.0410 U	0.0420 U	--	0.0380 U

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1651A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1651	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676
Field Sample ID:					220204H3IT03-1	220112-H3-ZT05	220112-H3-ZT07	220204H3IT04	220204H3IT04-1
Sample Date:					2022-02-04	2022-01-12	2022-01-12	2022-02-04	2022-02-04
Sample Type:					N	N	N	N	N
GENCHEM (mg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**			**SDG: 2A13084**		
Total Organic Carbon	2	None	None	None	--	--	0.190 U	--	--
HC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**		**SDG: 5801092891_Rev1**	**SDG: 5801092871**		
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	--	90.0 U	90.0 UJ	--	--
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	--	31.0 U	31.0 U	--	--
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	--	180 U	180 UJ	--	--
HG (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**			**SDG: 2A13084**		
Mercury	0.025	0.025	2	2	--	--	0.0170 U	--	--
METAL (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**			**SDG: 2A13084**		
Antimony	6	6	6	6	--	--	0.0889 U	--	--
Arsenic	10	10	10	10	--	--	**0.454**	--	--
Barium	220	220	2000	2000	--	--	**2.51**	--	--
Beryllium	0.66	0.66	4	4	--	--	0.0624 U	--	--
Cadmium	3	3	5	5	--	--	0.0416 U	--	--
Chromium	11	11	100	100	--	--	**1.58**	--	--
Copper	2.9	2.9	1300	1300	--	--	**5.37**	--	--
Lead	15	5.6	15	15	--	--	**0.538**	--	--
Selenium	5	5	50	50	--	--	**2.20**	--	--
Thallium	2	2	2	2	--	--	0.0210 U	--	--
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13084**	**SDG: 5801100291**	**SDG: 5801100291**
1,2,4-Trichlorobenzene	70	70	70	70	0.0910 U	0.0940 U	--	0.0860 U	0.0920 U
1,2-Dichlorobenzene	10	10	600	600	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
1,3-Dichlorobenzene	None	None	None	None	0.0410 U	0.0420 U	--	0.0380 U	0.0410 U

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1651A	H3-HYD1651A	H3-HYD1651A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1651	Hyrdrant 1651	Hyrdrant 1651
Field Sample ID:					220112-H3-ZT09	220112-H3-ZT11	220204H3IT01-1	220204H3IT02	220204H3IT02-1	220112-H3-ZT13	220112-H3-ZT15	220204H3IT03
Sample Date:					2022-01-12	2022-01-12	2022-02-04	2022-02-04	2022-02-04	2022-01-12	2022-01-12	2022-02-04
Sample Type:					N	N	N	N	N	N	N	N
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**
1,4-Dichlorobenzene	5	5	75	None	0.0420 U	--	0.0410 U	0.0380 U	0.0410 U	0.0420 U	--	0.0380 U
1-Methylnaphthalene	2.1	10	None	None	--	0.00801 U	--	--	--	--	0.00801 U	--
2,4,5-Trichlorophenol	None	None	None	None	--	--	0.100 U	--	0.100 U	--	--	--
2,4,6-Trichlorophenol	None	None	None	None	--	--	0.100 U	--	0.100 U	--	--	--
2,4-Dichlorophenol	None	None	None	None	--	--	0.200 U	--	0.200 U	--	--	--
2,4-Dimethylphenol	None	None	None	None	--	--	0.160 U	--	0.160 U	--	--	--
2,4-Dinitrophenol	None	None	None	None	--	--	1.60 U	--	1.60 U	--	--	--
2,4-Dinitrotoluene	None	None	None	None	0.100 U	--	0.100 U	0.0950 U	0.100 U	0.100 U	--	0.0960 U
2,6-Dinitrotoluene	None	None	None	None	0.100 U	--	0.100 U	0.0950 U	0.100 U	0.100 U	--	0.0960 U
2-Chloronaphthalene	None	None	None	None	0.0730 U	--	0.0710 U	0.0670 U	0.0710 U	0.0730 U	--	0.0670 U
2-Chlorophenol	None	None	None	None	--	--	0.0510 U	--	0.0510 U	--	--	--
2-Ethylhexyl adipate	None	None	None	None	--	0.00962 U	--	--	--	--	0.00962 U	--
2-Methylnaphthalene	4.7	10	None	None	--	0.00904 U	--	--	--	--	0.00904 U	--
2-Methylphenol (o-Cresol)	None	None	None	None	--	--	0.0510 U	--	0.0510 U	--	--	--
2-Nitroaniline	None	None	None	None	0.100 U	--	0.100 U	0.0950 U	0.100 U	0.100 U	--	0.0960 U
3,3'-Dichlorobenzidine	None	None	None	None	0.270 U	--	0.270 U	0.250 U	0.260 U	0.270 U	--	0.250 U
3-Nitroaniline	None	None	None	None	0.170 U	--	0.160 U	0.150 U	0.160 U	0.170 U	--	0.150 U
4,6-Dinitro-2-methylphenol	None	None	None	None	--	--	0.560 U	--	0.560 U	--	--	--
4-Bromophenyl phenyl ether	None	None	None	None	0.0630 U	--	0.0610 U	0.0570 U	0.0610 U	0.0630 U	--	0.0570 U
4-Chloro-3-methylphenol	None	None	None	None	--	--	0.130 U	--	0.130 U	--	--	--
4-Chloroaniline	None	None	None	None	0.620 U	--	0.600 U	0.560 U	0.600 U	0.620 U	--	0.560 U
4-Chlorophenyl phenyl ether	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
4-Nitroaniline	None	None	None	None	0.220 U	--	0.210 U	0.200 U	0.210 U	0.220 U	--	0.200 U
4-Nitrophenol	None	None	None	None	--	--	1.70 U	--	1.70 U	--	--	--
Acenaphthene	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
Acenaphthylene	None	None	None	None	0.0630 U	--	0.0610 U	0.0570 U	0.0610 U	0.0630 U	--	0.0570 U
Alachlor	None	None	None	None	--	0.0110 U	--	--	--	--	0.0110 U	--
Anthracene	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
Atrazine	None	None	None	None	--	0.00734 U	--	--	--	--	0.00734 U	--
Benzo(a)anthracene	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0420 U	0.0117 UJ	0.0410 U	0.0380 U	0.0410 U	0.0420 U	0.0117 UJ	0.0380 U
Benzo(b)fluoranthene	None	None	None	None	0.0420 U	--	0.0410 U	0.0380 U	0.0410 U	0.0420 U	--	0.0380 U
Benzo(g,h,i)perylene	None	None	None	None	0.0420 U	--	0.0410 U	0.0380 U	0.0410 U	0.0420 U	--	0.0380 U
Benzo(k)fluoranthene	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1651A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1651	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676
Field Sample ID:					220204H3IT03-1	220112-H3-ZT05	220112-H3-ZT07	220204H3IT04	220204H3IT04-1
Sample Date:					2022-02-04	2022-01-12	2022-01-12	2022-02-04	2022-02-04
Sample Type:					N	N	N	N	N
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13084**	**SDG: 5801100291**	**SDG: 5801100291**
1,4-Dichlorobenzene	5	5	75	None	0.0410 U	0.0420 U	--	0.0380 U	0.0410 U
1-Methylnaphthalene	2.1	10	None	None	--	--	0.00801 U	--	--
2,4,5-Trichlorophenol	None	None	None	None	0.100 U	--	--	--	0.100 U
2,4,6-Trichlorophenol	None	None	None	None	0.100 U	--	--	--	0.100 U
2,4-Dichlorophenol	None	None	None	None	0.200 U	--	--	--	0.200 U
2,4-Dimethylphenol	None	None	None	None	0.160 U	--	--	--	0.160 U
2,4-Dinitrophenol	None	None	None	None	1.60 U	--	--	--	1.60 U
2,4-Dinitrotoluene	None	None	None	None	0.100 U	0.100 U	--	0.0950 U	0.100 U
2,6-Dinitrotoluene	None	None	None	None	0.100 U	0.100 U	--	0.0950 U	0.100 U
2-Chloronaphthalene	None	None	None	None	0.0710 U	0.0730 U	--	0.0670 U	0.0710 U
2-Chlorophenol	None	None	None	None	0.0510 U	--	--	--	0.0510 U
2-Ethylhexyl adipate	None	None	None	None	--	--	5.00 U	--	--
2-Methylnaphthalene	4.7	10	None	None	--	--	0.00904 U	--	--
2-Methylphenol (o-Cresol)	None	None	None	None	0.0510 U	--	--	--	0.0510 U
2-Nitroaniline	None	None	None	None	0.100 U	0.100 U	--	0.0950 U	0.100 U
3,3'-Dichlorobenzidine	None	None	None	None	0.260 U	0.270 U	--	0.250 U	0.260 U
3-Nitroaniline	None	None	None	None	0.160 U	0.170 U	--	0.150 U	0.160 U
4,6-Dinitro-2-methylphenol	None	None	None	None	0.560 U	--	--	--	0.560 U
4-Bromophenyl phenyl ether	None	None	None	None	0.0610 U	0.0630 U	--	0.0570 U	0.0610 U
4-Chloro-3-methylphenol	None	None	None	None	0.130 U	--	--	--	0.130 U
4-Chloroaniline	None	None	None	None	0.600 U	0.620 U	--	0.560 U	0.600 U
4-Chlorophenyl phenyl ether	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
4-Nitroaniline	None	None	None	None	0.210 U	0.220 U	--	0.200 U	0.210 U
4-Nitrophenol	None	None	None	None	1.70 U	--	--	--	1.70 U
Acenaphthene	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
Acenaphthylene	None	None	None	None	0.0610 U	0.0630 U	--	0.0570 U	0.0610 U
Alachlor	None	None	None	None	--	--	0.0110 U	--	--
Anthracene	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
Atrazine	None	None	None	None	--	--	0.00734 U	--	--
Benzo(a)anthracene	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0410 U	0.0420 U	0.0117 UJ	0.0380 U	0.0410 U
Benzo(b)fluoranthene	None	None	None	None	0.0410 U	0.0420 U	--	0.0380 U	0.0410 U
Benzo(g,h,i)perylene	None	None	None	None	0.0410 U	0.0420 U	--	0.0380 U	0.0410 U
Benzo(k)fluoranthene	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1651A	H3-HYD1651A	H3-HYD1651A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1651	Hyrdrant 1651	Hyrdrant 1651
Field Sample ID:					220112-H3-ZT09	220112-H3-ZT11	220204H3IT01-1	220204H3IT02	220204H3IT02-1	220112-H3-ZT13	220112-H3-ZT15	220204H3IT03
Sample Date:					2022-01-12	2022-01-12	2022-02-04	2022-02-04	2022-02-04	2022-01-12	2022-01-12	2022-02-04
Sample Type:					N	N	N	N	N	N	N	N
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**
Benzyl butyl phthalate	None	None	None	None	0.280 U	--	0.280 U	0.260 U	0.270 U	0.280 U	--	0.260 U
Bis(2-chloroethoxy)methane	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
Bis(2-chloroethyl) ether (2-Chloroethyl ether)	None	None	None	None	0.0310 U	--	0.0310 U	0.0290 U	0.0300 U	0.0310 U	--	0.0290 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.770 U	0.437 U	0.750 U	0.700 U	0.750 U	0.770 U	0.437 U	0.710 U
Carbazole	None	None	None	None	0.100 U	--	0.100 U	0.0950 U	0.100 U	0.100 U	--	0.0960 U
Chlordane	None	None	None	None	--	0.0669 U	--	--	--	--	0.0669 U	--
Chrysene	None	None	None	None	0.0420 U	--	0.0410 U	0.0380 U	0.0410 U	0.0420 U	--	0.0380 U
Cresols, m- & p-	None	None	None	None	--	--	0.100 U	--	0.100 U	--	--	--
Dibenz(a,h)anthracene	None	None	None	None	0.0730 U	--	0.0710 U	0.0670 U	0.0710 U	0.0730 U	--	0.0670 U
Dibenzofuran	None	None	None	None	0.100 U	--	0.100 U	0.0950 U	0.100 U	0.100 U	--	0.0960 U
Diethyl phthalate	None	None	None	None	0.160 U	--	0.150 U	0.140 U	0.150 U	0.160 U	--	0.140 U
Dimethyl phthalate	None	None	None	None	0.0630 U	--	0.0610 U	0.0570 U	0.0610 U	0.0630 U	--	0.0570 U
Di-n-butyl phthalate	None	None	None	None	0.200 U	--	0.190 U	0.180 U	0.190 U	0.200 U	--	0.180 U
di-n-Octyl phthalate	None	None	None	None	0.140 U	--	0.130 U	**0.220 J**	0.130 U	0.140 U	--	0.120 U
Endrin	None	None	None	None	--	0.00991 U	--	--	--	--	0.00991 U	--
Fluoranthene	None	None	None	None	0.0630 U	--	0.0610 U	0.0570 U	0.0610 U	0.0630 U	--	0.0570 U
Fluorene	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
gamma-BHC (Lindane)	None	None	None	None	--	0.00633 U	--	--	--	--	0.00633 U	--
Heptachlor	None	None	None	None	--	0.00965 U	--	--	--	--	0.00965 U	--
Heptachlor epoxide	None	None	None	None	--	0.0122 U	--	--	--	--	0.0122 U	--
Hexachlorobenzene	0.0003	0.0003	1	1	0.0420 U	0.0980 U	0.0410 U	0.0380 U	0.0410 U	0.0420 U	0.0980 U	0.0380 U
Hexachlorobutadiene	None	None	None	None	0.0630 U	--	0.0610 U	0.0570 U	0.0610 U	0.0630 U	--	0.0570 U
Hexachlorocyclopentadiene	50	None	50	50	0.150 UJ	0.00594 U	0.140 U	0.130 U	0.140 U	0.150 UJ	0.00594 U	0.130 U
Hexachloroethane	None	None	None	None	0.0520 U	--	0.0510 U	0.0480 U	0.0510 U	0.0520 U	--	0.0480 U
Indeno(1,2,3-c,d)pyrene	None	None	None	None	0.140 U	--	0.130 U	0.120 U	0.130 U	0.140 U	--	0.120 U
Isophorone	None	None	None	None	0.100 U	--	0.100 U	0.0950 U	0.100 U	0.100 U	--	0.0960 U
Methoxychlor	None	None	None	None	--	0.00863 U	--	--	--	--	0.00863 U	--
Naphthalene	12	17	None	None	0.170 U	0.0103 U	0.160 U	0.150 U	0.160 U	0.170 U	0.0103 U	0.150 U
Nitrobenzene	None	None	None	None	0.0420 U	--	0.0410 U	0.0380 U	0.0410 U	0.0420 U	--	**0.0420 J**
N-Nitrosodi-n-propylamine	None	None	None	None	0.0630 UJ	--	0.0610 UJ	0.0570 UJ	0.0610 UJ	0.0630 UJ	--	0.0570 UJ
N-Nitrosodiphenylamine	None	None	None	None	0.0730 U	--	0.0710 U	0.0670 U	0.0710 U	0.0730 U	--	0.0670 U
PCB, Total	None	None	None	None	--	0.100 U	--	--	--	--	0.100 U	--
PCB-1016 (Aroclor 1016)	None	None	None	None	--	0.0157 U	--	--	--	--	0.0157 U	--
PCB-1221 (Aroclor 1221)	None	None	None	None	--	0.0436 U	--	--	--	--	0.0436 U	--

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1651A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1651	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676
Field Sample ID:					220204H3IT03-1	220112-H3-ZT05	220112-H3-ZT07	220204H3IT04	220204H3IT04-1
Sample Date:					2022-02-04	2022-01-12	2022-01-12	2022-02-04	2022-02-04
Sample Type:					N	N	N	N	N
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13084**	**SDG: 5801100291**	**SDG: 5801100291**
Benzyl butyl phthalate	None	None	None	None	0.270 U	**1.00 J**	--	**1.30 J**	**1.10 J**
Bis(2-chloroethoxy)methane	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
Bis(2-chloroethyl) ether (2-Chloroethyl ether)	None	None	None	None	0.0300 U	0.0310 U	--	0.0290 U	0.0310 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.750 U	0.770 U	0.437 U	0.700 U	0.750 U
Carbazole	None	None	None	None	0.100 U	0.100 U	--	0.0950 U	0.100 U
Chlordane	None	None	None	None	--	--	0.0669 U	--	--
Chrysene	None	None	None	None	0.0410 U	0.0420 U	--	0.0380 U	0.0410 U
Cresols, m- & p-	None	None	None	None	0.100 U	--	--	--	0.100 U
Dibenz(a,h)anthracene	None	None	None	None	0.0710 U	0.0730 U	--	0.0670 U	0.0710 U
Dibenzofuran	None	None	None	None	0.100 U	0.100 U	--	0.0950 U	0.100 U
Diethyl phthalate	None	None	None	None	0.150 U	0.160 U	--	0.140 U	0.150 U
Dimethyl phthalate	None	None	None	None	0.0610 U	0.0630 U	--	0.0570 U	0.0610 U
Di-n-butyl phthalate	None	None	None	None	0.190 U	0.200 U	--	0.180 U	0.190 U
di-n-Octyl phthalate	None	None	None	None	**0.160 J**	0.140 U	--	0.120 U	0.130 U
Endrin	None	None	None	None	--	--	0.00991 U	--	--
Fluoranthene	None	None	None	None	0.0610 U	0.0630 U	--	0.0570 U	0.0610 U
Fluorene	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
gamma-BHC (Lindane)	None	None	None	None	--	--	0.00633 U	--	--
Heptachlor	None	None	None	None	--	--	0.00965 U	--	--
Heptachlor epoxide	None	None	None	None	--	--	0.0122 U	--	--
Hexachlorobenzene	0.0003	0.0003	1	1	0.0410 U	0.0420 U	0.0980 U	0.0380 U	0.0410 U
Hexachlorobutadiene	None	None	None	None	0.0610 U	0.0630 U	--	0.0570 U	0.0610 U
Hexachlorocyclopentadiene	50	None	50	50	0.140 U	0.150 UJ	0.00594 U	0.130 U	0.140 U
Hexachloroethane	None	None	None	None	0.0510 U	0.0520 U	--	0.0480 U	0.0510 U
Indeno(1,2,3-c,d)pyrene	None	None	None	None	0.130 U	0.140 U	--	0.120 U	0.130 U
Isophorone	None	None	None	None	0.100 U	0.100 U	--	0.0950 U	0.100 U
Methoxychlor	None	None	None	None	--	--	0.00863 U	--	--
Naphthalene	12	17	None	None	0.160 U	0.170 U	0.0103 U	0.150 U	0.160 U
Nitrobenzene	None	None	None	None	0.0410 U	0.0420 U	--	0.0380 U	0.0410 U
N-Nitrosodi-n-propylamine	None	None	None	None	0.0610 UJ	0.0630 UJ	--	0.0570 UJ	0.0610 UJ
N-Nitrosodiphenylamine	None	None	None	None	0.0710 U	0.0730 U	--	0.0670 U	0.0710 U
PCB, Total	None	None	None	None	--	--	0.100 U	--	--
PCB-1016 (Aroclor 1016)	None	None	None	None	--	--	0.0157 U	--	--
PCB-1221 (Aroclor 1221)	None	None	None	None	--	--	0.0436 U	--	--

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1651A	H3-HYD1651A	H3-HYD1651A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1651	Hyrdrant 1651	Hyrdrant 1651
Field Sample ID:					220112-H3-ZT09	220112-H3-ZT11	220204H3IT01-1	220204H3IT02	220204H3IT02-1	220112-H3-ZT13	220112-H3-ZT15	220204H3IT03
Sample Date:					2022-01-12	2022-01-12	2022-02-04	2022-02-04	2022-02-04	2022-01-12	2022-01-12	2022-02-04
Sample Type:					N	N	N	N	N	N	N	N
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13026**	**SDG: 5801100291**
PCB-1232 (Aroclor 1232)	None	None	None	None	--	0.0102 U	--	--	--	--	0.0102 U	--
PCB-1242 (Aroclor 1242)	None	None	None	None	--	0.0737 U	--	--	--	--	0.0737 U	--
PCB-1248 (Aroclor 1248)	None	None	None	None	--	0.0941 U	--	--	--	--	0.0941 U	--
PCB-1254 (Aroclor 1254)	None	None	None	None	--	0.0869 U	--	--	--	--	0.0869 U	--
PCB-1260 (Aroclor 1260)	None	None	None	None	--	0.0379 U	--	--	--	--	0.0379 U	--
Pentachlorophenol	None	None	None	None	--	0.0242 U	0.520 U	--	0.520 U	--	0.0242 U	--
Phenanthrene	None	None	None	None	0.130 U	--	0.120 U	0.110 U	0.120 U	0.130 U	--	0.110 U
Phenol	None	None	None	None	--	--	0.370 UJ	--	0.370 UJ	--	--	--
Pyrene	None	None	None	None	0.0420 U	--	0.0410 U	0.0380 U	0.0410 U	0.0420 U	--	0.0380 U
Simazine	None	None	None	None	--	0.00734 U	--	--	--	--	0.00734 U	--
VOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**		**SDG: 2A13026**					**SDG: 2A13026**	
1,1,1-Trichloroethane	11	11	200	200	--	0.256 U	--	--	--	--	0.256 U	--
1,1,2-Trichloroethane	5	5	3	5	--	0.190 U	--	--	--	--	0.190 U	--
1,1-Dichloroethene	7	7	7	7	--	0.160 U	--	--	--	--	0.160 U	--
1,2,4-Trichlorobenzene	70	70	70	70	--	0.170 U	--	--	--	--	0.170 U	--
1,2-Dichlorobenzene	10	10	600	600	--	0.190 U	--	--	--	--	0.190 U	--
1,2-Dichloroethane	5	5	5	5	--	0.243 U	--	--	--	--	0.243 U	--
1,2-Dichloropropane	5	5	5	5	--	0.130 U	--	--	--	--	0.130 U	--
1,4-Dichlorobenzene	5	5	75	None	--	0.180 U	--	--	--	--	0.180 U	--
Benzene	5	5	5	5	--	0.150 U	--	--	--	--	0.150 U	--
Carbon Tetrachloride	5	5	5	5	--	0.270 U	--	--	--	--	0.270 U	--
Chlorobenzene	25	25	100	100	--	0.150 U	--	--	--	--	0.150 U	--
cis-1,2-Dichloroethene	70	70	70	70	--	0.250 U	--	--	--	--	0.250 U	--
Ethylbenzene	700	7.3	700	700	--	0.210 U	--	--	--	--	0.210 U	--
m,p-Xylene	10000	13	None	None	--	0.330 U	--	--	--	--	0.330 U	--
Methylene chloride	5	5	5	5	--	0.303 U	--	--	--	--	0.303 U	--
o-Xylene	10000	13	None	None	--	0.200 U	--	--	--	--	0.200 U	--
Styrene	10	10	100	100	--	0.190 U	--	--	--	--	0.190 U	--
Tetrachloroethene (PCE)	5	5	5	5	--	0.180 U	--	--	--	--	0.180 U	--
Toluene	1000	9.8	1000	1000	--	0.294 U	--	--	--	--	0.294 U	--
trans-1,2-Dichloroethene	100	100	100	100	--	0.259 U	--	--	--	--	0.259 U	--

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1651A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1651	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676
Field Sample ID:					220204H3IT03-1	220112-H3-ZT05	220112-H3-ZT07	220204H3IT04	220204H3IT04-1
Sample Date:					2022-02-04	2022-01-12	2022-01-12	2022-02-04	2022-02-04
Sample Type:					N	N	N	N	N
SVOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: 5801100291**	**SDG: 5801092891_Rev1**	**SDG: 2A13084**	**SDG: 5801100291**	**SDG: 5801100291**
PCB-1232 (Aroclor 1232)	None	None	None	None	--	--	0.0102 U	--	--
PCB-1242 (Aroclor 1242)	None	None	None	None	--	--	0.0737 U	--	--
PCB-1248 (Aroclor 1248)	None	None	None	None	--	--	0.0941 U	--	--
PCB-1254 (Aroclor 1254)	None	None	None	None	--	--	0.0869 U	--	--
PCB-1260 (Aroclor 1260)	None	None	None	None	--	--	0.0379 U	--	--
Pentachlorophenol	None	None	None	None	0.520 U	--	0.0242 UJ	--	0.520 U
Phenanthrene	None	None	None	None	0.120 U	0.130 U	--	0.110 U	0.120 U
Phenol	None	None	None	None	0.370 UJ	--	--	--	0.370 UJ
Pyrene	None	None	None	None	0.0410 U	0.0420 U	--	0.0380 U	0.0410 U
Simazine	None	None	None	None	--	--	0.00734 U	--	--
VOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**			**SDG: 2A13084**		
1,1,1-Trichloroethane	11	11	200	200	--	--	0.256 U	--	--
1,1,2-Trichloroethane	5	5	3	5	--	--	0.190 U	--	--
1,1-Dichloroethene	7	7	7	7	--	--	0.160 U	--	--
1,2,4-Trichlorobenzene	70	70	70	70	--	--	0.170 U	--	--
1,2-Dichlorobenzene	10	10	600	600	--	--	0.190 U	--	--
1,2-Dichloroethane	5	5	5	5	--	--	0.243 U	--	--
1,2-Dichloropropane	5	5	5	5	--	--	0.130 U	--	--
1,4-Dichlorobenzene	5	5	75	None	--	--	0.180 U	--	--
Benzene	5	5	5	5	--	--	0.150 U	--	--
Carbon Tetrachloride	5	5	5	5	--	--	0.270 U	--	--
Chlorobenzene	25	25	100	100	--	--	0.150 U	--	--
cis-1,2-Dichloroethene	70	70	70	70	--	--	0.250 U	--	--
Ethylbenzene	700	7.3	700	700	--	--	0.210 U	--	--
m,p-Xylene	10000	13	None	None	--	--	0.330 U	--	--
Methylene chloride	5	5	5	5	--	--	0.303 U	--	--
o-Xylene	10000	13	None	None	--	--	0.200 U	--	--
Styrene	10	10	100	100	--	--	0.190 U	--	--
Tetrachloroethene (PCE)	5	5	5	5	--	--	0.180 U	--	--
Toluene	1000	9.8	1000	1000	--	--	0.294 U	--	--
trans-1,2-Dichloroethene	100	100	100	100	--	--	0.259 U	--	--

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1641A	H3-HYD1651A	H3-HYD1651A	H3-HYD1651A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1641	Hyrdrant 1651	Hyrdrant 1651	Hyrdrant 1651
Field Sample ID:					220112-H3-ZT09	220112-H3-ZT11	220204H3IT01-1	220204H3IT02	220204H3IT02-1	220112-H3-ZT13	220112-H3-ZT15	220204H3IT03
Sample Date:					2022-01-12	2022-01-12	2022-02-04	2022-02-04	2022-02-04	2022-01-12	2022-01-12	2022-02-04
Sample Type:					N	N	N	N	N	N	N	N
VOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**		**SDG: 2A13026**					**SDG: 2A13026**	
Trichloroethene (TCE)	5	5	5	5	--	0.180 U	--	--	--	--	0.180 U	--
Vinyl chloride	2	2	2	2	--	0.180 U	--	--	--	--	0.180 U	--

Notes:

-- indicates that the sample was Not Analyzed for the analyte

Results highlighted yellow exceed the ISP
Results in purple font also exceed the EALs
Results in green font also exceed the DOH MCL
Results in blue font also exceed the EPA MCL

µg/L = Micrograms per Liter

H3 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-HYD1651A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A	H3-HYD1676A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1651	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676	Hyrdrant 1676
Field Sample ID:					220204H3IT03-1	220112-H3-ZT05	220112-H3-ZT07	220204H3IT04	220204H3IT04-1
Sample Date:					2022-02-04	2022-01-12	2022-01-12	2022-02-04	2022-02-04
Sample Type:					N	N	N	N	N
VOC (µg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**			**SDG: 2A13084**		
Trichloroethene (TCE)	5	5	5	5	--	--	0.180 U	--	--
Vinyl chloride	2	2	2	2	--	--	0.180 U	--	--

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Seattle
5755 8th Street East
Tacoma, WA 98424
Tel: (253)922-2310

Laboratory Job ID: 580-109289-1
Client Project/Site: Red Hill Drinking Water
Revision: 1

For:
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813

Attn: Margie F Pascua

M. Elaine Walker

Authorized for release by:
2/8/2022 5:48:00 PM

Elaine Walker, Project Manager II
(253)248-4972
m.elaine.walker@eurofinset.com

Table of Contents

Case Narrative

Client: AECOM
Project/Site: Red Hill Drinking Water

Job ID: 580-109289-1

Job ID: 580-109289-1

Laboratory: Eurofins Seattle

Narrative

02/07/2022: The report has been revised to report the 8270E analyte Bis(2-chloroethyl)ether as ND after further review of the data. Samples were initially reported to contain Bis(2-chloroethyl)ether above the reporting limit. Upon further review, these results do contain ions 93 and 95 in adequate ratios and at a satisfactory retention time; however, the results do not contain ion 63 at an adequate ratio, nor does the overall fragmentation pattern match that of Bis(2-chloroethyl)ether. Therefore, these detections have been identified as false positives and the status of Bis(2-chloroethyl)ether has been revised as non-detect.

Job Narrative
580-109289-1

Comments
No additional comments.

Receipt
The samples were received on 1/14/2022 12:15 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperatures of the 3 coolers at receipt time were 0.9º C, 1.0º C and 1.4º C.

GC/MS VOA
Method 8260D: The continuing calibration verification (CCV) associated with batch 580-378374 recovered above the upper control limit for Chloromethane, Vinyl chloride, Bromomethane, Ethyl Chloride and 1,1-Dichloroethene. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated samples are impacted: 220112-H3-ZT13 (580-109289-1), 220112-H3-ZT14 (580-109289-2), 220112-H3-ZT09 (580-109289-3), 220112-H3-ZT10 (580-109289-4), 220112-H3-ZT05 (580-109289-5), 220112-H3-ZT06 (580-109289-6) and (CCVIS 580-378374/3).

Method 8260D: The laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for analytical batch 580-378374 recovered outside control limits for the following analytes: Chloromethane, Vinyl chloride and Bromomethane. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Method 8260D: Surrogate Toluene-d8 (Surr) recovery for the following samples was outside control limits: 220112-H3-ZT13 (580-109289-1), 220112-H3-ZT09 (580-109289-3) and 220112-H3-ZT05 (580-109289-5). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC/MS Semi VOA
Method 8270E: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 580-378439 and analytical batch 580-378445 recovered outside control limits for the following analytes: 3,3'-Dichlorobenzidine. The individual recoveries of both the LCS and LCSD met the acceptance criteria.

Method 8270E: Surrogates 2-Fluorophenol (Surr), Phenol-d5 (Surr) and 2,4,6-Tribromophenol recovery for the following samples was outside control limits: 220112-H3-ZT13 (580-109289-1), 220112-H3-ZT09 (580-109289-3) and 220112-H3-ZT05 (580-109289-5). Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Method 8270E: The minimum response factor (RF) criteria for the continuing calibration verification (CCV) analyzed in batch 580-378445 was outside criteria for the following analytes: N-Nitrosodi-n-propylamine. As indicated in the reference method, sample analysis may proceed; however, any detection or non-detection for the affected analytes is considered estimated.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Methods 3510C, CWA_Prep: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-378338.Laboratory control sample/laboratory control sample duplicate were created and substituted for MS/MSD/DUP.

Job ID: 580-109289-1 (Continued)

Laboratory: Eurofins Seattle (Continued)

Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-378439, so a laboratory control sample/laboratory control sample duplicate were created and substituted for the MS/MSD/DUP.

Method 3510C: The following sample formed emulsions during the base phase of the extraction procedure: 220112-H3-ZT05 (580-109289-5). The emulsions were broken up using additional sodium sulfate filtration and methylene chloride rinses.

Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with preparation batch 580-378340. Laboratory control sample/laboratory control sample duplicate were created and substituted for MS/MSD/DUP.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

VOA Prep
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Definitions/Glossary

Client: AECOM
Job ID: 580-109289-1
Project/Site: Red Hill Drinking Water

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

GC/MS Semi VOA

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
S1-	Surrogate recovery exceeds control limits, low biased.
S1+	Surrogate recovery exceeds control limits, high biased.
U	Indicates the analyte was analyzed for but not detected.

GC Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Client Sample ID: 220112-H3-ZT13

Date Collected: 01/12/22 19:00
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-1

Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31	U	100	31	ug/L			01/14/22 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*78 - 120*		*01/14/22 21:40*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.2	U	15	3.2	ug/L			01/14/22 21:40	1
Benzene	0.24	U	1.0	0.24	ug/L			01/14/22 21:40	1
Bromodichloromethane	0.29	U	1.0	0.29	ug/L			01/14/22 21:40	1
Bromoform	0.51	U	1.0	0.51	ug/L			01/14/22 21:40	1
Bromomethane	0.21	U *+	1.0	0.21	ug/L			01/14/22 21:40	1
Carbon disulfide	0.53	U	1.0	0.53	ug/L			01/14/22 21:40	1
Carbon tetrachloride	0.30	U	1.0	0.30	ug/L			01/14/22 21:40	1
Chlorobenzene	0.44	U	1.0	0.44	ug/L			01/14/22 21:40	1
Chloroform	0.26	U	1.0	0.26	ug/L			01/14/22 21:40	1
Chloromethane	0.28	U *+	1.0	0.28	ug/L			01/14/22 21:40	1
cis-1,2-Dichloroethene	0.35	U	1.0	0.35	ug/L			01/14/22 21:40	1
cis-1,3-Dichloropropene	0.20	U	1.0	0.20	ug/L			01/14/22 21:40	1
Dibromochloromethane	0.43	U	1.0	0.43	ug/L			01/14/22 21:40	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/14/22 21:40	1
1,2-Dichloroethane	0.42	U	1.0	0.42	ug/L			01/14/22 21:40	1
1,1-Dichloroethene	0.28	U	1.0	0.28	ug/L			01/14/22 21:40	1
1,2-Dichloroethene, Total	0.39	U	1.0	0.39	ug/L			01/14/22 21:40	1
Dichloromethane	1.4	U	3.0	1.4	ug/L			01/14/22 21:40	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/14/22 21:40	1
Ethylbenzene	0.50	U	1.0	0.50	ug/L			01/14/22 21:40	1
Ethyl Chloride	0.35	U	1.0	0.35	ug/L			01/14/22 21:40	1
2-Hexanone	4.0	U	15	4.0	ug/L			01/14/22 21:40	1
Methyl Ethyl Ketone	4.7	U	15	4.7	ug/L			01/14/22 21:40	1
Methyl isobutyl ketone (MIBK)	2.5	U	5.0	2.5	ug/L			01/14/22 21:40	1
m-Xylene & p-Xylene	0.53	U	2.0	0.53	ug/L			01/14/22 21:40	1
o-Xylene	0.39	U	1.0	0.39	ug/L			01/14/22 21:40	1
Styrene	0.53	U	1.0	0.53	ug/L			01/14/22 21:40	1
1,1,2,2-Tetrachloroethane	0.52	U	1.0	0.52	ug/L			01/14/22 21:40	1
Tetrachloroethene	0.41	U	1.0	0.41	ug/L			01/14/22 21:40	1
Toluene	0.39	U	1.0	0.39	ug/L			01/14/22 21:40	1
trans-1,2-Dichloroethene	0.39	U	1.0	0.39	ug/L			01/14/22 21:40	1
trans-1,3-Dichloropropene	0.41	U	1.0	0.41	ug/L			01/14/22 21:40	1
1,1,1-Trichloroethane	0.39	U	1.0	0.39	ug/L			01/14/22 21:40	1
1,1,2-Trichloroethane	0.24	U	1.0	0.24	ug/L			01/14/22 21:40	1
Trichloroethene	0.26	U	1.0	0.26	ug/L			01/14/22 21:40	1
Vinyl chloride	0.22	U *+	1.0	0.22	ug/L			01/14/22 21:40	1
Xylenes, Total	0.53	U	2.0	0.53	ug/L			01/14/22 21:40	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*		*01/14/22 21:40*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*01/14/22 21:40*	*1*
1,2-Dichloroethane-d4 (Surr)	*105*		*80 - 120*		*01/14/22 21:40*	*1*
Toluene-d8 (Surr)	*0.2*	*S1-*	*80 - 120*		*01/14/22 21:40*	*1*

Client Sample ID: 220112-H3-ZT13

Date Collected: 01/12/22 19:00
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-1

Matrix: Water

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.052	U	0.42	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Acenaphthylene	0.063	U	1.0	0.063	ug/L		01/15/22 13:28	01/15/22 19:13	1
Anthracene	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Benzo[a]anthracene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Benzo[a]pyrene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
Benzo[b]fluoranthene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
Benzo[g,h,i]perylene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
Benzo[k]fluoranthene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Bis(2-chloroethoxy)methane	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Bis(2-chloroethyl)ether	0.031	U	0.10	0.031	ug/L		01/15/22 13:28	01/15/22 19:13	1
Bis(2-ethylhexyl) phthalate	0.77	U	3.1	0.77	ug/L		01/15/22 13:28	01/15/22 19:13	1
4-Bromophenyl phenyl ether	0.063	U	0.63	0.063	ug/L		01/15/22 13:28	01/15/22 19:13	1
Butyl benzyl phthalate	0.28	U	4.2	0.28	ug/L		01/15/22 13:28	01/15/22 19:13	1
Carbazole	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
4-Chloroaniline	0.62	U	2.1	0.62	ug/L		01/15/22 13:28	01/15/22 19:13	1
4-Chloro-3-methylphenol	0.14	U	0.63	0.14	ug/L		01/15/22 13:28	01/15/22 19:13	1
2-Chloronaphthalene	0.073	U	1.0	0.073	ug/L		01/15/22 13:28	01/15/22 19:13	1
2-Chlorophenol	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
4-Chlorophenyl phenyl ether	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Chrysene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
Dibenz(a,h)anthracene	0.073	U	0.26	0.073	ug/L		01/15/22 13:28	01/15/22 19:13	1
Dibenzofuran	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
1,2-Dichlorobenzene	0.052	U	0.42	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
1,3-Dichlorobenzene	0.042	U	0.42	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
1,4-Dichlorobenzene	0.042	U	0.42	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
3,3'-Dichlorobenzidine	0.27	U *1	1.0	0.27	ug/L		01/15/22 13:28	01/15/22 19:13	1
2,4-Dichlorophenol	0.21	U	1.0	0.21	ug/L		01/15/22 13:28	01/15/22 19:13	1
Diethyl phthalate	0.16	U	1.0	0.16	ug/L		01/15/22 13:28	01/15/22 19:13	1
2,4-Dimethylphenol	0.17	U	4.2	0.17	ug/L		01/15/22 13:28	01/15/22 19:13	1
Dimethyl phthalate	0.063	U	0.63	0.063	ug/L		01/15/22 13:28	01/15/22 19:13	1
Di-n-butyl phthalate	0.20	U	3.1	0.20	ug/L		01/15/22 13:28	01/15/22 19:13	1
4,6-Dinitro-2-methylphenol	0.57	U	2.1	0.57	ug/L		01/15/22 13:28	01/15/22 19:13	1
2,4-Dinitrophenol	1.7	U	5.2	1.7	ug/L		01/15/22 13:28	01/15/22 19:13	1
2,4-Dinitrotoluene	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
2,6-Dinitrotoluene	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
Di-n-octyl phthalate	0.14	U	1.0	0.14	ug/L		01/15/22 13:28	01/15/22 19:13	1
Fluoranthene	0.063	U	0.26	0.063	ug/L		01/15/22 13:28	01/15/22 19:13	1
Fluorene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Hexachlorobenzene	0.042	U	0.63	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
Hexachlorobutadiene	0.063	U	1.0	0.063	ug/L		01/15/22 13:28	01/15/22 19:13	1
Hexachlorocyclopentadiene	0.15	U	1.0	0.15	ug/L		01/15/22 13:28	01/15/22 19:13	1
Hexachloroethane	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
Indeno[1,2,3-cd]pyrene	0.14	U	0.42	0.14	ug/L		01/15/22 13:28	01/15/22 19:13	1
Isophorone	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
2-Methylphenol	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:13	1
3 & 4 Methylphenol	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
Naphthalene	0.17	U	0.42	0.17	ug/L		01/15/22 13:28	01/15/22 19:13	1
2-Nitroaniline	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
3-Nitroaniline	0.17	U	3.1	0.17	ug/L		01/15/22 13:28	01/15/22 19:13	1

Client: AECOM
Project/Site: Red Hill Drinking Water

Job ID: 580-109289-1

Client Sample ID: 220112-H3-ZT13
Date Collected: 01/12/22 19:00
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-1
Matrix: Water

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Nitroaniline	0.22	U	2.1	0.22	ug/L		01/15/22 13:28	01/15/22 19:13	1
Nitrobenzene	0.042	U	1.0	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
4-Nitrophenol	1.8	U	10	1.8	ug/L		01/15/22 13:28	01/15/22 19:13	1
N-Nitrosodi-n-propylamine	0.063	U	0.42	0.063	ug/L		01/15/22 13:28	01/15/22 19:13	1
N-Nitrosodiphenylamine	0.073	U	1.0	0.073	ug/L		01/15/22 13:28	01/15/22 19:13	1
Pentachlorophenol	0.53	U	10	0.53	ug/L		01/15/22 13:28	01/15/22 19:13	1
Phenanthrene	0.13	U	1.0	0.13	ug/L		01/15/22 13:28	01/15/22 19:13	1
Phenol	0.38	U	1.0	0.38	ug/L		01/15/22 13:28	01/15/22 19:13	1
Pyrene	0.042	U	1.0	0.042	ug/L		01/15/22 13:28	01/15/22 19:13	1
1,2,4-Trichlorobenzene	0.094	U	0.42	0.094	ug/L		01/15/22 13:28	01/15/22 19:13	1
2,4,5-Trichlorophenol	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1
2,4,6-Trichlorophenol	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*40*		*35 - 120*	*01/15/22 13:28*	*01/15/22 19:13*	*1*
2-Fluorophenol (Surr)	*3*	*S1-*	*21 - 120*	*01/15/22 13:28*	*01/15/22 19:13*	*1*
Nitrobenzene-d5 (Surr)	*50*		*39 - 120*	*01/15/22 13:28*	*01/15/22 19:13*	*1*
Phenol-d5 (Surr)	*0.4*	*S1-*	*10 - 120*	*01/15/22 13:28*	*01/15/22 19:13*	*1*
Terphenyl-d14	*64*		*63 - 137*	*01/15/22 13:28*	*01/15/22 19:13*	*1*
2,4,6-Tribromophenol	*94*		*50 - 130*	*01/15/22 13:28*	*01/15/22 19:13*	*1*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C9-C25	**99**	**J**	110	88	ug/L		01/14/22 13:09	01/14/22 22:54	1
C24-C40	180	U	200	180	ug/L		01/14/22 13:09	01/14/22 22:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*71*		*53 - 120*	*01/14/22 13:09*	*01/14/22 22:54*	*1*

Client: AECOM
Project/Site: Red Hill Drinking Water

Job ID: 580-109289-1

Client Sample ID: 220112-H3-ZT14
Date Collected: 01/12/22 18:55
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-2
Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31	U	100	31	ug/L			01/14/22 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*78 - 120*		*01/14/22 22:04*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.2	U	15	3.2	ug/L			01/14/22 22:04	1
Benzene	0.24	U	1.0	0.24	ug/L			01/14/22 22:04	1
Bromodichloromethane	0.29	U	1.0	0.29	ug/L			01/14/22 22:04	1
Bromoform	0.51	U	1.0	0.51	ug/L			01/14/22 22:04	1
Bromomethane	0.21	U *+	1.0	0.21	ug/L			01/14/22 22:04	1
Carbon disulfide	0.53	U	1.0	0.53	ug/L			01/14/22 22:04	1
Carbon tetrachloride	0.30	U	1.0	0.30	ug/L			01/14/22 22:04	1
Chlorobenzene	0.44	U	1.0	0.44	ug/L			01/14/22 22:04	1
Chloroform	0.26	U	1.0	0.26	ug/L			01/14/22 22:04	1
Chloromethane	0.28	U *+	1.0	0.28	ug/L			01/14/22 22:04	1
cis-1,2-Dichloroethene	0.35	U	1.0	0.35	ug/L			01/14/22 22:04	1
cis-1,3-Dichloropropene	0.20	U	1.0	0.20	ug/L			01/14/22 22:04	1
Dibromochloromethane	0.43	U	1.0	0.43	ug/L			01/14/22 22:04	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/14/22 22:04	1
1,2-Dichloroethane	0.42	U	1.0	0.42	ug/L			01/14/22 22:04	1
1,1-Dichloroethene	0.28	U	1.0	0.28	ug/L			01/14/22 22:04	1
1,2-Dichloroethene, Total	0.39	U	1.0	0.39	ug/L			01/14/22 22:04	1
Dichloromethane	1.4	U	3.0	1.4	ug/L			01/14/22 22:04	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/14/22 22:04	1
Ethylbenzene	0.50	U	1.0	0.50	ug/L			01/14/22 22:04	1
Ethyl Chloride	0.35	U	1.0	0.35	ug/L			01/14/22 22:04	1
2-Hexanone	4.0	U	15	4.0	ug/L			01/14/22 22:04	1
Methyl Ethyl Ketone	4.7	U	15	4.7	ug/L			01/14/22 22:04	1
Methyl isobutyl ketone (MIBK)	2.5	U	5.0	2.5	ug/L			01/14/22 22:04	1
m-Xylene & p-Xylene	0.53	U	2.0	0.53	ug/L			01/14/22 22:04	1
o-Xylene	0.39	U	1.0	0.39	ug/L			01/14/22 22:04	1
Styrene	0.53	U	1.0	0.53	ug/L			01/14/22 22:04	1
1,1,2,2-Tetrachloroethane	0.52	U	1.0	0.52	ug/L			01/14/22 22:04	1
Tetrachloroethene	0.41	U	1.0	0.41	ug/L			01/14/22 22:04	1
Toluene	0.39	U	1.0	0.39	ug/L			01/14/22 22:04	1
trans-1,2-Dichloroethene	0.39	U	1.0	0.39	ug/L			01/14/22 22:04	1
trans-1,3-Dichloropropene	0.41	U	1.0	0.41	ug/L			01/14/22 22:04	1
1,1,1-Trichloroethane	0.39	U	1.0	0.39	ug/L			01/14/22 22:04	1
1,1,2-Trichloroethane	0.24	U	1.0	0.24	ug/L			01/14/22 22:04	1
Trichloroethene	0.26	U	1.0	0.26	ug/L			01/14/22 22:04	1
Vinyl chloride	0.22	U *+	1.0	0.22	ug/L			01/14/22 22:04	1
Xylenes, Total	0.53	U	2.0	0.53	ug/L			01/14/22 22:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*80 - 120*		*01/14/22 22:04*	*1*
Dibromofluoromethane (Surr)	*105*		*80 - 120*		*01/14/22 22:04*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*01/14/22 22:04*	*1*
Toluene-d8 (Surr)	*95*		*80 - 120*		*01/14/22 22:04*	*1*

Client Sample ID: 220112-H3-ZT09

Date Collected: 01/12/22 17:00
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-3

Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31	U	100	31	ug/L			01/14/22 22:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*78 - 120*		*01/14/22 22:28*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.2	U	15	3.2	ug/L			01/14/22 22:28	1
Benzene	0.24	U	1.0	0.24	ug/L			01/14/22 22:28	1
Bromodichloromethane	0.29	U	1.0	0.29	ug/L			01/14/22 22:28	1
Bromoform	0.51	U	1.0	0.51	ug/L			01/14/22 22:28	1
Bromomethane	0.21	U *+	1.0	0.21	ug/L			01/14/22 22:28	1
Carbon disulfide	0.53	U	1.0	0.53	ug/L			01/14/22 22:28	1
Carbon tetrachloride	0.30	U	1.0	0.30	ug/L			01/14/22 22:28	1
Chlorobenzene	0.44	U	1.0	0.44	ug/L			01/14/22 22:28	1
Chloroform	0.26	U	1.0	0.26	ug/L			01/14/22 22:28	1
Chloromethane	0.28	U *+	1.0	0.28	ug/L			01/14/22 22:28	1
cis-1,2-Dichloroethene	0.35	U	1.0	0.35	ug/L			01/14/22 22:28	1
cis-1,3-Dichloropropene	0.20	U	1.0	0.20	ug/L			01/14/22 22:28	1
Dibromochloromethane	0.43	U	1.0	0.43	ug/L			01/14/22 22:28	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/14/22 22:28	1
1,2-Dichloroethane	0.42	U	1.0	0.42	ug/L			01/14/22 22:28	1
1,1-Dichloroethene	0.28	U	1.0	0.28	ug/L			01/14/22 22:28	1
1,2-Dichloroethene, Total	0.39	U	1.0	0.39	ug/L			01/14/22 22:28	1
Dichloromethane	1.4	U	3.0	1.4	ug/L			01/14/22 22:28	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/14/22 22:28	1
Ethylbenzene	0.50	U	1.0	0.50	ug/L			01/14/22 22:28	1
Ethyl Chloride	0.35	U	1.0	0.35	ug/L			01/14/22 22:28	1
2-Hexanone	4.0	U	15	4.0	ug/L			01/14/22 22:28	1
Methyl Ethyl Ketone	4.7	U	15	4.7	ug/L			01/14/22 22:28	1
Methyl isobutyl ketone (MIBK)	2.5	U	5.0	2.5	ug/L			01/14/22 22:28	1
m-Xylene & p-Xylene	0.53	U	2.0	0.53	ug/L			01/14/22 22:28	1
o-Xylene	0.39	U	1.0	0.39	ug/L			01/14/22 22:28	1
Styrene	0.53	U	1.0	0.53	ug/L			01/14/22 22:28	1
1,1,2,2-Tetrachloroethane	0.52	U	1.0	0.52	ug/L			01/14/22 22:28	1
Tetrachloroethene	0.41	U	1.0	0.41	ug/L			01/14/22 22:28	1
Toluene	0.39	U	1.0	0.39	ug/L			01/14/22 22:28	1
trans-1,2-Dichloroethene	0.39	U	1.0	0.39	ug/L			01/14/22 22:28	1
trans-1,3-Dichloropropene	0.41	U	1.0	0.41	ug/L			01/14/22 22:28	1
1,1,1-Trichloroethane	0.39	U	1.0	0.39	ug/L			01/14/22 22:28	1
1,1,2-Trichloroethane	0.24	U	1.0	0.24	ug/L			01/14/22 22:28	1
Trichloroethene	0.26	U	1.0	0.26	ug/L			01/14/22 22:28	1
Vinyl chloride	0.22	U *+	1.0	0.22	ug/L			01/14/22 22:28	1
Xylenes, Total	0.53	U	2.0	0.53	ug/L			01/14/22 22:28	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*94*		*80 - 120*		*01/14/22 22:28*	*1*
Dibromofluoromethane (Surr)	*109*		*80 - 120*		*01/14/22 22:28*	*1*
1,2-Dichloroethane-d4 (Surr)	*109*		*80 - 120*		*01/14/22 22:28*	*1*
Toluene-d8 (Surr)	*0.5*	*S1-*	*80 - 120*		*01/14/22 22:28*	*1*

Client Sample ID: 220112-H3-ZT09

Date Collected: 01/12/22 17:00
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-3

Matrix: Water

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.052	U	0.42	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Acenaphthylene	0.063	U	1.0	0.063	ug/L		01/15/22 13:28	01/15/22 19:36	1
Anthracene	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Benzo[a]anthracene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Benzo[a]pyrene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
Benzo[b]fluoranthene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
Benzo[g,h,i]perylene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
Benzo[k]fluoranthene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Bis(2-chloroethoxy)methane	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Bis(2-chloroethyl)ether	0.031	U	0.10	0.031	ug/L		01/15/22 13:28	01/15/22 19:36	1
Bis(2-ethylhexyl) phthalate	0.77	U	3.1	0.77	ug/L		01/15/22 13:28	01/15/22 19:36	1
4-Bromophenyl phenyl ether	0.063	U	0.63	0.063	ug/L		01/15/22 13:28	01/15/22 19:36	1
Butyl benzyl phthalate	0.28	U	4.2	0.28	ug/L		01/15/22 13:28	01/15/22 19:36	1
Carbazole	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
4-Chloroaniline	0.62	U	2.1	0.62	ug/L		01/15/22 13:28	01/15/22 19:36	1
4-Chloro-3-methylphenol	0.14	U	0.63	0.14	ug/L		01/15/22 13:28	01/15/22 19:36	1
2-Chloronaphthalene	0.073	U	1.0	0.073	ug/L		01/15/22 13:28	01/15/22 19:36	1
2-Chlorophenol	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
4-Chlorophenyl phenyl ether	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Chrysene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
Dibenz(a,h)anthracene	0.073	U	0.26	0.073	ug/L		01/15/22 13:28	01/15/22 19:36	1
Dibenzofuran	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
1,2-Dichlorobenzene	0.052	U	0.42	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
1,3-Dichlorobenzene	0.042	U	0.42	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
1,4-Dichlorobenzene	0.042	U	0.42	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
3,3'-Dichlorobenzidine	0.27	U *1	1.0	0.27	ug/L		01/15/22 13:28	01/15/22 19:36	1
2,4-Dichlorophenol	0.21	U	1.0	0.21	ug/L		01/15/22 13:28	01/15/22 19:36	1
Diethyl phthalate	0.16	U	1.0	0.16	ug/L		01/15/22 13:28	01/15/22 19:36	1
2,4-Dimethylphenol	0.17	U	4.2	0.17	ug/L		01/15/22 13:28	01/15/22 19:36	1
Dimethyl phthalate	0.063	U	0.63	0.063	ug/L		01/15/22 13:28	01/15/22 19:36	1
Di-n-butyl phthalate	0.20	U	3.1	0.20	ug/L		01/15/22 13:28	01/15/22 19:36	1
4,6-Dinitro-2-methylphenol	0.57	U	2.1	0.57	ug/L		01/15/22 13:28	01/15/22 19:36	1
2,4-Dinitrophenol	1.7	U	5.2	1.7	ug/L		01/15/22 13:28	01/15/22 19:36	1
2,4-Dinitrotoluene	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
2,6-Dinitrotoluene	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
Di-n-octyl phthalate	0.14	U	1.0	0.14	ug/L		01/15/22 13:28	01/15/22 19:36	1
Fluoranthene	0.063	U	0.26	0.063	ug/L		01/15/22 13:28	01/15/22 19:36	1
Fluorene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Hexachlorobenzene	0.042	U	0.63	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
Hexachlorobutadiene	0.063	U	1.0	0.063	ug/L		01/15/22 13:28	01/15/22 19:36	1
Hexachlorocyclopentadiene	0.15	U	1.0	0.15	ug/L		01/15/22 13:28	01/15/22 19:36	1
Hexachloroethane	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
Indeno[1,2,3-cd]pyrene	0.14	U	0.42	0.14	ug/L		01/15/22 13:28	01/15/22 19:36	1
Isophorone	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
2-Methylphenol	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:36	1
3 & 4 Methylphenol	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
Naphthalene	0.17	U	0.42	0.17	ug/L		01/15/22 13:28	01/15/22 19:36	1
2-Nitroaniline	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
3-Nitroaniline	0.17	U	3.1	0.17	ug/L		01/15/22 13:28	01/15/22 19:36	1

Client: AECOM
Project/Site: Red Hill Drinking Water

Job ID: 580-109289-1

Client Sample ID: 220112-H3-ZT09
Date Collected: 01/12/22 17:00
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-3
Matrix: Water

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Nitroaniline	0.22	U	2.1	0.22	ug/L		01/15/22 13:28	01/15/22 19:36	1
Nitrobenzene	0.042	U	1.0	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
4-Nitrophenol	1.8	U	10	1.8	ug/L		01/15/22 13:28	01/15/22 19:36	1
N-Nitrosodi-n-propylamine	0.063	U	0.42	0.063	ug/L		01/15/22 13:28	01/15/22 19:36	1
N-Nitrosodiphenylamine	0.073	U	1.0	0.073	ug/L		01/15/22 13:28	01/15/22 19:36	1
Pentachlorophenol	0.53	U	10	0.53	ug/L		01/15/22 13:28	01/15/22 19:36	1
Phenanthrene	0.13	U	1.0	0.13	ug/L		01/15/22 13:28	01/15/22 19:36	1
Phenol	0.38	U	1.0	0.38	ug/L		01/15/22 13:28	01/15/22 19:36	1
Pyrene	0.042	U	1.0	0.042	ug/L		01/15/22 13:28	01/15/22 19:36	1
1,2,4-Trichlorobenzene	0.094	U	0.42	0.094	ug/L		01/15/22 13:28	01/15/22 19:36	1
2,4,5-Trichlorophenol	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1
2,4,6-Trichlorophenol	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*68*		*35 - 120*	*01/15/22 13:28*	*01/15/22 19:36*	*1*
2-Fluorophenol (Surr)	*0*	*S1-*	*21 - 120*	*01/15/22 13:28*	*01/15/22 19:36*	*1*
Nitrobenzene-d5 (Surr)	*94*		*39 - 120*	*01/15/22 13:28*	*01/15/22 19:36*	*1*
Phenol-d5 (Surr)	*0.3*	*S1-*	*10 - 120*	*01/15/22 13:28*	*01/15/22 19:36*	*1*
Terphenyl-d14	*105*		*63 - 137*	*01/15/22 13:28*	*01/15/22 19:36*	*1*
2,4,6-Tribromophenol	*179*	*S1+*	*50 - 130*	*01/15/22 13:28*	*01/15/22 19:36*	*1*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C9-C25	90	U	110	90	ug/L		01/14/22 13:09	01/14/22 23:13	1
C24-C40	180	U	200	180	ug/L		01/14/22 13:09	01/14/22 23:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*76*		*53 - 120*	*01/14/22 13:09*	*01/14/22 23:13*	*1*

Client Sample ID: 220112-H3-ZT10

Date Collected: 01/12/22 16:55
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-4

Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31	U	100	31	ug/L			01/14/22 22:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*78 - 120*		*01/14/22 22:52*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.2	U	15	3.2	ug/L			01/14/22 22:52	1
Benzene	0.24	U	1.0	0.24	ug/L			01/14/22 22:52	1
Bromodichloromethane	0.29	U	1.0	0.29	ug/L			01/14/22 22:52	1
Bromoform	0.51	U	1.0	0.51	ug/L			01/14/22 22:52	1
Bromomethane	0.21	U *+	1.0	0.21	ug/L			01/14/22 22:52	1
Carbon disulfide	0.53	U	1.0	0.53	ug/L			01/14/22 22:52	1
Carbon tetrachloride	0.30	U	1.0	0.30	ug/L			01/14/22 22:52	1
Chlorobenzene	0.44	U	1.0	0.44	ug/L			01/14/22 22:52	1
Chloroform	0.26	U	1.0	0.26	ug/L			01/14/22 22:52	1
Chloromethane	0.28	U *+	1.0	0.28	ug/L			01/14/22 22:52	1
cis-1,2-Dichloroethene	0.35	U	1.0	0.35	ug/L			01/14/22 22:52	1
cis-1,3-Dichloropropene	0.20	U	1.0	0.20	ug/L			01/14/22 22:52	1
Dibromochloromethane	0.43	U	1.0	0.43	ug/L			01/14/22 22:52	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/14/22 22:52	1
1,2-Dichloroethane	0.42	U	1.0	0.42	ug/L			01/14/22 22:52	1
1,1-Dichloroethene	0.28	U	1.0	0.28	ug/L			01/14/22 22:52	1
1,2-Dichloroethene, Total	0.39	U	1.0	0.39	ug/L			01/14/22 22:52	1
Dichloromethane	1.4	U	3.0	1.4	ug/L			01/14/22 22:52	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/14/22 22:52	1
Ethylbenzene	0.50	U	1.0	0.50	ug/L			01/14/22 22:52	1
Ethyl Chloride	0.35	U	1.0	0.35	ug/L			01/14/22 22:52	1
2-Hexanone	4.0	U	15	4.0	ug/L			01/14/22 22:52	1
Methyl Ethyl Ketone	4.7	U	15	4.7	ug/L			01/14/22 22:52	1
Methyl isobutyl ketone (MIBK)	2.5	U	5.0	2.5	ug/L			01/14/22 22:52	1
m-Xylene & p-Xylene	0.53	U	2.0	0.53	ug/L			01/14/22 22:52	1
o-Xylene	0.39	U	1.0	0.39	ug/L			01/14/22 22:52	1
Styrene	0.53	U	1.0	0.53	ug/L			01/14/22 22:52	1
1,1,2,2-Tetrachloroethane	0.52	U	1.0	0.52	ug/L			01/14/22 22:52	1
Tetrachloroethene	0.41	U	1.0	0.41	ug/L			01/14/22 22:52	1
Toluene	0.39	U	1.0	0.39	ug/L			01/14/22 22:52	1
trans-1,2-Dichloroethene	0.39	U	1.0	0.39	ug/L			01/14/22 22:52	1
trans-1,3-Dichloropropene	0.41	U	1.0	0.41	ug/L			01/14/22 22:52	1
1,1,1-Trichloroethane	0.39	U	1.0	0.39	ug/L			01/14/22 22:52	1
1,1,2-Trichloroethane	0.24	U	1.0	0.24	ug/L			01/14/22 22:52	1
Trichloroethene	0.26	U	1.0	0.26	ug/L			01/14/22 22:52	1
Vinyl chloride	0.22	U *+	1.0	0.22	ug/L			01/14/22 22:52	1
Xylenes, Total	0.53	U	2.0	0.53	ug/L			01/14/22 22:52	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*91*		*80 - 120*		*01/14/22 22:52*	*1*
Dibromofluoromethane (Surr)	*106*		*80 - 120*		*01/14/22 22:52*	*1*
1,2-Dichloroethane-d4 (Surr)	*103*		*80 - 120*		*01/14/22 22:52*	*1*
Toluene-d8 (Surr)	*97*		*80 - 120*		*01/14/22 22:52*	*1*

Client Sample ID: 220112-H3-ZT05

Date Collected: 01/12/22 15:30
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-5

Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31	U	100	31	ug/L			01/14/22 23:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*78 - 120*		*01/14/22 23:15*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.2	U	15	3.2	ug/L			01/14/22 23:15	1
Benzene	0.24	U	1.0	0.24	ug/L			01/14/22 23:15	1
Bromodichloromethane	0.29	U	1.0	0.29	ug/L			01/14/22 23:15	1
Bromoform	0.51	U	1.0	0.51	ug/L			01/14/22 23:15	1
Bromomethane	0.21	U *+	1.0	0.21	ug/L			01/14/22 23:15	1
Carbon disulfide	0.53	U	1.0	0.53	ug/L			01/14/22 23:15	1
Carbon tetrachloride	0.30	U	1.0	0.30	ug/L			01/14/22 23:15	1
Chlorobenzene	0.44	U	1.0	0.44	ug/L			01/14/22 23:15	1
Chloroform	0.26	U	1.0	0.26	ug/L			01/14/22 23:15	1
Chloromethane	0.28	U *+	1.0	0.28	ug/L			01/14/22 23:15	1
cis-1,2-Dichloroethene	0.35	U	1.0	0.35	ug/L			01/14/22 23:15	1
cis-1,3-Dichloropropene	0.20	U	1.0	0.20	ug/L			01/14/22 23:15	1
Dibromochloromethane	0.43	U	1.0	0.43	ug/L			01/14/22 23:15	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/14/22 23:15	1
1,2-Dichloroethane	0.42	U	1.0	0.42	ug/L			01/14/22 23:15	1
1,1-Dichloroethene	0.28	U	1.0	0.28	ug/L			01/14/22 23:15	1
1,2-Dichloroethene, Total	0.39	U	1.0	0.39	ug/L			01/14/22 23:15	1
Dichloromethane	1.4	U	3.0	1.4	ug/L			01/14/22 23:15	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/14/22 23:15	1
Ethylbenzene	0.50	U	1.0	0.50	ug/L			01/14/22 23:15	1
Ethyl Chloride	0.35	U	1.0	0.35	ug/L			01/14/22 23:15	1
2-Hexanone	4.0	U	15	4.0	ug/L			01/14/22 23:15	1
Methyl Ethyl Ketone	4.7	U	15	4.7	ug/L			01/14/22 23:15	1
Methyl isobutyl ketone (MIBK)	2.5	U	5.0	2.5	ug/L			01/14/22 23:15	1
m-Xylene & p-Xylene	0.53	U	2.0	0.53	ug/L			01/14/22 23:15	1
o-Xylene	0.39	U	1.0	0.39	ug/L			01/14/22 23:15	1
Styrene	0.53	U	1.0	0.53	ug/L			01/14/22 23:15	1
1,1,2,2-Tetrachloroethane	0.52	U	1.0	0.52	ug/L			01/14/22 23:15	1
Tetrachloroethene	0.41	U	1.0	0.41	ug/L			01/14/22 23:15	1
Toluene	0.39	U	1.0	0.39	ug/L			01/14/22 23:15	1
trans-1,2-Dichloroethene	0.39	U	1.0	0.39	ug/L			01/14/22 23:15	1
trans-1,3-Dichloropropene	0.41	U	1.0	0.41	ug/L			01/14/22 23:15	1
1,1,1-Trichloroethane	0.39	U	1.0	0.39	ug/L			01/14/22 23:15	1
1,1,2-Trichloroethane	0.24	U	1.0	0.24	ug/L			01/14/22 23:15	1
Trichloroethene	0.26	U	1.0	0.26	ug/L			01/14/22 23:15	1
Vinyl chloride	0.22	U *+	1.0	0.22	ug/L			01/14/22 23:15	1
Xylenes, Total	0.53	U	2.0	0.53	ug/L			01/14/22 23:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*95*		*80 - 120*		*01/14/22 23:15*	*1*
Dibromofluoromethane (Surr)	*109*		*80 - 120*		*01/14/22 23:15*	*1*
1,2-Dichloroethane-d4 (Surr)	*109*		*80 - 120*		*01/14/22 23:15*	*1*
Toluene-d8 (Surr)	*0.6*	*S1-*	*80 - 120*		*01/14/22 23:15*	*1*

Client Sample ID: 220112-H3-ZT05

Date Collected: 01/12/22 15:30
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-5

Matrix: Water

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.052	U	0.42	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Acenaphthylene	0.063	U	1.0	0.063	ug/L		01/15/22 13:28	01/15/22 19:59	1
Anthracene	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Benzo[a]anthracene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Benzo[a]pyrene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
Benzo[b]fluoranthene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
Benzo[g,h,i]perylene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
Benzo[k]fluoranthene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Bis(2-chloroethoxy)methane	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Bis(2-chloroethyl)ether	0.031	U	0.10	0.031	ug/L		01/15/22 13:28	01/15/22 19:59	1
Bis(2-ethylhexyl) phthalate	0.77	U	3.1	0.77	ug/L		01/15/22 13:28	01/15/22 19:59	1
4-Bromophenyl phenyl ether	0.063	U	0.63	0.063	ug/L		01/15/22 13:28	01/15/22 19:59	1
Butyl benzyl phthalate	**1.0**	**J**	4.2	0.28	ug/L		01/15/22 13:28	01/15/22 19:59	1
Carbazole	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
4-Chloroaniline	0.62	U	2.1	0.62	ug/L		01/15/22 13:28	01/15/22 19:59	1
4-Chloro-3-methylphenol	0.14	U	0.63	0.14	ug/L		01/15/22 13:28	01/15/22 19:59	1
2-Chloronaphthalene	0.073	U	1.0	0.073	ug/L		01/15/22 13:28	01/15/22 19:59	1
2-Chlorophenol	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
4-Chlorophenyl phenyl ether	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Chrysene	0.042	U	0.26	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
Dibenz(a,h)anthracene	0.073	U	0.26	0.073	ug/L		01/15/22 13:28	01/15/22 19:59	1
Dibenzofuran	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
1,2-Dichlorobenzene	0.052	U	0.42	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
1,3-Dichlorobenzene	0.042	U	0.42	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
1,4-Dichlorobenzene	0.042	U	0.42	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
3,3'-Dichlorobenzidine	0.27	U *1	1.0	0.27	ug/L		01/15/22 13:28	01/15/22 19:59	1
2,4-Dichlorophenol	0.21	U	1.0	0.21	ug/L		01/15/22 13:28	01/15/22 19:59	1
Diethyl phthalate	0.16	U	1.0	0.16	ug/L		01/15/22 13:28	01/15/22 19:59	1
2,4-Dimethylphenol	0.17	U	4.2	0.17	ug/L		01/15/22 13:28	01/15/22 19:59	1
Dimethyl phthalate	0.063	U	0.63	0.063	ug/L		01/15/22 13:28	01/15/22 19:59	1
Di-n-butyl phthalate	0.20	U	3.1	0.20	ug/L		01/15/22 13:28	01/15/22 19:59	1
4,6-Dinitro-2-methylphenol	0.58	U	2.1	0.58	ug/L		01/15/22 13:28	01/15/22 19:59	1
2,4-Dinitrophenol	1.7	U	5.2	1.7	ug/L		01/15/22 13:28	01/15/22 19:59	1
2,4-Dinitrotoluene	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
2,6-Dinitrotoluene	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
Di-n-octyl phthalate	0.14	U	1.0	0.14	ug/L		01/15/22 13:28	01/15/22 19:59	1
Fluoranthene	0.063	U	0.26	0.063	ug/L		01/15/22 13:28	01/15/22 19:59	1
Fluorene	0.052	U	0.26	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Hexachlorobenzene	0.042	U	0.63	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
Hexachlorobutadiene	0.063	U	1.0	0.063	ug/L		01/15/22 13:28	01/15/22 19:59	1
Hexachlorocyclopentadiene	0.15	U	1.0	0.15	ug/L		01/15/22 13:28	01/15/22 19:59	1
Hexachloroethane	0.052	U	1.0	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
Indeno[1,2,3-cd]pyrene	0.14	U	0.42	0.14	ug/L		01/15/22 13:28	01/15/22 19:59	1
Isophorone	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
2-Methylphenol	0.052	U	0.63	0.052	ug/L		01/15/22 13:28	01/15/22 19:59	1
3 & 4 Methylphenol	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
Naphthalene	0.17	U	0.42	0.17	ug/L		01/15/22 13:28	01/15/22 19:59	1
2-Nitroaniline	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
3-Nitroaniline	0.17	U	3.1	0.17	ug/L		01/15/22 13:28	01/15/22 19:59	1

Client: AECOM
Project/Site: Red Hill Drinking Water

Job ID: 580-109289-1

Client Sample ID: 220112-H3-ZT05
Date Collected: 01/12/22 15:30
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-5
Matrix: Water

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Nitroaniline	0.22	U	2.1	0.22	ug/L		01/15/22 13:28	01/15/22 19:59	1
Nitrobenzene	0.042	U	1.0	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
4-Nitrophenol	1.8	U	10	1.8	ug/L		01/15/22 13:28	01/15/22 19:59	1
N-Nitrosodi-n-propylamine	0.063	U	0.42	0.063	ug/L		01/15/22 13:28	01/15/22 19:59	1
N-Nitrosodiphenylamine	0.073	U	1.0	0.073	ug/L		01/15/22 13:28	01/15/22 19:59	1
Pentachlorophenol	0.53	U	10	0.53	ug/L		01/15/22 13:28	01/15/22 19:59	1
Phenanthrene	0.13	U	1.0	0.13	ug/L		01/15/22 13:28	01/15/22 19:59	1
Phenol	0.38	U	1.0	0.38	ug/L		01/15/22 13:28	01/15/22 19:59	1
Pyrene	0.042	U	1.0	0.042	ug/L		01/15/22 13:28	01/15/22 19:59	1
1,2,4-Trichlorobenzene	0.094	U	0.42	0.094	ug/L		01/15/22 13:28	01/15/22 19:59	1
2,4,5-Trichlorophenol	0.10	U	0.42	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1
2,4,6-Trichlorophenol	0.10	U	0.63	0.10	ug/L		01/15/22 13:28	01/15/22 19:59	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*45*		*35 - 120*	*01/15/22 13:28*	*01/15/22 19:59*	*1*
2-Fluorophenol (Surr)	*0.7*	*S1-*	*21 - 120*	*01/15/22 13:28*	*01/15/22 19:59*	*1*
Nitrobenzene-d5 (Surr)	*68*		*39 - 120*	*01/15/22 13:28*	*01/15/22 19:59*	*1*
Phenol-d5 (Surr)	*0.4*	*S1-*	*10 - 120*	*01/15/22 13:28*	*01/15/22 19:59*	*1*
Terphenyl-d14	*89*		*63 - 137*	*01/15/22 13:28*	*01/15/22 19:59*	*1*
2,4,6-Tribromophenol	*133*	*S1+*	*50 - 130*	*01/15/22 13:28*	*01/15/22 19:59*	*1*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C9-C25	90	U	110	90	ug/L		01/14/22 13:09	01/14/22 23:32	1
C24-C40	180	U	200	180	ug/L		01/14/22 13:09	01/14/22 23:32	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*74*		*53 - 120*	*01/14/22 13:09*	*01/14/22 23:32*	*1*

Client Sample ID: 220112-H3-ZT06

Date Collected: 01/12/22 15:25
Date Received: 01/14/22 12:15

Lab Sample ID: 580-109289-6

Matrix: Water

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31	U	100	31	ug/L			01/15/22 00:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*78 - 120*		*01/15/22 00:03*	*1*

Method: 8260D - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.2	U	15	3.2	ug/L			01/15/22 00:03	1
Benzene	0.24	U	1.0	0.24	ug/L			01/15/22 00:03	1
Bromodichloromethane	0.29	U	1.0	0.29	ug/L			01/15/22 00:03	1
Bromoform	0.51	U	1.0	0.51	ug/L			01/15/22 00:03	1
Bromomethane	0.21	U *+	1.0	0.21	ug/L			01/15/22 00:03	1
Carbon disulfide	0.53	U	1.0	0.53	ug/L			01/15/22 00:03	1
Carbon tetrachloride	0.30	U	1.0	0.30	ug/L			01/15/22 00:03	1
Chlorobenzene	0.44	U	1.0	0.44	ug/L			01/15/22 00:03	1
Chloroform	0.26	U	1.0	0.26	ug/L			01/15/22 00:03	1
Chloromethane	0.28	U *+	1.0	0.28	ug/L			01/15/22 00:03	1
cis-1,2-Dichloroethene	0.35	U	1.0	0.35	ug/L			01/15/22 00:03	1
cis-1,3-Dichloropropene	0.20	U	1.0	0.20	ug/L			01/15/22 00:03	1
Dibromochloromethane	0.43	U	1.0	0.43	ug/L			01/15/22 00:03	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/15/22 00:03	1
1,2-Dichloroethane	0.42	U	1.0	0.42	ug/L			01/15/22 00:03	1
1,1-Dichloroethene	0.28	U	1.0	0.28	ug/L			01/15/22 00:03	1
1,2-Dichloroethene, Total	0.39	U	1.0	0.39	ug/L			01/15/22 00:03	1
Dichloromethane	1.4	U	3.0	1.4	ug/L			01/15/22 00:03	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/15/22 00:03	1
Ethylbenzene	0.50	U	1.0	0.50	ug/L			01/15/22 00:03	1
Ethyl Chloride	0.35	U	1.0	0.35	ug/L			01/15/22 00:03	1
2-Hexanone	4.0	U	15	4.0	ug/L			01/15/22 00:03	1
Methyl Ethyl Ketone	4.7	U	15	4.7	ug/L			01/15/22 00:03	1
Methyl isobutyl ketone (MIBK)	2.5	U	5.0	2.5	ug/L			01/15/22 00:03	1
m-Xylene & p-Xylene	0.53	U	2.0	0.53	ug/L			01/15/22 00:03	1
o-Xylene	0.39	U	1.0	0.39	ug/L			01/15/22 00:03	1
Styrene	0.53	U	1.0	0.53	ug/L			01/15/22 00:03	1
1,1,2,2-Tetrachloroethane	0.52	U	1.0	0.52	ug/L			01/15/22 00:03	1
Tetrachloroethene	0.41	U	1.0	0.41	ug/L			01/15/22 00:03	1
Toluene	0.39	U	1.0	0.39	ug/L			01/15/22 00:03	1
trans-1,2-Dichloroethene	0.39	U	1.0	0.39	ug/L			01/15/22 00:03	1
trans-1,3-Dichloropropene	0.41	U	1.0	0.41	ug/L			01/15/22 00:03	1
1,1,1-Trichloroethane	0.39	U	1.0	0.39	ug/L			01/15/22 00:03	1
1,1,2-Trichloroethane	0.24	U	1.0	0.24	ug/L			01/15/22 00:03	1
Trichloroethene	0.26	U	1.0	0.26	ug/L			01/15/22 00:03	1
Vinyl chloride	0.22	U *+	1.0	0.22	ug/L			01/15/22 00:03	1
Xylenes, Total	0.53	U	2.0	0.53	ug/L			01/15/22 00:03	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*90*		*80 - 120*		*01/15/22 00:03*	*1*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*01/15/22 00:03*	*1*
1,2-Dichloroethane-d4 (Surr)	*104*		*80 - 120*		*01/15/22 00:03*	*1*
Toluene-d8 (Surr)	*96*		*80 - 120*		*01/15/22 00:03*	*1*

Method: 8260B/CA_LUFTMS - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378375/5
Matrix: Water
Analysis Batch: 378375

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Gasoline Range Organics (C6-C12)	31	U	100	31	ug/L			01/14/22 15:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*78 - 120*		*01/14/22 15:43*	*1*

Lab Sample ID: LCS 580-378375/8
Matrix: Water
Analysis Batch: 378375

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Gasoline Range Organics (C6-C12)			1000	1200		ug/L		120	75 - 127		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*102*		*78 - 120*

Lab Sample ID: LCSD 580-378375/9
Matrix: Water
Analysis Batch: 378375

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Gasoline Range Organics (C6-C12)			1000	1070		ug/L		107	75 - 127	12	13

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*99*		*78 - 120*

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 580-378374/5
Matrix: Water
Analysis Batch: 378374

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.2	U	15	3.2	ug/L			01/14/22 15:43	1
Benzene	0.24	U	1.0	0.24	ug/L			01/14/22 15:43	1
Bromodichloromethane	0.29	U	1.0	0.29	ug/L			01/14/22 15:43	1
Bromoform	0.51	U	1.0	0.51	ug/L			01/14/22 15:43	1
Bromomethane	0.21	U	1.0	0.21	ug/L			01/14/22 15:43	1
Carbon disulfide	0.53	U	1.0	0.53	ug/L			01/14/22 15:43	1
Carbon tetrachloride	0.30	U	1.0	0.30	ug/L			01/14/22 15:43	1
Chlorobenzene	0.44	U	1.0	0.44	ug/L			01/14/22 15:43	1
Chloroform	0.26	U	1.0	0.26	ug/L			01/14/22 15:43	1
Chloromethane	0.28	U	1.0	0.28	ug/L			01/14/22 15:43	1
cis-1,2-Dichloroethene	0.35	U	1.0	0.35	ug/L			01/14/22 15:43	1
cis-1,3-Dichloropropene	0.20	U	1.0	0.20	ug/L			01/14/22 15:43	1
Dibromochloromethane	0.43	U	1.0	0.43	ug/L			01/14/22 15:43	1
1,1-Dichloroethane	0.22	U	1.0	0.22	ug/L			01/14/22 15:43	1

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: MB 580-378374/5
Matrix: Water
Analysis Batch: 378374

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane	0.42	U	1.0	0.42	ug/L			01/14/22 15:43	1
1,1-Dichloroethene	0.28	U	1.0	0.28	ug/L			01/14/22 15:43	1
1,2-Dichloroethene, Total	0.39	U	1.0	0.39	ug/L			01/14/22 15:43	1
Dichloromethane	1.4	U	3.0	1.4	ug/L			01/14/22 15:43	1
1,2-Dichloropropane	0.18	U	1.0	0.18	ug/L			01/14/22 15:43	1
Ethylbenzene	0.50	U	1.0	0.50	ug/L			01/14/22 15:43	1
Ethyl Chloride	0.35	U	1.0	0.35	ug/L			01/14/22 15:43	1
2-Hexanone	4.0	U	15	4.0	ug/L			01/14/22 15:43	1
Methyl Ethyl Ketone	4.7	U	15	4.7	ug/L			01/14/22 15:43	1
Methyl isobutyl ketone (MIBK)	2.5	U	5.0	2.5	ug/L			01/14/22 15:43	1
m-Xylene & p-Xylene	0.53	U	2.0	0.53	ug/L			01/14/22 15:43	1
o-Xylene	0.39	U	1.0	0.39	ug/L			01/14/22 15:43	1
Styrene	0.53	U	1.0	0.53	ug/L			01/14/22 15:43	1
1,1,2,2-Tetrachloroethane	0.52	U	1.0	0.52	ug/L			01/14/22 15:43	1
Tetrachloroethene	0.41	U	1.0	0.41	ug/L			01/14/22 15:43	1
Toluene	0.39	U	1.0	0.39	ug/L			01/14/22 15:43	1
trans-1,2-Dichloroethene	0.39	U	1.0	0.39	ug/L			01/14/22 15:43	1
trans-1,3-Dichloropropene	0.41	U	1.0	0.41	ug/L			01/14/22 15:43	1
1,1,1-Trichloroethane	0.39	U	1.0	0.39	ug/L			01/14/22 15:43	1
1,1,2-Trichloroethane	0.24	U	1.0	0.24	ug/L			01/14/22 15:43	1
Trichloroethene	0.26	U	1.0	0.26	ug/L			01/14/22 15:43	1
Vinyl chloride	0.22	U	1.0	0.22	ug/L			01/14/22 15:43	1
Xylenes, Total	0.53	U	2.0	0.53	ug/L			01/14/22 15:43	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*92*		*80 - 120*		*01/14/22 15:43*	*1*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*01/14/22 15:43*	*1*
1,2-Dichloroethane-d4 (Surr)	*101*		*80 - 120*		*01/14/22 15:43*	*1*
Toluene-d8 (Surr)	*100*		*80 - 120*		*01/14/22 15:43*	*1*

Lab Sample ID: LCS 580-378374/6
Matrix: Water
Analysis Batch: 378374

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	50.0	58.3		ug/L		117	44 - 150
Benzene	10.0	11.3		ug/L		113	80 - 122
Bromodichloromethane	10.0	10.6		ug/L		106	75 - 124
Bromoform	10.0	9.59		ug/L		96	56 - 139
Bromomethane	10.0	15.5	*+	ug/L		155	36 - 150
Carbon disulfide	10.0	10.5		ug/L		105	63 - 134
Carbon tetrachloride	10.0	11.1		ug/L		111	72 - 129
Chlorobenzene	10.0	10.4		ug/L		104	80 - 120
Chloroform	10.0	11.2		ug/L		112	78 - 127
Chloromethane	10.0	27.1	*+	ug/L		271	25 - 150
cis-1,2-Dichloroethene	10.0	11.2		ug/L		112	76 - 120
cis-1,3-Dichloropropene	10.0	10.4		ug/L		104	77 - 120
Dibromochloromethane	10.0	10.1		ug/L		101	73 - 125

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 580-378374/6
Matrix: Water
Analysis Batch: 378374

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethane	10.0	11.4		ug/L		114	80 - 120
1,2-Dichloroethane	10.0	10.9		ug/L		109	69 - 126
1,1-Dichloroethene	10.0	11.8		ug/L		118	70 - 129
1,2-Dichloroethene, Total	20.0	22.7		ug/L		114	76 - 129
Dichloromethane	10.0	11.8		ug/L		118	77 - 125
1,2-Dichloropropane	10.0	11.0		ug/L		110	80 - 120
Ethylbenzene	10.0	10.2		ug/L		102	80 - 120
Ethyl Chloride	10.0	13.8		ug/L		138	38 - 150
2-Hexanone	50.0	51.9		ug/L		104	65 - 144
Methyl Ethyl Ketone	50.0	59.3		ug/L		119	65 - 137
Methyl isobutyl ketone (MIBK)	50.0	51.0		ug/L		102	59 - 141
m-Xylene & p-Xylene	10.0	10.2		ug/L		102	80 - 120
o-Xylene	10.0	9.93		ug/L		99	80 - 120
Styrene	10.0	10.1		ug/L		101	76 - 122
1,1,2,2-Tetrachloroethane	10.0	10.5		ug/L		105	74 - 124
Tetrachloroethene	10.0	10.9		ug/L		109	76 - 125
Toluene	10.0	10.6		ug/L		106	80 - 120
trans-1,2-Dichloroethene	10.0	11.5		ug/L		115	75 - 120
trans-1,3-Dichloropropene	10.0	10.1		ug/L		101	76 - 122
1,1,1-Trichloroethane	10.0	10.6		ug/L		106	74 - 130
1,1,2-Trichloroethane	10.0	10.5		ug/L		105	80 - 121
Trichloroethene	10.0	11.2		ug/L		112	80 - 125
Vinyl chloride	10.0	20.4	*+	ug/L		204	31 - 150
Xylenes, Total	20.0	20.1		ug/L		101	80 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*
Dibromofluoromethane (Surr)	*101*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*98*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Lab Sample ID: LCSD 580-378374/7
Matrix: Water
Analysis Batch: 378374

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acetone	50.0	59.5		ug/L		119	44 - 150	2	33
Benzene	10.0	11.4		ug/L		114	80 - 122	1	14
Bromodichloromethane	10.0	10.7		ug/L		107	75 - 124	1	13
Bromoform	10.0	9.52		ug/L		95	56 - 139	1	21
Bromomethane	10.0	16.2	*+	ug/L		162	36 - 150	4	33
Carbon disulfide	10.0	11.7		ug/L		117	63 - 134	10	24
Carbon tetrachloride	10.0	11.2		ug/L		112	72 - 129	0	19
Chlorobenzene	10.0	10.4		ug/L		104	80 - 120	1	10
Chloroform	10.0	11.4		ug/L		114	78 - 127	1	14
Chloromethane	10.0	26.4	*+	ug/L		264	25 - 150	3	26
cis-1,2-Dichloroethene	10.0	11.4		ug/L		114	76 - 120	2	20
cis-1,3-Dichloropropene	10.0	10.1		ug/L		101	77 - 120	3	35

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCSD 580-378374/7
Matrix: Water
Analysis Batch: 378374

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dibromochloromethane	10.0	9.87		ug/L		99	73 - 125	2	13
1,1-Dichloroethane	10.0	11.4		ug/L		114	80 - 120	0	15
1,2-Dichloroethane	10.0	11.0		ug/L		110	69 - 126	1	11
1,1-Dichloroethene	10.0	12.0		ug/L		120	70 - 129	2	23
1,2-Dichloroethene, Total	20.0	22.8		ug/L		114	76 - 129	0	21
Dichloromethane	10.0	12.0		ug/L		120	77 - 125	1	18
1,2-Dichloropropane	10.0	11.4		ug/L		114	80 - 120	3	14
Ethylbenzene	10.0	10.0		ug/L		100	80 - 120	1	14
Ethyl Chloride	10.0	13.7		ug/L		137	38 - 150	0	28
2-Hexanone	50.0	48.0		ug/L		96	65 - 144	8	26
Methyl Ethyl Ketone	50.0	58.0		ug/L		116	65 - 137	2	34
Methyl isobutyl ketone (MIBK)	50.0	47.0		ug/L		94	59 - 141	8	22
m-Xylene & p-Xylene	10.0	9.98		ug/L		100	80 - 120	2	14
o-Xylene	10.0	9.96		ug/L		100	80 - 120	0	16
Styrene	10.0	10.2		ug/L		102	76 - 122	0	16
1,1,2,2-Tetrachloroethane	10.0	9.43		ug/L		94	74 - 124	11	25
Tetrachloroethene	10.0	10.5		ug/L		105	76 - 125	4	13
Toluene	10.0	10.4		ug/L		104	80 - 120	2	13
trans-1,2-Dichloroethene	10.0	11.4		ug/L		114	75 - 120	1	21
trans-1,3-Dichloropropene	10.0	9.75		ug/L		97	76 - 122	4	20
1,1,1-Trichloroethane	10.0	12.4		ug/L		124	74 - 130	16	19
1,1,2-Trichloroethane	10.0	10.2		ug/L		102	80 - 121	3	14
Trichloroethene	10.0	11.1		ug/L		111	80 - 125	0	13
Vinyl chloride	10.0	21.6	*+	ug/L		216	31 - 150	6	26
Xylenes, Total	20.0	19.9		ug/L		100	80 - 120	1	16

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*103*		*80 - 120*
Dibromofluoromethane (Surr)	*103*		*80 - 120*
1,2-Dichloroethane-d4 (Surr)	*100*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: MB 580-378439/1-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378439

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acenaphthene	0.050	U	0.40	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Acenaphthylene	0.060	U	1.0	0.060	ug/L		01/15/22 13:28	01/15/22 18:04	1
Anthracene	0.050	U	1.0	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Benzo[a]anthracene	0.050	U	0.25	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Benzo[a]pyrene	0.040	U	0.25	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
Benzo[b]fluoranthene	0.040	U	0.25	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
Benzo[g,h,i]perylene	0.040	U	0.25	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
Benzo[k]fluoranthene	0.050	U	0.25	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Bis(2-chloroethoxy)methane	0.050	U	0.60	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Bis(2-chloroethyl)ether	0.030	U	0.10	0.030	ug/L		01/15/22 13:28	01/15/22 18:04	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-378439/1-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378439

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Bis(2-ethylhexyl) phthalate	0.74	U	3.0	0.74	ug/L		01/15/22 13:28	01/15/22 18:04	1
4-Bromophenyl phenyl ether	0.060	U	0.60	0.060	ug/L		01/15/22 13:28	01/15/22 18:04	1
Butyl benzyl phthalate	0.27	U	4.0	0.27	ug/L		01/15/22 13:28	01/15/22 18:04	1
Carbazole	0.10	U	0.60	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
4-Chloroaniline	0.59	U	2.0	0.59	ug/L		01/15/22 13:28	01/15/22 18:04	1
4-Chloro-3-methylphenol	0.13	U	0.60	0.13	ug/L		01/15/22 13:28	01/15/22 18:04	1
2-Chloronaphthalene	0.070	U	1.0	0.070	ug/L		01/15/22 13:28	01/15/22 18:04	1
2-Chlorophenol	0.050	U	1.0	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
4-Chlorophenyl phenyl ether	0.050	U	0.60	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Chrysene	0.040	U	0.25	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
Dibenz(a,h)anthracene	0.070	U	0.25	0.070	ug/L		01/15/22 13:28	01/15/22 18:04	1
Dibenzofuran	0.10	U	0.40	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
1,2-Dichlorobenzene	0.050	U	0.40	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
1,3-Dichlorobenzene	0.040	U	0.40	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
1,4-Dichlorobenzene	0.040	U	0.40	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
3,3'-Dichlorobenzidine	0.26	U	1.0	0.26	ug/L		01/15/22 13:28	01/15/22 18:04	1
2,4-Dichlorophenol	0.20	U	1.0	0.20	ug/L		01/15/22 13:28	01/15/22 18:04	1
Diethyl phthalate	0.15	U	1.0	0.15	ug/L		01/15/22 13:28	01/15/22 18:04	1
2,4-Dimethylphenol	0.16	U	4.0	0.16	ug/L		01/15/22 13:28	01/15/22 18:04	1
Dimethyl phthalate	0.060	U	0.60	0.060	ug/L		01/15/22 13:28	01/15/22 18:04	1
Di-n-butyl phthalate	0.19	U	3.0	0.19	ug/L		01/15/22 13:28	01/15/22 18:04	1
4,6-Dinitro-2-methylphenol	0.55	U	2.0	0.55	ug/L		01/15/22 13:28	01/15/22 18:04	1
2,4-Dinitrophenol	1.6	U	5.0	1.6	ug/L		01/15/22 13:28	01/15/22 18:04	1
2,4-Dinitrotoluene	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
2,6-Dinitrotoluene	0.10	U	0.40	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
Di-n-octyl phthalate	0.13	U	1.0	0.13	ug/L		01/15/22 13:28	01/15/22 18:04	1
Fluoranthene	0.060	U	0.25	0.060	ug/L		01/15/22 13:28	01/15/22 18:04	1
Fluorene	0.050	U	0.25	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Hexachlorobenzene	0.040	U	0.60	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
Hexachlorobutadiene	0.060	U	1.0	0.060	ug/L		01/15/22 13:28	01/15/22 18:04	1
Hexachlorocyclopentadiene	0.14	U	1.0	0.14	ug/L		01/15/22 13:28	01/15/22 18:04	1
Hexachloroethane	0.050	U	1.0	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
Indeno[1,2,3-cd]pyrene	0.13	U	0.40	0.13	ug/L		01/15/22 13:28	01/15/22 18:04	1
Isophorone	0.10	U	0.40	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
2-Methylphenol	0.050	U	0.60	0.050	ug/L		01/15/22 13:28	01/15/22 18:04	1
3 & 4 Methylphenol	0.10	U	0.60	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
Naphthalene	0.16	U	0.40	0.16	ug/L		01/15/22 13:28	01/15/22 18:04	1
2-Nitroaniline	0.10	U	1.0	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
3-Nitroaniline	0.16	U	3.0	0.16	ug/L		01/15/22 13:28	01/15/22 18:04	1
4-Nitroaniline	0.21	U	2.0	0.21	ug/L		01/15/22 13:28	01/15/22 18:04	1
Nitrobenzene	0.040	U	1.0	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
4-Nitrophenol	1.7	U	10	1.7	ug/L		01/15/22 13:28	01/15/22 18:04	1
N-Nitrosodi-n-propylamine	0.060	U	0.40	0.060	ug/L		01/15/22 13:28	01/15/22 18:04	1
N-Nitrosodiphenylamine	0.070	U	1.0	0.070	ug/L		01/15/22 13:28	01/15/22 18:04	1
Pentachlorophenol	0.51	U	10	0.51	ug/L		01/15/22 13:28	01/15/22 18:04	1
Phenanthrene	0.12	U	1.0	0.12	ug/L		01/15/22 13:28	01/15/22 18:04	1
Phenol	0.36	U	1.0	0.36	ug/L		01/15/22 13:28	01/15/22 18:04	1
Pyrene	0.040	U	1.0	0.040	ug/L		01/15/22 13:28	01/15/22 18:04	1
1,2,4-Trichlorobenzene	0.090	U	0.40	0.090	ug/L		01/15/22 13:28	01/15/22 18:04	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: MB 580-378439/1-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378439

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4,5-Trichlorophenol	0.10	U	0.40	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1
2,4,6-Trichlorophenol	0.10	U	0.60	0.10	ug/L		01/15/22 13:28	01/15/22 18:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorobiphenyl	*83*		*35 - 120*	*01/15/22 13:28*	*01/15/22 18:04*	*1*
2-Fluorophenol (Surr)	*63*		*21 - 120*	*01/15/22 13:28*	*01/15/22 18:04*	*1*
Nitrobenzene-d5 (Surr)	*92*		*39 - 120*	*01/15/22 13:28*	*01/15/22 18:04*	*1*
Phenol-d5 (Surr)	*38*		*10 - 120*	*01/15/22 13:28*	*01/15/22 18:04*	*1*
Terphenyl-d14	*119*		*63 - 137*	*01/15/22 13:28*	*01/15/22 18:04*	*1*
2,4,6-Tribromophenol	*101*		*50 - 130*	*01/15/22 13:28*	*01/15/22 18:04*	*1*

Lab Sample ID: LCS 580-378439/2-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378439

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acenaphthene	2.00	1.50		ug/L		75	41 - 120
Acenaphthylene	2.00	1.54		ug/L		77	43 - 120
Anthracene	2.00	1.47		ug/L		73	58 - 120
Benzo[a]anthracene	2.00	1.51		ug/L		76	48 - 131
Benzo[a]pyrene	2.00	1.49		ug/L		75	55 - 125
Benzo[b]fluoranthene	2.00	1.48		ug/L		74	54 - 124
Benzo[g,h,i]perylene	2.00	1.54		ug/L		77	46 - 124
Benzo[k]fluoranthene	2.00	1.50		ug/L		75	52 - 132
Bis(2-chloroethoxy)methane	2.00	1.71		ug/L		85	38 - 120
Bis(2-ethylhexyl) phthalate	2.00	1.89	J	ug/L		95	41 - 150
4-Bromophenyl phenyl ether	2.00	1.60		ug/L		80	53 - 120
Butyl benzyl phthalate	2.00	1.83	J	ug/L		91	40 - 150
Carbazole	2.00	1.50		ug/L		75	61 - 150
4-Chloroaniline	2.00	1.35	J	ug/L		68	10 - 150
4-Chloro-3-methylphenol	2.00	1.77		ug/L		89	36 - 120
2-Chloronaphthalene	2.00	1.47		ug/L		73	35 - 120
2-Chlorophenol	2.00	1.53		ug/L		76	44 - 120
4-Chlorophenyl phenyl ether	2.00	1.58		ug/L		79	41 - 120
Chrysene	2.00	1.61		ug/L		80	57 - 125
Dibenz(a,h)anthracene	2.00	1.45		ug/L		73	48 - 126
Dibenzofuran	2.00	1.59		ug/L		79	45 - 120
1,2-Dichlorobenzene	2.00	1.39		ug/L		69	20 - 120
1,3-Dichlorobenzene	2.00	1.37		ug/L		69	20 - 120
1,4-Dichlorobenzene	2.00	1.34		ug/L		67	20 - 120
3,3'-Dichlorobenzidine	4.00	2.35		ug/L		59	33 - 150
2,4-Dichlorophenol	2.00	1.61		ug/L		81	45 - 120
Diethyl phthalate	2.00	1.72		ug/L		86	60 - 121
2,4-Dimethylphenol	2.00	1.86	J	ug/L		93	37 - 120
Dimethyl phthalate	2.00	1.61		ug/L		80	54 - 120
Di-n-butyl phthalate	2.00	1.64	J	ug/L		82	55 - 150
4,6-Dinitro-2-methylphenol	4.00	2.29		ug/L		57	29 - 136
2,4-Dinitrophenol	4.00	2.20	J	ug/L		55	10 - 146

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 580-378439/2-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378439

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4-Dinitrotoluene	2.00	1.56		ug/L		78	51 - 120
2,6-Dinitrotoluene	2.00	1.50		ug/L		75	52 - 120
Di-n-octyl phthalate	2.00	1.75		ug/L		88	48 - 140
Fluoranthene	2.00	1.57		ug/L		79	60 - 121
Fluorene	2.00	1.53		ug/L		77	20 - 120
Hexachlorobenzene	2.00	1.46		ug/L		73	49 - 120
Hexachlorobutadiene	2.00	1.37		ug/L		68	10 - 130
Hexachlorocyclopentadiene	2.00	0.830	J	ug/L		42	10 - 125
Hexachloroethane	2.00	1.40		ug/L		70	10 - 130
Indeno[1,2,3-cd]pyrene	2.00	1.44		ug/L		72	39 - 124
Isophorone	2.00	1.64		ug/L		82	41 - 120
2-Methylphenol	2.00	1.64		ug/L		82	30 - 120
3 & 4 Methylphenol	2.00	1.62		ug/L		81	29 - 120
Naphthalene	2.00	1.39		ug/L		70	42 - 120
2-Nitroaniline	2.00	1.59		ug/L		80	43 - 120
3-Nitroaniline	2.00	1.22	J	ug/L		61	10 - 138
4-Nitroaniline	2.00	1.29	J	ug/L		64	38 - 133
Nitrobenzene	2.00	1.64		ug/L		82	38 - 120
4-Nitrophenol	4.00	1.7	U	ug/L		39	10 - 120
N-Nitrosodi-n-propylamine	2.00	1.71		ug/L		86	39 - 120
N-Nitrosodiphenylamine	2.00	1.50		ug/L		75	52 - 120
Pentachlorophenol	4.00	1.27	J	ug/L		32	18 - 135
Phenanthrene	2.00	1.50		ug/L		75	54 - 120
Phenol	2.00	0.907	J	ug/L		45	13 - 120
Pyrene	2.00	1.52		ug/L		76	57 - 120
1,2,4-Trichlorobenzene	2.00	1.42		ug/L		71	21 - 120
2,4,5-Trichlorophenol	2.00	1.65		ug/L		83	45 - 120
2,4,6-Trichlorophenol	2.00	1.56		ug/L		78	43 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorobiphenyl	*69*		*35 - 120*
2-Fluorophenol (Surr)	*61*		*21 - 120*
Nitrobenzene-d5 (Surr)	*77*		*39 - 120*
Phenol-d5 (Surr)	*41*		*10 - 120*
Terphenyl-d14	*85*		*63 - 137*
2,4,6-Tribromophenol	*78*		*50 - 130*

Lab Sample ID: LCSD 580-378439/3-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378439

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Acenaphthene	2.00	1.65		ug/L		82	41 - 120	9	35
Acenaphthylene	2.00	1.69		ug/L		84	43 - 120	9	35
Anthracene	2.00	1.56		ug/L		78	58 - 120	6	35
Benzo[a]anthracene	2.00	1.71		ug/L		86	48 - 131	12	35
Benzo[a]pyrene	2.00	1.58		ug/L		79	55 - 125	5	35
Benzo[b]fluoranthene	2.00	1.58		ug/L		79	54 - 124	7	35

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-378439/3-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378439

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Benzo[g,h,i]perylene	2.00	1.61		ug/L		80	46 - 124	4	35
Benzo[k]fluoranthene	2.00	1.50		ug/L		75	52 - 132	0	35
Bis(2-chloroethoxy)methane	2.00	1.86		ug/L		93	38 - 120	9	35
Bis(2-ethylhexyl) phthalate	2.00	2.12	J	ug/L		106	41 - 150	11	35
4-Bromophenyl phenyl ether	2.00	1.75		ug/L		87	53 - 120	9	35
Butyl benzyl phthalate	2.00	2.07	J	ug/L		103	40 - 150	12	35
Carbazole	2.00	1.69		ug/L		85	61 - 150	12	35
4-Chloroaniline	2.00	1.43	J	ug/L		71	10 - 150	5	35
4-Chloro-3-methylphenol	2.00	1.92		ug/L		96	36 - 120	8	35
2-Chloronaphthalene	2.00	1.61		ug/L		80	35 - 120	9	35
2-Chlorophenol	2.00	1.59		ug/L		80	44 - 120	4	35
4-Chlorophenyl phenyl ether	2.00	1.76		ug/L		88	41 - 120	11	35
Chrysene	2.00	1.80		ug/L		90	57 - 125	11	35
Dibenz(a,h)anthracene	2.00	1.53		ug/L		77	48 - 126	6	35
Dibenzofuran	2.00	1.74		ug/L		87	45 - 120	9	35
1,2-Dichlorobenzene	2.00	1.41		ug/L		71	20 - 120	2	35
1,3-Dichlorobenzene	2.00	1.39		ug/L		69	20 - 120	1	35
1,4-Dichlorobenzene	2.00	1.36		ug/L		68	20 - 120	2	35
3,3'-Dichlorobenzidine	4.00	3.54	*1	ug/L		89	33 - 150	40	35
2,4-Dichlorophenol	2.00	1.68		ug/L		84	45 - 120	4	35
Diethyl phthalate	2.00	1.95		ug/L		97	60 - 121	13	35
2,4-Dimethylphenol	2.00	1.92	J	ug/L		96	37 - 120	3	35
Dimethyl phthalate	2.00	1.88		ug/L		94	54 - 120	15	35
Di-n-butyl phthalate	2.00	1.81	J	ug/L		91	55 - 150	10	35
4,6-Dinitro-2-methylphenol	4.00	2.56		ug/L		64	29 - 136	11	35
2,4-Dinitrophenol	4.00	2.42	J	ug/L		60	10 - 146	9	35
2,4-Dinitrotoluene	2.00	1.76		ug/L		88	51 - 120	12	35
2,6-Dinitrotoluene	2.00	1.78		ug/L		89	52 - 120	18	35
Di-n-octyl phthalate	2.00	1.87		ug/L		94	48 - 140	7	35
Fluoranthene	2.00	1.71		ug/L		85	60 - 121	8	35
Fluorene	2.00	1.76		ug/L		88	20 - 120	14	35
Hexachlorobenzene	2.00	1.63		ug/L		82	49 - 120	11	35
Hexachlorobutadiene	2.00	1.34		ug/L		67	10 - 130	2	35
Hexachlorocyclopentadiene	2.00	0.870	J	ug/L		43	10 - 125	5	35
Hexachloroethane	2.00	1.44		ug/L		72	10 - 130	3	35
Indeno[1,2,3-cd]pyrene	2.00	1.63		ug/L		81	39 - 124	12	35
Isophorone	2.00	1.74		ug/L		87	41 - 120	6	35
2-Methylphenol	2.00	1.60		ug/L		80	30 - 120	3	35
3 & 4 Methylphenol	2.00	1.52		ug/L		76	29 - 120	7	35
Naphthalene	2.00	1.44		ug/L		72	42 - 120	3	35
2-Nitroaniline	2.00	1.87		ug/L		93	43 - 120	16	35
3-Nitroaniline	2.00	1.64	J	ug/L		82	10 - 138	29	35
4-Nitroaniline	2.00	1.71	J	ug/L		86	38 - 133	28	35
Nitrobenzene	2.00	1.75		ug/L		87	38 - 120	6	35
4-Nitrophenol	4.00	1.7	U	ug/L		35	10 - 120	11	35
N-Nitrosodi-n-propylamine	2.00	1.96		ug/L		98	39 - 120	13	35
N-Nitrosodiphenylamine	2.00	1.66		ug/L		83	52 - 120	10	35
Pentachlorophenol	4.00	0.944	J	ug/L		24	18 - 135	29	35
Phenanthrene	2.00	1.64		ug/L		82	54 - 120	9	35

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCSD 580-378439/3-A
Matrix: Water
Analysis Batch: 378445

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378439

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Phenol			2.00	0.835	J	ug/L		42	13 - 120	8	35
Pyrene			2.00	1.67		ug/L		83	57 - 120	9	35
1,2,4-Trichlorobenzene			2.00	1.45		ug/L		73	21 - 120	2	35
2,4,5-Trichlorophenol			2.00	1.76		ug/L		88	45 - 120	6	35
2,4,6-Trichlorophenol			2.00	1.64		ug/L		82	43 - 120	5	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorobiphenyl	*78*		*35 - 120*
2-Fluorophenol (Surr)	*59*		*21 - 120*
Nitrobenzene-d5 (Surr)	*85*		*39 - 120*
Phenol-d5 (Surr)	*39*		*10 - 120*
Terphenyl-d14	*93*		*63 - 137*
2,4,6-Tribromophenol	*85*		*50 - 130*

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 580-378340/1-A
Matrix: Water
Analysis Batch: 378372

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 378340

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
C9-C25	90	U	110	90	ug/L		01/14/22 11:50	01/14/22 18:01	1
C24-C40	180	U	200	180	ug/L		01/14/22 11:50	01/14/22 18:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
o-Terphenyl	*73*		*53 - 120*	*01/14/22 11:50*	*01/14/22 18:01*	*1*

Lab Sample ID: LCS 580-378340/2-A
Matrix: Water
Analysis Batch: 378372

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 378340

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
C9-C25			4000	3200		ug/L		80	55 - 134
C24-C40			4000	4350		ug/L		109	36 - 143

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
o-Terphenyl	*80*		*53 - 120*

Lab Sample ID: LCSD 580-378340/3-A
Matrix: Water
Analysis Batch: 378372

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 378340

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
C9-C25			4000	3380		ug/L		85	55 - 134	6	26
C24-C40			4000	4320		ug/L		108	36 - 143	1	24

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
o-Terphenyl	*87*		*53 - 120*

Lab Chronicle

Client: AECOM
Job ID: 580-109289-1
Project/Site: Red Hill Drinking Water

Client Sample ID: 220112-H3-ZT13
Lab Sample ID: 580-109289-1
Date Collected: 01/12/22 19:00
Matrix: Water
Date Received: 01/14/22 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	378375	01/14/22 21:40	B1M	FGS SEA
Total/NA	Analysis	8260D		1	378374	01/14/22 21:40	JSM	FGS SEA
Total/NA	Prep	3510C			378439	01/15/22 13:28	RJL	FGS SEA
Total/NA	Analysis	8270E		1	378445	01/15/22 19:13	T1L	FGS SEA
Total/NA	Prep	3510C			378340	01/14/22 13:09	JHR	FGS SEA
Total/NA	Analysis	8015D		1	378372	01/14/22 22:54	JCM	FGS SEA

Client Sample ID: 220112-H3-ZT14
Lab Sample ID: 580-109289-2
Date Collected: 01/12/22 18:55
Matrix: Water
Date Received: 01/14/22 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	378375	01/14/22 22:04	B1M	FGS SEA
Total/NA	Analysis	8260D		1	378374	01/14/22 22:04	JSM	FGS SEA

Client Sample ID: 220112-H3-ZT09
Lab Sample ID: 580-109289-3
Date Collected: 01/12/22 17:00
Matrix: Water
Date Received: 01/14/22 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	378375	01/14/22 22:28	B1M	FGS SEA
Total/NA	Analysis	8260D		1	378374	01/14/22 22:28	JSM	FGS SEA
Total/NA	Prep	3510C			378439	01/15/22 13:28	RJL	FGS SEA
Total/NA	Analysis	8270E		1	378445	01/15/22 19:36	T1L	FGS SEA
Total/NA	Prep	3510C			378340	01/14/22 13:09	JHR	FGS SEA
Total/NA	Analysis	8015D		1	378372	01/14/22 23:13	JCM	FGS SEA

Client Sample ID: 220112-H3-ZT10
Lab Sample ID: 580-109289-4
Date Collected: 01/12/22 16:55
Matrix: Water
Date Received: 01/14/22 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	378375	01/14/22 22:52	B1M	FGS SEA
Total/NA	Analysis	8260D		1	378374	01/14/22 22:52	JSM	FGS SEA

Client Sample ID: 220112-H3-ZT05
Lab Sample ID: 580-109289-5
Date Collected: 01/12/22 15:30
Matrix: Water
Date Received: 01/14/22 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	378375	01/14/22 23:15	B1M	FGS SEA
Total/NA	Analysis	8260D		1	378374	01/14/22 23:15	JSM	FGS SEA
Total/NA	Prep	3510C			378439	01/15/22 13:28	RJL	FGS SEA
Total/NA	Analysis	8270E		1	378445	01/15/22 19:59	T1L	FGS SEA

Lab Chronicle

Client: AECOM
Job ID: 580-109289-1
Project/Site: Red Hill Drinking Water

Client Sample ID: 220112-H3-ZT05
Lab Sample ID: 580-109289-5
Date Collected: 01/12/22 15:30
Matrix: Water
Date Received: 01/14/22 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			378340	01/14/22 13:09	JHR	FGS SEA
Total/NA	Analysis	8015D		1	378372	01/14/22 23:32	JCM	FGS SEA

Client Sample ID: 220112-H3-ZT06
Lab Sample ID: 580-109289-6
Date Collected: 01/12/22 15:25
Matrix: Water
Date Received: 01/14/22 12:15

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B/CA_LUFTMS		1	378375	01/15/22 00:03	B1M	FGS SEA
Total/NA	Analysis	8260D		1	378374	01/15/22 00:03	JSM	FGS SEA

Laboratory References:

FGS SEA = Eurofins Seattle, 5755 8th Street East, Tacoma, WA 98424, TEL (253)922-2310

Accreditation/Certification Summary

Client: AECOM
Job ID: 580-109289-1
Project/Site: Red Hill Drinking Water

Laboratory: Eurofins Seattle

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2236	01-18-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
8260D		Water	1,2-Dichloroethene, Total

Sample Summary

Client: AECOM
Project/Site: Red Hill Drinking Water

Job ID: 580-109289-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-109289-1	220112-H3-ZT13	Water	01/12/22 19:00	01/14/22 12:15
580-109289-2	220112-H3-ZT14	Water	01/12/22 18:55	01/14/22 12:15
580-109289-3	220112-H3-ZT09	Water	01/12/22 17:00	01/14/22 12:15
580-109289-4	220112-H3-ZT10	Water	01/12/22 16:55	01/14/22 12:15
580-109289-5	220112-H3-ZT05	Water	01/12/22 15:30	01/14/22 12:15
580-109289-6	220112-H3-ZT06	Water	01/12/22 15:25	01/14/22 12:15

Chain of Custody Record

Hydrant Screening

eurofins | Environment Testing America

580-109289 Chain of Custody

Sampler: AECOM	Lab PM: Elaine Walker	Carrier Tracking No(s): FedEx	COC No: 01122622 DW-71
Client Contact: Alethea Ramos (alternate: Margie Pascua)	Phone:	E-Mail: M.Elaine.Walker@EurofinsET.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: AECOM	PWSID:			Job #:

Address: 1001 Bishop St. Suite 1600	Due Date Requested: see subcontract
City: Honolulu	TAT Requested (days): 48 hrs, RUSH
State, Zip: Hawaii 96813	Compliance Project: Δ Yes Δ No
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)	PO #:
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)	WO #:
Project Name: CV22F0106	Project #: 60674414
Site: RHSF	SSOW#:

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 TPH-g (HCl) + VOCs 8260	EPA 8015 TPH-d/o	SVOCs 8270	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	I			
22012-H3-2T13	1/12/22	1900	G	W	N	N	3	2	2	7	
22012-H3-2T14	1/12/22	1855	G	W	N	N	2			2	
											A3 1.4/1.4 Bubble/LLeA

Possible Hazard Identification

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQuIS EDD.

Special Instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by:		Date:	Time:	Method of Shipment:		
Relinquished by:	Date/Time: 1/12/22 2000	Company: AECOM	Received by: Connor Rotter	Date/Time: 1/12/22 2000	Company: AECOM	
Relinquished by: Connor Rotter	Date/Time: 1/13/22 1500	Company: AECOM	Received by:	Date/Time: 1/14/22 1030	Company: EPOS	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Eurofins FGS, Seattle
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

Hydrant Screening

eurofins Environment Testing America

Client Information	Sampler: AECOM	Lab PM: Elaine Walker	Carrier Tracking No(s): FedEx	COC No: 01122022 DW-75
Client Contact: Alethea Ramos (alternate: Margie Pascua)	Phone:	E-Mail: M.Elaine.Walker@EurofinsET.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: AECOM	PWSID:			Job #:
Address: 1001 Bishop St. Suite 1600	Due Date Requested: see subcontract			
City: Honolulu	TAT Requested (days): 48 hrs RUSH			
State, Zip: Hawaii 96813	Compliance Project: Δ Yes Δ No			
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)	PO #:			
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)	WO #:			
Project Name: CV22F0106	Project #: 60674414			
Site: RHSF	SSOW#:			

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 VOCs & TPH-g (HCl)	EPA 8270 SVOCs (none)	EPA 8015 TPH-d/o	Total Number of containers	Special Instructions/Note:
Preservation Code:					X	X	A	N	N	X	
220112-H3-ZT09	1/12/22	1700	G	W	N	N	3	2	2	7	
220112-H3-ZT10	1/12/22	1655	G	W	N	N	2			2	
											A3 0.9/0.9 Bubble/Wet

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQuIS EDD.

Special Instructions/QC Requirements: DOD QSM project.

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	1/12/22 2000	AECOM	[signature]	1/12/22 2000	AECOM
2	[signature]	1/13/22 1500	AECOM	[signature]	1/14/22 1035	CFAL
3						

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

Eurofins FGS, Seattle
5755 8th Street East
Tacoma, WA 98424

Chain of Custody Record

Hydrant Screening

eurofins Environment Testing America

Client Information	Sampler: AECOM	Lab PM: Elaine Walker	Carrier Tracking No(s): FedEx	COC No: 01122022 DW-78
Client Contact: Alethea Ramos (alternate: Margie Pascua)	Phone:	E-Mail: M.Elaine.Walker@EurofinsET.com	State of Origin: Hawaii	Page: Page 1 of 1
Company: AECOM	PWSID:			Job #:

Address: 1001 Bishop St. Suite 1600	Due Date Requested: see subcontract
City: Honolulu	TAT Requested (days): 48 hrs. Rush
State, Zip: Hawaii 96813	Compliance Project: Δ Yes Δ No
Phone: 808-521-3051 (direct: 808-529-7283) (alternate: 808-356-5373)	PO #:
Email: alethea.ramos@aecom.com (alternate: margie.pascua@aecom.com)	WO #:
Project Name: CV22F0106	Project #: 60674414
Site: RHSF	SSOW#:

Analysis Requested

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	EPA 8260 TPH-g (HCl) + VOCs 8260	EPA 8015 TPH-d/o	6025 SVOCs by 3270	Total Number of containers	Special Instructions/Note:
			Preservation Code:				A	I			
220112-HB-2TO5	1/12/22	1530	G	W	N	N	3	2	2	7	
220112-HB-2TO6	1/12/22	1525	G	W	N	N	2			2	

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Therm. ID: #3 Cor: 1.0 ° Unc: 1.0 °
Cooler Dsc: 76
Packing: Bag
Cust. Seal: Yes ✓ No
Blue Ice, Wet, Dry, None

FedEx: ✓
UPS:
Lab Cour:
Other:

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assess
☐ Return To Client ☐ Disposa

Deliverable Requested: I, II, III, IV, Other (specify)

Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM EQuIS EDD.

Special Instructions/QC Requirements: D

Empty Kit Relinquished by:	Date:	Time:	Me

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	1/12/22 2000	AECOM	[signature]	1/12/22 2000	AECOM
2	[signature]	1/13/22 1500	AECOM	[signature]	1/14/22 1030	EPGS
3						

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-109289-1

Login Number: 109289
List Number: 1
Creator: Greene, Ashton R

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

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5 March 2022

NAVFAC Hawaii
400 Marshall Road
JBPHH HI 96860-3139

Subject: **Red Hill Bulk Fuel Storage Facility**
AECOM Follow-up Technical Review of Bis(2-chloroethyl)ether in Hydrant Flushing Samples
Sample ID: Multiple
Zone: A3, B1, C1, C2, F2, H1, H2 and H3
Address: Multiple
Collection Date: Multiple

Attention Engineering Working Group:

Bis(2-chloroethyl)ether (BC2EE) is primarily used as a chemical intermediate for the manufacture of pesticides and as a solvent for fats, waxes, greases, and esters. It has also been used as a constituent in paints and varnishes, as a cleaning fluid for textiles, and in the purification of oils and gasoline. This analyte is not regulated under the Safe Drinking Water Act and for that reason does not have an associated Maximum Contamination Level.

BC2EE properties and Chemical Abstracts Service (CAS):

- CAS number: 111-44-4.
- BC2EE is a colorless, nonflammable liquid with a strong unpleasant odor.
- The odor threshold for BC2EE is 0.049 part per million.
- The chemical formula for BC2EE is $C_4H_8Cl_2O$, and the molecular weight is 143.01-gram moles.
- The vapor pressure for BC2EE is 0.71 millimeter of mercury at 20 degrees Celsius, and it has a log octanol/water partition coefficient of 1.58.

The initial evaluation of this issue involved the review of the Eurofins Seattle's SOP for Semi-volatile Organic Compounds (Base Neutrals and Acids) Analysis by GC/MS [Method 8270E]. The standard operating procedure (SOP) was used in conjunction with the extracted ion current profile (ECIP) for the referenced sample to derive the following conclusions.

A review of the laboratory analytical data packages indicates the associated method blanks and reagent/bottle blanks were all no-detect for BC2EE. In addition, the samples with detections of BC2EE were scattered throughout several preparation and analytical batches with passing quality control, thereby eliminating most types of laboratory contributed artifacts because of carryover or cross contamination. Based on a review of the analytical data, a laboratory contribution resulting in the detection of BC2EE is unlikely.

After discussion with the laboratory, they are not 100% confident that detection of BC2EE in the referenced sample is a true detection and could possibly be a false-positive based on the mass spectra. In addition, all samples that displayed detections for BC2EE coincide with low recovery of phenol-d5 surrogate in Method 8270 and low recovery of toluene-d8 surrogate in Method 8260. The detection of BC2EE could potentially be an isomer of BC2EE. Chromatograms show hits for dichlorinated alkanes and alcohols/ethers. The detections of the dichlorinated alkanes, alcohols, and ethers could be a by-product of reactions with the chlorination/bromination agent used to disinfect potable water. It is possible the chlorination/bromination agents are reacting with the 50 µL of acetone from the 1:1 methylene chloride/acetone solution used to contain the surrogate for the Method 8270

analysis. Acetone, under acidic or basic conditions, can form an intermediate that can react with chlorinating/brominating agents just as aromatic/BTEX compounds, as indicated by the low surrogate recovery of toluene-d8 and phenol-d5.

A closer evaluation of the mass spectra provided by the laboratory, (**Figure 1**, middle spectra in red font) reveals the secondary ion, mass 63, is virtually absent. EPA Method 8270E requires three specific quantitation ions to be present at specific abundances for qualitative identification of analytes of interest. For BC2EE (Figure 1, bottom spectra in green font), mass (m/z) 93 is the parent ion and should be present at 100%, m/z 63 is the secondary ion and should be present at approximately 60% abundance of mass 93, and m/z 95 is the tertiary ion and should be present at approximately 20% of mass 93. According to the Quality Fit Evaluation provided by the laboratory (**Figure 2**), the ECIP passed the ion ratio test, (reference the spectral test and retention time test in **Figure 1** [chromatogram on the right]); however, the "Q" or quality fit test failed because the percent match to the reference spectra is 71%. This analysis has a lower control limit of 80% to be considered a valid spectra match for the identification of the analyte(s) of interest. Based on the passing of the ion ratio test, the spectral test and almost complete absence of m/z 63, it is suspected the ion abundance ratio window was not set up in the calibration quantitation file. A review of the laboratory's SOP sections 16.1.1.2 through 16.1.1.4 confirmed an ion abundance window should be set for each quantitation ion. The referenced sections of the laboratory SOP provide the acceptance criteria for ion abundance and qualitative identification of analyte(s) of interest.

On February 7, 2022 at 0830 HST in a conversation with the laboratory's analyst that performed the method, the section supervisor, the QAM, and the laboratory director, they confirmed the abundance windows were not defined, resulting in the reporting of BC2EE. Based on the absence of m/z 63 and adherence with the laboratory's SOP, the laboratory will retract the impacted sample delivery groups (SDGs) and the detection of BC2EE and re-issue the reports with BC2EE reported as non-detect. In addition, the laboratory confirmed the other seven detections of BC2EE were also absent of m/z 63 and these reports would also be reissued with a discussion of the events provided in the case narrative. A National Institute of Standards and Technology mass spectra of BC2EE (**Figure 3**) was provided to the laboratory in addition to the spectra provided by the GCMS system for reference.

Based on the information obtained from the laboratory and re-evaluation of the associated data, AECOM re-collected the sample locations in question for EPA Method 8270. AECOM also collected a Method 8270 sample using a 525.2 pre-preserved sample bottle with 45 mg sodium sulfite preservative to mitigate the disinfect agents used with potable water suppliers. An empty 1-L amber bottle with the 45 mg sodium sulfite was also sent to the laboratory. The laboratory will fill the empty bottle with laboratory grade deionized water to assist in ascertaining any possible contributions from the sample containers and/or preservation. It is recommended AECOM continue with the re-analysis of the re-collected samples to confirm the absence of BC2EE and evaluate the effects that the disinfectant process has on the samples in question, if any.

Table 1 below summarizes the sample delivery groups (SDGs) initially issued reporting of bis(2-chloroethyl)ether (BC2EE) from fire hydrant zone screening samples in error. On February 12, 2022, AECOM issued a *Technical Review of Bis(2-chloroethyl)ether Hydrant Flushing Samples* memo which detailed the findings of an in-depth review of the analytical data and supporting documents, the contents of which are contained in this memo. As a result of the findings, Eurofins Seattle concurred with the finding conclusions and implemented the required corrective action in accordance with the laboratories SOP for EPA Method SW-846 8270E

The corrective action also determined the qualitative identification of BC2EE did not meet the analytical method or laboratories SOP requirements and the detections for BC2EE were retracted and the laboratory certificates of analysis reissued indicating the referenced analytes were non-detect. **Table 2** provides a list of the SDGs re-issued and the revised results.

Table 1

Laboratory Sample ID	Sampling Date	Field Sample ID	LOC ID	Analyte	Result	Unit
580-109090-4	01/06/22	20220106-F2-ZT08	FH17	BC2EE	1.6	µg/L
580-109117-5	01/08/22	20220108-B1-ZT04	FH8	BC2EE	2.6	µg/L
580-109117-6	01/08/22	20220108-A3-ZT01	SA-LFH2	BC2EE	3	µg/L
580-109117-8	01/07/22	220107-C2-YT02	FH315	BC2EE	0.76	µg/L
580-109054-1	01/05/22	20220105-C1-ZT03	FH512	BC2EE	0.1	µg/L
580-109239-2	01/11/22	20220111-H1-YT12	FH1396	BC2EE	3.3	µg/L
580-109243-1	01/11/22	20220111-H2-YT02	FH377	BC2EE	1.2 F1	µg/L
580-109243-3	01/11/22	20220111-H2-YT04	FH1331	BC2EE	1.7	µg/L
580-109243-4	01/11/22	20220111-H2-YT06	FH1646	BC2EE	2.3	µg/L
580-109289-1	01/12/22	220112-H3-ZT13	FH1651	BC2EE	1.7	µg/L
580-109289-3	01/12/22	220112-H3-ZT09	FH1641	BC2EE	2.4	µg/L
580-109289-5	01/12/22	220112-H3-ZT05	FH1676	BC2EE	1.7	µg/L

F1- MS and/or MSD recovery exceeds the control limit

Table 2

Laboratory Sample ID	Sampling Date	Field Sample ID	LOC ID	Analyte	Result	Unit
580-109090-4	01/06/22	20220106-F2-ZT08	FH17	BC2EE	0.031 U	µg/L
580-109117-5	01/08/22	20220108-B1-ZT04	FH8	BC2EE	0.031 U	µg/L
580-109117-6	01/08/22	20220108-A3-ZT01	SA-LFH2	BC2EE	0.030 U	µg/L
580-109117-8	01/07/22	220107-C2-YT02	FH315	BC2EE	0.031 U	µg/L
580-109054-1	01/05/22	20220105-C1-ZT03	FH512	BC2EE	0.031 U	µg/L
580-109239-2	01/11/22	20220111-H1-YT12	FH1396	BC2EE	0.032 U	µg/L
580-109243-1	01/11/22	20220111-H2-YT02	FH377	BC2EE	0.032 U	µg/L

Laboratory Sample ID	Sampling Date	Field Sample ID	LOC ID	Analyte	Result	Unit
580-109243-3	01/11/22	20220111-H2-YT04	FH1331	BC2EE	0.032 U	µg/L
580-109243-4	01/11/22	20220111-H2-YT06	FH1646	BC2EE	0.030 U	µg/L
580-109289-1	01/12/22	220112-H3-ZT13	FH1651	BC2EE	0.031 U	µg/L
580-109289-3	01/12/22	220112-H3-ZT09	FH1641	BC2EE	0.031 U	µg/L
580-109289-5	01/12/22	220112-H3-ZT05	FH1676	BC2EE	0.031 U	µg/L

F1- MS and/or MSD recovery exceeds the control limit

U Indicates the analyte was analyzed for but not detected

It was suspected the disinfection process (residual chlorine) was having an adverse effect on the recovery of the acid surrogates used in EPA Method 8270E for samples collected from January 6, 2022 through January 11, 2022. The failing acid surrogate recoveries could result in the rejection of the associated data. As a result, when AECOM re-collected the samples from the locations where the initial laboratory results indicated the presence of BC2EE, both unpreserved and preserved samples were collected. With the exception of location IDs FH512, FH17, FH315 and B1-8, only unpreserved samples were collected because these samples were collected before the decision to collect an additional preserved sample was made.

Sample location FH512 exhibited low but passing surrogate recoveries whereas locations FH17, FH315 and B1-8 all had failing acid surrogate recoveries. All four of the referenced samples were also non-detect for BC2EE. Two empty bottles were also sent to the lab as reagent/bottle blanks to eliminate both a bottle or a preservative contribution to the detection of BC2EE by having the lab fill the bottles with laboratory reagent grade laboratory ASTM Type II water and then analyzed. Both the reagent and bottle blank were non-detect for BC2EE. The 525.2 preservative, 45 milligrams (mg) sodium sulfite was used as the preservation method.

The results from the unpreserved samples collected from February 2, 2022 through February 4, 2022 exhibited a suppression of the acid surrogate recoveries as suspected, however the samples preserved with the 525.2 preservative exhibited passing acid surrogate recoveries for all samples analyzed. In addition, BC2EE was non-detect for all samples analyzed, both unpreserved and preserved, confirming the absence of BC2EE at the sampling locations in question.

Table 3 provides a list of the SDGs for the zone locations that were re-sampled, extracted and analyzed to confirm the absence of BC2EE for the referenced sampling locations. A complete listing of all the samples discussed is provided in **Attachment 1**, *Bis(2-chloroethyl)ether Fire Hydrant Zone Screening Sample Resolution Cross Walk*. This attachment provides the original sample results and SDGs, prior to the lab restating the results as well as the resample results with notes as to whether they were unpreserved or preserved.

Table 3

Laboratory Sample ID	Sampling Date	Field Sample ID	LOC ID	Analyte	Result	Unit
580-110026-1	02/04/22	220204H2HT02	FH377	BC2EE	0.029 U	µg/L
580-110026-2	02/04/22	220204H2HT02-1	FH377	BC2EE	0.029 U	µg/L
580-110026-3	02/04/22	220204H2HT03	FH1331	BC2EE	0.029 U	µg/L
580-110026-4	02/04/22	220204H2HT04	FH1646	BC2EE	0.029 U	µg/L
580-110026-5	02/04/22	220204H2HT03-1	FH1331	BC2EE	0.029 U	µg/L
580-110026-6	02/04/22	220204H2HT04-1	FH1646	BC2EE	0.029 U	µg/L
580-110026-7	02/04/22	A3-TW-HYDLFH2-22035-N	SA-LFH2	BC2EE	0.029 U	µg/L
580-110026-8	02/04/22	A3-TW-HYDLFH2-22035-N-1	SA-LFH2	BC2EE	0.031 U	µg/L
580-110029-1	02/04/22	220204H3IT01	FH1641	BC2EE	0.028 U	µg/L
580-110029-2	02/04/22	220204H3IT02	FH1641	BC2EE	0.028 U	µg/L
580-110029-3	02/04/22	220204H3IT01-1	FH1641	BC2EE	0.028 U	µg/L
580-110029-4	02/04/22	220204H3IT02-1	FH1641	BC2EE	0.028 U	µg/L
580-110029-5	02/04/22	220204H3IT03	FH1651	BC2EE	0.028 U	µg/L
580-110029-6	02/04/22	220204H3IT04	FH1676	BC2EE	0.028 U	µg/L
580-110029-7	02/04/22	220204H3IT03-1	FH1651	BC2EE	0.028 U	µg/L
580-110029-8	02/04/22	220204H3IT04-1	FH1676	BC2EE	0.028 U	µg/L
580-110034-1	02/03/22	220203C2ZT02	FH315	BC2EE	0.029 U	µg/L
580-110035-1	02/04/22	220204H1HT01	FH1396	BC2EE	0.029 U	µg/L
580-110035-2	02/04/22	220204H1HT01-1	FH1396	BC2EE	0.029 U	µg/L
580-110036-1	02/03/22	220203C1ZT03	FH512	BC2EE	0.029 U	µg/L
580-110037-1	02/03/22	220203F2ZT01	FH17	BC2EE	0.029 U	µg/L
580-110038-1	02/03/22	220203B1ZT04	FH8	BC2EE	0.029 U	µg/L

U Indicates the analyte was analyzed for but not detected

Therefore, based on a thorough re-evaluation of the referenced analytical data and professional judgment, the results of these twelve indicated samples were preliminarily reported in error and have been amended in the final results to be non-detect for bis(2-chloroethyl)ether.

Questions regarding this memo should be addressed to the Red Hill Drinking Water Task Manager, Bill Craig.

Yours sincerely,

Jim Refermat
Senior Program Chemist
jim.refermat@aecom.com

Robin Cababa
CLEAN Program Manager
robin.cababa@aecom.com

Attachments

Attachment 1: *Bis(2-chloroethyl)ether Fire Hydrant Zone Screening Sample Resolution Cross Walk*.

cc:
Bill Craig, AECOM Drinking Water Task Manager
Ken Vinson, AECOM Senior VP Program Manager
Jim Refermat, AECOM Senior Program Chemist
Contracting Officer
Victor Gonzalez, NAVFAC

Figure 1. Sample 580-109090-F-4-A Mass Spectra and EICP

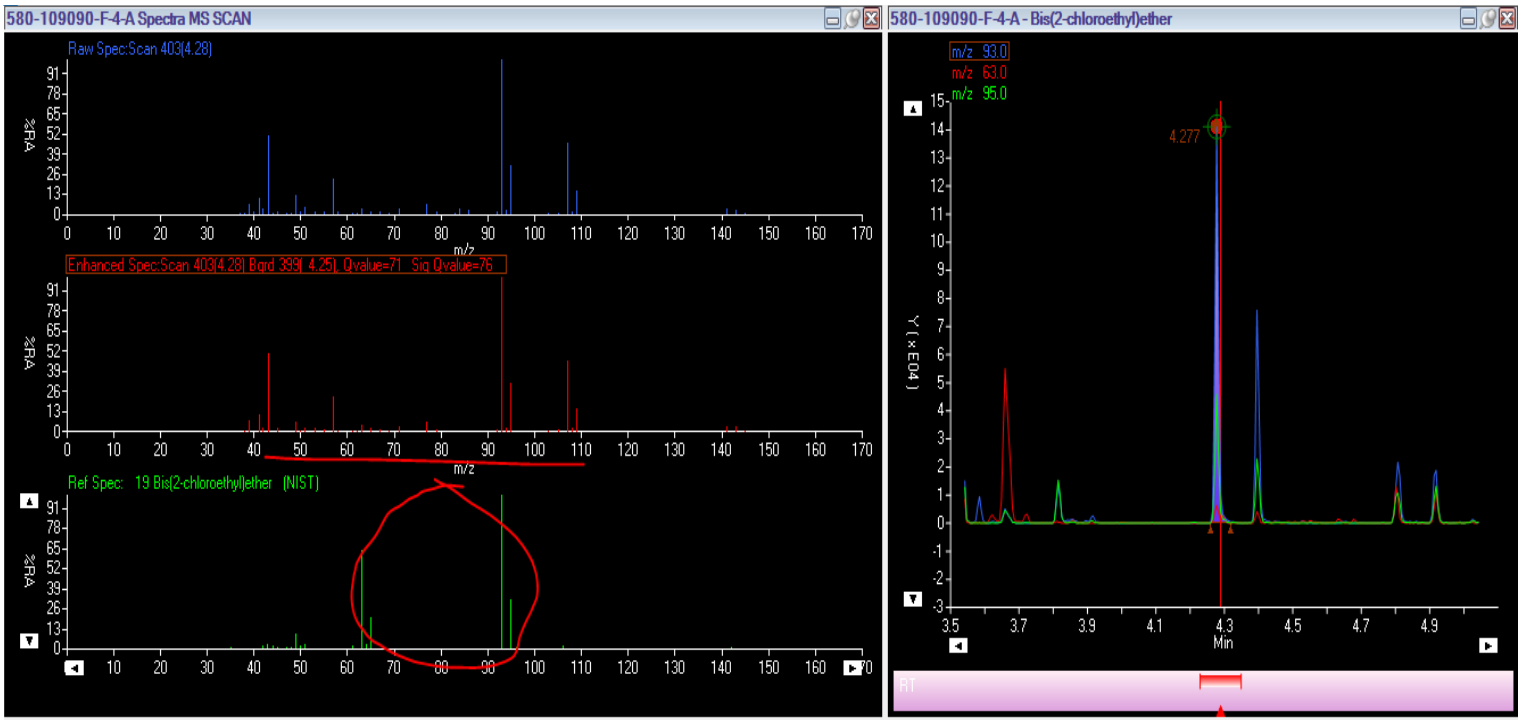
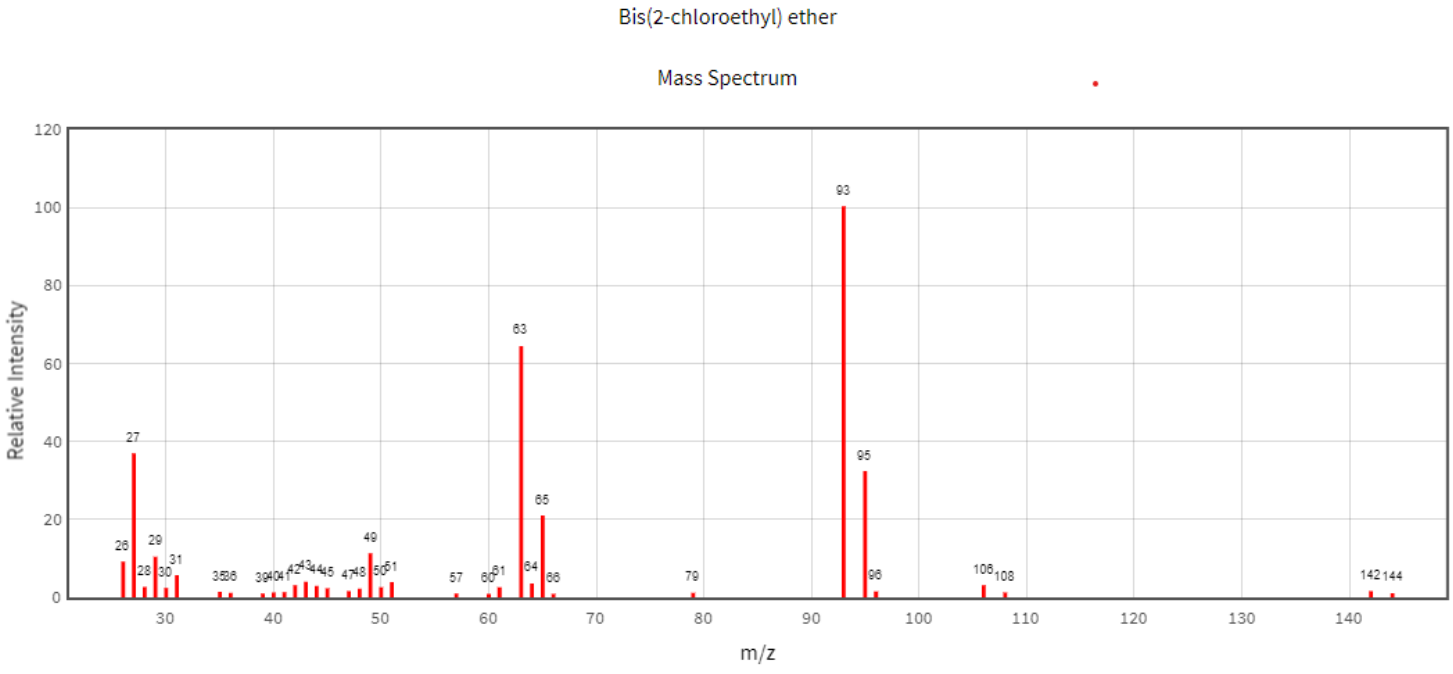


Figure 2. Quality Fit Evaluation Provided by the Laboratory

Hits / Signals for Bis(2-chloroethyl)ether

	RT	RRT	Amt	Q	Ratios	RTs	Spec	Flags
1	4.277	0.954	762.691	71	PASS	PASS	PASS	

Figure 3. Reference Mass Spectra for Bis(2-chloroethyl)ether



Attachment 1

Bis(2-chloroethyl)ether Fire Hydrant Zone Screening Sample Resolution Cross Walk

Field Sample ID	Sampling Date	Zone	Lab Sample ID	Analyte	Result	Unit	Loc Id	Field Sample ID	Sampling Date	Zone	Lab Sample ID	Analyte	Result	Unit	Loc Id
20220108-A3-ZT01	01/08/22	A3	580-109117-6	BC2EE	0.030 U	µg/L	SA-LFH2	A3-TW-HYDLFH2-22035	02/04/22	A3	580-110026-7	BC2EE	0.029 U	µg/L	SA-LFH2
								A3-TW-HYDLFH2-22035-1	02/04/22		580-110026-8		0.029 U	µg/L	
20220111-H2-YT02	01/11/22	H2	580-109243-1	BC2EE	0.032 F1	µg/L	FH377	220204H2HT02	02/04/22	H2	580-110026-1	BC2EE	0.029 U	µg/L	FH377
								220204H2HT02-1	02/04/22		580-110026-2		0.029 U	µg/L	
20220111-H2-YT04	01/11/22	H2	580-109243-3	BC2EE	0.032 U	µg/L	FH1331	220204H2HT03	02/04/22	H2	580-110026-3	BC2EE	0.029 U	µg/L	FH1331
								220204H2HT03-1	02/04/22		580-110026-5		0.029 U	µg/L	
20220111-H2-YT06	01/11/22	H2	580-109243-4	BC2EE	0.030 U	µg/L	FH1646	220204H2HT04	02/04/22	H2	580-110026-4	BC2EE	0.029 U	µg/L	FH1646
								220204H2HT04-1	02/04/22		580-110026-6		0.029 U	µg/L	
20220111-H1-YT12	01/11/22	H1	580-109239-2	BC2EE	0.031 U	µg/L	FH1396	220204H1HT01	02/04/22	H1	580-110035-1	BC2EE	0.029 U	µg/L	FH1396
								220204H1HT01-1	02/04/22		580-110035-2		0.029 U	µg/L	
220112-H3-ZT09	01/12/22	H3	580-109289-3	BC2EE	0.031 U	µg/L	FH1641	220204H3IT01	02/04/22	H3	580-110029-1	BC2EE	0.028 U	µg/L	FH1641
								220204H3IT01-1	02/04/22		580-110029-3		0.028 U	µg/L	
								220204H3IT02	02/04/22		580-110029-2		0.028 U	µg/L	
								220204H3IT02-1	02/04/22		580-110029-4		0.028 U	µg/L	
220112-H3-ZT13	01/12/22	H3	580-109289-1	BC2EE	0.031	µg/L	FH1651	220204H3IT03	02/04/22	H3	580-110029-7	BC2EE	0.028 U	µg/L	FH1651
								220204H3IT03-1	02/04/22		580-110029-8		0.028 U	µg/L	
220112-H3-ZT05	01/12/22	H3	580-109289-5	BC2EE	0.031 U	µg/L	FH1676	220204H3IT04-1	02/04/22	H3	580-110029-5	BC2EE	0.028 U	µg/L	FH1676
								220204H3IT04	02/04/22		580-110029-6		0.028 U	µg/L	
20220105-C1-ZT03	01/05/22	C1	580-109054-1	BC2EE	0.031 U	µg/L	FH512	220203C1ZT03	02/03/22	C1	580-110036-1	BC2EE	0.029 U	µg/L	FH512
20220106-F2-ZT08	01/06/22	F2	580-109090-4	BC2EE	0.031 U	µg/L	FH17	220203F2ZT01	02/03/22	F2	580-110037-1	BC2EE	0.029 U	µg/L	FH17
220107-C2-YT02	01/07/22	C2	580-109117-8	BC2EE	0.031 U	µg/L	FH315	220203C2ZT02	02/03/22	C2	580-110034-1	BC2EE	0.029 U	µg/L	FH315
20220108-B1-ZT04	01/08/22	B1	580-109117-5	BC2EE	0.031 U	µg/L	FH8	220203B1ZT04	02/03/22	B1	580-110038-1	BC2EE	0.029 U	µg/L	FH8

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CORRECTIVE ACTION – SEATTLE LABORATORY

Date Initiated: 2/7/2022

Terri Torres, Quality Assurance Manager

Subject: bis(2-Chloroethyl)ether false positive results

Client: AECOM

3/1/2022
Date Approved

Samples Affected: 580-109090-4 (20220106-F2-ZT08), 580-109117-5 (20220208-B1-ZT04), 580-109117-6 (20220108-A3-ZT01), 580-109117-8 (20220107-C2-YT02), 580-109054-1 (20220105-C1-ZT03), 580-109239-2 (20220111-H1-YT12), 580-109243-1 (2022011-H2-YT02), 580-109243-3 (2022011-H2-YT04), 580-109243-4 (2022011-H2-YT06), 580-109289-1 (2022112-H3-ZT13), 580-109289-3 (2022112-H3-ZT09) and 580-109289-5 (2022112-H3-ZT05)

Method: 8270E

Problem
The detections of the 8270E analyte bis(2-Chloroethyl)ether was determined to be due to false positive detections in several samples.

Assessment/Investigation
Bis(2-chloroethyl)ether is a relatively uncommon environmental contaminant and hits reported by Eurofins Seattle prompted confirmation by the client. Upon further review, it was determined that though a compound similar to Bis(2-chloroethyl)ether was detected, the compound lacked qualifying features: 1) overall mass spectral breakdown was inconsistent with that of Bis(2-chloroethyl)ether, 2) the ion ratio for m/z 95 was inconsistent with that of Bis(2-chloroethyl)ether. It was known to the lab that samples from this project occasionally contained a brominating or chlorinating agent, such as elemental bromine, elemental chlorine, or hypobromous or hypochlorous acid formed in situ from the addition of sodium hypochlorite or sodium hypobromite. These compounds, commonly added to drinking water to treat or disinfect, caused reactive halogenation of 2-methyl-2-butene (amylene), a stabilizer for methylene chloride used at the laboratory. By mass spectral interpretation, it was determined that a polychlorinated amylene was the cause of the false positive.

Final Assessment/Corrective Action
There were two main root causes for the miss-identification, overall mass spectral breakdown and ion ratio inconsistency. The overall mass spectral breakdown pattern was overlooked by analysts because the analyte eluted at the correct retention time, contained all quantifier and qualifier ions, and the ions appeared to present at the correct ratios. However there was a discrepancy of the mass spectral breakdown pattern that may have been caused by a coelution of another unknown analyte. Additionally there was an ion ratio inconsistency. After looking through settings in the quantitation software, it was determined that a setting which would flag false positives for inaccurate ion ratios was turned off. The analyst, unaware of any qualitative flags to the data as they had been turned off, would see a "PASS" for ions whose ratios were not necessarily consistent with the ratios obtained in the analyte ICAL.

To improve the data quality of the project, the samples were re-sampled using sodium sulfite, which quenches halogenated species, as a preservative. Use of this preservative was found to eliminate presence of the false positive amylene derivative. Additionally the setting in the software to flag analytes with inconsistent ion ratio results has been turned on with an ion ratio acceptance criteria of +-30% as specified by EPA 8270E. Analysts were instructed to contact additional resources or reviewers in the case of any doubt with regards to the qualitative identification of analytes.

Kathleen Ho

02/12/2022

KATHLEEN S. HO DATE
Deputy Director of Environmental Health

DOH's Guidance on the Approach to Amending the Public Health Advisory, Addendum 1
Public Health Advisory initiated November 29, 2021
Joint Base Pearl Harbor-Hickam Public Water System No. 360
HEER Incident Case No.: 20211128-1848

Purpose: This guidance provides the criteria that the Hawaii Department of Health (DOH) will be using to **amend** the Public Health Advisory (Advisory) issued on November 29, 2021.

DOH's priority is to protect the public health of the people of Hawaii. The guidance is based on "lines of evidence" (Table 1) that must be met before DOH will amend the health advisory and issue notices that the water can be used for drinking. The Navy must also commit to following the long-term monitoring (LTM) of system water quality for this incident under the IDWST Drinking Water Sampling Plan, as amended.

Background: A chemical release of petroleum, which is a hazardous substance, entered the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water distribution system and the Red Hill Shaft. This release triggered an emergency response and DOH issuance of an Advisory on November 29, 2021. State and Federal Drinking Water (DW) Maximum Contaminant Levels (MCLs) under the Safe Drinking Water Act do not adequately address petroleum contamination of drinking water. DOH has established Environmental Action Levels (EALs) and Incident Specific Parameters (ISPs) to more comprehensively monitor and respond to petroleum contaminated drinking water. Any contaminants that exceed the State and Federal DW MCLs, EALs, or ISPs require additional action prior to amending the Advisory. Lines of evidence will be achieved by evaluating the data generated during the investigation conducted by the Interagency Drinking Water System Team (IDWST). The data will be assessed for each Flushing Zone of the Drinking Water Distribution System Recovery Plan. All lines of evidence will require documentation.

DOH Project Screening Levels: State and Federal Drinking Water MCLs, specified State EALs, and ISPs are considered in development of Project Screening Levels. The actions for the thresholds for each contaminant are listed in Tables 2 and 3.

Table 1: Lines of Evidence Under Evaluation

1. Ensure no contamination is entering the water system.		
Objective	**Lines of Evidence**	**Incident Specific Criteria**
1a	All reported sources of contamination are isolated and contained.	Contamination from Red Hill Shaft is isolated from Navy's water distribution system.
1b	The regulated public water system's water quality data is compliant.	Data meets Federal DW MCLs, specified State EALs, and ISPs.
1c	No additional contamination through the distribution system is occurring.	Cross Connection Control investigation shows distribution system is protected, resulting in no additional sources of contamination.

2. Ensure no contamination remains in the system and water chemistry concerns are addressed.		
Objective	**Lines of Evidence**	**Incident Specific Criteria**
2a	Water within the distribution system meets State and Federal DW MCLs, specified State EALs, and ISPs.	• Zone flushing plan demonstrates entire distribution system is flushed. • Certification of Water Storage Tank(s) Flushing. • Sample results show the water in distribution system meets State and Federal DW MCLs, specified State EALs, and ISPs. • Drinking water does not show sheen, olfactory evidence, or other qualitative methods of petroleum.
2b	Water in premise plumbing of homes/buildings meets State and Federal DW MCLs, specified State EALs, and ISPs.	• Flushing Plan includes procedures to ensure no service connections will re-contaminate the distribution system. • Certification of Completed Irrigation Line Flushing. • Sample Plan includes 72-hour stagnation to account for leaching of contaminants from premise plumbing. • Sample results show water in homes/buildings meets State and Federal DW MCLs, specified State EALs, and ISPs.

Table 2: Threshold Determinations that Drinking Water is NOT Fit For Human Consumption

If the DOH MCLs or DOH Project Screening Levels are exceeded, the Drinking Water Health Advisory shall NOT be amended and the drinking water is considered NOT fit for human consumption.

Table 2 Contaminant	DOH MCL (ug/L)	DOH Project Screening Level (ug/L)	Basis	Notes
Benzene	5	5	DOH MCL[1]	
Toluene	1,000	1,000		
Ethylbenzene	700	700		
Xylenes (total)	10,000	10,000		
JP-5 as Combined Total Petroleum Hydrocarbons (TPH)-Gasoline, Diesel, and Oil Ranges [Incident Specific Parameter]	Not Applicable	211	Release of fresh fuel and potential direct release.	The 211 ug/L screening level is based on risk-based action levels for TPH associated with JP-5 jet fuel described in a HIDOH Technical Memorandum dated January 27, 2022, revised February 12, 2022 (HIDOH 2022). The action (screening) level conservatively assumes that TPH detected in the water is associated with non-degraded, dissolved-phase, fuel in the drinking water system. The memorandum serves as an addendum to the *HIDOH 2017 EAL Guidance*[2].
1,1,1-Trichloroethane	200	200	DOH MCL[1]	
1,1,2-Trichloroethane	5	5		
1,1-Dichloroethylene	7	7		
1,2,4-Trichlorobenzene	70	70		
1,2-Dichlorobenzene	600	600		
1,2-Dichloroethane (EDC)	5	5		
1,2-Dichloropropane (DCP)	5	5		
1,4-Dichlorobenzene	75	75		
Carbon tetrachloride (CTC)	5	5		
Chlorobenzene	100	100		
cis-1,2-Dichloroethylene	70	70		
Dichloromethane	5	5		
Styrene	100	100		
Tetrachloroethylene	5	5		
trans-1,2-Dichloroethylene	100	100		
Trichloroethylene (TCE)	5	5		
Vinyl Chloride	2	2		
Benzo[a]pyrene	0.2	0.2		
Di(2-ethylhexyl)phthalate	6	6		
Antimony	6	6		
Arsenic	10	10		

Table 2 Contaminant	DOH MCL (ug/L)	DOH Project Screening Level (ug/L)	Basis	Notes
Barium	2000	2000	DOH MCL[1]	
Beryllium	4	4		
Cadmium	5	5		
Chromium	100	100		
Copper [3]	1300	1300	DOH AL[1]	
Lead [3]	15	15		
Mercury	2	2	DOH MCL[1]	
Selenium	50	50		
Thallium	2	2		
Dichloroethylene, 1,2- (Mixed Isomers)	70	70		
Total trihalomethanes (TTHM) (sum of chloroform, bromoform, bromodichloromethane, and dibromochloromethane).	80	80		
Total Haloacetic acids (five) (HAA5) (sum of mono-, di-, trichloroacetic acids and mono- and dibromoacetic acids).	60	60		
Bromate	10	10		
Chlorite	1000	1000		

Notes:
[1] CONTAMINANTS REGULATED BY THE SAFE DRINKING WATER BRANCH (updated 7/10/14) at https://health.hawaii.gov/sdwb/files/2014/07/MCL-Fct-2014-07-10.pdf
[2] HIDOH, 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater – Hawaii Edition (Fall 2017): Hawai'i Department of Health, Office of Hazard Evaluation and Emergency Response. https://health.hawaii.gov/heer/guidance/ehe-and-eals/. HIDOH, 2022, Recommended Risk-Based Drinking Water Action Levels for Total Petroleum Hydrocarbons (TPH) Associated with Releases of JP-5 Jet Fuel: Hawaii Department of Health, Hazard Evaluation and Emergency Response Office, January 27, 2022, revised February 12, 2022.
[3] Action Levels.

Table 3: Threshold Concentrations to Trigger Investigation(s)

If the DOH Project Screening Level is exceeded, the Navy shall investigate the source(s) of the contamination under direction of the DOH.

Table 3 Contaminant	DOH MCL (ug/L)	DOH Project Screening Level (ug/L)	Basis	Notes
1-methylnaphthalene	None	10	HIDOH EALs Table D-1a[1]	HIDOH 2017[2] (lowest of drinking water toxicity and taste and odor action levels). If the Project Screening Level for the listed contaminants are exceeded, the Navy shall: 1. Notify the DOH within 24 hours of receipt of the preliminary analytical results; 2. Start the investigation of the source of the contamination pursuant to the DOH *Technical Guidance Manual*[3]; 3. Submit a draft Corrective Action Plan to the DOH for approval within 72 hours of receipt of the preliminary analytical results; and 4. Comply with interim actions as identified by DOH.
2-methylnaphthalene	None	10		
Naphthalene	None	17		
Total Organic Carbon (TOC) [Incident Specific Parameter]	None	2000	Additional surrogate for TPH	TOC used as an additional surrogate for TPH to increase confidence in representativeness of sample data. • While most Oahu ground water sources are closer to 1000 ug/l or below, the proposed EAL acknowledges that distribution system conditions and operational changes may cause a temporary increase in baseline TOC fluctuations. • The proposed EAL can be supported by all current EPA approved drinking water methods utilized for compliance with 40 CFR 141.132(d)(3) as revised: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100WD1L.txt Results with Detection Limits up to 1500 ug/L may be used to meet the criteria for amending the health advisory.
Fuel-like Odor in the Water or Obvious Petroleum Sheen, or Dermal Irritation due to water [Incident Specific Parameter]	N/A	Present	Public Health Advisory	Within 12 hours of field observations by Navy or DOH or EPA or within 24 hours of receipt of a complaint by the Navy or DOH, the Navy shall follow the *JBPHH Water Response Resident Resources* or the Water Rapid Response Team process and notify DOH of the status of the response. This continues to be a trigger under the Long Term Monitoring Plan.

[1] HIDOH EALs Table D-1a. Groundwater Action Levels. https://health.hawaii.gov/heer/files/2019/11/HDOH-EAL-Surfer-Fall-2017.xlsx
[2] HIDOH, 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater – Hawaii Edition (Fall 2017): Hawai'i Department of Health, Office of Hazard Evaluation and Emergency Response. https://health.hawaii.gov/heer/guidance/ehe-and-eals/
[3] HIDOH, 2017, DOH *Technical Guidance Manual*, https://health.hawaii.gov/heer/tgm/.

DOH SVOCs-Results
Navy Water System Incident
Red Hill, Post-Flushing, Flushing Area H3

Date Collected	Location Name	Street Name	Closest Cross Street	Analyte	Results	Lab Qualifier	Validator Qualifier	Results Unit	Zone	Feature Type
1/12/2022	011222-18-01			1-Methylnaphthalene	NI	U		ug/L	H3	Distribution
1/12/2022	011222-18-01			2,4-DDD	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			2,4-DDE	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			2,4-DDT	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			2,4-Dinitrotoluene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			2,6-Dinitrotoluene	ND	U(LE)	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			2-Methylnaphthalene	NI	U		ug/L	H3	Distribution
1/12/2022	011222-18-01			4,4-DDD	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			4,4-DDE	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			4,4-DDT	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Acenaphthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Acenaphthylene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Acetochlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Alachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Alpha-BHC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			alpha-Chlordane	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Anthracene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Atrazine	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Benz(a)Anthracene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Benzo(a)pyrene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Benzo(b)Fluoranthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Benzo(g,h,i)Perylene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Benzo(k)Fluoranthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Beta-BHC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Bromacil	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Butachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Butylbenzylphthalate	**1.1**			ug/L	H3	Distribution
1/12/2022	011222-18-01			Caffeine by method 525mod	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Chlorobenzilate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Chloroneb	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Chlorothalonil(Draconil,Bravo)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Chlorpyrifos (Dursban)	ND	U	U	ug/L	H3	Distribution

DOH SVOCs-Results
Navy Water System Incident
Red Hill, Post-Flushing, Flushing Area H3

Date Collected	Location Name	Street Name	Closest Cross Street	Analyte	Results	Lab Qualifier	Validator Qualifier	Results Unit	Zone	Feature Type
1/12/2022	011222-18-01			Chrysene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Delta-BHC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Di-(2-Ethylhexyl)adipate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Di(2-Ethylhexyl)phthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Diazinon (Qualitative)	ND	U	UJ	ug/L	H3	Distribution
1/12/2022	011222-18-01			Dibenz(a,h)Anthracene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Dichlorvos (DDVP)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Dieldrin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Diethylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Dimethoate	ND	U(R7)	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Dimethylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Di-n-Butylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Di-N-octylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Endosulfan I (Alpha)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Endosulfan II (Beta)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Endosulfan Sulfate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Endrin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Endrin Aldehyde	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			EPTC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Fluoranthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Fluorene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			gamma-Chlordane	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Heptachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Heptachlor Epoxide (isomer B)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Hexachlorobenzene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Hexachlorocyclopentadiene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Indeno(1,2,3,c,d)Pyrene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Isophorone	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Lindane	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Malathion	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Methoxychlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Metolachlor	ND	U	U	ug/L	H3	Distribution

DOH SVOCs-Results
Navy Water System Incident
Red Hill, Post-Flushing, Flushing Area H3

Date Collected	Location Name	Street Name	Closest Cross Street	Analyte	Results	Lab Qualifier	Validator Qualifier	Results Unit	Zone	Feature Type
1/12/2022	011222-18-01			Metribuzin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Molinate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Naphthalene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Parathion	ND	U(LE)	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Pendimethalin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Permethrin (mixed isomers)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Phenanthrene	**0.0060**	J	J	ug/L	H3	Distribution
1/12/2022	011222-18-01			Propachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Pyrene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Simazine	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Terbacil	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Terbuthylazine	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Thiobencarb (ELAP)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			trans-Nonachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-01			Trifluralin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			1-Methlynaphthalene	NI	U		ug/L	H3	Distribution
1/12/2022	011222-18-02			2,4-DDD	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			2,4-DDE	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			2,4-DDT	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			2,4-Dinitrotoluene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			2,6-Dinitrotoluene	ND	U(LE)	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			2-Methylnaphthalene	NI	U		ug/L	H3	Distribution
1/12/2022	011222-18-02			4,4-DDD	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			4,4-DDE	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			4,4-DDT	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Acenaphthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Acenaphthylene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Acetochlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Alachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Alpha-BHC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			alpha-Chlordane	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Anthracene	ND	U	U	ug/L	H3	Distribution

DOH SVOCs-Results
Navy Water System Incident
Red Hill, Post-Flushing, Flushing Area H3

Date Collected	Location Name	Street Name	Closest Cross Street	Analyte	Results	Lab Qualifier	Validator Qualifier	Results Unit	Zone	Feature Type
1/12/2022	011222-18-02			Atrazine	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Benz(a)Anthracene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Benzo(a)pyrene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Benzo(b)Fluoranthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Benzo(g,h,i)Perylene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Benzo(k)Fluoranthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Beta-BHC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Bromacil	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Butachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Butylbenzylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Caffeine by method 525mod	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Chlorobenzilate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Chloroneb	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Chlorothalonil(Draconil,Bravo)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Chlorpyrifos (Dursban)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Chrysene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Delta-BHC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Di-(2-Ethylhexyl)adipate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Di(2-Ethylhexyl)phthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Diazinon (Qualitative)	ND	U	UJ	ug/L	H3	Distribution
1/12/2022	011222-18-02			Dibenz(a,h)Anthracene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Dichlorvos (DDVP)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Dieldrin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Diethylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Dimethoate	ND	U(R7)	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Dimethylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Di-n-Butylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Di-N-octylphthalate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Endosulfan I (Alpha)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Endosulfan II (Beta)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Endosulfan Sulfate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Endrin	ND	U	U	ug/L	H3	Distribution

DOH SVOCs-Results
Navy Water System Incident
Red Hill, Post-Flushing, Flushing Area H3

Date Collected	Location Name	Street Name	Closest Cross Street	Analyte	Results	Lab Qualifier	Validator Qualifier	Results Unit	Zone	Feature Type
1/12/2022	011222-18-02			Endrin Aldehyde	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			EPTC	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Fluoranthene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Fluorene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			gamma-Chlordane	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Heptachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Heptachlor Epoxide (isomer B)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Hexachlorobenzene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Hexachlorocyclopentadiene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Indeno(1,2,3,c,d)Pyrene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Isophorone	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Lindane	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Malathion	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Methoxychlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Metolachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Metribuzin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Molinate	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Naphthalene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Parathion	ND	U(LE)	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Pendimethalin	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Permethrin (mixed isomers)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Phenanthrene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Propachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Pyrene	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Simazine	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Terbacil	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Terbuthylazine	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Thiobencarb (ELAP)	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			trans-Nonachlor	ND	U	U	ug/L	H3	Distribution
1/12/2022	011222-18-02			Trifluralin	ND	U	U	ug/L	H3	Distribution

Exceeds the ISP

Bold= Detected

DOH TPH-Results
Navy Water System Incident
Red Hill, Post-Flushing, Flushing Area H3

Date Collected	Location Name	Street Name	Closest Cross Street	Analyte	Results	Lab Qualifier	Validator Qualifier	Results Unit	Results Category	Zone	Feature Type	Sheen Present	Odor
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	C8-C44	**62**		J+	ug/L	Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	Diesel Range Organics (DRO)-C10-C28	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	Gas Range Organics C8-C10	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	Oil Range Organics (C28-C40)	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	TPH-g	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	C8-C44	50	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	Diesel Range Organics (DRO)-C10-C28	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	Gas Range Organics C8-C10	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	Oil Range Organics (C28-C40)	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	TPH-g	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	C8-C44	45	J	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	Diesel Range Organics (DRO)-C10-C28	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	Gas Range Organics C8-C10	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	Oil Range Organics (C28-C40)	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	TPH-g	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/31/2022	013122-60-03	Valley View Loop	Aliamanu Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-03	Valley View Loop	Aliamanu Dr	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-03	Valley View Loop	Aliamanu Dr	TPH-g	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-01	Blackhaw Place	Kukui Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-01	Blackhaw Place	Kukui Dr	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-01	Blackhaw Place	Kukui Dr	TPH-g	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-02	Poinciana Place	Hibiscus Street	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-02	Poinciana Place	Hibiscus Street	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-02	Poinciana Place	Hibiscus Street	TPH-g	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	C9-C40	**81**			ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	Diesel Range Organic C9-C25	**47**	J	J	ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	Oil Range Organic C24-C40	**47**	J	J	ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	C9-C40	**58**			ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	Oil Range Organic C24-C40	**37**	J	J	ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-03	Point Welcome Pl	Taney Circle	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-03	Point Welcome Pl	Taney Circle	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/2/2022	020222-25-01	Olive Place	Aliamanu Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-01	Olive Place	Aliamanu Dr	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-02	Macdonald Pl	Hibiscus Street	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-02	Macdonald Pl	Hibiscus Street	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-03	Point Welcome Pl	Taney Circle	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/2/2022	020222-25-01	Olive Place	Aliamanu Dr	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-02	Macdonald Pl	Hibiscus Street	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	None

Exceeds the ISP

Bold= Detected

Section 2a.6 Distribution System Exceedance Investigation Summary and Resample Results

ENCL (8)

Interagency Drinking Water System Team
Zone H3 Removal Action Report
March 2022

Line of Evidence 2b

Water in Premise Plumbing of Homes/Buildings does not exceed State and Federal Drinking Water MCLs, specified State EALs, and ISPs

Table 1: Lines of Evidence Under Evaluation – Ensure no contamination remains in the system and water chemistry concerns are addressed.

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

Incident Specific Criteria –

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

Lines of Evidence	Completion Status	Outstanding Items
Flushing Plan includes procedures to ensure no service connections will re-contaminate the distribution system.	Complete	• None.

February 20, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: SUMMARY OF LINE OF EVIDENCE OBJECTIVE 2B – WATER IN PREMISE OF PLUMBING OF HOMES/BUILDINGS DOES NOT EXCEED STATE AND FEDERAL DW MCLs, SPECIFIED STATE EALs, AND ISPs

Encl: (1) 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing
(2) 2b.2 Residential Sampling Report for Flushing Zone
(3) 2b.3 Exceedance Investigation Summary and Results
(4) 2b.4 Certification of Completed Irrigation Flushing
(5) 2b.5 DOH Guidance for Active Irrigation Line Purging and Flushing

1. Enclosures (1) through (5) document completion of Line of Evidence 2b, that water in premise of plumbing of homes/buildings does not exceed State of Hawaii and Federal Drinking Water standards, Maximum Contaminate Levels, Environmental Action Levels and Incident Specific Parameters. On the evening of November 28, 2021, the Red Hill Shaft was secured from operation and all pumping operations ceased. The Aiea/Halawa shaft briefly served as the secondary source starting on November 28, 2021, but it was shut down on December 3, 2021 to prevent potential westward contaminant migration in the aquifer and because there were concerns over high chloride concentrations caused by saltwater intrusion. Since December 3, 2021, the Waiawa Shaft has been the sole water source providing potable water to the Joint Base Pearl Harbor-Hickam (JBPHH) distribution network. Zone H3 is part of the JBPHH Drinking Water system that is operated and maintained by the United States Navy. Flushing operations are summarized in Enclosure (1), signed by CDR Trevor Bingham, team lead for the Drinking Water Residential and Non-residential Recovery Team.

2. Enclosure (1) documents the flushing records for all facilities within Zone H3, as well as pressure logs for the distribution system during facility flushing operations. The completion of irrigation flushing in Zone H3, described in Enclosure (5), is documented in Enclosure (4). Sampling data collected after flushing is summarized in Enclosure (2).

3. Sample results with analyte detections exceeding the prescribed Maximum Contaminant Level (MCL), Environmental Action Level (EAL), or Incident Specific Parameter (ISP) are documented in Enclosure (3). The follow-on investigation summary and additional sampling results are also documented in Enclosure (3).

4. This information documents completion of Line of Evidence 2b, that water in premise of plumbing of homes/buildings does not exceed State of Hawaii and Federal Drinking Water standards, MCLs, EALs, or ISPs.

5. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and I believe the submitted information is true, accurate, and complete.

WETZEL.CHRISTOPHER.JAMES.1540194862

Digitally signed by WETZEL.CHRISTOPHER.JAMES.1540194862
Date: 2022.02.20 13:54:53 -08'00'

C. J. Wetzel
LT, CEC, USN

22 February 2022

From: US Army Representative, Interagency Drinking Water System Team
To: Interagency Drinking Water System Team

Subj: RECORDS OF COMPLETED RESIDENTIAL AND NON-RESIDENTIAL FLUSHING ZONES H3

Ref: (a) Single Family Home Flushing Plan Checklist and Standard Operating Procedures, December 2021

Encl: (1) EDMS Residential Flushing Records Zone H3
(2) EDMS Non-Residential Flushing Records Zone H3

1. This memo documents the completion of residential and non-residential flushing in Zones H3. The completed records of residential flushing, as shown in Enclosure (1), document the flushing of all homes in EDMS. The completed records of non-residential flushing, as shown in Enclosure (2), document the flushing of all facilities in EDMS. Records annotated with no water did not have a connection to the water distribution system.

2. The distribution pressure was monitored on site using pressure gauges while flushing homes to ensure that the pressure did not drop below 30 psi (Uniformed Facilities Guide 3-230-02). The Pressure graphs are provided in 2a.3 - Hydraulic Model.

3. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

2/22/2022

X Nisit A. Gainey

Signed by: GAINEY.NISIT.ANTHONY.1067651371

Nisit A. Gainey
Director
Public Works, USAG-HI

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Total Homes	Total Homes Flushed	Percent Complete	No Access	Flushed on Selected Dates
379	379	100.0 %	0	379

Zone	Neighborhood	Address	Appointment Date/Time	Arrive Date	Start Time	Certified	Summary General Notes	Unable To Access	Access Reason
Flushing Zone H3		173 Abelia Place (H3-ABEL0173)		01-Feb-22	14:00	☑		☐	
Flushing Zone H3		177 Abelia Place (H3-ABEL0177)		01-Feb-22	07:00	☑		☐	
Flushing Zone H3		181 Abelia Place (H3-ABEL0181)		01-Feb-22	12:00	☑		☐	
Flushing Zone H3		187 Abelia Place (H3-ABEL0187)		01-Feb-22	15:00	☑		☐	
Flushing Zone H3		193 Abelia Place (H3-ABEL0193)		01-Feb-22	08:00	☑		☐	
Flushing Zone H3		1601 Bittersweet Place (H3-BITT1601)		28-Jan-22	08:20	☑		☐	
Flushing Zone H3		1603 Bittersweet Place (H3-BITT1603)		28-Jan-22	12:38	☑		☐	
Flushing Zone H3		1605 Bittersweet Place (H3-BITT1605)		28-Jan-22	17:20	☑		☐	
Flushing Zone H3		1607 Bittersweet Place (H3-BITT1607)		30-Jan-22	09:40	☑		☐	
Flushing Zone H3		1701 Blackhaw Place (H3-BLAC1701)		28-Jan-22	08:03	☑		☐	
Flushing Zone H3		1702 Blackhaw Place (H3-BLAC1702)		28-Jan-22	11:47	☑		☐	
Flushing Zone H3		1703 Blackhaw Place (H3-BLAC1703)		02-Feb-22	15:59	☑		☐	
Flushing Zone H3		1704 Blackhaw Place (H3-BLAC1704)		29-Jan-22	08:11	☑		☐	
Flushing Zone H3		1705 Blackhaw Place (H3-BLAC1705)		29-Jan-22	08:36	☑		☐	
Flushing Zone H3		1705 Blackhaw Place (H3-BLAC1706)		27-Jan-22	07:55	☑		☐	
Flushing Zone H3		1707 Blackhaw Place (H3-BLAC1707)		30-Jan-22	16:40	☑		☐	
Flushing Zone H3		1708 Blackhaw Place (H3-BLAC1708)		27-Jan-22	10:20	☑		☐	
Flushing Zone H3		1709 Blackhaw Place (H3-BLAC1709)		31-Jan-22	07:57	☑		☐	
Flushing Zone H3		1710 Blackhaw Place (H3-BLAC1710)		30-Jan-22	09:08	☑		☐	
Flushing Zone H3		1711 Blackhaw Place (H3-BLAC1711)		31-Jan-22	14:26	☑		☐	
Flushing Zone H3		1712 Blackhaw Place (H3-BLAC1712)		31-Jan-22	06:30	☑		☐	
Flushing Zone H3		1705 Blackhaw Place (H3-BLAC1713)		31-Jan-22	17:30	☑		☐	
Flushing Zone H3		1715 Blackhaw Place (H3-BLAC1715)		31-Jan-22	17:30	☑		☐	
Flushing Zone H3		1801 Blackthorn Loop (H3-BLAC1801)		01-Feb-22	09:06	☑		☐	
Flushing Zone H3		1803 Blackthorn Loop (H3-BLAC1803)		31-Jan-22	16:10	☑		☐	
Flushing Zone H3		1805 Blackthorn Loop (H3-BLAC1805)		01-Feb-22	11:00	☑		☐	
Flushing Zone H3		1851 Blackthorn Loop (H3-BLAC1851)		11-Feb-22	15:00	☑		☐	
Flushing Zone H3		1853 Blackthorn Loop (H3-BLAC1853)		01-Feb-22	14:46	☑		☐	
Flushing Zone H3		1855 Blackthorn Loop (H3-BLAC1855)		01-Feb-22	07:50	☑		☐	
Flushing Zone H3		1857 Blackthorn Loop (H3-BLAC1857)		01-Feb-22	11:44	☑		☐	
Flushing Zone H3		1858 Blackthorn Loop (H3-BLAC1858)		30-Jan-22	12:37	☑		☐	
Flushing Zone H3		1859 Blackthorn Loop (H3-BLAC1859)		01-Feb-22	07:50	☑		☐	
Flushing Zone H3		1860 Blackthorn Loop (H3-BLAC1860)		01-Feb-22	07:50	☑		☐	
Flushing Zone H3		1861 Blackthorn Loop (H3-BLAC1861)		28-Jan-22	18:10	☑		☐	
Flushing Zone H3		1862 Blackthorn Loop (H3-BLAC1862)		28-Jan-22	08:14	☑		☐	
Flushing Zone H3		1863 Blackthorn Loop (H3-BLAC1863)		28-Jan-22	14:00	☑		☐	
Flushing Zone H3		157 Bower Place (H3-BOWE0157)		31-Jan-22	07:00	☑		☐	
Flushing Zone H3		163 Bower Place (H3-BOWE0163)		29-Jan-22	08:00	☑		☐	
Flushing Zone H3		171 Bower Place (H3-BOWE0171)		30-Jan-22	13:00	☑		☐	
Flushing Zone H3		177 Bower Place (H3-BOWE0177)		01-Feb-22	11:00	☑		☐	
Flushing Zone H3		183 Bower Place (H3-BOWE0183)		28-Jan-22	08:00	☑		☐	
Flushing Zone H3		190 Bower Place (H3-BOWE0190)		28-Jan-22	08:00	☑		☐	

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	191 Bower Place (H3-BOWE0191)	28-Jan-22	11:00	☑	☐
Flushing Zone H3	195 Bower Place (H3-BOWE0195)	28-Jan-22	15:00	☑	☐
Flushing Zone H3	196 Bower Place (H3-BOWE0196)	30-Jan-22	17:00	☑	☐
Flushing Zone H3	108 Chung-Hoon Place (H3-CHUN0108)	28-Jan-22	08:00	☑	☐
Flushing Zone H3	110 Chung-Hoon Place (H3-CHUN0110)	28-Jan-22	08:00	☑	☐
Flushing Zone H3	114 Chung-Hoon Place (H3-CHUN0114)	27-Jan-22	08:00	☑	☐
Flushing Zone H3	116 Chung-Hoon Place (H3-CHUN0116)	29-Jan-22	08:00	☑	☐
Flushing Zone H3	120 Chung-Hoon Place (H3-CHUN0120)	31-Jan-22	08:00	☑	☐
Flushing Zone H3	122 Chung-Hoon Place (H3-CHUN0122)	01-Feb-22	15:00	☑	☐
Flushing Zone H3	101 Clarey Place (H3-CLAR0101)	30-Jan-22	08:00	☑	☐
Flushing Zone H3	111 Clarey Place (H3-CLAR0111)	30-Jan-22	13:00	☑	☐
Flushing Zone H3	121 Clarey Place (H3-CLAR0121)	30-Jan-22	13:00	☑	☐
Flushing Zone H3	127 Clarey Place (H3-CLAR0127)	30-Jan-22	14:00	☑	☐
Flushing Zone H3	135 Clarey Place (H3-CLAR0135)	30-Jan-22	17:00	☑	☐
Flushing Zone H3	143 Clarey Place (H3-CLAR0143)	30-Jan-22	17:00	☑	☐
Flushing Zone H3	161 Clarey Place (H3-CLAR0161)	30-Jan-22	09:20	☑	☐
Flushing Zone H3	169 Clarey Place (H3-CLAR0169)	30-Jan-22	12:05	☑	☐
Flushing Zone H3	177 Clarey Place (H3-CLAR0177)	28-Jan-22	08:00	☑	☐
Flushing Zone H3	185 Clarey Place (H3-CLAR0185)	28-Jan-22	12:21	☑	☐
Flushing Zone H3	195 Clarey Place (H3-CLAR0195)	28-Jan-22	16:29	☑	☐
Flushing Zone H3	109 Cocos Place (H3-COCO0109)	31-Jan-22	09:32	☑	☐
Flushing Zone H3	115 Cocos Place (H3-COCO0115)	30-Jan-22	10:35	☑	☐
Flushing Zone H3	119 Cocos Place (H3-COCO0119)	30-Jan-22	15:17	☑	☐
Flushing Zone H3	125 Cocos Place (H3-COCO0125)	31-Jan-22	08:42	☑	☐
Flushing Zone H3	129 Cocos Place (H3-COCO0129)	30-Jan-22	17:05	☑	☐
Flushing Zone H3	130 Cocos Place (H3-COCO0130)	30-Jan-22	10:02	☑	☐
Flushing Zone H3	133 Cocos Place (H3-COCO0133)	02-Feb-22	12:55	☑	☐
Flushing Zone H3	134 Cocos Place (H3-COCO0134)	02-Feb-22	07:35	☑	☐
Flushing Zone H3	165 Eucalyptus Place (H3-EUCA0165)	01-Feb-22	07:55	☑	☐
Flushing Zone H3	171 Eucalyptus Place (H3-EUCA0171)	31-Jan-22	11:50	☑	☐
Flushing Zone H3	175 Eucalyptus Place (H3-EUCA0175)	31-Jan-22	16:01	☑	☐
Flushing Zone H3	179 Eucalyptus Place (H3-EUCA0179)	01-Feb-22	11:40	☑	☐
Flushing Zone H3	183 Eucalyptus Place (H3-EUCA0183)	01-Feb-22	15:10	☑	☐
Flushing Zone H3	187 Eucalyptus Place (H3-EUCA0187)	01-Feb-22	08:00	☑	☐
Flushing Zone H3	193 Eucalyptus Place (H3-EUCA0193)	01-Feb-22	09:20	☑	☐
Flushing Zone H3	167 Grewia Place (H3-GREW0167)	31-Jan-22	11:17	☑	☐
Flushing Zone H3	175 Grewia Place (H3-GREW0175)	31-Jan-22	11:09	☑	☐
Flushing Zone H3	185 Grewia Place (H3-GREW0185)	31-Jan-22	14:52	☑	☐
Flushing Zone H3	191 Grewia Place (H3-GREW0191)	01-Feb-22	07:50	☑	☐
Flushing Zone H3	199 Grewia Place (H3-GREW0199)	01-Feb-22	11:10	☑	☐
Flushing Zone H3	202 Halawa View Circle (H3-HALA0202)	02-Feb-22	11:50	☑	☐
Flushing Zone H3	204 Halawa View Circle (H3-HALA0204)	02-Feb-22	07:52	☑	☐
Flushing Zone H3	206 Halawa View Circle (H3-HALA0206)	02-Feb-22	11:21	☑	☐
Flushing Zone H3	209 Halawa View Circle (H3-HALA0209)	02-Feb-22	14:57	☑	☐
Flushing Zone H3	219 Halawa View Circle (H3-HALA0219)	02-Feb-22	07:42	☑	☐
Flushing Zone H3	229 Halawa View Circle (H3-HALA0229)	02-Feb-22	11:47	☑	☐
Flushing Zone H3	233 Halawa View Circle (H3-HALA0233)	02-Feb-22	15:19	☑	☐

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	106 Halawa View Loop (H3-HALA0106)	01-Feb-22	07:56	☑	☐
Flushing Zone H3	110 Halawa View Loop (H3-HALA0110)	31-Jan-22	11:45	☑	☐
Flushing Zone H3	114 Halawa View Loop (H3-HALA0114)	31-Jan-22	11:45	☑	☐
Flushing Zone H3	118 Halawa View Loop (H3-HALA0118)	01-Feb-22	07:45	☑	☐
Flushing Zone H3	122 Halawa View Loop (H3-HALA0122)	31-Jan-22	14:15	☑	☐
Flushing Zone H3	123 Halawa View Loop (H3-HALA0123)	01-Feb-22	07:49	☑	☐
Flushing Zone H3	126 Halawa View Loop (H3-HALA0126)	02-Feb-22	12:48	☑	☐
Flushing Zone H3	127 Halawa View Loop (H3-HALA0127)	02-Feb-22	08:38	☑	☐
Flushing Zone H3	130 Halawa View Loop (H3-HALA0130)	02-Feb-22	12:49	☑	☐
Flushing Zone H3	138 Halawa View Loop (H3-HALA0138)	02-Feb-22	11:30	☑	☐
Flushing Zone H3	142 Halawa View Loop (H3-HALA0142)	02-Feb-22	07:42	☑	☐
Flushing Zone H3	143 Halawa View Loop (H3-HALA0143)	02-Feb-22	14:37	☑	☐
Flushing Zone H3	147 Halawa View Loop (H3-HALA0147)	02-Feb-22	07:50	☑	☐
Flushing Zone H3	181 Halawa View Loop (H3-HALA0181)	02-Feb-22	11:10	☑	☐
Flushing Zone H3	185 Halawa View Loop (H3-HALA0185)	02-Feb-22	13:32	☑	☐
Flushing Zone H3	189 Halawa View Loop (H3-HALA0189)	02-Feb-22	08:05	☑	☐
Flushing Zone H3	193 Halawa View Loop (H3-HALA0193)	02-Feb-22	15:45	☑	☐
Flushing Zone H3	325 Hibiscus Street (H3-HIBI0325)	01-Feb-22	07:50	☑	☐
Flushing Zone H3	335 Hibiscus Street (H3-HIBI0335)	31-Jan-22	14:25	☑	☐
Flushing Zone H3	345 Hibiscus Street (H3-HIBI0345)	31-Jan-22	10:17	☑	☐
Flushing Zone H3	355 Hibiscus Street (H3-HIBI0355)	31-Jan-22	11:40	☑	☐
Flushing Zone H3	368 Hibiscus Street (H3-HIBI0368)	31-Jan-22	15:30	☑	☐
Flushing Zone H3	380 Hibiscus Street (H3-HIBI0380)	31-Jan-22	11:06	☑	☐
Flushing Zone H3	390 Hibiscus Street (H3-HIBI0390)	31-Jan-22	15:36	☑	☐
Flushing Zone H3	391 Hibiscus Street (H3-HIBI0391)	01-Feb-22	07:55	☑	☐
Flushing Zone H3	399 Hibiscus Street (H3-HIBI0399)	01-Feb-22	12:15	☑	☐
Flushing Zone H3	610 Hibiscus Street (H3-HIBI0610)	01-Feb-22	15:38	☑	☐
Flushing Zone H3	630 Hibiscus Street (H3-HIBI0630)	01-Feb-22	07:43	☑	☐
Flushing Zone H3	650 Hibiscus Street (H3-HIBI0650)	01-Feb-22	11:30	☑	☐
Flushing Zone H3	670 Hibiscus Street (H3-HIBI0670)	01-Feb-22	15:23	☑	☐
Flushing Zone H3	690 Hibiscus Street (H3-HIBI0690)	01-Feb-22	07:56	☑	☐
Flushing Zone H3	710 Hibiscus Street (H3-HIBI0710)	01-Feb-22	10:43	☑	☐
Flushing Zone H3	722 Hibiscus Street (H3-HIBI0722)	01-Feb-22	13:56	☑	☐
Flushing Zone H3	738 Hibiscus Street (H3-HIBI0738)	01-Feb-22	12:46	☑	☐
Flushing Zone H3	754 Hibiscus Street (H3-HIBI0754)	01-Feb-22	07:59	☑	☐
Flushing Zone H3	766 Hibiscus Street (H3-HIBI0766)	01-Feb-22	11:00	☑	☐
Flushing Zone H3	120 Jasmine Place (H3-JASM0120)	28-Jan-22	08:19	☑	☐
Flushing Zone H3	132 Jasmine Place (H3-JASM0132)	27-Jan-22	08:00	☑	☐
Flushing Zone H3	140 Jasmine Place (H3-JASM0140)	28-Jan-22	12:48	☑	☐
Flushing Zone H3	144 Jasmine Place (H3-JASM0144)	29-Jan-22	08:27	☑	☐
Flushing Zone H3	148 Jasmine Place (H3-JASM0148)	01-Feb-22	01:57	☑	☐
Flushing Zone H3	152 Jasmine Place (H3-JASM0152)	01-Feb-22	12:14	☑	☐
Flushing Zone H3	170 Jasmine Place (H3-JASM0170)	31-Jan-22	10:25	☑	☐
Flushing Zone H3	171 Jasmine Place (H3-JASM0171)	02-Feb-22	10:20	☑	☐
Flushing Zone H3	174 Jasmine Place (H3-JASM0174)	30-Jan-22	12:10	☑	☐
Flushing Zone H3	177 Jasmine Place (H3-JASM0177)	29-Jan-22	08:59	☑	☐
Flushing Zone H3	178 Jasmine Place (H3-JASM0178)	01-Feb-22	12:44	☑	☐

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	195 Jasmine Place (H3-JASM0195)	28-Jan-22	11:48	☑	☐
Flushing Zone H3	199 Jasmine Place (H3-JASM0199)	28-Jan-22	16:10	☑	☐
Flushing Zone H3	131 Justicia Place (H3-JUST0131)	28-Jan-22	08:04	☑	☐
Flushing Zone H3	135 Justicia Place (H3-JUST0135)	28-Jan-22	11:52	☑	☐
Flushing Zone H3	139 Justicia Place (H3-JUST0139)	28-Jan-22	15:51	☑	☐
Flushing Zone H3	143 Justicia Place (H3-JUST0143)	01-Feb-22	07:45	☑	☐
Flushing Zone H3	147 Justicia Place (H3-JUST0147)	30-Jan-22	12:40	☑	☐
Flushing Zone H3	155 Justicia Place (H3-JUST0155)	01-Feb-22	08:00	☑	☐
Flushing Zone H3	161 Justicia Place (H3-JUST0161)	30-Jan-22	12:44	☑	☐
Flushing Zone H3	167 Justicia Place (H3-JUST0167)	30-Jan-22	08:49	☑	☐
Flushing Zone H3	171 Justicia Place (H3-JUST0171)	30-Jan-22	14:45	☑	☐
Flushing Zone H3	175 Justicia Place (H3-JUST0175)	01-Feb-22	08:00	☑	☐
Flushing Zone H3	181 Justicia Place (H3-JUST0181)	31-Jan-22	10:50	☑	☐
Flushing Zone H3	185 Justicia Place (H3-JUST0185)	31-Jan-22	14:54	☑	☐
Flushing Zone H3	191 Justicia Place (H3-JUST0191)	01-Feb-22	08:05	☑	☐
Flushing Zone H3	195 Justicia Place (H3-JUST0195)	01-Feb-22	12:08	☑	☐
Flushing Zone H3	199 Justicia Place (H3-JUST0199)	01-Feb-22	12:08	☑	☐
Flushing Zone H3	103 Koa Place (H3-KOAP0103)	30-Jan-22	09:01	☑	☐
Flushing Zone H3	107 Koa Place (H3-KOAP0107)	30-Jan-22	08:38	☑	☐
Flushing Zone H3	108 Koa Place (H3-KOAP0108)	30-Jan-22	11:30	☑	☐
Flushing Zone H3	112 Koa Place (H3-KOAP0112)	30-Jan-22	15:16	☑	☐
Flushing Zone H3	113 Koa Place (H3-KOAP0113)	02-Feb-22	15:26	☑	☐
Flushing Zone H3	116 Koa Place (H3-KOAP0116)	30-Jan-22	14:09	☑	☐
Flushing Zone H3	117 Koa Place (H3-KOAP0117)	02-Feb-22	13:20	☑	☐
Flushing Zone H3	120 Koa Place (H3-KOAP0120)	02-Feb-22	08:23	☑	☐
Flushing Zone H3	161 MacDonald Place (H3-MACD0161)	31-Jan-22	10:12	☑	☐
Flushing Zone H3	165 MacDonald Place (H3-MACD0165)	31-Jan-22	16:13	☑	☐
Flushing Zone H3	173 MacDonald Place (H3-MACD0173)	31-Jan-22	11:22	☑	☐
Flushing Zone H3	181 MacDonald Place (H3-MACD0181)	01-Feb-22	13:00	☑	☐
Flushing Zone H3	189 MacDonald Place (H3-MACD0189)	31-Jan-22	15:24	☑	☐
Flushing Zone H3	131 Octopus Lane (H3-OCTO0131)	29-Jan-22	08:31	☑	☐
Flushing Zone H3	133 Octopus Lane (H3-OCTO0133)	28-Jan-22	08:15	☑	☐
Flushing Zone H3	135 Octopus Lane (H3-OCTO0135)	28-Jan-22	17:13	☑	☐
Flushing Zone H3	137 Octopus Lane (H3-OCTO0137)	29-Jan-22	08:20	☑	☐
Flushing Zone H3	140 Octopus Lane (H3-OCTO0140)	29-Jan-22	09:20	☑	☐
Flushing Zone H3	141 Octopus Lane (H3-OCTO0141)	01-Feb-22	11:35	☑	☐
Flushing Zone H3	142 Octopus Lane (H3-OCTO0142)	30-Jan-22	09:30	☑	☐
Flushing Zone H3	143 Octopus Lane (H3-OCTO0143)	28-Jan-22	13:47	☑	☐
Flushing Zone H3	144 Octopus Lane (H3-OCTO0144)	02-Feb-22	11:46	☑	☐
Flushing Zone H3	145 Octopus Lane (H3-OCTO0145)	28-Jan-22	14:32	☑	☐
Flushing Zone H3	146 Octopus Lane (H3-OCTO0146)	02-Feb-22	07:58	☑	☐
Flushing Zone H3	147 Octopus Lane (H3-OCTO0147)	02-Feb-22	11:27	☑	☐
Flushing Zone H3	150 Octopus Lane (H3-OCTO0150)	02-Feb-22	13:30	☑	☐
Flushing Zone H3	151 Octopus Lane (H3-OCTO0151)	02-Feb-22	13:30	☑	☐
Flushing Zone H3	152 Octopus Lane (H3-OCTO0152)	02-Feb-22	08:05	☑	☐
Flushing Zone H3	153 Octopus Lane (H3-OCTO0153)	02-Feb-22	12:05	☑	☐
Flushing Zone H3	154 Octopus Lane (H3-OCTO0154)	02-Feb-22	15:33	☑	☐

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	155 Octopus Lane (H3-OCTO0155)	02-Feb-22	07:58	☑	☐
Flushing Zone H3	156 Octopus Lane (H3-OCTO0156)	02-Feb-22	11:24	☑	☐
Flushing Zone H3	157 Octopus Lane (H3-OCTO0157)	31-Jan-22	11:00	☑	☐
Flushing Zone H3	160 Octopus Lane (H3-OCTO0160)	31-Jan-22	12:00	☑	☐
Flushing Zone H3	162 Octopus Lane (H3-OCTO0162)	31-Jan-22	15:20	☑	☐
Flushing Zone H3	164 Octopus Lane (H3-OCTO0164)	31-Jan-22	11:12	☑	☐
Flushing Zone H3	166 Octopus Lane (H3-OCTO0166)	31-Jan-22	13:11	☑	☐
Flushing Zone H3	114 Olive Place (H3-OLIV0114)	28-Jan-22	08:05	☑	☐
Flushing Zone H3	115 Olive Place (H3-OLIV0115)	28-Jan-22	12:13	☑	☐
Flushing Zone H3	116 Olive Place (H3-OLIV0116)	28-Jan-22	15:43	☑	☐
Flushing Zone H3	117 Olive Place (H3-OLIV0117)	30-Jan-22	09:48	☑	☐
Flushing Zone H3	119 Olive Place (H3-OLIV0119)	30-Jan-22	14:46	☑	☐
Flushing Zone H3	121 Olive Place (H3-OLIV0121)	01-Feb-22	16:40	☑	☐
Flushing Zone H3	127 Olive Place (H3-OLIV0127)	31-Jan-22	07:45	☑	☐
Flushing Zone H3	129 Olive Place (H3-OLIV0129)	31-Jan-22	08:17	☑	☐
Flushing Zone H3	131 Olive Place (H3-OLIV0131)	30-Jan-22	12:42	☑	☐
Flushing Zone H3	133 Olive Place (H3-OLIV0133)	27-Jan-22	12:10	☑	☐
Flushing Zone H3	135 Olive Place (H3-OLIV0135)	01-Feb-22	07:44	☑	☐
Flushing Zone H3	137 Olive Place (H3-OLIV0137)	31-Jan-22	12:11	☑	☐
Flushing Zone H3	139 Olive Place (H3-OLIV0139)	31-Jan-22	13:40	☑	☐
Flushing Zone H3	141 Olive Place (H3-OLIV0141)	01-Feb-22	07:44	☑	☐
Flushing Zone H3	144 Olive Place (H3-OLIV0144)	31-Jan-22	08:00	☑	☐
Flushing Zone H3	146 Olive Place (H3-OLIV0146)	31-Jan-22	12:35	☑	☐
Flushing Zone H3	148 Olive Place (H3-OLIV0148)	01-Feb-22	11:09	☑	☐
Flushing Zone H3	150 Olive Place (H3-OLIV0150)	01-Feb-22	14:30	☑	☐
Flushing Zone H3	154 Olive Place (H3-OLIV0154)	01-Feb-22	07:58	☑	☐
Flushing Zone H3	156 Olive Place (H3-OLIV0156)	02-Feb-22	12:08	☑	☐
Flushing Zone H3	162 Olive Place (H3-OLIV0162)	02-Feb-22	15:45	☑	☐
Flushing Zone H3	164 Olive Place (H3-OLIV0164)	02-Feb-22	14:45	☑	☐
Flushing Zone H3	166 Olive Place (H3-OLIV0166)	02-Feb-22	11:16	☑	☐
Flushing Zone H3	168 Olive Place (H3-OLIV0168)	02-Feb-22	08:00	☑	☐
Flushing Zone H3	120 Orig Place (H3-ORIG0120)	28-Jan-22	08:09	☑	☐
Flushing Zone H3	121 Orig Place (H3-ORIG0121)	28-Jan-22	13:00	☑	☐
Flushing Zone H3	122 Orig Place (H3-ORIG0122)	28-Jan-22	17:05	☑	☐
Flushing Zone H3	123 Orig Place (H3-ORIG0123)	29-Jan-22	08:09	☑	☐
Flushing Zone H3	124 Orig Place (H3-ORIG0124)	29-Jan-22	09:02	☑	☐
Flushing Zone H3	126 Orig Place (H3-ORIG0126)	01-Feb-22	07:53	☑	☐
Flushing Zone H3	127 Orig Place (H3-ORIG0127)	30-Jan-22	16:49	☑	☐
Flushing Zone H3	129 Orig Place (H3-ORIG0129)	31-Jan-22	07:50	☑	☐
Flushing Zone H3	130 Orig Place (H3-ORIG0130)	31-Jan-22	07:50	☑	☐
Flushing Zone H3	132 Orig Place (H3-ORIG0132)	02-Feb-22	08:20	☑	☐
Flushing Zone H3	158 Poinciana Place (H3-POIN0158)	01-Feb-22	13:47	☑	☐
Flushing Zone H3	159 Poinciana Place (H3-POIN0159)	27-Jan-22	11:35	☑	☐
Flushing Zone H3	162 Poinciana Place (H3-POIN0162)	01-Feb-22	12:18	☑	☐
Flushing Zone H3	167 Poincana Place (H3-POIN0167)	27-Jan-22	08:30	☑	☐
Flushing Zone H3	168 Poinciana Place (H3-POIN0168)	01-Feb-22	07:53	☑	☐
Flushing Zone H3	174 Poinciana Place (H3-POIN0174)	31-Jan-22	10:56	☑	☐

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	177 Poinciana Place (H3-POIN0177)	31-Jan-22	15:17	☑	☐
Flushing Zone H3	189 Poinciana Place (H3-POIN0189)	01-Feb-22	08:11	☑	☐
Flushing Zone H3	1901 Point Welcome Place (H3-POIN1901)	31-Jan-22	11:50	☑	☐
Flushing Zone H3	1903 Point Welcome Place (H3-POIN1903)	31-Jan-22	14:00	☑	☐
Flushing Zone H3	1905 Point Welcome Place (H3-POIN1905)	01-Feb-22	08:00	☑	☐
Flushing Zone H3	2001 Point Welcome Place (H3-POIN2001)	02-Feb-22	07:41	☑	☐
Flushing Zone H3	2002 Point Welcome Place (H3-POIN2002)	31-Jan-22	11:30	☑	☐
Flushing Zone H3	2003 Point Welcome Place (H3-POIN2003)	30-Jan-22	09:46	☑	☐
Flushing Zone H3	2004 Point Welcome Place (H3-POIN2004)	30-Jan-22	08:34	☑	☐
Flushing Zone H3	2005 Point Welcome Place (H3-POIN2005)	28-Jan-22	08:00	☑	☐
Flushing Zone H3	2006 Point Welcome Place (H3-POIN2006)	28-Jan-22	11:44	☑	☐
Flushing Zone H3	2007 Point Welcome Place (H3-POIN2007)	28-Jan-22	16:39	☑	☐
Flushing Zone H3	2008 Point Welcome Place (H3-POIN2008)	28-Jan-22	14:51	☑	☐
Flushing Zone H3	2009 Point Welcome Place (H3-POIN2009)	31-Jan-22	14:08	☑	☐
Flushing Zone H3	2010 Point Welcome Place (H3-POIN2010)	01-Feb-22	15:33	☑	☐
Flushing Zone H3	2011 Point Welcome Place (H3-POIN2011)	01-Feb-22	08:14	☑	☐
Flushing Zone H3	2012 Point Welcome Place (H3-POIN2012)	01-Feb-22	11:51	☑	☐
Flushing Zone H3	2013 Point Welcome Place (H3-POIN2013)	02-Feb-22	11:30	☑	☐
Flushing Zone H3	2014 Point Welcome Place (H3-POIN2014)	30-Jan-22	13:18	☑	☐
Flushing Zone H3	2015 Point Welcome Place (H3-POIN2015)	30-Jan-22	15:59	☑	☐
Flushing Zone H3	2016 Point Welcome Place (H3-POIN2016)	01-Feb-22	07:50	☑	☐
Flushing Zone H3	2017 Point Welcome Place (H3-POIN2017)	30-Jan-22	10:24	☑	☐
Flushing Zone H3	2018 Point Welcome Place (H3-POIN2018)	30-Jan-22	15:32	☑	☐
Flushing Zone H3	2019 Point Welcome Place (H3-POIN2019)	30-Jan-22	14:20	☑	☐
Flushing Zone H3	2020 Point Welcome Place (H3-POIN2020)	30-Jan-22	17:01	☑	☐
Flushing Zone H3	2021 Point Welcome Place (H3-POIN2021)	29-Jan-22	08:11	☑	☐
Flushing Zone H3	2022 Point Welcome Place (H3-POIN2022)	01-Feb-22	00:44	☑	☐
Flushing Zone H3	2023 Point Welcome Place (H3-POIN2023)	30-Jan-22	12:50	☑	☐
Flushing Zone H3	2024 Point Welcome Place (H3-POIN2024)	28-Jan-22	08:10	☑	☐
Flushing Zone H3	2025 Point Welcome Place (H3-POIN2025)	28-Jan-22	13:00	☑	☐
Flushing Zone H3	2026 Point Welcome Place (H3-POIN2026)	28-Jan-22	18:19	☑	☐
Flushing Zone H3	2101 Point Welcome Place (H3-POIN2101)	28-Jan-22	08:05	☑	☐
Flushing Zone H3	2103 Point Welcome Place (H3-POIN2103)	28-Jan-22	12:11	☑	☐
Flushing Zone H3	2105 Point Welcome Place (H3-POIN2105)	28-Jan-22	16:04	☑	☐
Flushing Zone H3	2107 Point Welcome Place (H3-POIN2107)	30-Jan-22	09:55	☑	☐
Flushing Zone H3	2108 Point Welcome Place (H3-POIN2108)	27-Jan-22	14:10	☑	☐
Flushing Zone H3	2109 Point Welcome Place (H3-POIN2109)	01-Feb-22	15:39	☑	☐
Flushing Zone H3	2111 Point Welcome Place (H3-POIN2111)	31-Jan-22	08:45	☑	☐
Flushing Zone H3	2112 Point Welcome Place (H3-POIN2112)	30-Jan-22	15:14	☑	☐
Flushing Zone H3	2113 Point Welcome Place (H3-POIN2113)	30-Jan-22	14:10	☑	☐
Flushing Zone H3	2114 Point Welcome Place (H3-POIN2114)	31-Jan-22	08:50	☑	☐
Flushing Zone H3	2115 Point Welcome Place (H3-POIN2115)	31-Jan-22	12:29	☑	☐
Flushing Zone H3	2116 Point Welcome Place (H3-POIN2116)	29-Jan-22	08:25	☑	☐
Flushing Zone H3	2118 Point Welcome Place (H3-POIN2118)	30-Jan-22	09:33	☑	☐
Flushing Zone H3	2120 Point Welcome Place (H3-POIN2120)	01-Feb-22	07:59	☑	☐
Flushing Zone H3	2122 Point Welcome Place (H3-POIN2122)	28-Jan-22	12:19	☑	☐
Flushing Zone H3	2124 Point Welcome Place (H3-POIN2124)	28-Jan-22	15:32	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	2126 Point Welcome Place (H3-POIN2126)	28-Jan-22	16:12	☑	☐
Flushing Zone H3	1402 Sassafras Drive (H3-SASS1402)	29-Jan-22	08:51	☑	☐
Flushing Zone H3	1403 Sassafras Drive (H3-SASS1403)	30-Jan-22	09:18	☑	☐
Flushing Zone H3	1404 Sassafras Drive (H3-SASS1404)	01-Feb-22	12:57	☑	☐
Flushing Zone H3	1405 Sassafras Drive (H3-SASS1405)	30-Jan-22	14:05	☑	☐
Flushing Zone H3	1406 Sassafras Drive (H3-SASS1406)	31-Jan-22	14:00	☑	☐
Flushing Zone H3	1407 Sassafras Drive (H3-SASS1407)	30-Jan-22	16:40	☑	☐
Flushing Zone H3	1408 Sassafras Drive (H3-SASS1408)	30-Jan-22	15:30	☑	☐
Flushing Zone H3	1409 Sassafras Drive (H3-SASS1409)	28-Jan-22	08:17	☑	☐
Flushing Zone H3	1411 Sassafras Drive (H3-SASS1411)	28-Jan-22	14:24	☑	☐
Flushing Zone H3	1413 Sassafras Drive (H3-SASS1413)	29-Jan-22	08:06	☑	☐
Flushing Zone H3	1501 Sassafras Drive (H3-SASS1501)	28-Jan-22	08:10	☑	☐
Flushing Zone H3	1502 Sassafras Drive (H3-SASS1502)	30-Jan-22	09:21	☑	☐
Flushing Zone H3	1503 Sassafras Drive (H3-SASS1503)	28-Jan-22	17:00	☑	☐
Flushing Zone H3	1504 Sassafras Drive (H3-SASS1504)	01-Feb-22	17:28	☑	☐
Flushing Zone H3	1505 Sassafras Drive (H3-SASS1505)	28-Jan-22	15:15	☑	☐
Flushing Zone H3	1506 Sassafras Drive (H3-SASS1506)	30-Jan-22	00:20	☑	☐
Flushing Zone H3	1507 Sassafras Drive (H3-SASS1507)	29-Jan-22	08:23	☑	☐
Flushing Zone H3	1508 Sassafras Drive (H3-SASS1508)	01-Feb-22	08:12	☑	☐
Flushing Zone H3	1509 Sassafras Drive (H3-SASS1509)	30-Jan-22	09:25	☑	☐
Flushing Zone H3	1511 Sassafras Drive (H3-SASS1511)	30-Jan-22	12:23	☑	☐
Flushing Zone H3	106 Shower Place (H3-SHOW0106)	28-Jan-22	14:46	☑	☐
Flushing Zone H3	108 Shower Place (H3-SHOW0108)	28-Jan-22	08:05	☑	☐
Flushing Zone H3	126 Shower Place (H3-SHOW0126)	28-Jan-22	12:30	☑	☐
Flushing Zone H3	128 Shower Place (H3-SHOW0128)	29-Jan-22	08:15	☑	☐
Flushing Zone H3	138 Shower Place (H3-SHOW0138)	30-Jan-22	09:21	☑	☐
Flushing Zone H3	140 Shower Place (H3-SHOW0140)	01-Feb-22	12:33	☑	☐
Flushing Zone H3	146 Shower Place (H3-SHOW0146)	30-Jan-22	13:30	☑	☐
Flushing Zone H3	148 Shower Place (H3-SHOW0148)	30-Jan-22	15:06	☑	☐
Flushing Zone H3	152 Shower Place (H3-SHOW0152)	31-Jan-22	08:06	☑	☐
Flushing Zone H3	154 Shower Place (H3-SHOW0154)	02-Feb-22	11:40	☑	☐
Flushing Zone H3	158 Shower Place (H3-SHOW0158)	02-Feb-22	07:57	☑	☐
Flushing Zone H3	160 Shower Place (H3-SHOW0160)	02-Feb-22	11:58	☑	☐
Flushing Zone H3	177 Shower Place (H3-SHOW0177)	02-Feb-22	07:55	☑	☐
Flushing Zone H3	178 Shower Place (H3-SHOW0178)	02-Feb-22	12:15	☑	☐
Flushing Zone H3	179 Shower Place (H3-SHOW0179)	27-Jan-22	16:10	☑	☐
Flushing Zone H3	180 Shower Place (H3-SHOW0180)	02-Feb-22	15:45	☑	☐
Flushing Zone H3	181 Shower Place (H3-SHOW0181)	02-Feb-22	08:00	☑	☐
Flushing Zone H3	182 Shower Place (H3-SHOW0182)	02-Feb-22	12:38	☑	☐
Flushing Zone H3	183 Shower Place (H3-SHOW0183)	02-Feb-22	13:48	☑	☐
Flushing Zone H3	184 Shower Place (H3-SHOW0184)	02-Feb-22	10:45	☑	☐
Flushing Zone H3	193 Shower Place (H3-SHOW0193)	02-Feb-22	07:55	☑	☐
Flushing Zone H3	195 Shower Place (H3-SHOW0195)	02-Feb-22	13:28	☑	☐
Flushing Zone H3	219 Shower Place (H3-SHOW0219)	02-Feb-22	08:00	☑	☐
Flushing Zone H3	221 Shower Place (H3-SHOW0221)	02-Feb-22	15:30	☑	☐
Flushing Zone H3	223 Shower Place (H3-SHOW0223)	31-Jan-22	15:20	☑	☐
Flushing Zone H3	225 Shower Place (H3-SHOW0225)	31-Jan-22	11:20	☑	☐

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	249 Shower Place (H3-SHOW0249)	31-Jan-22	12:29	☑	☐
Flushing Zone H3	251 Shower Place (H3-SHOW0251)	31-Jan-22	15:50	☑	☐
Flushing Zone H3	253 Shower Place (H3-SHOW0253)	01-Feb-22	08:09	☑	☐
Flushing Zone H3	255 Shower Place (H3-SHOW0255)	31-Jan-22	13:18	☑	☐
Flushing Zone H3	260 Shower Place (H3-SHOW0260)	31-Jan-22	12:46	☑	☐
Flushing Zone H3	250 Valley View Loop (H3-VALL0250)	28-Jan-22	08:38	☑	☐
Flushing Zone H3	252 Valley View Loop (H3-VALL0252)	27-Jan-22	14:32	☑	☐
Flushing Zone H3	254 Valley View Loop (H3-VALL0254)	29-Jan-22	08:10	☑	☐
Flushing Zone H3	256 Valley View Loop (H3-VALL0256)	29-Jan-22	08:05	☑	☐
Flushing Zone H3	340 Valley View Loop (H3-VALL0340)	30-Jan-22	09:20	☑	☐
Flushing Zone H3	342 Valley View Loop (H3-VALL0342)	30-Jan-22	12:53	☑	☐
Flushing Zone H3	344 Valley View Loop (H3-VALL0344)	30-Jan-22	16:12	☑	☐
Flushing Zone H3	346 Valley View Loop (H3-VALL0346)	30-Jan-22	15:08	☑	☐
Flushing Zone H3	350 Valley View Loop (H3-VALL0350)	30-Jan-22	16:08	☑	☐
Flushing Zone H3	352 Valley View Loop (H3-VALL0352)	02-Feb-22	12:13	☑	☐
Flushing Zone H3	413 Valley View Loop (H3-VALL0413)	02-Feb-22	14:35	☑	☐
Flushing Zone H3	415 Valley View Loop (H3-VALL0415)	02-Feb-22	10:13	☑	☐
Flushing Zone H3	417 Valley View Loop (H3-VALL0417)	02-Feb-22	08:18	☑	☐
Flushing Zone H3	419 Valley View Loop (H3-VALL0419)	02-Feb-22	07:54	☑	☐
Flushing Zone H3	425 Valley View Loop (H3-VALL0425)	02-Feb-22	11:15	☑	☐
Flushing Zone H3	427 Valley View Loop (H3-VALL0427)	02-Feb-22	14:28	☑	☐
Flushing Zone H3	429 Valley View Loop (H3-VALL0429)	02-Feb-22	07:45	☑	☐
Flushing Zone H3	431 Valley View Loop (H3-VALL0431)	02-Feb-22	11:50	☑	☐
Flushing Zone H3	437 Valley View Loop (H3-VALL0437)	02-Feb-22	15:14	☑	☐
Flushing Zone H3	439 Valley View Loop (H3-VALL0439)	02-Feb-22	09:30	☑	☐
Flushing Zone H3	441 Valley View Loop (H3-VALL0441)	02-Feb-22	08:15	☑	☐
Flushing Zone H3	443 Valley View Loop (H3-VALL0443)	02-Feb-22	14:00	☑	☐
Flushing Zone H3	457 Valley View Loop (H3-VALL0457)	02-Feb-22	12:47	☑	☐
Flushing Zone H3	459 Valley View Loop (H3-VALL0459)	02-Feb-22	15:53	☑	☐
Flushing Zone H3	462 Valley View Loop (H3-VALL0462)	02-Feb-22	07:43	☑	☐
Flushing Zone H3	463 Valley View Loop (H3-VALL0463)	02-Feb-22	07:40	☑	☐
Flushing Zone H3	464 Valley View Loop (H3-VALL0464)	02-Feb-22	11:07	☑	☐
Flushing Zone H3	465 Valley View Loop (H3-VALL0465)	02-Feb-22	14:37	☑	☐
Flushing Zone H3	468 Valley View Loop (H3-VALL0468)	02-Feb-22	07:46	☑	☐
Flushing Zone H3	470 Valley View Loop (H3-VALL0470)	02-Feb-22	11:11	☑	☐
Flushing Zone H3	475 Valley View Loop (H3-VALL0475)	02-Feb-22	14:15	☑	☐
Flushing Zone H3	477 Valley View Loop (H3-VALL0477)	02-Feb-22	08:05	☑	☐
Flushing Zone H3	485 Valley View Loop (H3-VALL0485)	27-Jan-22	07:52	☑	☐
Flushing Zone H3	487 Valley View Loop (H3-VALL0487)	02-Feb-22	11:57	☑	☐
Flushing Zone H3	488 Valley View Loop (H3-VALL0488)	27-Jan-22	10:12	☑	☐
Flushing Zone H3	490 Valley View Loop (H3-VALL0490)	02-Feb-22	15:00	☑	☐
Flushing Zone H3	492 Valley View Loop (H3-VALL0492)	02-Feb-22	07:41	☑	☐
Flushing Zone H3	494 Valley View Loop (H3-VALL0494)	02-Feb-22	12:00	☑	☐
Flushing Zone H3	557 Valley View Loop (H3-VALL0557)	02-Feb-22	07:49	☑	☐
Flushing Zone H3	559 Valley View Loop (H3-VALL0559)	02-Feb-22	16:04	☑	☐
Flushing Zone H3	565 Valley View Loop (H3-VALL0565)	02-Feb-22	11:17	☑	☐
Flushing Zone H3	567 Valley View Loop (H3-VALL0567)	02-Feb-22	14:34	☑	☐

Encl: (1) EDMS Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-27 - 2022-02-11

Flushing Zone H3	573 Valley View Loop (H3-VALL0573)	02-Feb-22	08:09	☑	☐
Flushing Zone H3	575 Valley View Loop (H3-VALL0575)	02-Feb-22	11:49	☑	☐
Flushing Zone H3	581 Valley View Loop (H3-VALL0581)	02-Feb-22	14:50	☑	☐
Flushing Zone H3	583 Valley View Loop (H3-VALL0583)	02-Feb-22	08:25	☑	☐
Flushing Zone H3	589 Valley View Loop (H3-VALL0589)	02-Feb-22	11:37	☑	☐
Flushing Zone H3	591 Valley View Loop (H3-VALL0591)	02-Feb-22	15:00	☑	☐
Flushing Zone H3	595 Valley View Loop (H3-VALL0595)	02-Feb-22	08:10	☑	☐
Flushing Zone H3	597 Valley View Loop (H3-VALL0597)	02-Feb-22	11:35	☑	☐

Key

- Not Started
- No Access
- In Progress
- Complete

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Encl: (2) EDMS Non-Residential Flushing Records Zone H3

Flushing Zone H3

2022-01-25 - 2022-01-27

Total Facilities	Total Facilities Flushed	Percent Complete	No Access	Flushed on Selected Dates
4	4	100.0 %	0	4

Zone	Neighborhood	Address	Appointment Date/Time	Arrive Date	Start Time	Certified	Summary General Notes	Unable To Access	Access Reason
Flushing Zone H3		AMR 88 COSA, Lay Down Yard (H3-		25-Jan-22	07:17	☑		☐	
Flushing Zone H3		AMR 88, Construction Site (H3-		27-Jan-22	07:10	☑		☐	
Flushing Zone H3		Sewer Lift Pump Station AMR#2, adjacent		25-Jan-22	07:00	☑		☐	
Flushing Zone H3		Sewer Lift Pump Station CG/RH#2, 1395		25-Jan-22	07:35	☑		☐	

Key

- Not Started
- No Access
- In Progress
- Complete

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-ABEL0193	H3-ABEL0193	H3-BLAC1706	H3-BLAC1706	H3-BLAC1713	H3-BLAC1713	H3-BLAC1851	H3-BLAC1851
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	193 Abelia Place	193 Abelia Place	1705 Blackhaw Place	1705 Blackhaw Place	1705 Blackhaw Place	1705 Blackhaw Place	1851 Blackthorn Loop	1851 Blackthorn Loop
Field Sample ID:	220203H3ET07	220203H3ET08	220129H3IT06	220131H3KT06	220202H3KT03	220202H3KT04	220203H3DT01	220203H3DT02
Sample Date:	2022-02-03	2022-02-03	2022-01-29	2022-01-31	2022-02-02	2022-02-02	2022-02-03	2022-02-03
Sample Type:	N	FD	N	N (72 Hour Stagnation)	N	FD	N	FD

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B018	SDG: C22B018	SDG: C22A066	SDG: DA41418	SDG: C22B015	SDG: C22B015	SDG: C22B018	SDG: C22B018
Total Organic Carbon	2	None	None	None	**1.89**	**2.17**	0.200 U	**0.530**	**1.84**	**1.60**	**1.52**	**1.58**

HC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 5801097571	SDG: DA41418	SDG: DA41508	SDG: DA41508	SDG: DA41542	SDG: DA41542
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 UJ	190 U	92.0 U	190 U	190 UJ	190 UJ	190 U	190 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	40.0 U	31.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 UJ	190 U	180 U	190 U	190 UJ	190 UJ	190 U	190 U
Total Petroleum Hydrocarbons	211				--	--	--	--	--	--	--	--

HG (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 810134401	SDG: DA41418	SDG: DA41508	SDG: DA41508	SDG: DA41542	SDG: DA41542
Mercury	0.025	0.025	2	2	0.0250 U	0.0250 U	**0.0590 J**	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U

METAL (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 810134401	SDG: DA41418	SDG: DA41508	SDG: DA41508	SDG: DA41542	SDG: DA41542
Antimony	6	6	6	6	0.100 U	0.100 U	0.0570 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Arsenic	10	10	10	10	0.500 UJ	0.500 UJ	0.890 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Barium	220	220	2000	2000	**2.60**	**2.50**	**3.40**	**2.90**	**2.50**	**2.50**	**2.40**	**2.40**
Beryllium	0.66	0.66	4	4	0.150 U	0.150 U	0.0830 U	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U
Cadmium	3	3	5	5	0.0500 UJ	0.0500 UJ	0.140 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U
Chromium	11	11	100	100	**1.70 J**	**1.80 J**	**2.00**	**1.40 J**	**1.60 J**	**1.60 J**	**1.70 J**	**1.60 J**
Copper	2.9	2.9	1300	1300	**46.6**	**43.6**	**54.0**	**62.6**	**53.4 J**	**29.3 J**	**37.9**	**35.9**
Lead	15	5.6	15	15	0.130 U	0.130 U	**0.170 J**	**0.340 J**	**0.160 J**	0.130 U	**0.240 J**	**0.320 J**
Selenium	5	5	50	50	0.300 U	0.300 U	**1.60 J**	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U
Thallium	2	2	2	2	**0.0920 J**	0.0500 U	0.160 U	0.0500 U	**0.0850 J**	0.0500 U	0.0500 U	0.0500 U

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 810134401	SDG: DA41418	SDG: DA41508	SDG: DA41508	SDG: DA41542	SDG: DA41542
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.240 U	0.0200 U	0.240 U	0.240 U	0.240 U	0.240 U	0.240 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-CLAR0195	H3-EUCA0187	H3-EUCA0187	H3-HALA0123	H3-HALA0138	H3-HALA0219	H3-HIBI0399	H3-HIBI0650
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	195 Clarey Place	187 Eucalyptus Place	187 Eucalyptus Place	123 Halawa View Loop	138 Halawa View Loop	219 Halawa View Circle	399 Hibiscus Street	650 Hibiscus Street
Field Sample ID:	220130H3LT04	220203H3GT01	220203H3GT02	220203H3GT04	220204H3GT04	220204H3GT02	220203H3ET06	220203H3ET04
Sample Date:	2022-01-30	2022-02-03	2022-02-03	2022-02-03	2022-02-04	2022-02-04	2022-02-03	2022-02-03
Sample Type:	N	N	FD	N	N	N	N	N

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22A073_Rev1	SDG: C22B018	SDG: C22B018	SDG: C22B018	SDG: C22B022	SDG: C22B022	SDG: C22B018	SDG: C22B018
Total Organic Carbon	2	None	None	None	**2.68 J**	**1.58**	**2.24**	0.200 U	**2.11**	**1.92**	0.200 U	**1.82**

HC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 5801097901	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: DA41570	SDG: DA41570	SDG: DA41542	SDG: DA41542
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	91.0 U	190 UJ	190 U	190 U	190 U	190 U	190 U	190 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	190 UJ	190 U	190 U	190 U	190 U	190 U	190 U
Total Petroleum Hydrocarbons	211				--	--	--	--	--	--	--	--

HG (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 810134441_Rev_JNC	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: DA41570	SDG: DA41570	SDG: DA41542	SDG: DA41542
Mercury	0.025	0.025	2	2	0.0560 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U

METAL (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 810134441_Rev_JNC	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: DA41570	SDG: DA41570	SDG: DA41542	SDG: DA41542
Antimony	6	6	6	6	0.0570 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U
Arsenic	10	10	10	10	0.890 U	0.500 U	0.500 U	0.500 UJ	0.500 U	0.500 U	0.500 UJ	0.500 U
Barium	220	220	2000	2000	**3.10**	**2.80**	**2.80**	**2.40**	**2.50**	**2.30**	**2.50**	**2.40**
Beryllium	0.66	0.66	4	4	0.0830 U	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U
Cadmium	3	3	5	5	0.140 U	0.0500 U	0.0500 U	0.0500 UJ	0.0500 U	0.0500 U	0.0500 UJ	0.0500 U
Chromium	11	11	100	100	**1.60**	**1.60 J**	**1.60 J**	**1.80 J**	**1.70 J**	**1.80 J**	**1.80 J**	**1.90 J**
Copper	2.9	2.9	1300	1300	**47.0**	**35.6**	**33.3**	**57.5**	**101**	**10.9**	**21.6**	**15.5**
Lead	15	5.6	15	15	**1.50**	**0.300 J**	**0.350 J**	**0.210 J**	**0.280 J**	**0.390 J**	**0.230 J**	**0.180 J**
Selenium	5	5	50	50	1.60 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U
Thallium	2	2	2	2	0.160 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0500 U

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 810134441_Rev_JNC	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: DA41570	SDG: DA41570	SDG: DA41542	SDG: DA41542
1-Methylnaphthalene	2.1	10	None	None	0.0190 U	0.240 U	0.240 U	0.240 U	0.240 U	0.250 U	0.240 U	0.240 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-HIBI0670	H3-HIBI0690	H3-JUST0171	H3-JUST0171	H3-KOAP0116	H3-MACD0161	H3-OCTO0131	H3-OCTO0145
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	670 Hibiscus Street	690 Hibiscus Street	171 Justicia Place	171 Justicia Place	116 Koa Place	161 MacDonald Place	131 Octopus Lane	145 Octopus Lane
Field Sample ID:	220203H3ET05	220203H3GT03	220201H3BT02	220201H3BT03	220201H3BT04	220202H3KT02	220131H3BT08	220130H3CT01
Sample Date:	2022-02-03	2022-02-03	2022-02-01	2022-02-01	2022-02-01	2022-02-02	2022-01-31	2022-01-30
Sample Type:	N	N	N	FD	N	N	N	N

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B018	SDG: C22B018	SDG: C22B015	SDG: C22B015	SDG: C22B015	SDG: C22B015	SDG: C22B004	SDG: C22A073_Rev1
Total Organic Carbon	2	None	None	None	**2.06**	0.200 U	0.200 U	**2.28**	0.200 U	0.200 U	**1.67**	**7.48 J**

HC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 5801098751	SDG: 5801098751	SDG: 5801098751	SDG: DA41508	SDG: 5801098751	SDG: 5801097901
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 UJ	190 U	93.0 U	93.0 U	91.0 U	190 U	92.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	40.0 U	31.0 U	31.0 U	31.0 U	40.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 UJ	190 U	190 U	190 U	180 U	190 U	180 U	180 U
Total Petroleum Hydrocarbons	211				--	--	--	--	--	--	--	--

HG (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 35694116	SDG: 35694116	SDG: 35694116	SDG: DA41508	SDG: 35693855	SDG: 35693535_REV
Mercury	0.025	0.025	2	2	0.0250 U	0.0250 U	0.0900 U	0.0900 U	0.0900 U	0.0250 U	0.0900 U	0.0900 U

METAL (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 35694116	SDG: 35694116	SDG: 35694116	SDG: DA41508	SDG: 35693855	SDG: 35693535_REV
Antimony	6	6	6	6	0.100 U	0.100 U	0.210 U	0.210 U	0.210 U	0.100 U	0.210 U	0.210 U
Arsenic	10	10	10	10	0.500 U	0.500 UJ	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Barium	220	220	2000	2000	**2.40**	**2.50**	**2.80**	**2.80**	**2.60**	**2.60**	**2.90**	**3.20**
Beryllium	0.66	0.66	4	4	0.150 U	0.150 U	0.140 U	0.140 U	0.0700 U	0.150 U	0.0700 U	0.0700 U
Cadmium	3	3	5	5	0.0500 U	0.0500 UJ	0.120 U	0.120 U	0.120 U	0.0500 U	0.120 U	0.120 U
Chromium	11	11	100	100	**1.90 J**	**1.80 J**	2.20 U	**4.00**	**1.30 J**	**1.70 J**	**1.50 J**	**1.80 J**
Copper	2.9	2.9	1300	1300	**16.7**	**23.6**	**31.1**	**33.6**	**86.6**	**23.4**	**52.4**	**21.6**
Lead	15	5.6	15	15	**0.180 J**	**0.300 J**	**0.270 J**	**0.250 J**	**0.440 J**	**0.190 J**	0.220 U	**0.710 J**
Selenium	5	5	50	50	0.300 U	0.300 U	0.830 U	0.830 U	0.830 U	0.300 U	0.830 U	**1.40**
Thallium	2	2	2	2	0.0500 U	0.0500 U	0.500 U	0.500 U	0.500 U	0.0500 U	0.500 U	0.500 U

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 35694116	SDG: 35694116	SDG: 35694116	SDG: DA41508	SDG: 35693855	SDG: 35693535_REV
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.240 U	0.180 U	0.180 U	0.180 U	0.250 U	0.170 U	0.180 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-OCTO0162	H3-OLIV0114	H3-OLIV0114	H3-OLIV0131	H3-OLIV0144	H3-POIN0167	H3-POIN0167	H3-POIN2004
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	162 Octopus Lane	114 Olive Place	114 Olive Place	131 Olive Place	144 Olive Place	167 Poincana Place	167 Poincana Place	2004 Point Welcome Place
Field Sample ID:	220203H3DT05	220130H3KT02	220130H3KT03	220201H3AT01	220202H3KT01	220129H3IT07	220131H3KT07	220201H3AT03
Sample Date:	2022-02-03	2022-01-30	2022-01-30	2022-02-01	2022-02-02	2022-01-29	2022-01-31	2022-02-01
Sample Type:	N	N	FD	N	N	N	N (72 Hour Stagnation)	N

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B018	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22B011	SDG: C22B015	SDG: C22A066	SDG: DA41418	SDG: C22B011
Total Organic Carbon	2	None	None	None	0.200 U	0.200 UJ	**3.11 J**	**2.40**	**1.53**	0.200 U	**0.560**	0.200 U

HC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41570	SDG: 5801097901	SDG: 5801097901	SDG: 5801098751	SDG: DA41508	SDG: 5801097571	SDG: DA41418	SDG: 5801098751
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	93.0 U	92.0 U	91.0 U	190 UJ	92.0 U	190 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	31.0 UJ	31.0 UJ	31.0 U	40.0 U	31.0 U	40.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	190 U	180 U	**180 J**	190 UJ	180 U	190 U	180 U
Total Petroleum Hydrocarbons	211				--	--	--	180	--	--	--	--

HG (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41570	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 35694112	SDG: DA41508	SDG: 810134401	SDG: DA41418	SDG: 35694112
Mercury	0.025	0.025	2	2	0.0250 U	**0.0560 J**	0.0560 U	0.0900 U	0.0250 U	**0.0780 J**	0.0250 U	0.0900 U

METAL (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41570	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 35694112	SDG: DA41508	SDG: 810134401	SDG: DA41418	SDG: 35694112
Antimony	6	6	6	6	0.100 U	0.0570 U	0.0570 U	0.210 U	0.100 U	0.0570 U	0.100 U	0.210 U
Arsenic	10	10	10	10	0.500 U	0.890 U	0.890 U	0.500 U	0.500 U	0.890 U	0.500 U	0.500 U
Barium	220	220	2000	2000	**2.50**	**2.90**	**3.00**	**2.70**	**2.40**	**3.40**	**3.00**	**3.10**
Beryllium	0.66	0.66	4	4	0.150 U	0.0830 U	0.0830 U	0.140 U	0.150 U	0.0830 U	0.150 U	0.140 U
Cadmium	3	3	5	5	0.0500 U	0.140 U	0.140 U	0.120 U	0.0500 U	0.140 U	0.0500 U	0.120 U
Chromium	11	11	100	100	**1.50 J**	**1.50**	**1.50**	**2.60 J**	**1.50 J**	**1.90**	**1.40 J**	**2.30 J**
Copper	2.9	2.9	1300	1300	**12.7**	**12.0**	**12.0**	**19.2**	**13.9**	**44.0**	**45.3**	**63.5**
Lead	15	5.6	15	15	**0.190 J**	**0.410 J**	**0.410 J**	**0.510 J**	**0.350 J**	**0.410 J**	**0.350 J**	0.220 U
Selenium	5	5	50	50	0.300 U	1.60 U	1.60 U	0.830 U	0.300 U	1.60 U	0.300 U	0.830 U
Thallium	2	2	2	2	0.0500 U	0.160 U	0.160 U	0.500 U	0.0500 U	0.160 U	0.0500 U	0.500 U

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41570	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 35694112	SDG: DA41508	SDG: 810134401	SDG: DA41418	SDG: 35694112
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.0190 UJ	0.0190 U	0.180 U	0.250 U	0.0190 U	0.240 U	0.170 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-POIN2005	H3-POIN2011	H3-POIN2012	H3-POIN2025	H3-POIN2122	H3-SASS1503	H3-SHOW0108	H3-SHOW0126
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	2005 Point Welcome Place	2011 Point Welcome Place	2012 Point Welcome Place	2025 Point Welcome Place	2122 Point Welcome Place	1503 Sassafras Drive	108 Shower Place	126 Shower Place
Field Sample ID:	220201H3BT01	220203H3DT04	220203H3DT03	220130H3LT03	220130H3LT02	220130H3KT04	220130H3KT01	220130H3JT03
Sample Date:	2022-02-01	2022-02-03	2022-02-03	2022-01-30	2022-01-30	2022-01-30	2022-01-30	2022-01-30
Sample Type:	N	N	N	N	N	N	N	N

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B015	SDG: C22B018	SDG: C22B018	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22A073_Rev1
Total Organic Carbon	2	None	None	None	0.200 U	0.200 U	0.200 U	**1.55 J**	0.200 UJ	0.200 UJ	**1.89 J**	**1.74 J**

HC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 5801098751	SDG: DA41570	SDG: DA41542	SDG: 5801097901	SDG: 5801097901	SDG: 5801097901	SDG: 5801097901	SDG: 5801097901
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	92.0 U	190 U	190 UJ	91.0 U	91.0 U	92.0 U	92.0 U	95.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	40.0 U	40.0 U	31.0 U	31.0 U	31.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	190 U	190 UJ	180 U	180 U	180 U	180 U	190 U
Total Petroleum Hydrocarbons	211				--	--	--	--	--	--	--	--

HG (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694116	SDG: DA41570	SDG: DA41542	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC
Mercury	0.025	0.025	2	2	0.0900 U	0.0250 U	0.0250 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U

METAL (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694116	SDG: DA41570	SDG: DA41542	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC
Antimony	6	6	6	6	0.210 U	0.100 U	0.100 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U
Arsenic	10	10	10	10	0.500 U	0.500 U	0.500 U	0.890 U	0.890 U	0.890 U	0.890 U	0.890 U
Barium	220	220	2000	2000	**3.10**	**3.10**	**3.20**	**4.10**	**3.50**	**3.60**	**2.70**	**2.60**
Beryllium	0.66	0.66	4	4	0.140 U	0.150 U	0.150 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U	0.0830 U
Cadmium	3	3	5	5	0.120 U	0.0500 U	0.0500 U	0.140 U	0.140 U	0.140 U	0.140 U	0.140 U
Chromium	11	11	100	100	2.20 U	**1.70 J**	**1.80 J**	**1.60**	**1.60**	**1.70**	**1.40**	**1.50**
Copper	2.9	2.9	1300	1300	**70.7**	**43.5**	**25.4**	**31.0**	**49.0**	**36.0**	**13.0**	**5.40**
Lead	15	5.6	15	15	0.220 U	0.130 U	**0.260 J**	**0.110 J**	**0.700**	**1.10**	**0.890**	**0.340 J**
Selenium	5	5	50	50	0.830 U	0.300 U	0.300 U	1.60 U	1.60 U	1.60 U	1.60 U	1.60 U
Thallium	2	2	2	2	0.500 U	0.0500 U	0.0500 U	0.160 U	0.160 U	0.160 U	0.160 U	0.160 U

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694116	SDG: DA41570	SDG: DA41542	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC
1-Methylnaphthalene	2.1	10	None	None	0.170 U	0.240 U	0.240 U	0.0190 U	0.0200 U	0.0190 U	0.0200 U	0.0200 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-SHOW0146	H3-SHOW0183	H3-SHOW0223	H3-SHOW0251	H3-SHOW0251	H3-VALL0485	H3-VALL0485	H3-VALL0485
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	146 Shower Place	183 Shower Place	223 Shower Place	251 Shower Place	251 Shower Place	485 Valley View Loop	485 Valley View Loop	485 Valley View Loop
Field Sample ID:	220201H3AT02	220204H3GT01	220202H3GT06	220202H3GT04	220202H3GT05	220129H3IT01	220129H3IT02	220131H3KT01
Sample Date:	2022-02-01	2022-02-04	2022-02-02	2022-02-02	2022-02-02	2022-01-29	2022-01-29	2022-01-31
Sample Type:	N	N	N	N	FD	N	FD	N (72 Hour Stagnation)

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B011	SDG: C22B022	SDG: C22B015	SDG: C22B015	SDG: C22B015	SDG: C22A066	SDG: C22A066	SDG: DA41418
Total Organic Carbon	2	None	None	None	0.200 U	0.200 U	0.200 U	0.200 U	**1.68**	0.200 U	**1.55**	0.200 U

HC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 5801098751	SDG: DA41570	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: 5801097571	SDG: 5801097571	SDG: DA41418
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	92.0 U	190 U	190 U	190 U	190 U	93.0 U	92.0 U	190 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	40.0 U	40.0 U	40.0 U	40.0 U	31.0 U	31.0 U	40.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	190 U	190 U	190 U	190 U	190 U	180 U	190 U
Total Petroleum Hydrocarbons	211				--	--	--	--	--	--	--	--

HG (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694112	SDG: DA41570	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: 810134401	SDG: 810134401	SDG: DA41418
Mercury	0.025	0.025	2	2	0.0900 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0560 U	0.0560 U	0.0250 U

METAL (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694112	SDG: DA41570	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: 810134401	SDG: 810134401	SDG: DA41418
Antimony	6	6	6	6	0.210 U	0.100 U	0.100 U	0.100 U	0.100 U	0.0570 U	0.0570 U	0.100 U
Arsenic	10	10	10	10	0.500 U	0.500 U	0.500 UJ	0.500 UJ	0.500 UJ	0.890 U	0.890 U	0.500 U
Barium	220	220	2000	2000	**2.60**	**2.40**	**2.40**	**2.40**	**2.50**	**3.00**	**2.90**	**2.80**
Beryllium	0.66	0.66	4	4	0.140 U	0.150 U	0.150 U	0.150 U	0.150 U	0.0830 U	0.0830 U	0.150 U
Cadmium	3	3	5	5	0.120 U	0.0500 U	0.0500 UJ	0.0500 UJ	0.0500 UJ	0.140 U	0.140 U	0.0500 U
Chromium	11	11	100	100	**2.40 J**	**1.80 J**	**1.50 J**	**1.50 J**	**2.80**	**1.80**	**1.80**	**1.40 J**
Copper	2.9	2.9	1300	1300	**8.40**	**17.4**	**8.00**	**9.30**	**16.5**	**11.0**	**11.0**	**18.4**
Lead	15	5.6	15	15	**0.650 J**	**0.140 J**	**0.230 J**	**0.280 J**	**4.10**	**0.290 J**	**0.320 J**	**0.870**
Selenium	5	5	50	50	0.830 U	0.300 U	0.300 U	0.300 U	0.300 U	1.60 U	1.60 U	0.300 U
Thallium	2	2	2	2	0.500 U	0.0500 U	0.0500 U	**0.0750 J**	0.0500 U	0.160 U	0.160 U	**0.120 J**

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694112	SDG: DA41570	SDG: DA41542R	SDG: DA41542	SDG: DA41542R	SDG: 810134401	SDG: 810134401	SDG: DA41418
1-Methylnaphthalene	2.1	10	None	None	0.180 U	0.240 U	0.240 U	0.240 U	0.250 U	0.0190 U	0.0200 U	0.240 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-VALL0485	H3-VALL0595
Location Type:	Residence	Residence
Residence:	485 Valley View Loop	595 Valley View Loop
Field Sample ID:	220131H3KT02	220204H3GT03
Sample Date:	2022-01-31	2022-02-04
Sample Type:	FD (72 Hour Stagnation)	N

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41418	SDG: C22B022
Total Organic Carbon	2	None	None	None	0.200 U	**1.70**

HC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41418	SDG: DA41570
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	190 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	40.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	190 U
Total Petroleum Hydrocarbons	211				--	--

HG (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41418	SDG: DA41570
Mercury	0.025	0.025	2	2	0.0250 U	0.0250 U

METAL (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41418	SDG: DA41570
Antimony	6	6	6	6	0.100 U	0.100 U
Arsenic	10	10	10	10	0.500 U	0.500 U
Barium	220	220	2000	2000	**3.00**	**2.40**
Beryllium	0.66	0.66	4	4	0.150 U	0.150 U
Cadmium	3	3	5	5	0.0500 U	0.0500 U
Chromium	11	11	100	100	**1.40 J**	**1.70 J**
Copper	2.9	2.9	1300	1300	**18.4**	**14.5**
Lead	15	5.6	15	15	**0.950**	**0.340 J**
Selenium	5	5	50	50	0.300 U	0.300 U
Thallium	2	2	2	2	0.0500 U	0.0500 U

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41418	SDG: DA41570
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.250 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-ABEL0193	H3-ABEL0193	H3-BLAC1706	H3-BLAC1706	H3-BLAC1713	H3-BLAC1713	H3-BLAC1851	H3-BLAC1851
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	193 Abelia Place	193 Abelia Place	1705 Blackhaw Place	1705 Blackhaw Place	1705 Blackhaw Place	1705 Blackhaw Place	1851 Blackthorn Loop	1851 Blackthorn Loop
Field Sample ID:	220203H3ET07	220203H3ET08	220129H3IT06	220131H3KT06	220202H3KT03	220202H3KT04	220203H3DT01	220203H3DT02
Sample Date:	2022-02-03	2022-02-03	2022-01-29	2022-01-31	2022-02-02	2022-02-02	2022-02-03	2022-02-03
Sample Type:	N	FD	N	N (72 Hour Stagnation)	N	FD	N	FD

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 810134401	SDG: DA41418	SDG: DA41508	SDG: DA41508	SDG: DA41542	SDG: DA41542
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.240 U	0.0200 U	0.240 U	0.240 U	0.240 U	0.240 U	0.240 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00960 U	0.00980 U	0.00950 U	0.00950 U	0.00950 U	0.00950 U	0.00950 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.380 U	0.590 U	0.380 U	0.380 U	0.380 U	0.380 U	0.380 U
Naphthalene	12	17	None	None	0.240 U	0.240 U	0.0200 U	0.240 U	0.240 U	0.240 U	0.240 U	0.240 U

VOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B018	SDG: C22B018	SDG: C22A066	SDG: DA41418	SDG: C22B015	SDG: C22B015	SDG: C22B018	SDG: C22B018
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.500 U	0.119 U	0.119 U	0.119 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.288 U	0.500 U	0.288 U	0.288 U	0.288 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.128 U	0.500 U	0.128 U	0.128 U	0.128 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.318 U	0.500 U	0.318 U	0.318 U	0.318 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.272 U	0.500 U	0.272 U	0.272 U	0.272 U	0.272 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.0884 U	0.500 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.129 U	0.500 U	0.129 U	0.129 U	0.129 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.245 U	0.500 U	0.245 U	0.245 U	0.245 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.500 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.165 U	0.500 U	0.165 U	0.165 U	0.165 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.500 U	0.146 U	0.146 U	0.146 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.0570 U	0.500 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.141 U	0.500 U	0.141 U	0.141 U	0.141 U	0.141 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.317 U	0.500 U	0.317 U	0.317 U	0.317 U	0.317 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	2.15 U	0.500 U	2.15 U	2.15 U	2.15 U	2.15 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.157 U	0.500 U	0.157 U	0.157 U	0.157 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.500 U	0.224 U	0.224 U	0.224 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.125 U	0.500 U	0.125 U	0.125 U	0.125 U	0.125 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.120 U	0.500 U	0.120 U	0.120 U	0.120 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.0958 U	0.500 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.0574 U	0.500 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.611 U	0.500 U	0.611 U	0.611 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	0.472 U	0.472 U	--	--	0.472 U	0.472 U	0.472 U	0.472 U

Notes:

-- indicates that the sample was Not Analyzed for the analyte

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-CLAR0195	H3-EUCA0187	H3-EUCA0187	H3-HALA0123	H3-HALA0138	H3-HALA0219	H3-HIBI0399	H3-HIBI0650
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	195 Clarey Place	187 Eucalyptus Place	187 Eucalyptus Place	123 Halawa View Loop	138 Halawa View Loop	219 Halawa View Circle	399 Hibiscus Street	650 Hibiscus Street
Field Sample ID:	220130H3LT04	220203H3GT01	220203H3GT02	220203H3GT04	220204H3GT04	220204H3GT02	220203H3ET06	220203H3ET04
Sample Date:	2022-01-30	2022-02-03	2022-02-03	2022-02-03	2022-02-04	2022-02-04	2022-02-03	2022-02-03
Sample Type:	N	N	FD	N	N	N	N	N

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 810134441_Rev_JNC	SDG: DA41542	SDG: DA41542	SDG: DA41542	SDG: DA41570	SDG: DA41570	SDG: DA41542	SDG: DA41542
2-Methylnaphthalene	4.7	10	None	None	0.0190 U	0.240 U	0.240 U	0.240 U	0.240 U	0.250 U	0.240 U	0.240 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00960 U	0.00950 U	0.00950 U	0.00950 U	0.00970 U	0.00990 U	0.00950 U	0.00950 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.580 U	0.380 U	0.380 U	0.380 U	0.390 U	0.400 U	0.380 U	0.380 U
Naphthalene	12	17	None	None	0.0190 U	0.240 U	0.240 U	0.240 U	0.240 U	0.250 U	0.240 U	0.240 U

VOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22A073_Rev1	SDG: C22B018	SDG: C22B018	SDG: C22B018	SDG: C22B022	SDG: C22B022	SDG: C22B018	SDG: C22B018
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	--	0.472 U	0.472 U	0.472 U	0.472 U	0.472 U	0.472 U	0.472 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-HIBI0670	H3-HIBI0690	H3-JUST0171	H3-JUST0171	H3-KOAP0116	H3-MACD0161	H3-OCTO0131	H3-OCTO0145
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	670 Hibiscus Street	690 Hibiscus Street	171 Justicia Place	171 Justicia Place	116 Koa Place	161 MacDonald Place	131 Octopus Lane	145 Octopus Lane
Field Sample ID:	220203H3ET05	220203H3GT03	220201H3BT02	220201H3BT03	220201H3BT04	220202H3KT02	220131H3BT08	220130H3CT01
Sample Date:	2022-02-03	2022-02-03	2022-02-01	2022-02-01	2022-02-01	2022-02-02	2022-01-31	2022-01-30
Sample Type:	N	N	N	FD	N	N	N	N

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41542	SDG: DA41542	SDG: 35694116	SDG: 35694116	SDG: 35694116	SDG: DA41508	SDG: 35693855	SDG: 35693535_REV
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.240 U	0.190 U	0.190 U	0.180 U	0.250 U	0.180 U	0.180 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00950 U	0.0200 U	0.0200 U	0.0190 U	0.00980 U	0.0190 U	0.0190 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.380 U	0.480 U	0.470 U	0.470 U	0.390 U	0.470 U	0.470 U
Naphthalene	12	17	None	None	0.240 U	0.240 U	0.180 U	0.180 U	0.180 U	0.250 U	0.170 U	0.180 U

VOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B018	SDG: C22B018	SDG: C22B015	SDG: C22B015	SDG: C22B015	SDG: C22B015	SDG: C22B004	SDG: C22A073_Rev1
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	0.472 U	0.472 U	0.472 U	0.472 U	0.472 U	0.472 U	--	--

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-OCTO0162	H3-OLIV0114	H3-OLIV0114	H3-OLIV0131	H3-OLIV0144	H3-POIN0167	H3-POIN0167	H3-POIN2004
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	162 Octopus Lane	114 Olive Place	114 Olive Place	131 Olive Place	144 Olive Place	167 Poincana Place	167 Poincana Place	2004 Point Welcome Place
Field Sample ID:	220203H3DT05	220130H3KT02	220130H3KT03	220201H3AT01	220202H3KT01	220129H3IT07	220131H3KT07	220201H3AT03
Sample Date:	2022-02-03	2022-01-30	2022-01-30	2022-02-01	2022-02-02	2022-01-29	2022-01-31	2022-02-01
Sample Type:	N	N	FD	N	N	N	N (72 Hour Stagnation)	N

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41570	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 35694112	SDG: DA41508	SDG: 810134401	SDG: DA41418	SDG: 35694112
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.0190 UJ	0.0190 U	0.190 U	0.250 U	0.0190 U	0.240 U	0.180 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00970 U	0.00960 U	0.0200 U	0.00980 U	0.00970 U	0.00960 U	0.0190 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.580 U	0.580 U	0.490 U	0.390 U	0.580 U	0.380 U	0.470 U
Naphthalene	12	17	None	None	0.240 U	0.0190 UJ	0.0190 U	0.180 U	0.250 U	0.0190 U	0.240 U	0.170 U

VOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B018	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22B011	SDG: C22B015	SDG: C22A066	SDG: DA41418	SDG: C22B011
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.500 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.500 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.500 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.500 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.500 U	0.272 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.500 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.500 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.500 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.500 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.500 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.500 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.500 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.500 U	0.141 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.500 U	0.317 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	0.500 U	2.15 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.500 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.500 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.500 U	0.125 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.500 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.500 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.500 U	0.0574 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.500 U	0.611 U
Xylenes, Total	10000	13	10000	10000	0.472 U	--	--	--	0.472 U	--	--	--

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-POIN2005	H3-POIN2011	H3-POIN2012	H3-POIN2025	H3-POIN2122	H3-SASS1503	H3-SHOW0108	H3-SHOW0126
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	2005 Point Welcome Place	2011 Point Welcome Place	2012 Point Welcome Place	2025 Point Welcome Place	2122 Point Welcome Place	1503 Sassafras Drive	108 Shower Place	126 Shower Place
Field Sample ID:	220201H3BT01	220203H3DT04	220203H3DT03	220130H3LT03	220130H3LT02	220130H3KT04	220130H3KT01	220130H3JT03
Sample Date:	2022-02-01	2022-02-03	2022-02-03	2022-01-30	2022-01-30	2022-01-30	2022-01-30	2022-01-30
Sample Type:	N	N	N	N	N	N	N	N

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694116	SDG: DA41570	SDG: DA41542	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC	SDG: 810134441_Rev_JNC
2-Methylnaphthalene	4.7	10	None	None	0.180 U	0.240 U	0.240 U	0.0190 U	0.0200 U	0.0190 U	0.0200 U	0.0200 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0190 U	0.00950 U	0.00960 U	0.00960 U	0.00990 U	0.00960 U	0.00980 U	0.00990 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.460 U	0.380 U	0.380 U	0.580 U	0.590 U	0.580 U	0.590 U	0.590 U
Naphthalene	12	17	None	None	0.170 U	0.240 U	0.240 U	0.0190 U	0.0200 U	0.0190 U	0.0200 U	0.0200 U

VOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B015	SDG: C22B018	SDG: C22B018	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22A073_Rev1	SDG: C22A073_Rev1
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U
1,2-Dichloroethane	5	5	5	5	**0.130 J**	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	0.472 U	0.472 U	0.472 U	--	--	--	--	--

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-SHOW0146	H3-SHOW0183	H3-SHOW0223	H3-SHOW0251	H3-SHOW0251	H3-VALL0485	H3-VALL0485	H3-VALL0485
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	146 Shower Place	183 Shower Place	223 Shower Place	251 Shower Place	251 Shower Place	485 Valley View Loop	485 Valley View Loop	485 Valley View Loop
Field Sample ID:	220201H3AT02	220204H3GT01	220202H3GT06	220202H3GT04	220202H3GT05	220129H3IT01	220129H3IT02	220131H3KT01
Sample Date:	2022-02-01	2022-02-04	2022-02-02	2022-02-02	2022-02-02	2022-01-29	2022-01-29	2022-01-31
Sample Type:	N	N	N	N	FD	N	FD	N (72 Hour Stagnation)

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: 35694112	SDG: DA41570	SDG: DA41542R	SDG: DA41542	SDG: DA41542R	SDG: 810134401	SDG: 810134401	SDG: DA41418
2-Methylnaphthalene	4.7	10	None	None	0.190 U	0.240 U	0.240 U	0.240 U	0.250 U	0.0190 U	0.0200 U	0.240 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0200 U	0.00950 U	0.00950 U	0.00950 U	0.00980 U	0.00970 U	0.00980 U	0.00960 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.490 U	0.380 U	0.380 U	0.380 U	0.390 U	0.580 U	0.590 U	0.380 U
Naphthalene	12	17	None	None	0.180 U	0.240 U	0.240 U	0.240 U	0.250 U	0.0190 U	0.0200 U	0.240 U

VOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B011	SDG: C22B022	SDG: C22B015	SDG: C22B015	SDG: C22B015	SDG: C22A066	SDG: C22A066	SDG: DA41418
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.500 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.288 U	0.500 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.128 U	0.500 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.318 U	0.500 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.272 U	0.500 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.500 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.129 U	0.500 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.245 U	0.500 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.500 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.165 U	0.500 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.146 U	0.500 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.500 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.141 U	0.500 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.317 U	0.500 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	2.15 U	0.500 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.157 U	0.500 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.224 U	0.500 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.125 U	0.500 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.500 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.500 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.500 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.611 U	0.500 U
Xylenes, Total	10000	13	10000	10000	--	0.472 U	0.472 U	0.472 U	0.472 U	--	--	--

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-VALL0485	H3-VALL0595
Location Type:	Residence	Residence
Residence:	485 Valley View Loop	595 Valley View Loop
Field Sample ID:	220131H3KT02	220204H3GT03
Sample Date:	2022-01-31	2022-02-04
Sample Type:	FD (72 Hour Stagnation)	N

SVOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41418	SDG: DA41570
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.250 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00990 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.400 U
Naphthalene	12	17	None	None	0.240 U	0.250 U

VOC (µg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: DA41418	SDG: C22B022
1,1,1-Trichloroethane	11	11	200	200	0.500 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.500 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.500 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.500 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.500 U	0.272 U
1,2-Dichloroethane	5	5	5	5	0.500 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.500 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.500 U	0.245 U
Benzene	5	5	5	5	0.500 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.500 U	0.165 U
Chlorobenzene	25	25	100	100	0.500 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.500 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.500 U	0.141 U
m,p-Xylene	10000	13	None	None	0.500 U	0.317 U
Methylene chloride	5	5	5	5	0.500 U	2.15 U
o-Xylene	10000	13	None	None	0.500 U	0.157 U
Styrene	10	10	100	100	0.500 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.500 U	0.125 U
Toluene	1000	9.8	1000	1000	0.500 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.500 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.500 U	0.0574 U
Vinyl chloride	2	2	2	2	0.500 U	0.611 U
Xylenes, Total	10000	13	10000	10000	--	0.472 U

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Results highlighted yellow exceed the ISP
Results in purple font also exceed the EALs
Results in green font also exceed the DOH MCL
Results in blue font also exceed the EPA MCL
Results from G1/G3 sampling, where the G3 result is greater than the G1 result, have a red border and the associated G1/G3 result in parentheses for comparison

µg/L = Micrograms per Liter

March 1, 2022

From: Naval Facilities Engineering Systems Command Representative, IDWS Team
To: Interagency Drinking Water System Team

SUBJ: ZONE H3 EXCEEDANCE INVESTIGATION SUMMARY AND RESULTS

Encl: (1) Zone H3 Exceedance Sample Report
(2) DoH TPH Sample Results for Zone H3

1. Enclosure (1) contains the exceedance sample report for Zone H3. There were no exceedances above the MCL. There were sample results above the ISP for total organic carbon (TOC). The IDWST determined that no further action was required beyond the long term monitoring sampling. Enclosure (2) are the test results for samples taken by DoH. There were no exceedances above the MCL or exceedances above the ISP that required further action. The laboratory reports will be made publically available at https://jbphh-safewaters.org/ upon amendment of the health advisory for Zone H3.

2. I certify under penalty of law that I have personally examined and I am familiar with the information submitted and the submitted information is true, accurate, and complete.

MENO.MICHAEL.WAYNE.JR.1088310035
Digitally signed by MENO.MICHAEL.WAYNE.JR.1088310035
Date: 2022.03.01 14:11:44 -10'00'

M. W. Meno
Captain, U.S. Navy Civil Engineer Corps

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H3-ABEL0193	H3-CLAR0195	H3-EUCA0187	H3-HALA0138	H3-HIBI0670	H3-JUST0171	H3-OCTO0145	H3-OLIV0114
Location Type:					Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:					193 Abelia Place	195 Clarey Place	187 Eucalyptus Place	138 Halawa View Loop	670 Hibiscus Street	171 Justicia Place	145 Octopus Lane	114 Olive Place
Field Sample ID:					220203H3ET08	220130H3LT04	220203H3GT02	220204H3GT04	220203H3ET05	220201H3BT03	220130H3CT01	220130H3KT03
Sample Date:					2022-02-03	2022-01-30	2022-02-03	2022-02-04	2022-02-03	2022-02-01	2022-01-30	2022-01-30
Sample Type:					FD	N	FD	N	N	FD	N	FD
GENCHEM (mg/L)	**Incident Specific Parameters**	**DOH Environmental Action Levels Table D-1A Groundwater Action Levels**	**DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents**	**Environmental Protection Agency Maximum Contaminant Levels**	**SDG: C22B018**	**SDG: C22A073_Rev1**	**SDG: C22B018**	**SDG: C22B022**	**SDG: C22B018**	**SDG: C22B015**	**SDG: C22A073_Rev1**	**SDG: C22A073_Rev1**
Total Organic Carbon	2	None	None	None	**2.17**	**2.68 J**	**2.24**	**2.11**	**2.06**	**2.28**	**7.48 J**	**3.11 J**

Notes:

-- indicates that the sample was Not Analyzed for the analyte

Results highlighted yellow exceed the ISP
Results in purple font also exceed the EALs
Results in green font also exceed the DOH MCL
Results in blue font also exceed the EPA MCL

mg/L = Milligrams per Liter

Section 2b.3 Exceedance Investigation Summary and Results

ENCL (1)

H3 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H3-OLIV0131
Location Type:	Residence
Residence:	131 Olive Place
Field Sample ID:	220201H3AT01
Sample Date:	2022-02-01
Sample Type:	N

GENCHEM (mg/L)	Incident Specific Parameters	DOH Environmental Action Levels Table D-1A Groundwater Action Levels	DOH Safe Drinking Water Branch (SDWB) Regulatory Constituents	Environmental Protection Agency Maximum Contaminant Levels	SDG: C22B011
Total Organic Carbon	2	None	None	None	**2.40**

Section 2b.3 Exceedance Investigation Summary and Results

ENCL (1)

DOH TPH-Results
Navy Water System Incident
Red Hill, Post-Flushing, Flushing Area H3

Date Collected	Location Name	Street Name	Closest Cross Street	Analyte	Results	Lab Qualifier	Validator Qualifier	Results Unit	Results Category	Zone	Feature Type	Sheen Present	Odor
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	C8-C44	**62**		J+	ug/L	Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	Diesel Range Organics (DRO)-C10-C28	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	Gas Range Organics C8-C10	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	Oil Range Organics (C28-C40)	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-01	Octopus Ln	Valley View Lp	TPH-g	ND	U	U	ug/L	Not Detected	H3	Distribution	No	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	C8-C44	50	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	Diesel Range Organics (DRO)-C10-C28	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	Gas Range Organics C8-C10	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	Oil Range Organics (C28-C40)	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-02	Justicia Place	Hibiscus Street	TPH-g	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	C8-C44	45	J	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	Diesel Range Organics (DRO)-C10-C28	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	Gas Range Organics C8-C10	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	Oil Range Organics (C28-C40)	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/12/2022	011222-18-03	Bittersweet Pl	Sassafras Dr	TPH-g	ND	U	U	ug/L	Not Detected	H3	Distribution	NO	NO ODOR
1/31/2022	013122-60-03	Valley View Loop	Aliamanu Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-03	Valley View Loop	Aliamanu Dr	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-03	Valley View Loop	Aliamanu Dr	TPH-g	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-01	Blackhaw Place	Kukui Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-01	Blackhaw Place	Kukui Dr	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-01	Blackhaw Place	Kukui Dr	TPH-g	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-02	Poinciana Place	Hibiscus Street	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-02	Poinciana Place	Hibiscus Street	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
1/31/2022	013122-60-02	Poinciana Place	Hibiscus Street	TPH-g	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	C9-C40	**81**			ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	Diesel Range Organic C9-C25	**47**	J	J	ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	Oil Range Organic C24-C40	**47**	J	J	ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	C9-C40	**58**			ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	Oil Range Organic C24-C40	**37**	J	J	ug/L	Detected	H3	Residential	No	No
2/1/2022	020122-08-03	Point Welcome Pl	Taney Circle	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-03	Point Welcome Pl	Taney Circle	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/2/2022	020222-25-01	Olive Place	Aliamanu Dr	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-01	Olive Place	Aliamanu Dr	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-02	Macdonald Pl	Hibiscus Street	Diesel Range Organic C9-C25	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-02	Macdonald Pl	Hibiscus Street	Oil Range Organic C24-C40	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/1/2022	020122-08-01	Olive Place	Aliamanu Dr	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-02	Shower Place	Aliamanu Dr	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/1/2022	020122-08-03	Point Welcome Pl	Taney Circle	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	No
2/2/2022	020222-25-01	Olive Place	Aliamanu Dr	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	None
2/2/2022	020222-25-02	Macdonald Pl	Hibiscus Street	TPH as Gas	ND	U	U	ug/L	Not Detected	H3	Residential	No	None

Exceeds the ISP

Bold= Detected

Section 2b.3 Exceedance Investigation Summary and Results

ENCL (2)

DEPARTMENT OF THE ARMY
HEADQUARTERS, UNITED STATES ARMY GARRISON, HAWAII
DIRECTORATE OF PUBLIC WORKS
947 WRIGHT AVENUE, WHEELER ARMY AIRFIELD
SCHOFIELD BARRACKS, HAWAII 96857-5013

AMIM-HWP 22 February 2022

MEMORANDUM FOR Interagency Drinking Water System Team (IDSWT) Building C27, Nanumea Road, Naval Station Pearl Harbor, Joint Base Pearl Harbor-Hickam, Hawaii 96818

SUBJECT: Army Flushing of Irrigation Systems in Zones H1, H2, and H3

1. OBJECTIVE. This addendum provides additional technical information to document the irrigation flushing methodology and engineering approach used to restore Flushing Zones H1, H2, and H3. This memorandum serves as the certification that the irrigation flushing was conducted in accordance with Department of Health (DOH) Hawaii guidance.

2. BACKGROUND.

2.1. The DOH-Hawaii provided guidance on 8 February 2022 to the IDSWT for active irrigation and line purging. Guidance provided includes:

- Determine what the irrigation system pipe size is (for volume calculations).
- Calculate the approximate amount of time needed to complete 3 volumetric turnovers of the subject line (est. duration per foot).
- Assess how long each line will need to be purged/flushed based on the above estimates.
- Notify community.
- Cover or otherwise minimize any spray from the system (traffic cone) in order to prevent
- Contact.
- Purge irrigation system under supervision for the estimated duration.
- Allow ground to absorb and dry.
- Notify residents to avoid area for the next 24 hours.
- Prevent/minimize any runoff.
- Prevent contact with the irrigation water.

2.2. In accordance with DOH guidance, the Army developed a Standard Operating Proceure (SOP) with a check-list that follows the guidance provided by DOH-Hawaii. Training was provided in accordance with SOP prior to flushing. See enclosure 1 (Irrigation Line Flushing Plan).

3. Engineering Analysis and Tools. US Army Garrison-Hawaii (USAG-HI) utilized engineering judgement informed by existing tools and data sources to determine the Volume of irrigation line required to be flushed.

3.1. Review of Zone H1, H2 & H3 irrigation system drawings indicated that the system consists of primarily a drip irrigation system connected to a perimeter sprinkler irrigation system.

4. FLUSHING OPERATIONS.

4.1. Date. Flushing started on 15 February 2022 and was completed on 17 February 2022.

4.2. Housing partners Island Palm Community (IPC) provided the staff to conduct the flushing operations. The Army provided government oversight to ensure documentation of the flushing operations was conducted in accordance with the Irrigation Line Flushing plan.

4.3. Flushing check-list have been completed for each residence and hard copy files will be retained.

4.4. Flushing was conducted in accordance with DOH-Hawaii guidance.

10.0. Point of Contact. For additional information, please contact undersigned at (808) 787-6128.

2/22/2022

_X_Nisit A. Gainey

Signed by: GAINEY.NISIT.ANTHONY.1067651371

Encls
1. Irrigation Line Flushing Plan

Nisit A. Gainey
Director
Public Works, USAG-HI

Irrigation Line Flushing Plan

AMR, O‘ahu, Hawai‘i

February 2022

FLUSHING CHECKLIST: IRRIGATION LINES

ADDRESS: _____

This checklist is to be used by Army personnel to include Government Housing Partners and Contractors for flushing irrigation lines that may have water contaminated with petroleum chemicals. Irrigation lines shall be flushed only **AFTER** the water distribution system has been flushed. Signed checklist will be added to the home management record.

All irrigation line flushing teams will adhere to current CDC, State of Hawaii, and Army COVID-19 safety protocols.

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED.
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.
- ENSURE FLUSHING IS SUPERVISED AT ALL TIMES

☐ STEP 1: NOTIFY RESIDENTS. PREPARE FOR IRRIGATION LINE FLUSHING
☐ STEP 2: IDENTIFY ALL SPRAY HEADS IN LINE, COVER HEADS WITH BUCKETS, CONES, ETC TO MINIMIZE SPRAY
☐ STEP 3: ENSURE NO PERSONS ARE NEAR THE SITE, PREVENT CONTACT WITH HUMANS, PETS, WILDLIFE
☐ STEP 4: PURGE IRRIGATION SYSTEM FOR SPECIFIED AMOUNT OF TIME.
☐ STEP 5: PLACE WARNING SIGNS NOTIFYING RESIDENTS TO AVOID AREA FOR 24 HOURS AFTER FLUSH.
☐ STEP 6: CLEAN UP**
*See Appendix A for Standard Operating Procedures of Steps 1-6.
**See Appendix B for Home Drop Card

Confirmation of Flushing for Irrigation Systems

_____ _____
Name of Technician Organization

_____ _____
Signature Date

APPENDIX A: FLUSHING STANDARD OPERATING PROCEDURES: Irrigation Systems

Team Supplies Needed

- Cones, buckets or other device to cover spray heads
- Nitrile or Latex gloves
- Warning Signs

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED.
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.
- ENSURE FLUSHING IS SUPERVISED AT ALL TIMES

STEP 1. NOTIFY RESIDENTS. PREPARE FOR IRRIGATION LINE FLUSHING

☐ Confirm that resident notification is complete.

☐ Determine irrigation system pipe size

☐ Calculate the approximate amount of time needed to complete 3 volumetric turnovers. If unknown, run for 30 minutes or 2 minutes per spray head, whichever is longer

☐ For drip irrigation lines, flush for 15 minutes.

☐ Assess how long each line will need to be purged/flushed based on the above calculation

STEP 2: IDENTIFY ALL SPRAY HEADS IN LINE, COVER HEADS WITH BUCKETS, CONES, ETC TO MINIMIZE SPRAY

☐ Confirm the number of spray heads based on site drawings or IPC knowledge of home configuration.

☐ Cover all spray heads with a traffic cone or bucket

☐ To the maximum extent ensure the largest portion of the bucket or cone is over grass

☐ For drip irrigation lines, remove the flush cap or crimp at the end of the line, ensure the line discharges to soil or grass

STEP 3. ENSURE NO PERSONS ARE NEAR THE SITE, PREVENT CONTACT WITH HUMANS, PETS, WILDLIFE

☐ Verify that no people are outside the home.

☐ Confirm that no pets or other animals are outside the home.

☐ If pets are outside the home and cannot be relocated by the resident. Note the address and move to the next location.

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED.
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.
- ENSURE FLUSHING IS SUPERVISED AT ALL TIMES

STEP 4. PURGE IRRIGATION SYSTEM FOR SPECIFIED AMOUNT OF TIME.

☐ Turn on the irrigation system and run for 30 minutes or 2 minutes per spray head, whichever is longer.

☐ Turn on the drip irrigation system and run for 15 minutes.

☐ Discontinue flushing if irrigation water runs off of / along the pavement and toward or into a storm drain.

☐ Following the flush, shut off the irrigation system and return the system to its normal configuration.

STEP 5. PLACE WARNING SIGNS NOTIFYING RESIDENTS TO AVOID AREA FOR 24 HOURS AFTER FLUSH.

☐ Place warning signs at either end or the irrigation line along pathways that residents are likely to use to approach (i.e. sidewalks, driveways, etc.)

ATTENTION

- PREVENT CONTACT WITH HUMANS, PETS AND WILDLIFE
- COVER SPRAY HEADS (BUCKETS, CONES, ETC) TO MINIMIZE SPRAY
- DO NOT LEAVE IRRIGATION LINES UNATTENDED.
- DOCUMENT ANYTHING UNUSUAL ENCOUNTERED BEFORE OR DURING FLUSH.
- IF STRONG FUEL SMELL IS PRESENT WHEN FLUSHING, STOP FLUSHING
- DO NOT LET WATER RUNOFF INTO STREETS/STORM DRAINS. ENSURE WATER DISCHARGES TO GROUND AND IS ABSORBED.

STEP 6. CLEAN UP**

☐ Return the irrigation system to its previous configuration.

☐ Ensure drip irrigation is capped / crimped as it was previously.
☐ Verify that water is not absorbed into surrounding soil and not running into storm drains.
☐ Confirm removal of buckets/cones from the irrigation system.
☐ Do one last walkthrough to ensure all water is secured, trash is removed.
☐ Place the DROP CARD at the front door of the residence.

NOTES TO IDENTIFY DISCREPCIENCES OR MAINTANENCE ISSUES

1.

2.

3.

DOH Guidance for Active Irrigation Line Purging and Flushing

Given the minimal quantities and concentration of fuel contamination in the irrigation lines, along with the expected degradation due to time, the following guidance lines are being provided:

System operator responsibility:

- Determine what the irrigation system pipe size is (for volume calculations).
- Calculate the approximate amount of time needed to complete 3 volumetric turnovers of the subject line (est. duration per foot).
- Assess how long each line will need to be purged/flushed based on the above estimates.
- Notify community.
- Cover or otherwise minimize any spray from the system (traffic cone) in order to prevent contact.
- Purge irrigation system under supervision for the estimated duration.
- Allow ground to absorb and dry.
- Notify residents to avoid area for the next 24 hours.
- Prevent/minimize any runoff.
- Prevent contact with the irrigation water.

Navy/Army must develop a standard operating procedure incorporating the above guidance and provide training to personnel responsible for execution of the irrigation line purging/flushing.