Documentation to Amend Drinking Water Health Advisory in Zone H1

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

Interagency Drinking Water System Team
Zone H1 Removal Action Report
February 2022

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

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Introduction

Zone H1 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 H1 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 H1, 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. • 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	AR 200-1 Environmental Protection and Enhancement dated 13 DEC 2007, 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 H1 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. Outline of flushing process and pressure graphs during the flushing process maintaining 30 psi (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 H1 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 H1, 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 H1 with: • EDMS Residential Flushing Records Zone H1 • EDMS Non-Residential Flushing Records Zone H1
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 H1.
Tab 2b.4	Complete	Memorandum for Record showing that irrigation flushing is complete.
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 H1 Removal Action Report
February 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.

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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.

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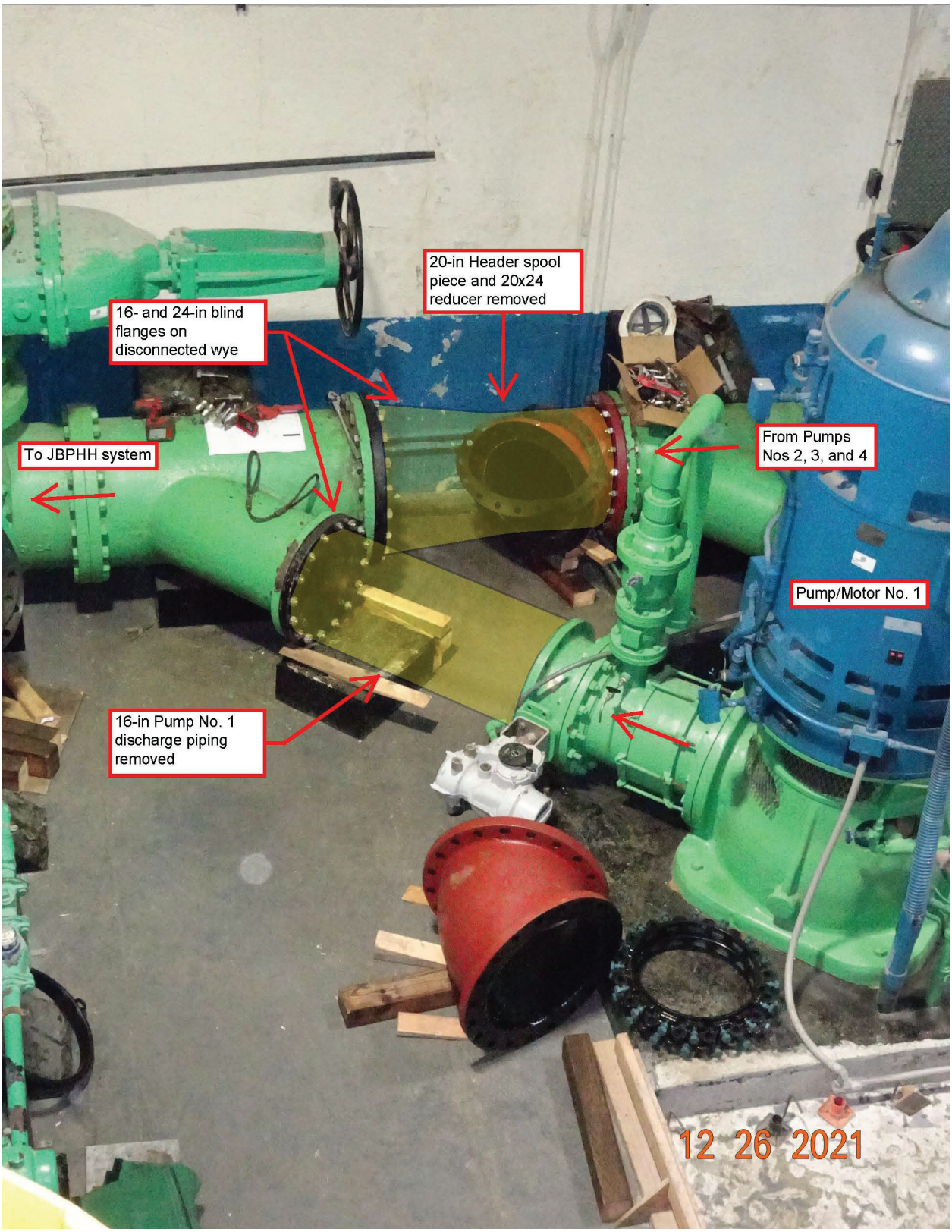
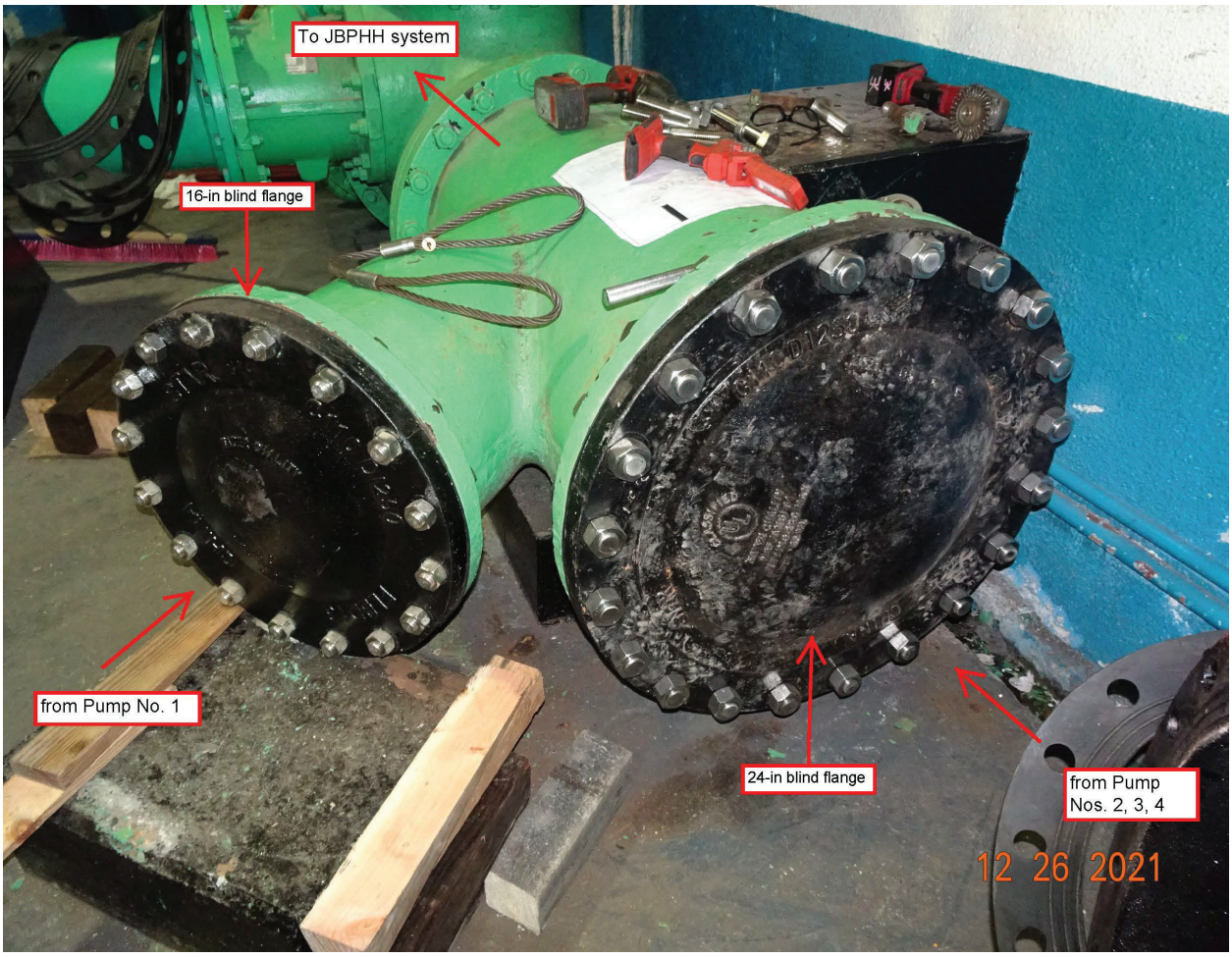
J. MITCHELL
Deputy Public Works Officer
Joint Base Pearl Harbor Hickam


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

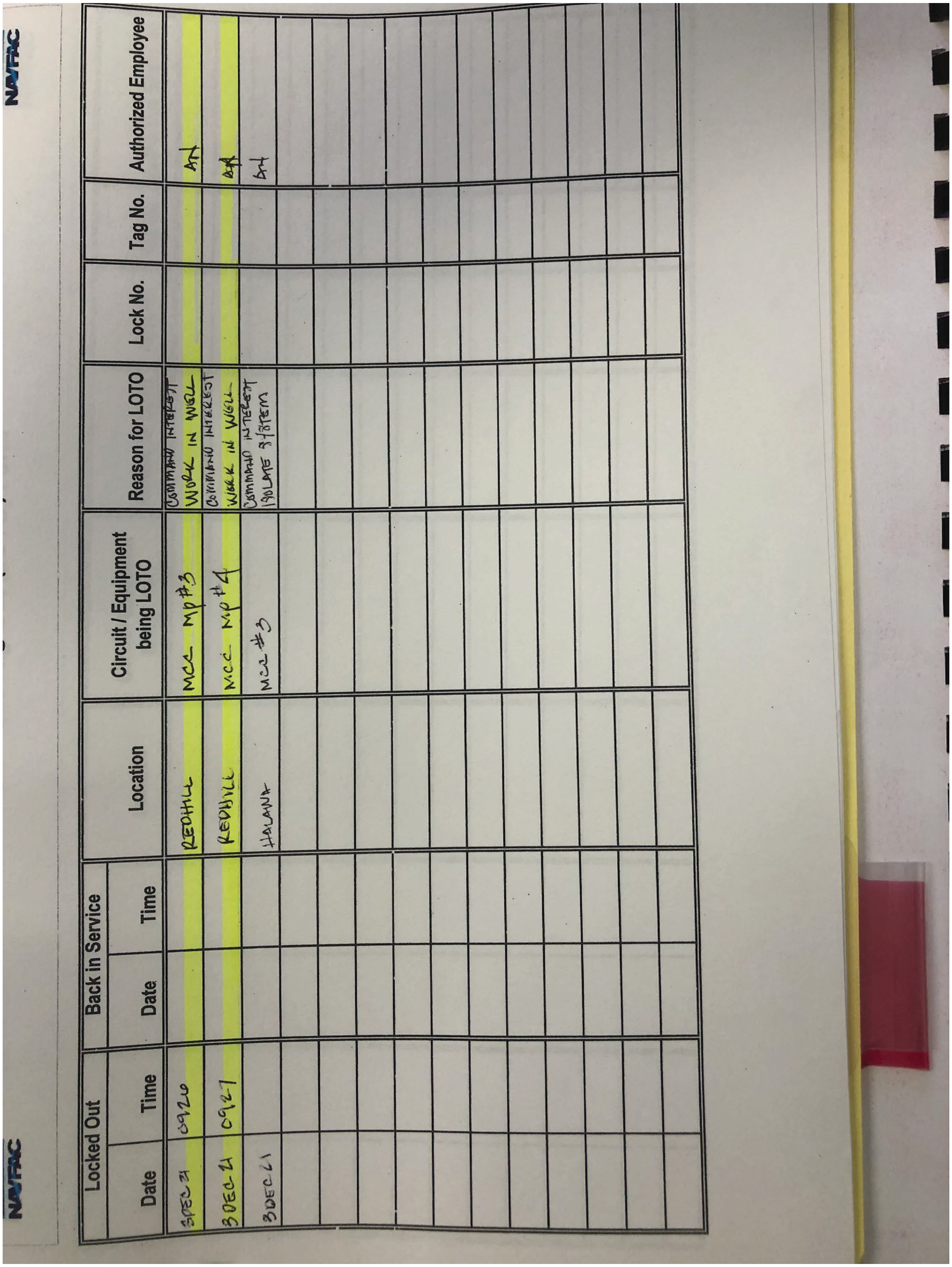
Red Hill Pump Station Photographs
Post Pump Isolation dated 12/26/2021

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 9	An
19 JUL 21	0745	19 JUL	0900	HALAWA	EXHAUST FAN	REPLACE BELT			DS
17 NOV 21	1230			MANANA	PUMP #1	PUMP FAIL			AH
17 NOV 21	1230			MANANA	PUMP #2	MOTOR FAIL			AH
3 DEC 21	0925			REDHILL	MCC MP#2	COMMAND INTEREST WORK IN WELL			AH



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 SYSTEM			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.

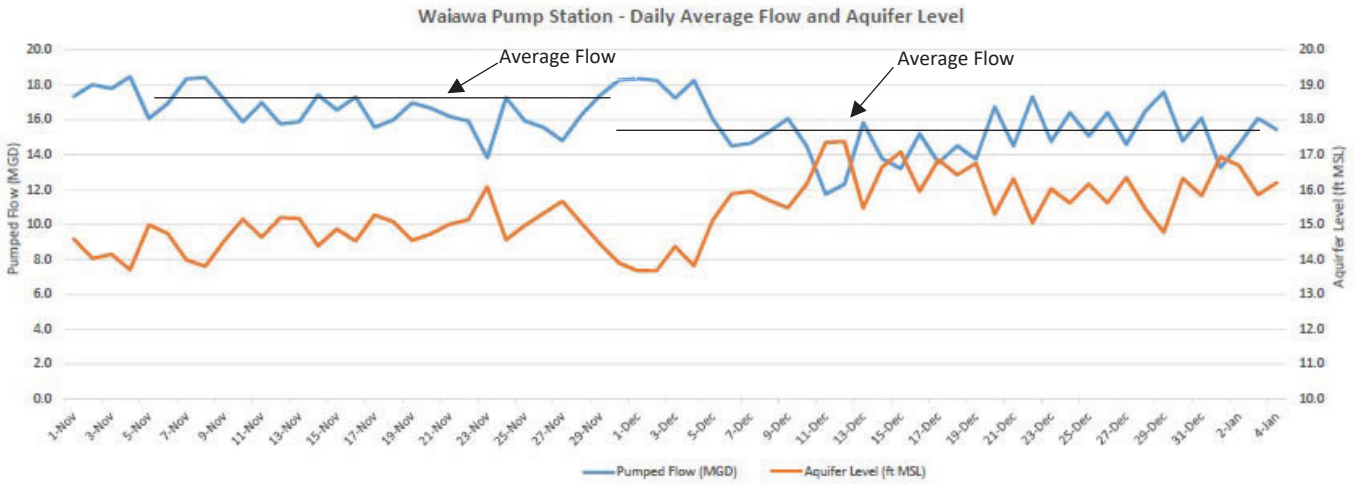


Figure 1. Waiawa Shaft Daily Average Flows and Aquifer Water Surface Elevation

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

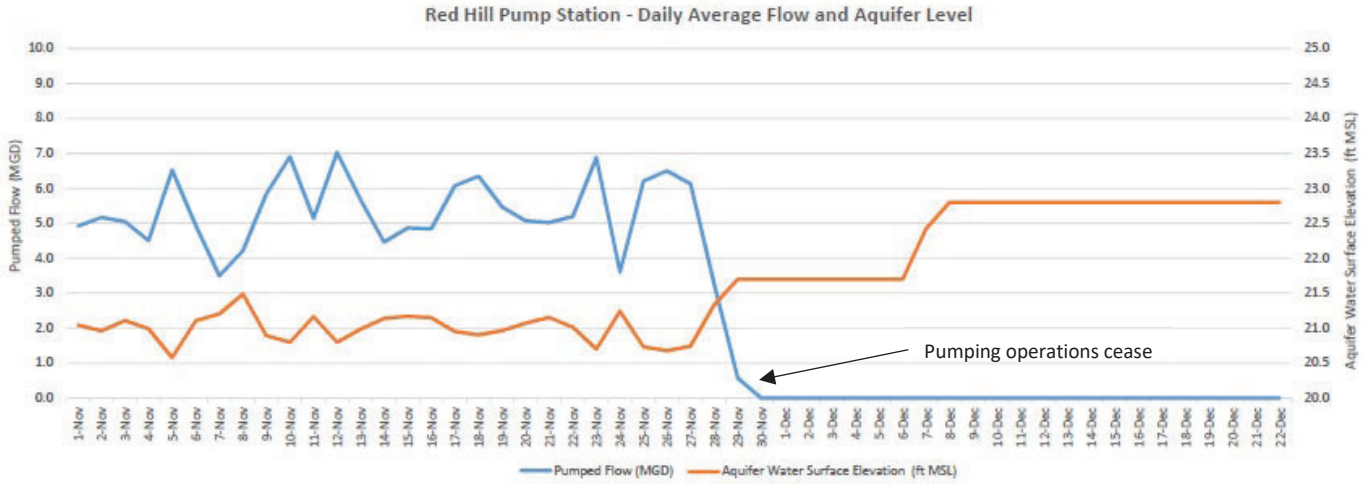


Figure 2. Red Hill Shaft Daily Average Flows and Aquifer Water Surface Elevation

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.

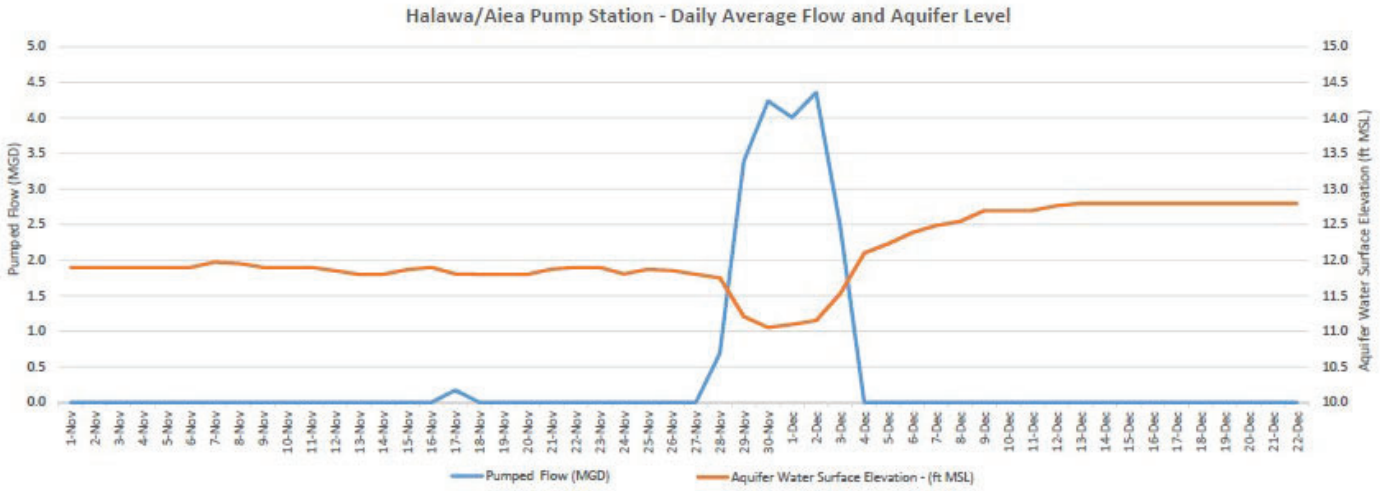


Figure 2. Halawa/Aiea Shaft Daily Average Flows and Aquifer Water Surface Elevation

Photograph of Concrete Blocking Between Air-gapped Isolation Flange

Interagency Drinking Water System Team
Zone H1 Removal Action Report
February 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 H1 Removal Action Report
February 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 26, 2022

From: U.S. Army Representative, IDWS Team
To: Interagency Drinking Water System (IDWS) 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.

SUZUKI.RHONDA.L S.1275028912 Digitally signed by SUZUKI.RHONDA.L S.1275028912 Date: 2022.02.26 21:51:38 -10'00'

Rhonda L.S. Suzuki, P.E.
Deputy Director, Directorate of Public Works
U.S. Army Garrison, Hawaii

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 H1

Enclosure: [1] ZONE H1: Backflow Prevention Devices

[2] ZONE H1: 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 H1, are identified in Enclosure [1], "Zone H1: 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.

SUBJECT: CERTIFICATE REGARDING CROSS CONNECTION CONTROL REVIEW AND CONFIRMATION – ZONE H1

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

Enclosure 1 - ZONE H1: Backflow Prevention Devices

Post	Facility	EID	Make	Model	Type	Size (")	Serial Number	Owner	ZONE	Installation Date	Changed (Replacement Date)	Last Tested Date	Last Repaired Date
AMR	142	BF01	Wilkins	975XL2	RP	2	3984492	Aqua	H1	N/A	N/A	7/28/2021	N/A
AMR	142	BF02	Apollo	RFLF4A0	DC	1.25	682681	Aqua	H1	N/A	N/A	7/28/2021	N/A
AMR	142	BF03	Wilkins	975XL2	RP	2	3940345	Aqua	H1	N/A	N/A	7/28/2021	N/A
AMR	888	BF01	Watts	709	DC	4	180456	DPW	H1	N/A	N/A	3/17/2021	N/A
AMR	888	BF03	Watts	909M1	RP	1.5	448600	DPW	H1	N/A	N/A	3/17/2021	N/A
AMR	888	BF02	Wilkins	975XL2	RP	1	ABE8524	DPW	H1	3/17/2021	3/17/2021	3/17/2021	N/A
AMR	1781	BF01	Ames	2000SS	DCDA	4	34843	DPW	H1	N/A	N/A	6/8/2021	N/A
AMR	1783	BF01	Watts	709	DCDA	4	144423	DPW	H1	2/23/2019	2/23/2019	6/8/2021	N/A
AMR	1790	BF01	Febco	825Y	RP	1.5	H15560	DPW	H1	N/A	N/A	11/9/2020	N/A
AMR	1783	BF02	Watts	7	DCDA	0.5	10313U	DPW	H1	N/A	N/A	6/8/2021	N/A
AMR	1783	BF04	Watts	909	RP	1	628359	DPW	H1	N/A	N/A	No Test	N/A
AMR	84210	BF01	Febco	975	RP	6	1629	DPW	H1	N/A	N/A	No Test	N/A
AMR	1788	BF02	Wilkins	975XL	RP	1.5	2662381	IPC	H1	N/A	N/A	11/20/2020	N/A
AMR	3339 Croton Ln	BF01	Febco	860	RP	2	H14918	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	1788	BF01	Watts	909	RP	2.5	125035	IPC	H1	N/A	N/A	1/29/2021	1/29/2021
AMR	1788	BF03	Febco	825Y	RP	2	J008474	IPC	H1	N/A	N/A	5/18/2021	N/A
AMR	140 Bogainviliea	BF01	Wilkins	975XL	RP	1	2775881	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	2147 Coral Ln.	BF01	Febco	825Y	RP	2	J024602	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	3210 Aulu Ln.	BF01	Febco	860	RP	1	H31070	IPC	H1	N/A	N/A	11/12/2020	N/A
AMR	3534 Albizia Ln.	BF01	Febco	860	RP	2	H14818	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	3617 Bamboo Ln.	BF01	Febco	860	RP	2	H14819	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	4594 Mamane Ln.	BF01	Wilkins	975XL	RP	2	3152075	IPC	H1	N/A	N/A	11/9/2020	N/A
AMR	4674 Lilikoi Ln.	BF01	Wilkins	975XL	RP	1	2778879	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	4705 Oleander St.	BF01	Wilkins	975XL	RP	2	3152061	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	6617 Plumeria Lp	BF01	Wilkins	975XL	RP	2	2842587	IPC	H1	N/A	N/A	11/9/2020	N/A
AMR	916 Tulip Ln	BF01	Febco	825Y	RP	2	J006849	IPC	H1	N/A	N/A	11/9/2020	N/A
AMR	Aliamanu and	BF01	Febco	825Y	RP	1.5	J015820	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	Ama and Aliamanu	BF01	Febco	860	RP	1	H3015	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	AMR Community Center	BF02	Wilkins	975XL	RP	1.5	2662781	IPC	H1	N/A	N/A	5/18/2021	N/A
AMR	Guava Ln.	BF01	Febco	860	RP	2	H13335	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	Lilikoi Ln. and Bergonia Lp.	BF01	Febco	825Y	RP	2	J016876	IPC	H1	N/A	N/A	11/10/2020	N/A
AMR	5054 Macadamia	BF01	Wilkins	975XL	RP	2	3228720	IPC	H1	N/A	N/A	11/9/2020	N/A
AMR	Skyview Lp &	BF01	Apollo	RP40	RP	2	238623	IPC	H1	N/A	N/A	11/10/2020	N/A

Enclosure 2: ZONE H1: POL Activities Map

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

Enclosure 3:

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

Installation A2:T19A2:T22T3A2:T	faciltyNumber1	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 cannisters 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.

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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 H1 Removal Action Report February
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 26, 2022

From: US Army 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 Results

1. Enclosures (1) through (6) document completion of Line of Evidence 2a, that water within the Zone H1, H2 & 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 H1, H2, & H3 is an Army consecutive system to the JBPHH Drinking Water system that is operated and maintained by the United States Navy. Flushing operations for Zone H1, H2, & H3 are summarized in Enclosure (1), signed by Nisit A. Gainey, Director of Public Works.

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 H1, H2, & 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.

GAINEY.NISIT.ANTHONY.1067651371

Digitally signed by GAINEY.NISIT.ANTHONY.1067651371
Date: 2022.02.26 19:43:59 -10'00'

Nisit A. Gainey
Director
Public Works, USAG-HI

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 H1

ENCL: (1) Water Storage Facilities & Water Source for one H1

1. OBJECTIVE. This addendum provides additional technical information to document the system flushing methodology and engineering approach used to restore Flushing Zone H1 (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 H1) 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 H1. 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 20 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. See section 2a.3 (hydraulic model) for more information on flushing.

6. Flushing Zones. Detailed information, i.e., maps, calculations, data, are included in the Hydraulic Model (2a.3).

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. Average flow of all hydrants was 210 gallons per minute (gpm).

6.2. Specific Limitations. None.

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 H1.

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.

SUBJECT: Army Flushing Report for Zone H1

Zone H1= 148,200 (gals), 5 volumes is 741,000 (gals) of water.

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 H1 started on 20 December 2021 and ended 25 December 2021. Flush 2 for Zone H1 started on 9 January 2022 and ended on 11 January 2022.

7.0. Water Storage Tanks. Zone H1 has the Army's 2070 water storage tank (referred to as Middle Tank), which serves the lower elevation homes within the AMR housing crater. The Army's Middle tank water is drawn from the JBPHH's distribution system. The JBPHH's distribution system water 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 H1 have been flushed in accordance with the IDWST Drinking Water Distribution System Recovery Plan, December 2021. The volumes of the storage tanks were not recorded. See enclosure 1, Water Storage Facilities & Water Source for Zone H1 certifying that the Middle tank was flushed in accordance with the Drinking Water Distribution System and Recovery Plan.

8.0. Residential Flushing. Residential flushing in Zone H1 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 918 residential homes were flushed in Zone H1. 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 13 non-residential buildings were flushed in Zone H1. 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. All samples 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 H1 was re-flushed in January 2022. After Flush 1 the a distribution sample in Zone H2 came back with a TPH detection and out an abundance of caution all 3 H Zones (H1, H2 & H3) were re-flushed.

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 H1

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 H1 has the Army's 2070 water storage tank (Middle Tank), which serves the lower elevation homes within the Aliumanu Military Reservation (AMR) crater. The Army's Middle tank water is drawn from the JBPHH's distribution system. The JBPHH's distribution system water 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 H1 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

ENCL(2)

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 <awhelton@purdue.edu>
Sent: Saturday, January 8, 2022 4:58 AM
To: Lee, Andre K (NAVFAC HI BD) CIV USN NAVFAC HAWAII PEARL (USA) <andre.k.lee4.civ@us.navy.mil>
Cc: Isaacson, Kristofer P <isaacsok@purdue.edu>; Proctor, Caitlin Rose <proctoc@purdue.edu>
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]

ARMY FLUSHING REPORT FOR ALUMANU MILITARY RESERVATION HOUSING AREA ZONE H1

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 H1.

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.

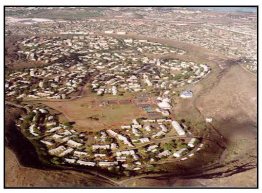
Groundwater is currently pumped from the Waiawa shaft to supply the drinking water for AMR housing in Zone H1. The treated groundwater is pumped to two Six (6) Million Gallon Storage tanks (S1 & S2) and gravity feed to the distribution system to supply consumers in Zone H1.

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.

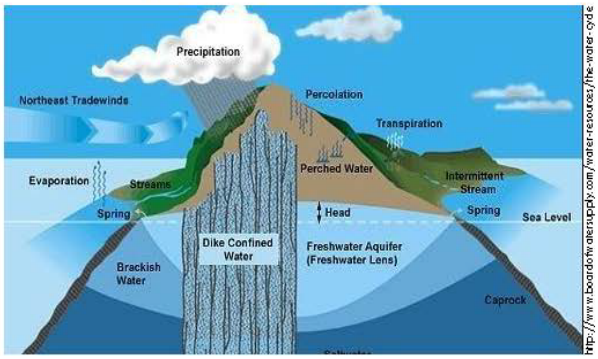
Red Hill Information:
In January 2014, a fuel release from Tank #5 at the Red Hill Bulk Fuel Storage Facility was reported. As a proactive measure, the Navy has been conducting testing at the Red Hill Shaft above what is required by regulation for several years. The table on page 4 shows the levels of 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:

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
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1 Jarrett White Road
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WATER STORAGE TANKS

Zone H1 has the Army's 2070 water storage tank (referred to as Middle Tank), which serves the lower elevation homes within the AMR housing crater. The Army's Middle tank water is drawn from the JBPHH's distribution system. The JBPHH's distribution system water 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 H1 have been flushed in accordance with the IDWST Drinking Water Distribution System Recovery Plan, December 2021.

HYDRANT FLUSHING NARRATIVES ZONE H1

ZONE H1:

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 H1. The First flushing event referred to as Flush 1 was conducted in 20-25 December 2021. The re-flush of Zone H1 referred to as Flush 2 was conducted 6-12 January 2022.

FIGURE 1: HYDRANTS FLUSHED ZONE H1

WATER MAINS HYDRANT FLUSHING (ZONE H1):

This section summarizes flush records for distribution system flushing in Zone H1 Flush 1 (December 2022) and Flush 2 (January 2022). The AMR #1 flushing log contains the flow rates for Zone H1 during flush 1. The AMR #2 flushing log contains the flow rates for Zone H1 during flush 2. Dr. Whelton (a Purdue University associate professor of civil, environmental, and ecological engineering) recommended three volumetric turnovers for impacted pipe networks. A factor of safety was applied to the highest priority zones by specifying a minimum of five volumetric turnovers.

Zone H1= 148,200 (kgals), 5 volumes is 741,000 (kgals) of water.

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

ALIAMANU MILITARY RESERVATION FLUSH LOG ZONE H1 FLOW RATES (FLUSH 1)

ZONE H1 - MIDDLE TANK - TOTAL 5 VOLUME TARGET FLUSH = 740.823 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)
12/20/2021	AMR #1	H1	8:40	9:20	0:40	40	230	9.2	9.2
	AMR #16	H1	10:00	18:00	8:00	480	266.7	128.0	137.2
	AMR #28A	H1	13:35	14:35	1:00	60	151	9.1	146.3
							DAILY TOTAL:	**146.3**	
12/21/2021	AMR #1	H1	14:35	15:15	0:45	45	230	10.4	156.6
	AMR #2	H1	12:10	13:40	1:30	90	230	20.7	177.3
	AMR #3	H1	14:20	15:45	1:35	95	230	21.9	199.2
	AMR #4	H1	16:30	18:00	1:30	90	233	21.0	220.1
	AMR #5	H1	16:05	17:35	1:30	90	233	21.0	241.1
	AMR #7	H1	18:00	19:20	1:20	80	250	20.0	261.1
	AMR #8	H1	18:20	19:20	1:00	60	250	15.0	276.1
	AMR #9	H1	20:00	21:00	1:00	60	245	14.7	290.8
	AMR #10	H1	19:50	20:50	1:00	60	245	14.7	305.5
	AMR #11	H1	21:50	23:00	1:10	70	225	15.8	321.3
	AMR #12	H1	21:10	22:30	1:20	80	225	18.0	339.3
							DAILY TOTAL:	**193.0**	
12/22/2021	AMR #13	H1	23:30	0:30	1:00	60	250	15.0	354.3
	AMR #14	H1	1:15	2:45	1:30	90	165	14.9	369.1
	AMR #15	H1	1:30	3:00	1:30	90	165	14.9	384.0
	AMR #17	H1	3:30	5:00	1:30	90	190	17.1	401.1
	AMR #18	H1	3:50	5:30	1:40	100	190	19.0	420.1
	AMR #19	H1	5:50	7:50	2:00	120	170	20.4	440.5
	AMR #20	H1	6:00	8:00	2:00	120	170	20.4	460.9
							DAILY TOTAL:	**121.6**	
12/24/2021	AMR SP1	H1	0:00	24:00	24:00	1440	70	100.8	561.7
	AMR SP1a	H1	10:00	24:00	14:00	840	300	252.0	813.7
							DAILY TOTAL:	**352.8**	
12/25/2021	AMR SP1	H1	0:00	6:00	6:00	360	70	25.2	838.9
	AMR SP1a	H1	0:00	6:00	6:00	360	300	108.0	**946.9**
							DAILY TOTAL:	**133.2**	
							CUM VOL:	**946.85**	
							TARGET VOL	**740.82**	

ALIAMANU MILITARY RESERVATION FLUSH LOG ZONE H1 FLOW RATES (FLUSH 2)

ZONE H1 - MIDDLE TANK - TOTAL 5 VOLUMES + DEAD ENDS TARGET FLUSH = 743.5 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)
01/09/2022	AMR #15	H1	8:15	10:52	2:37	157	4419400	4447900	28.5	22	181.5	28.5
	AMR #16	H1	9:20	11:37	2:17	137	3300700	3328800	28.1	22	205.1	56.6
	AMR #17	H1	11:04	13:15	2:11	131	4447900	4476200	28.3	22	216.0	84.9
	AMR #18	H1	11:56	14:07	2:11	131	3328800	3356900	28.1	22	214.5	113.0
	AMR #19	H1	13:30	15:29	1:59	119	4476200	4504600	28.4	22	238.7	141.4
	AMR #20	H1	14:21	16:12	1:51	111	3356900	3385000	28.1	28	253.2	169.5
	AMR #20a	H1	17:20	18:00	0:40	40			0.2	0	5.0	169.7
	AMR #21	H1	17:00	19:05	2:05	125	3385000	3413000	28.0	28	224.0	197.7
	AMR #22	H1	17:30	19:45	2:15	135	4504600	4532630	28.0	28	207.6	225.7
	AMR #22a	H1			1:00	60			0.3	0	5.0	226.0
	AMR #23	H1	19:17	21:20	2:03	120	3413000	3441000	28.0	28	233.3	254.0
	AMR #23a	H1			0:50	50			0.3	0	5.0	254.3
	AMR #24	H1	20:20	22:15	1:55	115	4532600	4560900	28.3	28	246.1	282.6
	AMR #25	H1	21:40	23:30	1:50	110	3441000	3469000	28.0	28	254.5	310.6
	AMR #26	H1	22:45	24:00:00	1:15	75	4560900	4573719	12.8	13	170.9	323.4
								DAILY TOTAL:	323.4	291.6		
01/10/2022	AMR #26	H1	0:00	1:29	1:29	89	4573719	4588930	15.2	15	170.9	338.6
	AMR #27	H1	1:31	3:13	1:42	102	3497100	3525324	28.2	28	276.7	366.8
	AMR #28	H1	23:42	1:19	1:37	97	3469000	3497100	28.1	28	289.7	394.9
	AMR #29	H1	2:04	5:05	3:01	181	4588930	4617406	28.5	28	157.3	423.4
	AMR #30	H1	3:30	5:02	3:29	92	3525324	3553566	28.2	28	307.0	451.7
	AMR #31	H1	5:54	7:49	1:55	115	4617406	4645848	28.4	28	247.3	480.1
	AMR #32	H1	5:32	7:18	1:37	106	3553566	3581670	28.1	28	265.1	508.2
	AMR #33	H1	8:22	10:58	2:36	156	4645848	4674428	28.6	28	183.2	536.8
	AMR #33a	H1	11:15	13:55	2:40	160			0.8	0.3	5.0	537.6
	AMR #33b	H1	11:15	12:15	1:00	60			0.3	0.3	5.0	537.9
	AMR #34	H1	8:59	11:05	2:06	126	3581670	3611539	29.9	28	237.1	567.7
	AMR #34a	H1	11:23	12:13	0:50	50			0.3	0.3	5.0	568.0
	AMR #34b	H1	12:50	13:40	0:50	50			0.3	0.3	5.0	568.2
	AMR #35	H1	11:43	13:48	2:05	125	4674428	4702549	28.1	28	225.0	596.4
	AMR #36	H1	12:06	13:39	1:33	93	3611539	3640514	29.0	28	311.6	625.3
	AMR #37	H1	14:00	15:37	1:37	97	3640514	3669554	29.0	28	299.4	654.4
	AMR #38	H1	14:29	16:52	2:23	143	4702549	4730555	28.0	28	195.8	682.4
	AMR #39	H1	17:29	19:21	1:52	112	4730555	4758700	28.1	28	251.3	710.5
	AMR #39a	H1	17:50	19:10	1:20	80			0.4	0.4	5.0	710.9
	AMR #40	H1	18:46	20:15	1:29	89	3669554	3711900	42.3	28	475.8	753.3
	AMR #41	H1	19:45	21:42	1:57	117	4758700	4787100	28.4	28	242.7	781.7
	AMR #42	H1	20:49	22:30	1:41	101	3711900	3740200	28.3	28	280.2	810.0
	AMR #44	H1	22:01	23:45	1:44	104	4787100	4815200	28.1	28	270.2	838.1
	AMR #43	H1	22:58	0:45	1:47	107	3740200	3756400	16.2	16	151.4	854.3
								DAILY TOTAL:	530.9	508.9		854.3
1/11/2022	AMR #43	H1	22:58	0:45	1:47	107	3756400	3768200	11.8	12	110.3	866.1
	AMR #45	H1	0:09	2:11	2:02	122	4815200	4845800	30.6	28	250.8	896.7
	AMR #46	H1	1:25	3:36	2:11	131	3768200	3798800	30.6	28	233.6	927.3
	AMR #46a	H1	1:44	2:36	0:52	52			0.3	0.26	5.0	927.5
	AMR #47	H1	2:32	4:49	2:17	137	4845800	4876400	30.6	28	223.4	958.1
	AMR #48	H1	4:15	6:20	2:05	125	3798800	3825700	26.9	28	215	985.0
	AMR #48	H1	4:15	6:20	2:05	125	3864400	3866400	2.0		16	987.0
								DAILY TOTAL:	132.8	124.1		987.0
									987.0			
										CUM VOL:		987.0
										TARGET VOL		743.5

########	1:29	2:44		164	78.162180		
########	24:00:00	1:15		75	170.91463	12818.6	4573719
0:00	1:29	1:29		89	170.91463	15211.4	4588930
				164		28030	

11:15		
13:55	160	
2:40		

							########
########	0:45	1:47	107	261.6822	3740200	28000	########
########	0:00	1:02	62	261.6822	3740200	16224.3	########
0:00	0:45	0:45	45	261.6822	3756424	11775.7	########
			214			28000	

ALIAMANU MILITARY RESERVATION FLUSH VELOCITES ZONE H1 FLOW RATES:

	Low Velocity (feet per second)	High Velocity (feet per second)
H1	0.45	1.70

RESIDENTIAL FLUSHING RED HILL (ZONE H1):

Residential flushing in Aliamanu Military Housing (AMR) Zone H1 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 936 residential homes were flushed in Zone H1. 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 middle water storage tank water level was monitored to ensure Zone H1 had adequate water during the flushing event.

Single Family Home Flushing Plan Checklist and Standard Operating Procedure

https://health.hawaii.gov/about/files/2021/12/Home-Flushing-Plan-Checklist-and-Standard-Operating-Procedures-FINAL.pdf

FIGURE 1: SUMMARY OF RESIDENTIAL FLUSHING for ALIAMANU MILITARY RESERVATION (Zone H1)

NON-RESIDENTIAL FLUSHING ALIAMANU MILITARY RESERVATION (Zone H1):

Non-residential flushing has been conducted in accordance with the IDWST Non-Residential Facility Flushing Plan checklist and standard operating procedure. A total of 13 non-residential buildings were flushed in Zone H1. 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 H1):

Irrigation flushing for the Aliamanu Military Reservation (AMR), Zone H1 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 H1 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, Kaeolani
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 H1. 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)**

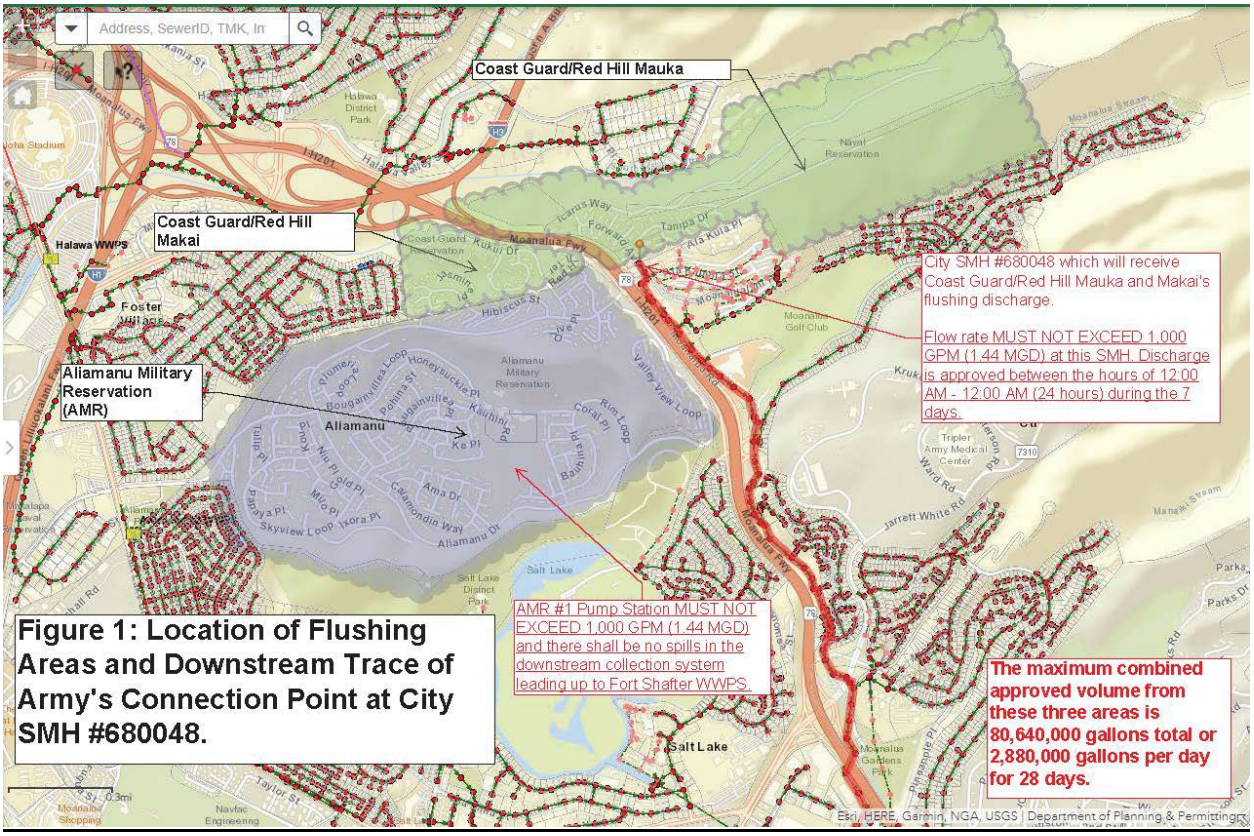
8. The permittee shall conduct sampling for the following parameters in the beginning and end of the entire flushing period and must comply with applicable limits:

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.


Coast Guard/Red Hill Mauka
Coast Guard/Red Hill Makai
Halawa WWPS
Aliamanu Military Reservation (AMR)
City SMH #680048 which will receive Coast Guard/Red Hill Mauka and Makai's flushing discharge.
Flow rate MUST NOT EXCEED 1,000 GPM (1.44 MGD) at this SMH. Discharge is approved between the hours of 12:00 AM - 12:00 AM (24 hours) during the 7 days.
AMR #1 Pump Station MUST NOT EXCEED 1,000 GPM (1.44 MGD) and there shall be no spills in the downstream collection system leading up to Fort Shafter WWPS.
The maximum combined approved volume from these three areas is 80,640,000 gallons total or 2,880,000 gallons per day for 28 days.
Figure 1: Location of Flushing Areas and Downstream Trace of Army's Connection Point at City SMH #680048.
Esri, HERE, Garmin, NGA, USGS | Department of Planning & Permitting

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 H1 can be found in EDMS the database of record for sampling data.

SAMPLING PLAN

https://health.hawaii.gov/about/files/2022/01/Drinking-Water-Sampling-Plan-Addendum_V6_010422_Final2.pdf

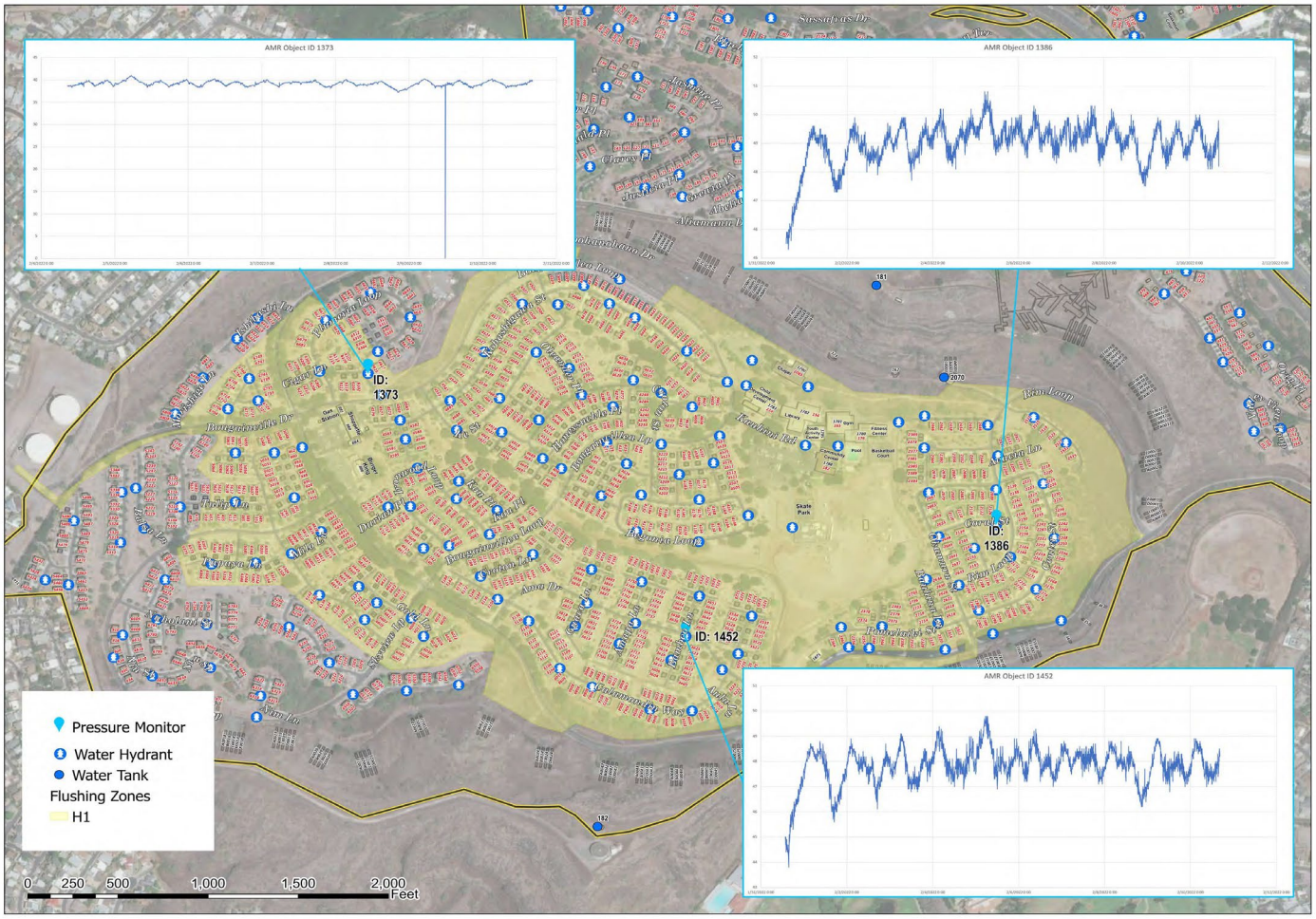
FLUSHING MAP WITH PRESSURE GRAPHS Zone H1

Below is a summary of the data the Army was able to collect with pressure data loggers placed on Hydrants during flushing events. The drop is residential flushing is the data logger being adjusted on the hydrant, but not a true drop in pressure. 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 H1

FIGURE 2: RESIDENITAL FLUSHING PRESSURE DATA Zone H1



2a.4 RECORDS OF COMPLETED VOLUMETRIC EXCHANGES

ZONE H1 - MIDDLE TANK - TOTAL 5 VOLUME TARGET FLUSH = 740.823 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)
12/20/2021	AMR #1	H1	8:40	9:20	0:40	40	230	9.2	9.2
	AMR #16	H1	10:00	18:00	8:00	480	266.7	128.0	137.2
	AMR #28A	H1	13:35	14:35	1:00	60	151	9.1	146.3
							DAILY TOTAL:	146.3	
12/21/2021	AMR #1	H1	14:35	15:15	0:45	45	230	10.4	156.6
	AMR #2	H1	12:10	13:40	1:30	90	230	20.7	177.3
	AMR #3	H1	14:20	15:45	1:35	95	230	21.9	199.2
	AMR #4	H1	16:30	18:00	1:30	90	233	21.0	220.1
	AMR #5	H1	16:05	17:35	1:30	90	233	21.0	241.1
	AMR #7	H1	18:00	19:20	1:20	80	250	20.0	261.1
	AMR #8	H1	18:20	19:20	1:00	60	250	15.0	276.1
	AMR #9	H1	20:00	21:00	1:00	60	245	14.7	290.8
	AMR #10	H1	19:50	20:50	1:00	60	245	14.7	305.5
	AMR #11	H1	21:50	23:00	1:10	70	225	15.8	321.3
	AMR #12	H1	21:10	22:30	1:20	80	225	18.0	339.3
							DAILY TOTAL:	193.0	
12/22/2021	AMR #13	H1	23:30	0:30	1:00	60	250	15.0	354.3
	AMR #14	H1	1:15	2:45	1:30	90	165	14.9	369.1
	AMR #15	H1	1:30	3:00	1:30	90	165	14.9	384.0
	AMR #17	H1	3:30	5:00	1:30	90	190	17.1	401.1
	AMR #18	H1	3:50	5:30	1:40	100	190	19.0	420.1
	AMR #19	H1	5:50	7:50	2:00	120	170	20.4	440.5
	AMR #20	H1	6:00	8:00	2:00	120	170	20.4	460.9
							DAILY TOTAL:	121.6	
12/24/2021	AMR SP1	H1	0:00	24:00	24:00	1440	70	100.8	561.7
	AMR SP1a	H1	10:00	24:00	14:00	840	300	252.0	813.7
							DAILY TOTAL:	352.8	
12/25/2021	AMR SP1	H1	0:00	6:00	6:00	360	70	25.2	838.9
	AMR SP1a	H1	0:00	6:00	6:00	360	300	108.0	946.9
							DAILY TOTAL:	133.2	
							CUM VOL:	946.85	
							TARGET VOL	740.82	

ZONE H1 - MIDDLE TANK - TOTAL 5 VOLUMES + DEAD ENDS TARGET FLUSH = 743.5 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)
01/09/2022	AMR #15	H1	8:15	10:52	2:37	157	4419400	4447900	28.5	22	181.5	28.5
	AMR #16	H1	9:20	11:37	2:17	137	3300700	3328800	28.1	22	205.1	56.6
	AMR #17	H1	11:04	13:15	2:11	131	4447900	4476200	28.3	22	216.0	84.9
	AMR #18	H1	11:56	14:07	2:11	131	3328800	3356900	28.1	22	214.5	113.0
	AMR #19	H1	13:30	15:29	1:59	119	4476200	4504600	28.4	22	238.7	141.4
	AMR #20	H1	14:21	16:12	1:51	111	3356900	3385000	28.1	28	253.2	169.5
	AMR #20a	H1	17:20	18:00	0:40	40			0.2	0	5.0	169.7
	AMR #21	H1	17:00	19:05	2:05	125	3385000	3413000	28.0	28	224.0	197.7
	AMR #22	H1	17:30	19:45	2:15	135	4504600	4532630	28.0	28	207.6	225.7
	AMR #22a	H1			1:00	60			0.3	0	5.0	226.0
	AMR #23	H1	19:17	21:20	2:03	120	3413000	3441000	28.0	28	233.3	254.0
	AMR #23a	H1			0:50	50			0.3	0	5.0	254.3
	AMR #24	H1	20:20	22:15	1:55	115	4532600	4560900	28.3	28	246.1	282.6
	AMR #25	H1	21:40	23:30	1:50	110	3441000	3469000	28.0	28	254.5	310.6
	AMR #26	H1	22:45	24:00:00	1:15	75	4560900	4573719	12.8	13	170.9	323.4
								DAILY TOTAL:	323.4	291.6		
01/10/2022	AMR #26	H1	0:00	1:29	1:29	89	4573719	4588930	15.2	15	170.9	338.6
	AMR #27	H1	1:31	3:13	1:42	102	3497100	3525324	28.2	28	276.7	366.8
	AMR #28	H1	23:42	1:19	1:37	97	3469000	3497100	28.1	28	289.7	394.9
	AMR #29	H1	2:04	5:05	3:01	181	4588930	4617406	28.5	28	157.3	423.4
	AMR #30	H1	3:30	5:02	3:29	92	3525324	3553566	28.2	28	307.0	451.7
	AMR #31	H1	5:54	7:49	1:55	115	4617406	4645848	28.4	28	247.3	480.1
	AMR #32	H1	5:32	7:18	1:37	106	3553566	3581670	28.1	28	265.1	508.2
	AMR #33	H1	8:22	10:58	2:36	156	4645848	4674428	28.6	28	183.2	536.8
	AMR #33a	H1	11:15	13:55	2:40	160			0.8	0.3	5.0	537.6
	AMR #33b	H1	11:15	12:15	1:00	60			0.3	0.3	5.0	537.9
	AMR #34	H1	8:59	11:05	2:06	126	3581670	3611539	29.9	28	237.1	567.7
	AMR #34a	H1	11:23	12:13	0:50	50			0.3	0.3	5.0	568.0
	AMR #34b	H1	12:50	13:40	0:50	50			0.3	0.3	5.0	568.2
	AMR #35	H1	11:43	13:48	2:05	125	4674428	4702549	28.1	28	225.0	596.4
	AMR #36	H1	12:06	13:39	1:33	93	3611539	3640514	29.0	28	311.6	625.3
	AMR #37	H1	14:00	15:37	1:37	97	3640514	3669554	29.0	28	299.4	654.4
	AMR #38	H1	14:29	16:52	2:23	143	4702549	4730555	28.0	28	195.8	682.4
	AMR #39	H1	17:29	19:21	1:52	112	4730555	4758700	28.1	28	251.3	710.5
	AMR #39a	H1	17:50	19:10	1:20	80			0.4	0.4	5.0	710.9
	AMR #40	H1	18:46	20:15	1:29	89	3669554	3711900	42.3	28	475.8	753.3
	AMR #41	H1	19:45	21:42	1:57	117	4758700	4787100	28.4	28	242.7	781.7
	AMR #42	H1	20:49	22:30	1:41	101	3711900	3740200	28.3	28	280.2	810.0
	AMR #44	H1	22:01	23:45	1:44	104	4787100	4815200	28.1	28	270.2	838.1
	AMR #43	H1	22:58	0:45	1:47	107	3740200	3756400	16.2	16	151.4	854.3
								DAILY TOTAL:	530.9	508.9		854.3
1/11/2022	AMR #43	H1	22:58	0:45	1:47	107	3756400	3768200	11.8	12	110.3	866.1
	AMR #45	H1	0:09	2:11	2:02	122	4815200	4845800	30.6	28	250.8	896.7
	AMR #46	H1	1:25	3:36	2:11	131	3768200	3798800	30.6	28	233.6	927.3
	AMR #46a	H1	1:44	2:36	0:52	52			0.3	0.26	5.0	927.5
	AMR #47	H1	2:32	4:49	2:17	137	4845800	4876400	30.6	28	223.4	958.1
	AMR #48	H1	4:15	6:20	2:05	125	3798800	3825700	26.9	28	215	985.0
	AMR #48	H1	4:15	6:20	2:05	125	3864400	3866400	2.0		16	987.0
								DAILY TOTAL:	132.8	124.1		987.0
									987.0			
											CUM VOL:	987.0
											TARGET VOL	743.5

#######	1:29	2:44		164	78.162180			
#######	24:00:00	1:15		75	170.91463	12818.6	4573719	
0:00	1:29	1:29		89	170.91463	15211.4	4588930	
				164		28030		

11:15								
13:55	160							
2:40								

								#######
#######	0:45	1:47	107	261.6822	3740200	28000	#######	
#######	0:00	1:02	62	261.6822	3740200	16224.3	#######	
0:00	0:45	0:45	45	261.6822	3756424	11775.7	#######	
			214			28000		

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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Date: 2022.02.26 17:41:31 -10'00'

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.

MENO.MICHAEL.WAYNE.JR.1088310035
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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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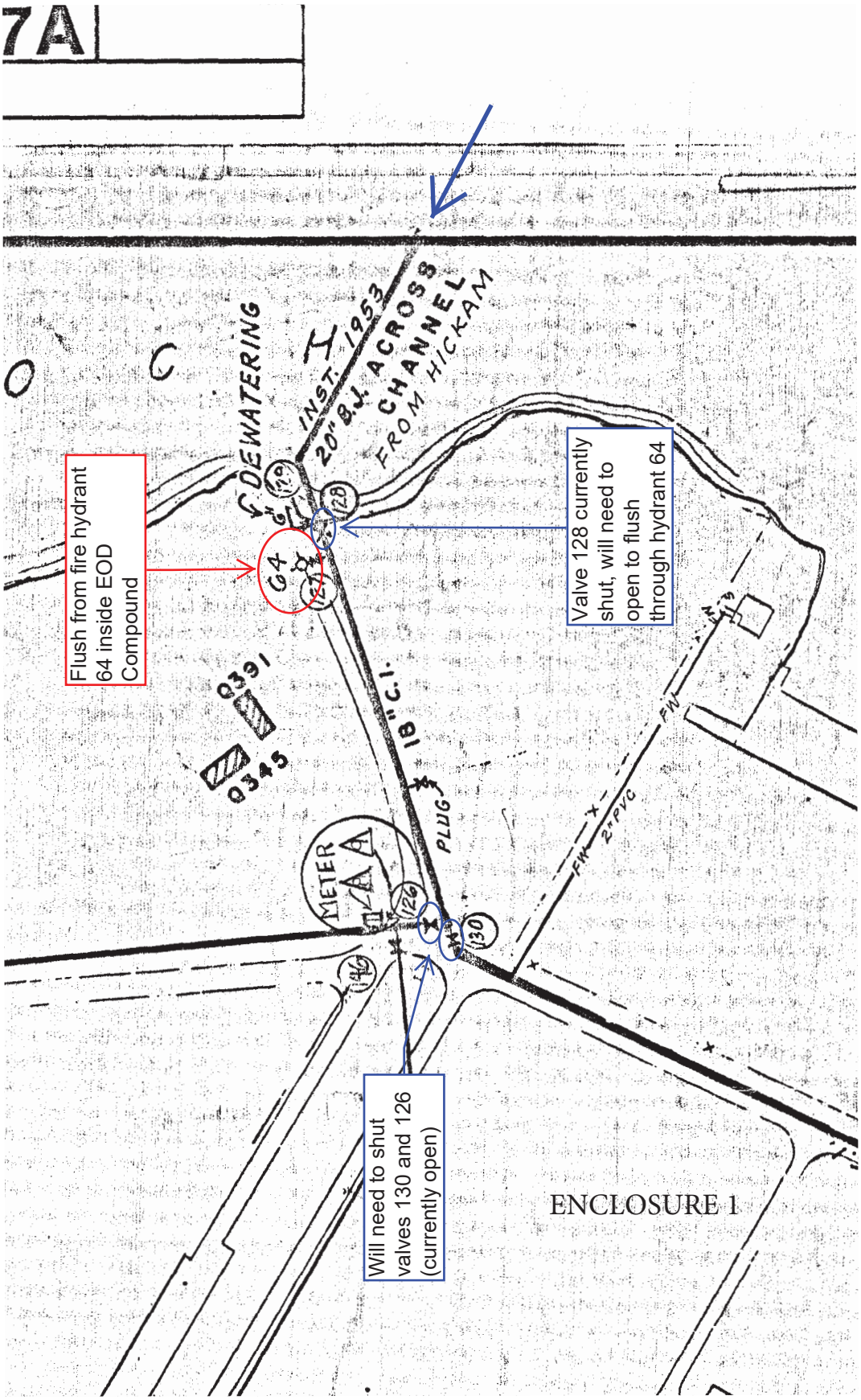
CAPT R. Harmeyer
Public Works Officer
Joint Base Pearl Harbor Hickam


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

February 25, 2022

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

SUBJ: ZONE H1 DISTRIBUTION SYSTEM EXCEEDANCE INVESTIGSTION SUMMARY AND RESULTS

Encl: (1) Stage 2 Distribution Sampling Report
(2) Zone H1 Distribution System Sampling Report

1. The Zone H1 Distribution System sampling results are listed in enclosures (1) and (2). 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 Paramaters (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. Enclosure (1) contains the initial distribution system sample results for Zone H1. Enclosure (2) documents additional distribution samples that were taken in Zone H1. The investigation summary and results are covered in section 2b.3 of this report.

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
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Date: 2022.02.25 19:43:11 -10'00'

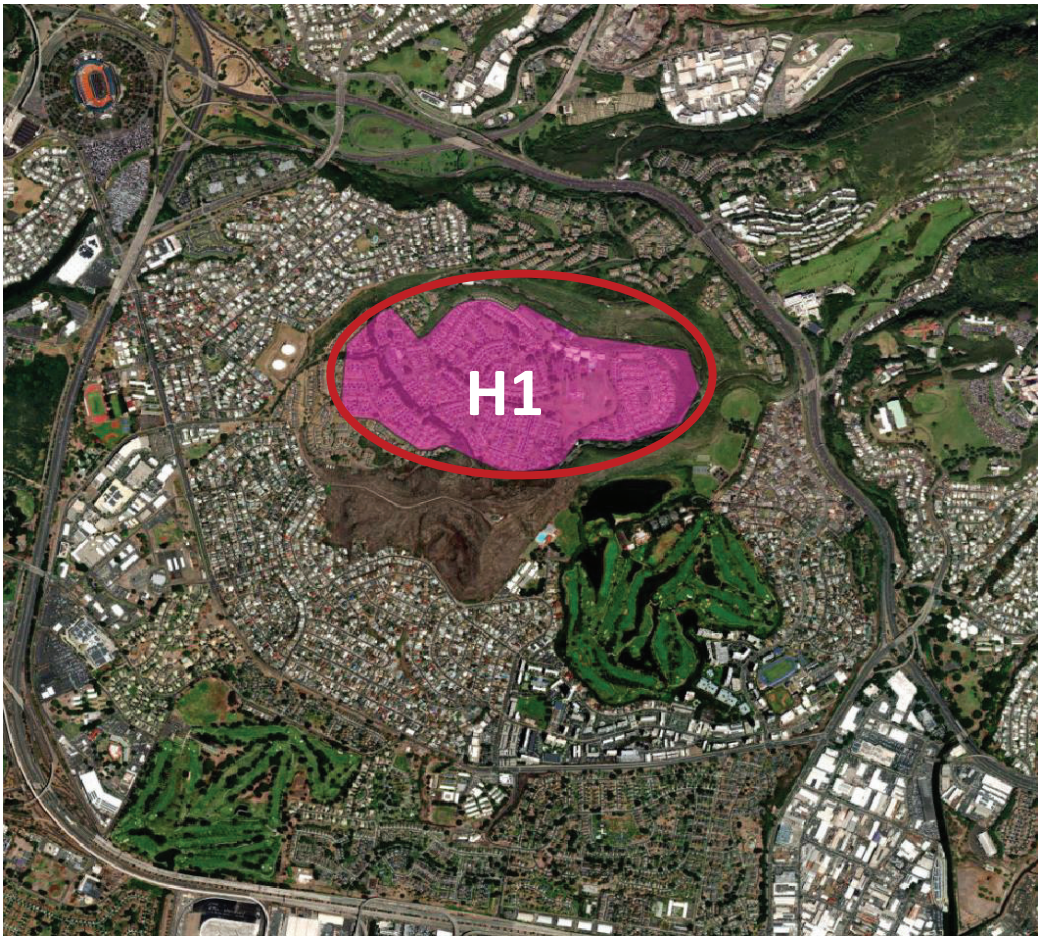
M. W. Meno
CAPT, CEC, USN

Interagency Drinking Water System Team

Drinking Water Distribution System Recovery Plan: *Stage 2 Sampling Results for Zone H1*

Joint Base Pearl-Hickam (JBPHH)

03 February 2022



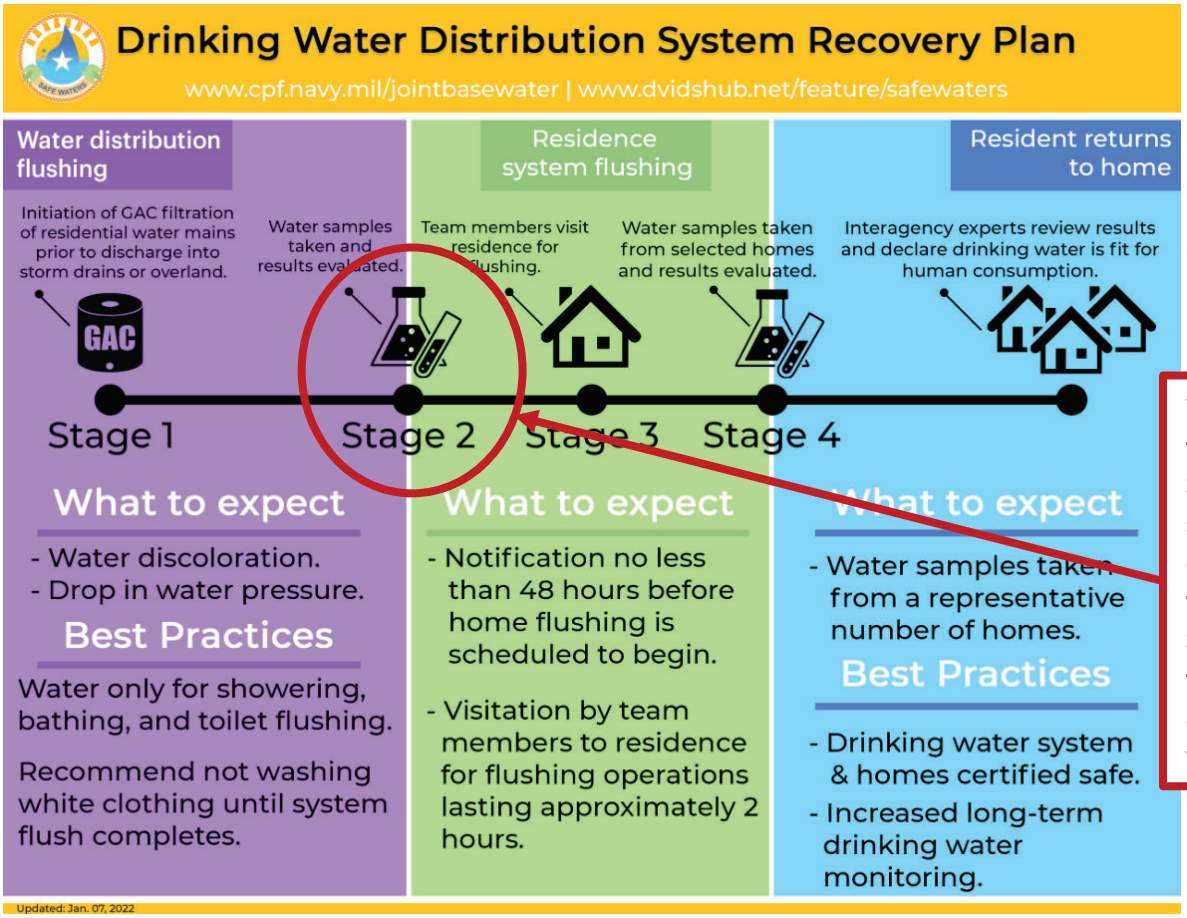
Neighborhoods included in Zone H1: Aliamanu Military Reservation (see also H2)

EXECUTIVE SUMMARY FOR ZONE H1

The State of Hawaii Department of Health's (DOH) November 29, 2021 Public Health Advisory for the JPBHH Public Water System for Zone H1 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 H1. 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 H1

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	01/11/2022	ppb	5	MCL	ND	**Yes**	Discharge from factories; Leaching from gas storage tanks and landfills
Ethylbenzene	01/11/2022	ppb	700	MCL	ND	**Yes**	Discharge from petroleum refineries
Toluene	01/11/2022	ppb	1000	MCL	ND	**Yes**	Discharge from petroleum factories
m,p-Xylenes	01/11/2022	ppb	10000	MCL	ND	**Yes**	Discharge from petroleum factories; Discharge from chemical factories
o-Xylenes	01/11/2022	ppb	10000	MCL	ND	**Yes**	
1-Methylnaphthalene	01/11/2022	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	01/11/2022	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	01/11/2022	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	01/11/2022	ppb	15	ISP	1.02	**Yes**	Corrosion of household plumbing systems; Erosion of natural deposits
Total Petroleum Hydrocarbons (TPH)-Gasoline (C6-C12)	01/11/2022	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)	01/11/2022	ppb	200	ISP	ND	**Yes**	Diesel is a petroleum product that can contaminate drinking water through spills and other releases into the environment
TPH-Oil (C24-C40)	01/11/2022	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)	01/11/2022	ppb	2000	ISP	ND	**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							
Arsenic	01/11/2022	ppb	10	MCL	0.262	**Yes**	Erosion of natural deposits; Runoff from orchards; Runoff from glass and electronics production waste
Barium	01/11/2022	ppb	2000	MCL	2.28	**Yes**	Discharge of drilling wastes; Discharge from metal refineries; Erosion of natural deposits
Chromium	01/11/2022	ppb	100	MCL	1.53	**Yes**	Corrosion of galvanized pipes; Erosion of natural deposits; Discharge from metal refineries; Runoff from waste batteries and paints
Copper	01/11/2022	ppb	1300	AL	7.10	**Yes**	Corrosion of household plumbing systems; Erosion of natural deposits
Selenium	01/11/2022	ppb	50	MCL	1.37	**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	01/11/2022	ppb	0.014	EAL	3.3	**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
Di(2-ethylhexyl) adipate (aka Bis(2-ethylhexyl) adipate)	01/11/2022	ppb	400	MCL	0.0581	**Yes**	Discharge from chemical factories

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 H1

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 H1?

The final round of distribution water main flushing in Zone H1 was completed on January 10, 2022.

How much water was flushed through the water distribution system in Zone H1?

From January 09 – 10, 2022, a total of 0.9 million gallons was flushed through Zone H1.

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.

H1 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-HYD1387A	H1-HYD1387A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1416A	H1-HYD1416A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1387	Hyrdrant 1387	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1416	Hyrdrant 1416
Field Sample ID:					20220111-H1-YT10	20220111-H1-YT11	20220111-H1-YT12	20220111-H1-YT13	220204H1HT01	220204H1HT01-1	20220111-H1-YT08	20220111-H1-YT09
Sample Date:					2022-01-11	2022-01-11	2022-01-11	2022-01-11	2022-02-04	2022-02-04	2022-01-11	2022-01-11
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: 2A12049**		**SDG: 2A12047**				**SDG: 2A12048**
Total Organic Carbon	2	None	None	None	--	0.190 U	--	0.190 U	--	--	--	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: 5801092391**	**SDG: 5801092471**	**SDG: 5801092391**	**SDG: 5801092471**			**SDG: 5801092581**	**SDG: 5801092471**
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	93.0 U	94.0 U	89.0 U	94.0 U	--	--	92.0 U	93.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 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	190 U	190 U	180 U	190 U	--	--	180 U	190 U
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: 2A12049**		**SDG: 2A12047**				**SDG: 2A12048**
Mercury	0.025	0.025	2	2	--	0.0170 U	--	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: 2A12049**		**SDG: 2A12047**				**SDG: 2A12048**
Antimony	6	6	6	6	--	0.0889 U	--	0.0889 U	--	--	--	0.0889 U
Arsenic	10	10	10	10	--	**0.258 J**	--	**0.262 J**	--	--	--	**0.240 J**
Barium	220	220	2000	2000	--	**2.28**	--	**2.23**	--	--	--	**1.96**
Beryllium	0.66	0.66	4	4	--	0.0624 U	--	0.0624 U	--	--	--	0.0624 U
Cadmium	3	3	5	5	--	0.0416 U	--	0.0416 U	--	--	--	0.0416 U
Chromium	11	11	100	100	--	**1.52**	--	**1.53**	--	--	--	**1.46**
Copper	2.9	2.9	1300	1300	--	**7.10**	--	**4.61**	--	--	--	**3.50**
Lead	15	5.6	15	15	--	**1.02**	--	**0.484**	--	--	--	**0.208**
Selenium	5	5	50	50	--	**1.31**	--	**1.37**	--	--	--	**1.01**
Thallium	2	2	2	2	--	0.0210 U	--	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: 5801092391**	**SDG: 2A12049**	**SDG: 5801092391**	**SDG: 2A12047**	**SDG: 5801100351**	**SDG: 5801100351**	**SDG: 5801092581**	**SDG: 2A12048**
1,2,4-Trichlorobenzene	70	70	70	70	0.0910 U	--	0.0950 U	--	0.0860 U	0.0920 U	0.0920 U	--
1,2-Dichlorobenzene	10	10	600	600	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--
1,3-Dichlorobenzene	None	None	None	None	0.0410 U	--	0.0420 U	--	0.0380 U	0.0410 U	0.0410 U	--

ENCL (2)

H1 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-HYD1387A	H1-HYD1387A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1416A	H1-HYD1416A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1387	Hyrdrant 1387	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1416	Hyrdrant 1416
Field Sample ID:					20220111-H1-YT10	20220111-H1-YT11	20220111-H1-YT12	20220111-H1-YT13	220204H1HT01	220204H1HT01-1	20220111-H1-YT08	20220111-H1-YT09
Sample Date:					2022-01-11	2022-01-11	2022-01-11	2022-01-11	2022-02-04	2022-02-04	2022-01-11	2022-01-11
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: 5801092391**	**SDG: 2A12049**	**SDG: 5801092391**	**SDG: 2A12047**	**SDG: 5801100351**	**SDG: 5801100351**	**SDG: 5801092581**	**SDG: 2A12048**
1,4-Dichlorobenzene	5	5	75	None	0.0410 U	--	0.0420 U	--	0.0380 U	0.0410 U	0.0410 U	--
1-Methylnaphthalene	2.1	10	None	None	--	0.00801 U	--	0.00801 U	--	--	--	0.00801 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	--	--	--	--	--	0.200 U	--	--
2,4-Dimethylphenol	None	None	None	None	--	--	--	--	--	0.160 U	--	--
2,4-Dinitrophenol	None	None	None	None	--	--	--	--	--	1.60 U	--	--
2,4-Dinitrotoluene	None	None	None	None	0.100 U	--	0.110 U	--	0.0950 U	0.100 U	0.100 U	--
2,6-Dinitrotoluene	None	None	None	None	0.100 U	--	0.110 U	--	0.0950 U	0.100 U	0.100 U	--
2-Chloronaphthalene	None	None	None	None	0.0710 U	--	0.0740 U	--	0.0670 U	0.0710 U	0.0720 U	--
2-Chlorophenol	None	None	None	None	--	--	--	--	--	0.0510 U	--	--
2-Ethylhexyl adipate	None	None	None	None	--	**0.0581 J**	--	0.00962 U	--	--	--	0.00962 U
2-Methylnaphthalene	4.7	10	None	None	--	0.00904 U	--	0.00904 U	--	--	--	0.00904 U
2-Methylphenol (o-Cresol)	None	None	None	None	--	--	--	--	--	0.0510 U	--	--
2-Nitroaniline	None	None	None	None	0.100 U	--	0.110 U	--	0.0950 U	0.100 U	0.100 U	--
3,3'-Dichlorobenzidine	None	None	None	None	0.260 U	--	0.280 U	--	0.250 U	0.260 U	0.270 U	--
3-Nitroaniline	None	None	None	None	0.160 U	--	0.170 U	--	0.150 U	0.160 U	0.160 U	--
4,6-Dinitro-2-methylphenol	None	None	None	None	--	--	--	--	--	0.560 U	--	--
4-Bromophenyl phenyl ether	None	None	None	None	0.0610 U	--	0.0640 U	--	0.0570 U	0.0610 U	0.0610 U	--
4-Chloro-3-methylphenol	None	None	None	None	--	--	--	--	--	0.130 U	--	--
4-Chloroaniline	None	None	None	None	0.600 U	--	0.630 U	--	0.560 U	0.600 U	0.600 U	--
4-Chlorophenyl phenyl ether	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--
4-Nitroaniline	None	None	None	None	0.210 U	--	0.220 U	--	0.200 U	0.210 U	0.220 U	--
4-Nitrophenol	None	None	None	None	--	--	--	--	--	1.70 U	--	--
Acenaphthene	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--
Acenaphthylene	None	None	None	None	0.0610 U	--	0.0640 U	--	0.0570 U	0.0610 U	0.0610 U	--
Alachlor	None	None	None	None	--	0.0110 U	--	0.0110 U	--	--	--	0.0110 U
Anthracene	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--
Atrazine	None	None	None	None	--	0.00734 U	--	0.00734 U	--	--	--	0.00734 U
Benzo(a)anthracene	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0410 U	0.0117 UJ	0.0420 U	0.0117 UJ	0.0380 U	0.0410 U	0.0410 U	0.0117 UJ
Benzo(b)fluoranthene	None	None	None	None	0.0410 U	--	0.0420 U	--	0.0380 U	0.0410 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	0.0410 U	--
Benzo(k)fluoranthene	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--

ENCL (2)

H1 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-HYD1387A	H1-HYD1387A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1416A	H1-HYD1416A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1387	Hyrdrant 1387	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1416	Hyrdrant 1416
Field Sample ID:					20220111-H1-YT10	20220111-H1-YT11	20220111-H1-YT12	20220111-H1-YT13	220204H1HT01	220204H1HT01-1	20220111-H1-YT08	20220111-H1-YT09
Sample Date:					2022-01-11	2022-01-11	2022-01-11	2022-01-11	2022-02-04	2022-02-04	2022-01-11	2022-01-11
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: 5801092391**	**SDG: 2A12049**	**SDG: 5801092391**	**SDG: 2A12047**	**SDG: 5801100351**	**SDG: 5801100351**	**SDG: 5801092581**	**SDG: 2A12048**
Benzyl butyl phthalate	None	None	None	None	0.270 U	--	0.290 U	--	0.260 U	0.270 U	0.280 U	--
Bis(2-chloroethoxy)methane	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--
Bis(2-chloroethyl) ether (2-Chloroethyl ether)	None	None	None	None	0.0300 U	--	0.0320 U	--	0.0290 U	0.0310 U	0.0310 U	--
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.750 U	0.437 U	0.780 U	0.437 U	0.700 U	0.750 U	0.760 U	0.437 U
Carbazole	None	None	None	None	0.100 U	--	0.110 U	--	0.0950 U	0.100 U	0.100 U	--
Chlordane	None	None	None	None	--	0.0669 U	--	0.0669 U	--	--	--	0.0669 U
Chrysene	None	None	None	None	0.0410 U	--	0.0420 U	--	0.0380 U	0.0410 U	0.0410 U	--
Cresols, m- & p-	None	None	None	None	0.100 U	--	0.110 U	--	--	0.100 U	0.100 U	--
Dibenz(a,h)anthracene	None	None	None	None	0.0710 U	--	0.0740 U	--	0.0670 U	0.0710 U	0.0720 U	--
Dibenzofuran	None	None	None	None	0.100 U	--	0.110 U	--	0.0950 U	0.100 U	0.100 U	--
Diethyl phthalate	None	None	None	None	0.150 U	--	0.160 U	--	0.140 U	0.150 U	0.150 U	--
Dimethyl phthalate	None	None	None	None	0.0610 U	--	0.0640 U	--	0.0570 U	0.0610 U	0.0610 U	--
Di-n-butyl phthalate	None	None	None	None	0.190 U	--	0.200 U	--	0.180 U	0.190 U	0.190 U	--
di-n-Octyl phthalate	None	None	None	None	0.130 U	--	0.140 U	--	0.120 U	0.130 U	0.130 U	--
Endrin	None	None	None	None	--	0.00991 U	--	0.00991 U	--	--	--	0.00991 U
Fluoranthene	None	None	None	None	0.0610 U	--	0.0640 U	--	0.0570 U	0.0610 U	0.0610 U	--
Fluorene	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 U	0.0510 U	--
gamma-BHC (Lindane)	None	None	None	None	--	0.00633 U	--	0.00633 U	--	--	--	0.00633 U
Heptachlor	None	None	None	None	--	0.00965 U	--	0.00965 U	--	--	--	0.00965 U
Heptachlor epoxide	None	None	None	None	--	0.0122 U	--	0.0122 U	--	--	--	0.0122 U
Hexachlorobenzene	0.0003	0.0003	1	1	0.0410 U	0.0980 U	0.0420 U	0.0980 U	0.0380 U	0.0410 U	0.0410 U	0.0980 U
Hexachlorobutadiene	None	None	None	None	0.0610 U	--	0.0640 U	--	0.0570 U	0.0610 U	0.0610 U	--
Hexachlorocyclopentadiene	50	None	50	50	0.140 U	0.00594 U	0.150 U	0.00594 U	0.130 U	0.140 U	0.140 U	0.00594 U
Hexachloroethane	None	None	None	None	0.0510 U	--	0.0530 U	--	0.0480 U	0.0510 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	0.130 U	--
Isophorone	None	None	None	None	0.100 U	--	0.110 U	--	0.0950 U	0.100 U	0.100 U	--
Methoxychlor	None	None	None	None	--	0.00863 U	--	0.00863 U	--	--	--	0.00863 U
Naphthalene	12	17	None	None	0.160 U	0.0103 U	0.170 U	0.0103 U	0.150 U	0.160 U	0.160 U	0.0103 U
Nitrobenzene	None	None	None	None	0.0410 U	--	0.0420 U	--	**0.0400 J**	0.0410 U	0.0410 U	--
N-Nitrosodi-n-propylamine	None	None	None	None	0.0610 U	--	0.0640 U	--	0.0570 UJ	0.0610 UJ	0.0610 U	--
N-Nitrosodiphenylamine	None	None	None	None	0.0710 U	--	0.0740 U	--	0.0670 U	0.0710 U	0.0720 U	--
PCB, Total	None	None	None	None	--	0.100 U	--	0.100 U	--	--	--	0.100 U
PCB-1016 (Aroclor 1016)	None	None	None	None	--	0.0157 U	--	0.0157 U	--	--	--	0.0157 U
PCB-1221 (Aroclor 1221)	None	None	None	None	--	0.0436 U	--	0.0436 U	--	--	--	0.0436 U

ENCL (2)

H1 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-HYD1387A	H1-HYD1387A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1416A	H1-HYD1416A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1387	Hyrdrant 1387	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1416	Hyrdrant 1416
Field Sample ID:					20220111-H1-YT10	20220111-H1-YT11	20220111-H1-YT12	20220111-H1-YT13	220204H1HT01	220204H1HT01-1	20220111-H1-YT08	20220111-H1-YT09
Sample Date:					2022-01-11	2022-01-11	2022-01-11	2022-01-11	2022-02-04	2022-02-04	2022-01-11	2022-01-11
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: 5801092391**	**SDG: 2A12049**	**SDG: 5801092391**	**SDG: 2A12047**	**SDG: 5801100351**	**SDG: 5801100351**	**SDG: 5801092581**	**SDG: 2A12048**
PCB-1232 (Aroclor 1232)	None	None	None	None	--	0.0102 U	--	0.0102 U	--	--	--	0.0102 U
PCB-1242 (Aroclor 1242)	None	None	None	None	--	0.0737 U	--	0.0737 U	--	--	--	0.0737 U
PCB-1248 (Aroclor 1248)	None	None	None	None	--	0.0941 U	--	0.0941 U	--	--	--	0.0941 U
PCB-1254 (Aroclor 1254)	None	None	None	None	--	0.0869 U	--	0.0869 U	--	--	--	0.0869 U
PCB-1260 (Aroclor 1260)	None	None	None	None	--	0.0379 U	--	0.0379 U	--	--	--	0.0379 U
Pentachlorophenol	None	None	None	None	--	0.0242 U	--	0.0242 U	--	0.520 U	--	0.0242 U
Phenanthrene	None	None	None	None	0.120 U	--	0.130 U	--	0.110 U	0.120 U	0.120 U	--
Phenol	None	None	None	None	--	--	--	--	--	0.370 UJ	--	--
Pyrene	None	None	None	None	0.0410 U	--	0.0420 U	--	0.0380 U	0.0410 U	0.0410 U	--
Simazine	None	None	None	None	--	0.00734 U	--	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: 2A12049**		**SDG: 2A12047**				**SDG: 2A12048**
1,1,1-Trichloroethane	11	11	200	200	--	0.256 U	--	0.256 U	--	--	--	0.256 U
1,1,2-Trichloroethane	5	5	3	5	--	0.190 U	--	0.190 U	--	--	--	0.190 U
1,1-Dichloroethene	7	7	7	7	--	0.160 U	--	0.160 U	--	--	--	0.160 U
1,2,4-Trichlorobenzene	70	70	70	70	--	0.170 U	--	0.170 U	--	--	--	0.170 U
1,2-Dichlorobenzene	10	10	600	600	--	0.190 U	--	0.190 U	--	--	--	0.190 U
1,2-Dichloroethane	5	5	5	5	--	0.243 U	--	0.243 U	--	--	--	0.243 U
1,2-Dichloropropane	5	5	5	5	--	0.130 U	--	0.130 U	--	--	--	0.130 U
1,4-Dichlorobenzene	5	5	75	None	--	0.180 U	--	0.180 U	--	--	--	0.180 U
Benzene	5	5	5	5	--	0.150 U	--	0.150 U	--	--	--	0.150 U
Carbon Tetrachloride	5	5	5	5	--	0.270 U	--	0.270 U	--	--	--	0.270 U
Chlorobenzene	25	25	100	100	--	0.150 U	--	0.150 U	--	--	--	0.150 U
cis-1,2-Dichloroethene	70	70	70	70	--	0.250 U	--	0.250 U	--	--	--	0.250 U
Ethylbenzene	700	7.3	700	700	--	0.210 U	--	0.210 U	--	--	--	0.210 U
m,p-Xylene	10000	13	None	None	--	0.330 U	--	0.330 U	--	--	--	0.330 U
Methylene chloride	5	5	5	5	--	0.303 U	--	0.303 U	--	--	--	0.303 U
o-Xylene	10000	13	None	None	--	0.200 U	--	0.200 U	--	--	--	0.200 U
Styrene	10	10	100	100	--	0.190 U	--	0.190 U	--	--	--	0.190 U
Tetrachloroethene (PCE)	5	5	5	5	--	0.180 U	--	0.180 U	--	--	--	0.180 U
Toluene	1000	9.8	1000	1000	--	0.294 U	--	0.294 U	--	--	--	0.294 U
trans-1,2-Dichloroethene	100	100	100	100	--	0.259 U	--	0.259 U	--	--	--	0.259 U

H1 Zone Distribution Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-HYD1387A	H1-HYD1387A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1396A	H1-HYD1416A	H1-HYD1416A
Location Type:					Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant	Hydrant
Residence:					Hyrdrant 1387	Hyrdrant 1387	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1396	Hyrdrant 1416	Hyrdrant 1416
Field Sample ID:					20220111-H1-YT10	20220111-H1-YT11	20220111-H1-YT12	20220111-H1-YT13	220204H1HT01	220204H1HT01-1	20220111-H1-YT08	20220111-H1-YT09
Sample Date:					2022-01-11	2022-01-11	2022-01-11	2022-01-11	2022-02-04	2022-02-04	2022-01-11	2022-01-11
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: 2A12049**		**SDG: 2A12047**				**SDG: 2A12048**
Trichloroethene (TCE)	5	5	5	5	--	0.180 U	--	0.180 U	--	--	--	0.180 U
Vinyl chloride	2	2	2	2	--	0.180 U	--	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

Interagency Drinking Water System Team
Zone H1 Removal Action Report February
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 22, 2022

From: US Army 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 H1, H2 & H3 are part of the JBPHH Drinking Water system that is operated and maintained by the United States Navy. Flushing operations aresummarized in Enclosure (1).

2. Enclosure (1) documents the flushing records for all facilities within Zones H1, H2, and H3, as well as pressure logs for the distribution system during facility flushing operations. The completion of irrigation flushing in Zones H1, H2, and 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.

2/22/2022

X Nisit A. Gainey

Signed by: GAINEY.NISIT.ANTHONY.1067651371

Nisit A. Gainey
Director
Public Works, USAG-HI

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 FOR FLUSHING ZONE H1.

Ref: (a) Single Family Home Flushing Plan Checklist and Standard Operating Procedures, December 2021

Encl: (1) EDMS Residential Flushing Records Zone H1
(2) EDMS Non-Residential Flushing Records Zone H1

1. This memo documents the completion of residential and non-residential flushing in Zones H1. 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

Flushing Zone H1

2021-12-28 - 2022-02-27

Total Homes	Total Homes Flushed	Percent Complete	No Access	Flushed on Selected Dates
918	918	100.0 %	0	918

Zone	Neighborhood	Address	Appointment Date/Time	Arrive Date	Start Time	Certified	Summary General Notes	Unable To Access	Access Reason
Flushing Zone H1		2327 Acacia Lane (H1-ACAC2327)		02-Feb-22	12:00	☑		☐	
Flushing Zone H1		2331 Acacia Lane (H1-ACAC2331)		26-Jan-22	08:17	☑		☐	
Flushing Zone H1		2335 Acacia Lane (H1-ACAC2335)		26-Jan-22	11:20	☑		☐	
Flushing Zone H1		3518 Albizia Lane (H1-ALBI3518)		28-Jan-22	08:00	☑		☐	
Flushing Zone H1		3520 Albizia Lane (H1-ALBI3520)		28-Jan-22	10:59	☑		☐	
Flushing Zone H1		3521 Albizia Lane (H1-ALBI3521)		28-Jan-22	15:20	☑		☐	
Flushing Zone H1		3523 Albizia Lane (H1-ALBI3523)		31-Jan-22	11:21	☑		☐	
Flushing Zone H1		3526 Albizia Lane (H1-ALBI3526)		31-Jan-22	14:02	☑		☐	
Flushing Zone H1		3527 Albizia Lane (H1-ALBI3527)		27-Jan-22	14:28	☑		☐	
Flushing Zone H1		3528 Albizia Lane (H1-ALBI3528)		02-Feb-22	13:45	☑		☐	
Flushing Zone H1		3529 Albizia Lane (H1-ALBI3529)		27-Jan-22	09:05	☑		☐	
Flushing Zone H1		3532 Albizia Lane (H1-ALBI3532)		27-Jan-22	11:34	☑		☐	
Flushing Zone H1		3533 Albizia Lane (H1-ALBI3533)		27-Jan-22	08:12	☑		☐	
Flushing Zone H1		3534 Albizia Lane (H1-ALBI3534)		02-Feb-22	07:38	☑		☐	
Flushing Zone H1		3535 Albizia Lane (H1-ALBI3535)		27-Jan-22	11:20	☑		☐	
Flushing Zone H1		916 Aliamanu Drive (H1-ALIA0916)		24-Jan-22	13:00	☑		☐	
Flushing Zone H1		918 Aliamanu Drive (H1-ALIA0918)		24-Jan-22	17:00	☑		☐	
Flushing Zone H1		928 Aliamanu Drive (H1-ALIA0928)		25-Jan-22	09:00	☑		☐	
Flushing Zone H1		930 Aliamanu Drive (H1-ALIA0930)		25-Jan-22	12:00	☑		☐	
Flushing Zone H1		938 Aliamanu Drive (H1-ALIA0938)		25-Jan-22	15:00	☑		☐	
Flushing Zone H1		940 Aliamanu Drive (H1-ALIA0940)		26-Jan-22	12:23	☑		☐	
Flushing Zone H1		948 Aliamanu Drive (H1-ALIA0948)		02-Feb-22	11:00	☑		☐	
Flushing Zone H1		950 Aliamanu Drive (H1-ALIA0950)		01-Feb-22	15:00	☑		☐	
Flushing Zone H1		960 Aliamanu Drive (H1-ALIA0960)		02-Feb-22	12:00	☑		☐	
Flushing Zone H1		962 Aliamanu Drive (H1-ALIA0962)		01-Feb-22	12:00	☑		☐	
Flushing Zone H1		3210 Ama Drive (H1-AMA 3210)		24-Jan-22	15:00	☑		☐	
Flushing Zone H1		3216 Ama Drive (H1-AMA 3216)		25-Jan-22	08:23	☑		☐	
Flushing Zone H1		3221 Ama Drive (H1-AMA 3221)		27-Jan-22	08:25	☑		☐	
Flushing Zone H1		3222 Ama Drive (H1-AMA 3222)		27-Jan-22	08:25	☑		☐	
Flushing Zone H1		3223 Ama Drive (H1-AMA 3223)		27-Jan-22	15:17	☑		☐	
Flushing Zone H1		3224 Ama Drive (H1-AMA 3224)		28-Jan-22	10:32	☑		☐	
Flushing Zone H1		3227 Ama Drive (H1-AMA 3227)		28-Jan-22	13:22	☑		☐	
Flushing Zone H1		3229 Ama Drive (H1-AMA 3229)		30-Jan-22	09:24	☑		☐	
Flushing Zone H1		3335 Ama Drive (H1-AMA 3335)		01-Feb-22	15:01	☑		☐	
Flushing Zone H1		3337 Ama Drive (H1-AMA 3337)		27-Jan-22	07:58	☑		☐	
Flushing Zone H1		3339 Ama Drive (H1-AMA 3339)		26-Jan-22	15:46	☑		☐	
Flushing Zone H1		3341 Ama Drive (H1-AMA 3341)		26-Jan-22	15:45	☑		☐	
Flushing Zone H1		3345 Ama Drive (H1-AMA 3345)		26-Jan-22	08:00	☑		☐	
Flushing Zone H1		3347 Ama Drive (H1-AMA 3347)		27-Jan-22	12:05	☑		☐	
Flushing Zone H1		3349 Ama Drive (H1-AMA 3349)		30-Jan-22	12:40	☑		☐	
Flushing Zone H1		3351 Ama Drive (H1-AMA 3351)		31-Jan-22	09:15	☑		☐	
Flushing Zone H1		3355 Ama Drive (H1-AMA 3355)		30-Jan-22	12:35	☑		☐	

Flushing Zone H1

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Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1	3357 Ama Drive (H1-AMA 3357)	31-Jan-22	10:25	☑	☐
Flushing Zone H1	3359 Ama Drive (H1-AMA 3359)	30-Jan-22	16:15	☑	☐
Flushing Zone H1	3208 Ama Drive (H1-AMAD3208)	24-Jan-22	13:00	☑	☐
Flushing Zone H1	3218 Ama Drive (H1-AMAD3218)	25-Jan-22	11:00	☑	☐
Flushing Zone H1	3353 Ama Drive (H1-AMAD3353)	30-Jan-22	15:50	☑	☐
Flushing Zone H1	3704 Amapa Lane (H1-AMAP3704)	31-Jan-22	13:49	☑	☐
Flushing Zone H1	3705 Amapa Lane (H1-AMAP3705)	24-Jan-22	12:30	☑	☐
Flushing Zone H1	3706 Amapa Lane (H1-AMAP3706)	27-Jan-22	11:20	☑	☐
Flushing Zone H1	3707 Amapa Lane (H1-AMAP3707)	27-Jan-22	11:20	☑	☐
Flushing Zone H1	3710 Amapa Lane (H1-AMAP3710)	01-Feb-22	15:51	☑	☐
Flushing Zone H1	3711 Amapa Lane (H1-AMAP3711)	25-Jan-22	09:21	☑	☐
Flushing Zone H1	3712 Amapa Lane (H1-AMAP3712)	31-Jan-22	17:04	☑	☐
Flushing Zone H1	3713 Amapa Lane (H1-AMAP3713)	25-Jan-22	12:24	☑	☐
Flushing Zone H1	3716 Amapa Lane (H1-AMAP3716)	28-Jan-22	08:05	☑	☐
Flushing Zone H1	3717 Amapa Lane (H1-AMAP3717)	28-Jan-22	11:30	☑	☐
Flushing Zone H1	3718 Amapa Lane (H1-AMAP3718)	28-Jan-22	15:06	☑	☐
Flushing Zone H1	3719 Amapa Lane (H1-AMAP3719)	30-Jan-22	09:00	☑	☐
Flushing Zone H1	3722 Amapa Lane (H1-AMAP3722)	29-Jan-22	08:48	☑	☐
Flushing Zone H1	3723 Amapa Lane (H1-AMAP3723)	27-Jan-22	10:27	☑	☐
Flushing Zone H1	3724 Amapa Lane (H1-AMAP3724)	30-Jan-22	15:26	☑	☐
Flushing Zone H1	3725 Amapa Lane (H1-AMAP3725)	01-Feb-22	07:52	☑	☐
Flushing Zone H1	3736 Amapa Lane (H1-AMAP3736)	30-Jan-22	08:46	☑	☐
Flushing Zone H1	3737 Amapa Lane (H1-AMAP3737)	30-Jan-22	12:22	☑	☐
Flushing Zone H1	3738 Amapa Lane (H1-AMAP3738)	30-Jan-22	08:46	☑	☐
Flushing Zone H1	3739 Amapa Lane (H1-AMAP3739)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	3742 Amapa Lane (H1-AMAP3742)	31-Jan-22	11:20	☑	☐
Flushing Zone H1	3743 Amapa Lane (H1-AMAP3743)	31-Jan-22	14:45	☑	☐
Flushing Zone H1	3744 Amapa Lane (H1-AMAP3744)	31-Jan-22	17:21	☑	☐
Flushing Zone H1	3745 Amapa Lane (H1-AMAP3745)	31-Jan-22	10:54	☑	☐
Flushing Zone H1	3748 Amapa Lane (H1-AMAP3748)	27-Jan-22	13:00	☑	☐
Flushing Zone H1	3749 Amapa Lane (H1-AMAP3749)	27-Jan-22	07:57	☑	☐
Flushing Zone H1	3750 Amapa Lane (H1-AMAP3750)	27-Jan-22	14:16	☑	☐
Flushing Zone H1	3751 Amapa Lane (H1-AMAP3751)	27-Jan-22	11:35	☑	☐
Flushing Zone H1	3313 Areca Lane (H1-AREC3313)	27-Jan-22	10:36	☑	☐
Flushing Zone H1	3315 Areca Lane (H1-AREC3315)	27-Jan-22	15:01	☑	☐
Flushing Zone H1	3319 Areca Lane (H1-AREC3319)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	3321 Areca Lane (H1-AREC3321)	28-Jan-22	11:00	☑	☐
Flushing Zone H1	3325 Areca Lane (H1-AREC3325)	28-Jan-22	14:04	☑	☐
Flushing Zone H1	3327 Areca Lane (H1-AREC3327)	02-Feb-22	11:45	☑	☐
Flushing Zone H1	3604 Bamboo Lane (H1-BAMB3604)	26-Jan-22	11:36	☑	☐
Flushing Zone H1	3605 Bamboo Lane (H1-BAMB3605)	24-Jan-22	16:30	☑	☐
Flushing Zone H1	3606 Bamboo Lane (H1-BAMB3606)	26-Jan-22	11:38	☑	☐
Flushing Zone H1	3607 Bamboo Lane (H1-BAMB3607)	24-Jan-22	13:07	☑	☐
Flushing Zone H1	3610 Bamboo Lane (H1-BAMB3610)	02-Feb-22	08:05	☑	☐
Flushing Zone H1	3611 Bamboo Lane (H1-BAMB3611)	02-Feb-22	08:05	☑	☐
Flushing Zone H1	3612 Bamboo Lane (H1-BAMB3612)	02-Feb-22	10:30	☑	☐
Flushing Zone H1	3613 Bamboo Lane (H1-BAMB3613)	25-Jan-22	16:00	☑	☐

Flushing Zone H1

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Flushing Zone H1	3616 Bamboo Lane (H1-BAMB3616)	26-Jan-22	08:00	☑	☐
Flushing Zone H1	3617 Bamboo Lane (H1-BAMB3617)	27-Jan-22	07:55	☑	☐
Flushing Zone H1	3618 Bamboo Lane (H1-BAMB3618)	27-Jan-22	08:25	☑	☐
Flushing Zone H1	3619 Bamboo Lane (H1-BAMB3619)	27-Jan-22	10:16	☑	☐
Flushing Zone H1	3622 Bamboo Lane (H1-BAMB3622)	28-Dec-21	08:05	☑	☐
Flushing Zone H1	3623 Bamboo Lane (H1-BAMB3623)	28-Jan-22	13:44	☑	☐
Flushing Zone H1	3624 Bamboo Lane (H1-BAMB3624)	28-Jan-22	10:46	☑	☐
Flushing Zone H1	3625 Bamboo Lane (H1-BAMB3625)	29-Jan-22	08:38	☑	☐
Flushing Zone H1	3636 Bamboo Lane (H1-BAMB3636)	01-Feb-22	08:36	☑	☐
Flushing Zone H1	3637 Bamboo Lane (H1-BAMB3637)	01-Feb-22	11:00	☑	☐
Flushing Zone H1	3638 Bamboo Lane (H1-BAMB3638)	30-Jan-22	11:30	☑	☐
Flushing Zone H1	3639 Bamboo Lane (H1-BAMB3639)	30-Jan-22	14:45	☑	☐
Flushing Zone H1	3642 Bamboo Lane (H1-BAMB3642)	30-Jan-22	08:34	☑	☐
Flushing Zone H1	3643 Bamboo Lane (H1-BAMB3643)	30-Jan-22	11:46	☑	☐
Flushing Zone H1	3644 Bamboo Lane (H1-BAMB3644)	30-Jan-22	15:16	☑	☐
Flushing Zone H1	3645 Bamboo Lane (H1-BAMB3645)	31-Jan-22	07:54	☑	☐
Flushing Zone H1	3648 Bamboo Lane (H1-BAMB3648)	01-Feb-22	07:40	☑	☐
Flushing Zone H1	3649 Bamboo Lane (H1-BAMB3649)	31-Jan-22	11:44	☑	☐
Flushing Zone H1	3650 Bamboo Lane (H1-BAMB3650)	31-Jan-22	14:42	☑	☐
Flushing Zone H1	3651 Bamboo Lane (H1-BAMB3651)	31-Jan-22	08:24	☑	☐
Flushing Zone H1	2714 Bauhina Lane (H1-BAUH2714)	26-Jan-22	12:15	☑	☐
Flushing Zone H1	2718 Bauhina Lane (H1-BAUH2718)	24-Jan-22	00:34	☑	☐
Flushing Zone H1	2722 Bauhina Lane (H1-BAUH2722)	24-Jan-22	16:33	☑	☐
Flushing Zone H1	2726 Bauhina Lane (H1-BAUH2726)	25-Jan-22	11:57	☑	☐
Flushing Zone H1	2730 Bauhina Lane (H1-BAUH2730)	25-Jan-22	08:32	☑	☐
Flushing Zone H1	4108 Begonia Loop (H1-BEGO4108)	24-Jan-22	16:07	☑	☐
Flushing Zone H1	4110 Begonia Loop (H1-BEGO4110)	24-Jan-22	00:35	☑	☐
Flushing Zone H1	4114 Begonia Loop (H1-BEGO4114)	25-Jan-22	09:20	☑	☐
Flushing Zone H1	4116 Begonia Loop (H1-BEGO4116)	26-Jan-22	07:45	☑	☐
Flushing Zone H1	4120 Begonia Loop (H1-BEGO4120)	27-Jan-22	07:55	☑	☐
Flushing Zone H1	4122 Begonia Loop (H1-BEGO4122)	27-Jan-22	08:14	☑	☐
Flushing Zone H1	4126 Begonia Loop (H1-BEGO4126)	28-Jan-22	08:05	☑	☐
Flushing Zone H1	4128 Begonia Loop (H1-BEGO4128)	28-Jan-22	10:55	☑	☐
Flushing Zone H1	4132 Begonia Loop (H1-BEGO4132)	28-Jan-22	14:10	☑	☐
Flushing Zone H1	4134 Begonia Loop (H1-BEGO4134)	29-Jan-22	08:18	☑	☐
Flushing Zone H1	4138 Begonia Loop (H1-BEGO4138)	30-Jan-22	09:05	☑	☐
Flushing Zone H1	4140 Begonia Loop (H1-BEGO4140)	01-Feb-22	14:40	☑	☐
Flushing Zone H1	4144 Begonia Loop (H1-BEGO4144)	31-Jan-22	11:52	☑	☐
Flushing Zone H1	4146 Begonia Loop (H1-BEGO4146)	26-Jan-22	07:49	☑	☐
Flushing Zone H1	4162 Begonia Loop (H1-BEGO4162)	27-Jan-22	00:10	☑	☐
Flushing Zone H1	4164 Begonia Loop (H1-BEGO4164)	30-Jan-22	00:30	☑	☐
Flushing Zone H1	4168 Begonia Loop (H1-BEGO4168)	30-Jan-22	15:11	☑	☐
Flushing Zone H1	4170 Begonia Loop (H1-BEGO4170)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	4174 Begonia Loop (H1-BEGO4174)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	4175 Begonia Loop (H1-BEGO4175)	30-Jan-22	16:17	☑	☐
Flushing Zone H1	4176 Begonia Loop (H1-BEGO4176)	30-Jan-22	11:45	☑	☐
Flushing Zone H1	4177 Begonia Loop (H1-BEGO4177)	31-Jan-22	13:45	☑	☐

Flushing Zone H1

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Flushing Zone H1	4180 Begonia Loop (H1-BEGO4180)	27-Jan-22	00:37	☑	☐
Flushing Zone H1	4181 Begonia Loop (H1-BEGO4181)	01-Feb-22	08:15	☑	☐
Flushing Zone H1	4182 Begonia Loop (H1-BEGO4182)	27-Jan-22	08:01	☑	☐
Flushing Zone H1	4183 Begonia Loop (H1-BEGO4183)	31-Jan-22	07:35	☑	☐
Flushing Zone H1	4186 Begonia Loop (H1-BEGO4186)	27-Jan-22	11:17	☑	☐
Flushing Zone H1	4188 Begonia Loop (H1-BEGO4188)	27-Jan-22	14:22	☑	☐
Flushing Zone H1	4190 Begonia Loop (H1-BEGO4190)	26-Jan-22	08:00	☑	☐
Flushing Zone H1	4192 Begonia Loop (H1-BEGO4192)	26-Jan-22	08:01	☑	☐
Flushing Zone H1	4196 Begonia Loop (H1-BEGO4196)	31-Jan-22	13:16	☑	☐
Flushing Zone H1	4198 Begonia Loop (H1-BEGO4198)	31-Jan-22	15:43	☑	☐
Flushing Zone H1	140 Bougainvillea Loop (H1-BOUG0140)	27-Jan-22	11:21	☑	☐
Flushing Zone H1	142 Bougainvillea Loop (H1-BOUG0142)	27-Feb-22	15:00	☑	☐
Flushing Zone H1	156 Bougainvillea Loop (H1-BOUG0156)	27-Jan-22	15:00	☑	☐
Flushing Zone H1	158 Bougainvillea Loop (H1-BOUG0158)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	199 Bougainvillea Loop (H1-BOUG0199)	28-Jan-22	15:00	☑	☐
Flushing Zone H1	201 Bougainvillea Loop (H1-BOUG0201)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	219 Bougainvillea Loop (H1-BOUG0219)	29-Jan-22	09:00	☑	☐
Flushing Zone H1	221 Bougainvillea Loop (H1-BOUG0221)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	239 Bougainvillea Loop (H1-BOUG0239)	30-Jan-22	08:00	☑	☐
Flushing Zone H1	241 Bougainvillea Loop (H1-BOUG0241)	30-Jan-22	11:00	☑	☐
Flushing Zone H1	255 Bougainvillea Loop (H1-BOUG0255)	30-Jan-22	14:00	☑	☐
Flushing Zone H1	257 Bougainvillea Loop (H1-BOUG0257)	25-Jan-22	10:00	☑	☐
Flushing Zone H1	258 Bougainvillea Loop (H1-BOUG0258)	24-Jan-22	18:00	☑	☐
Flushing Zone H1	262 Bougainvillea Loop (H1-BOUG0262)	24-Jan-22	18:00	☑	☐
Flushing Zone H1	273 Bougainvillea Loop (H1-BOUG0273)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	275 Bougainvillea Loop (H1-BOUG0275)	27-Jan-22	11:00	☑	☐
Flushing Zone H1	282 Bougainvillea Loop (H1-BOUG0282)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	284 Bougainvillea Loop (H1-BOUG0284)	25-Jan-22	11:00	☑	☐
Flushing Zone H1	299 Bougainvillea Loop (H1-BOUG0299)	27-Jan-22	13:00	☑	☐
Flushing Zone H1	301 Bougainvillea Loop (H1-BOUG0301)	27-Jan-22	15:00	☑	☐
Flushing Zone H1	306 Bougainvillea Loop (H1-BOUG0306)	26-Jan-22	08:00	☑	☐
Flushing Zone H1	308 Bougainvillea Loop (H1-BOUG0308)	25-Jan-22	14:00	☑	☐
Flushing Zone H1	328 Bougainvillea Loop (H1-BOUG0328)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	330 Bougainvillea Loop (H1-BOUG0330)	27-Jan-22	10:00	☑	☐
Flushing Zone H1	384 Bougainvillea Loop (H1-BOUG0384)	02-Feb-22	15:00	☑	☐
Flushing Zone H1	386 Bougainvillea Loop (H1-BOUG0386)	02-Feb-22	15:00	☑	☐
Flushing Zone H1	404 Bougainvillea Loop (H1-BOUG0404)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	406 Bougainvillea Loop (H1-BOUG0406)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	423 Bougainvillea Loop (H1-BOUG0423)	26-Jan-22	11:35	☑	☐
Flushing Zone H1	425 Bougainvillea Loop (H1-BOUG0425)	26-Jan-22	10:31	☑	☐
Flushing Zone H1	463 Bougainvillea Loop (H1-BOUG0463)	26-Jan-22	08:03	☑	☐
Flushing Zone H1	465 Bougainvillea Loop (H1-BOUG0465)	26-Jan-22	14:42	☑	☐
Flushing Zone H1	468 Bougainvillea Loop (H1-BOUG0468)	27-Jan-22	14:00	☑	☐
Flushing Zone H1	470 Bougainvillea Loop (H1-BOUG0470)	02-Feb-22	10:00	☑	☐
Flushing Zone H1	495 Bougainvillea Loop (H1-BOUG0495)	26-Jan-22	14:42	☑	☐
Flushing Zone H1	497 Bougainvillea Loop (H1-BOUG0497)	26-Jan-22	13:38	☑	☐
Flushing Zone H1	498 Bougainvillea Loop (H1-BOUG0498)	01-Feb-22	13:00	☑	☐

Flushing Zone H1

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Flushing Zone H1	500 Bougainvillea Loop (H1-BOUG0500)	01-Feb-22	16:00	☑	☐
Flushing Zone H1	524 Bougainvillea Loop (H1-BOUG0524)	01-Feb-22	10:00	☑	☐
Flushing Zone H1	526 Bougainvillea Loop (H1-BOUG0526)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	554 Bougainvillea Loop (H1-BOUG0554)	03-Feb-22	07:00	☑	☐
Flushing Zone H1	556 Bougainvillea Loop (H1-BOUG0556)	01-Feb-22	07:00	☑	☐
Flushing Zone H1	571 Bougainvillea Loop (H1-BOUG0571)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	573 Bougainvillea Loop (H1-BOUG0573)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	578 Bougainvillea Loop (H1-BOUG0578)	31-Jan-22	13:00	☑	☐
Flushing Zone H1	580 Bougainvillea Loop (H1-BOUG0580)	28-Jan-22	11:00	☑	☐
Flushing Zone H1	600 Bougainvillea Loop (H1-BOUG0600)	28-Jan-22	11:00	☑	☐
Flushing Zone H1	602 Bougainvillea Loop (H1-BOUG0602)	28-Jan-22	15:00	☑	☐
Flushing Zone H1	613 Bougainvillea Loop (H1-BOUG0613)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	615 Bougainvillea Loop (H1-BOUG0615)	25-Jan-22	14:00	☑	☐
Flushing Zone H1	643 Bougainvillea Loop (H1-BOUG0643)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	645 Bougainvillea Loop (H1-BOUG0645)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	3016 Calamondin Way (H1-CALA3016)	27-Jan-22	15:00	☑	☐
Flushing Zone H1	3018 Calamondin Way (H1-CALA3018)	27-Jan-22	15:00	☑	☐
Flushing Zone H1	3024 Calamondin Way (H1-CALA3024)	26-Jan-22	08:10	☑	☐
Flushing Zone H1	3026 Calamondin Way (H1-CALA3026)	26-Jan-22	11:35	☑	☐
Flushing Zone H1	3030 Calamondin Way (H1-CALA3030)	26-Jan-22	15:10	☑	☐
Flushing Zone H1	3032 Calamondin Way (H1-CALA3032)	27-Jan-22	11:00	☑	☐
Flushing Zone H1	3038 Calamondin Way (H1-CALA3038)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	3040 Calamondin Way (H1-CALA3040)	28-Jan-22	11:00	☑	☐
Flushing Zone H1	3041 Calamondin Way (H1-CALA3041)	28-Jan-22	14:00	☑	☐
Flushing Zone H1	3043 Calamondin Way (H1-CALA3043)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	3046 Calamondin Way (H1-CALA3046)	01-Feb-22	18:00	☑	☐
Flushing Zone H1	3048 Calamondin Way (H1-CALA3048)	30-Jan-22	08:00	☑	☐
Flushing Zone H1	3049 Calamondin Way (H1-CALA3049)	30-Jan-22	13:00	☑	☐
Flushing Zone H1	3051 Calamondin Way (H1-CALA3051)	30-Jan-22	13:00	☑	☐
Flushing Zone H1	3054 Calamondin Way (H1-CALA3054)	30-Jan-22	15:00	☑	☐
Flushing Zone H1	3055 Calamondin Way (H1-CALA3055)	30-Jan-22	12:00	☑	☐
Flushing Zone H1	3056 Calamondin Way (H1-CALA3056)	30-Jan-22	15:00	☑	☐
Flushing Zone H1	3057 Calamondin Way (H1-CALA3057)	31-Jan-22	10:00	☑	☐
Flushing Zone H1	3062 Calamondin Way (H1-CALA3062)	31-Jan-22	10:00	☑	☐
Flushing Zone H1	3064 Calamondin Way (H1-CALA3064)	31-Jan-22	13:00	☑	☐
Flushing Zone H1	3067 Calamondin Way (H1-CALA3067)	31-Jan-22	12:00	☑	☐
Flushing Zone H1	3069 Calamondin Way (H1-CALA3069)	31-Jan-22	12:00	☑	☐
Flushing Zone H1	3072 Calamondin Way (H1-CALA3072)	31-Jan-22	14:00	☑	☐
Flushing Zone H1	3074 Calamondin Way (H1-CALA3074)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	3075 Calamondin Way (H1-CALA3075)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	3077 Calamondin Way (H1-CALA3077)	31-Jan-22	14:00	☑	☐
Flushing Zone H1	3081 Calamondin Way (H1-CALA3081)	31-Jan-22	15:00	☑	☐
Flushing Zone H1	3082 Calamondin Way (H1-CALA3082)	31-Jan-22	13:00	☑	☐
Flushing Zone H1	3083 Calamondin Way (H1-CALA3083)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	3084 Calamondin Way (H1-CALA3084)	27-Jan-22	10:00	☑	☐
Flushing Zone H1	3087 Calamondin Way (H1-CALA3087)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	3088 Calamondin Way (H1-CALA3088)	24-Jan-22	17:00	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

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Flushing Zone H1	3089 Calamondin Way (H1-CALA3089)	26-Jan-22	08:25	☑	☐
Flushing Zone H1	3090 Calamondin Way (H1-CALA3090)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	3098 Calamondin Way (H1-CALA3098)	01-Feb-22	10:00	☑	☐
Flushing Zone H1	3100 Calamondin Way (H1-CALA3100)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	3104 Calamondin Way (H1-CALA3104)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	3106 Calamondin Way (H1-CALA3106)	01-Feb-22	17:00	☑	☐
Flushing Zone H1	3107 Calamondin Way (H1-CALA3107)	31-Jan-22	10:00	☑	☐
Flushing Zone H1	3109 Calamondin Way (H1-CALA3109)	01-Feb-22	13:00	☑	☐
Flushing Zone H1	3112 Calamondin Way (H1-CALA3112)	26-Jan-22	11:51	☑	☐
Flushing Zone H1	3113 Calamondin Way (H1-CALA3113)	26-Jan-22	16:12	☑	☐
Flushing Zone H1	3114 Calamondin Way (H1-CALA3114)	26-Jan-22	12:09	☑	☐
Flushing Zone H1	3115 Calamondin Way (H1-CALA3115)	26-Jan-22	15:39	☑	☐
Flushing Zone H1	3119 Calamondin Way (H1-CALA3119)	26-Jan-22	08:00	☑	☐
Flushing Zone H1	3120 Calamondin Way (H1-CALA3120)	26-Jan-22	12:05	☑	☐
Flushing Zone H1	3121 Calamondin Way (H1-CALA3121)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	3122 Calamondin Way (H1-CALA3122)	27-Jan-22	07:00	☑	☐
Flushing Zone H1	3128 Calamondin Way (H1-CALA3128)	11-Feb-22	08:00	☑	☐
Flushing Zone H1	3130 Calamondin Way (H1-CALA3130)	02-Feb-22	17:00	☑	☐
Flushing Zone H1	3136 Calamondin Way (H1-CALA3136)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	3138 Calamondin Way (H1-CALA3138)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	3156 Calamondin Way (H1-CALA3156)	01-Feb-22	17:00	☑	☐
Flushing Zone H1	3158 Calamondin Way (H1-CALA3158)	28-Jan-22	12:00	☑	☐
Flushing Zone H1	3164 Calamondin Way (H1-CALA3164)	28-Jan-22	12:00	☑	☐
Flushing Zone H1	3166 Calamondin Way (H1-CALA3166)	28-Jan-22	07:00	☑	☐
Flushing Zone H1	3172 Calamondin Way (H1-CALA3172)	24-Jan-22	15:00	☑	☐
Flushing Zone H1	3174 Calamondin Way (H1-CALA3174)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	3182 Calamondin Way (H1-CALA3182)	27-Jan-22	09:00	☑	☐
Flushing Zone H1	3184 Calamondin Way (H1-CALA3184)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	3223 Cassia Lane (H1-CASS3223)	26-Jan-22	14:03	☑	☐
Flushing Zone H1	3225 Cassia Lane (H1-CASS3225)	26-Jan-22	12:21	☑	☐
Flushing Zone H1	3229 Cassia Lane (H1-CASS3229)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	3231 Cassia Lane (H1-CASS3231)	24-Jan-22	15:00	☑	☐
Flushing Zone H1	3235 Cassia Lane (H1-CASS3235)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	3237 Cassia Lane (H1-CASS3237)	25-Jan-22	15:00	☑	☐
Flushing Zone H1	2204 Center Street (H1-CENT2204)	30-Jan-22	08:00	☑	☐
Flushing Zone H1	2206 Center Street (H1-CENT2206)	01-Feb-22	10:00	☑	☐
Flushing Zone H1	2210 Center Street (H1-CENT2210)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	2214 Center Street (H1-CENT2214)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	2218 Center Street (H1-CENT2218)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	2220 Center Street (H1-CENT2220)	24-Jan-22	16:00	☑	☐
Flushing Zone H1	2221 Center Street (H1-CENT2221)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	2223 Center Street (H1-CENT2223)	30-Jan-22	14:00	☑	☐
Flushing Zone H1	2224 Center Street (H1-CENT2224)	26-Jan-22	13:26	☑	☐
Flushing Zone H1	2226 Center Street (H1-CENT2226)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	2227 Center Street (H1-CENT2227)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	2229 Center Street (H1-CENT2229)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	2230 Center Street (H1-CENT2230)	26-Jan-22	08:09	☑	☐

Flushing Zone H1

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Flushing Zone H1	2232 Center Street (H1-CENT2232)	26-Jan-22	12:11	☑	☐
Flushing Zone H1	2233 Center Street (H1-CENT2233)	31-Jan-22	10:00	☑	☐
Flushing Zone H1	2235 Center Street (H1-CENT2235)	31-Jan-22	13:00	☑	☐
Flushing Zone H1	2236 Center Street (H1-CENT2236)	26-Jan-22	15:38	☑	☐
Flushing Zone H1	2238 Center Street (H1-CENT2238)	27-Jan-22	07:00	☑	☐
Flushing Zone H1	2242 Center Street (H1-CENT2242)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	2243 Center Street (H1-CENT2243)	31-Jan-22	17:00	☑	☐
Flushing Zone H1	2244 Center Street (H1-CENT2244)	31-Jan-22	12:00	☑	☐
Flushing Zone H1	2245 Center Street (H1-CENT2245)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	2248 Center Street (H1-CENT2248)	31-Jan-22	15:00	☑	☐
Flushing Zone H1	2250 Center Street (H1-CENT2250)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	2251 Center Street (H1-CENT2251)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	2253 Center Street (H1-CENT2253)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	2256 Center Street (H1-CENT2256)	02-Feb-22	14:00	☑	☐
Flushing Zone H1	2258 Center Street (H1-CENT2258)	02-Feb-22	08:00	☑	☐
Flushing Zone H1	2259 Center Street (H1-CENT2259)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	2261 Center Street (H1-CENT2261)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	2262 Center Street (H1-CENT2262)	02-Feb-22	08:00	☑	☐
Flushing Zone H1	2264 Center Street (H1-CENT2264)	02-Feb-22	08:00	☑	☐
Flushing Zone H1	2268 Center Street (H1-CENT2268)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	2269 Center Street (H1-CENT2269)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	2270 Center Street (H1-CENT2270)	02-Feb-22	10:00	☑	☐
Flushing Zone H1	2271 Center Street (H1-CENT2271)	02-Feb-22	13:00	☑	☐
Flushing Zone H1	2274 Center Street (H1-CENT2274)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	2276 Center Street (H1-CENT2276)	02-Feb-22	09:00	☑	☐
Flushing Zone H1	2277 Center Street (H1-CENT2277)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	2279 Center Street (H1-CENT2279)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	2280 Center Street (H1-CENT2280)	02-Feb-22	09:00	☑	☐
Flushing Zone H1	2284 Center Street (H1-CENT2284)	02-Feb-22	13:00	☑	☐
Flushing Zone H1	2287 Center Street (H1-CENT2287)	02-Feb-22	08:00	☑	☐
Flushing Zone H1	2288 Center Street (H1-CENT2288)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	2289 Center Street (H1-CENT2289)	30-Jan-22	10:00	☑	☐
Flushing Zone H1	2290 Center Street (H1-CENT2290)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	2294 Center Street (H1-CENT2294)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	2295 Center Street (H1-CENT2295)	27-Jan-22	13:00	☑	☐
Flushing Zone H1	2296 Center Street (H1-CENT2296)	24-Jan-22	16:00	☑	☐
Flushing Zone H1	2297 Center Street (H1-CENT2297)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	2300 Center Street (H1-CENT2300)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	2301 Center Street (H1-CENT2301)	27-Jan-22	13:00	☑	☐
Flushing Zone H1	2302 Center Street (H1-CENT2302)	25-Jan-22	14:00	☑	☐
Flushing Zone H1	2303 Center Street (H1-CENT2303)	27-Jan-22	14:00	☑	☐
Flushing Zone H1	6203 Cigar Lane (H1-CIGA6203)	24-Jan-22	13:00	☑	☐
Flushing Zone H1	6204 Cigar Lane (H1-CIGA6204)	26-Jan-22	10:39	☑	☐
Flushing Zone H1	6205 Cigar Lane (H1-CIGA6205)	25-Jan-22	16:00	☑	☐
Flushing Zone H1	6206 Cigar Lane (H1-CIGA6206)	24-Jan-22	18:00	☑	☐
Flushing Zone H1	6209 Cigar Lane (H1-CIGA6209)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	6210 Cigar Lane (H1-CIGA6210)	25-Jan-22	08:00	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

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Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1	6211 Cigar Lane (H1-CIGA6211)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	6212 Cigar Lane (H1-CIGA6212)	25-Jan-22	14:00	☑	☐
Flushing Zone H1	2110 Coral Lane (H1-CORA2110)	27-Jan-22	14:00	☑	☐
Flushing Zone H1	2114 Coral Lane (H1-CORA2114)	27-Jan-22	17:00	☑	☐
Flushing Zone H1	2118 Coral Lane (H1-CORA2118)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	2122 Coral Lane (H1-CORA2122)	30-Jan-22	10:00	☑	☐
Flushing Zone H1	2126 Coral Lane (H1-CORA2126)	01-Feb-22	18:00	☑	☐
Flushing Zone H1	2139 Coral Lane (H1-CORA2139)	26-Jan-22	08:02	☑	☐
Flushing Zone H1	2143 Coral Lane (H1-CORA2143)	26-Jan-22	08:00	☑	☐
Flushing Zone H1	2147 Coral Lane - May be a CDC (H1-	26-Jan-22	15:44	☑	☐
Flushing Zone H1	2151 Coral Lane (H1-CORA2151)	27-Jan-22	07:00	☑	☐
Flushing Zone H1	2155 Coral Lane (H1-CORA2155)	27-Jan-22	07:00	☑	☐
Flushing Zone H1	4203 Croton Street (H1-CROT4203)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	4205 Croton Street (H1-CROT4205)	27-Jan-22	15:00	☑	☐
Flushing Zone H1	4209 Croton Street (H1-CROT4209)	28-Jan-22	11:00	☑	☐
Flushing Zone H1	4211 Croton Street (H1-CROT4211)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	4215 Croton Street (H1-CROT4215)	28-Jan-22	11:00	☑	☐
Flushing Zone H1	4217 Croton Street (H1-CROT4217)	29-Jan-22	09:00	☑	☐
Flushing Zone H1	4221 Croton Street (H1-CROT4221)	30-Jan-22	14:00	☑	☐
Flushing Zone H1	4223 Croton Street (H1-CROT4223)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	4234 Croton Street (H1-CROT4234)	30-Jan-22	16:00	☑	☐
Flushing Zone H1	4236 Croton Street (H1-CROT4236)	30-Jan-22	14:00	☑	☐
Flushing Zone H1	4237 Croton Street (H1-CROT4237)	31-Jan-22	09:00	☑	☐
Flushing Zone H1	4239 Croton Street (H1-CROT4239)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	4240 Croton Street (H1-CROT4240)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	4242 Croton Street (H1-CROT4242)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	4246 Croton Street (H1-CROT4246)	31-Jan-22	14:00	☑	☐
Flushing Zone H1	4248 Croton Street (H1-CROT4248)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	4255 Croton Street (H1-CROT4255)	01-Feb-22	07:00	☑	☐
Flushing Zone H1	4257 Croton Street (H1-CROT4257)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	4272 Croton Street (H1-CROT4272)	31-Jan-22	14:00	☑	☐
Flushing Zone H1	4274 Croton Street (H1-CROT4274)	01-Feb-22	07:00	☑	☐
Flushing Zone H1	4278 Croton Street (H1-CROT4278)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	4280 Croton Street (H1-CROT4280)	31-Jan-22	13:00	☑	☐
Flushing Zone H1	4286 Croton Street (H1-CROT4286)	31-Jan-22	17:00	☑	☐
Flushing Zone H1	4288 Croton Street (H1-CROT4288)	31-Jan-22	14:00	☑	☐
Flushing Zone H1	4292 Croton Street (H1-CROT4292)	31-Jan-22	16:00	☑	☐
Flushing Zone H1	4294 Croton Street (H1-CROT4294)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	4298 Croton Street (H1-CROT4298)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	4300 Croton Street (H1-CROT4300)	01-Feb-22	10:00	☑	☐
Flushing Zone H1	4304 Croton Street (H1-CROT4304)	01-Feb-22	13:00	☑	☐
Flushing Zone H1	4306 Croton Street (H1-CROT4306)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	4312 Croton Street (H1-CROT4312)	24-Jan-22	12:22	☑	☐
Flushing Zone H1	4314 Croton Street (H1-CROT4314)	25-Jan-22	16:41	☑	☐
Flushing Zone H1	4318 Croton Street (H1-CROT4318)	24-Jan-22	12:43	☑	☐
Flushing Zone H1	4320 Croton Street (H1-CROT4320)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	4628 Durian Lane (H1-DURI4628)	25-Jan-22	15:09	☑	☐

Flushing Zone H1

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Flushing Zone H1	4630 Durian Lane (H1-DURI4630)	25-Jan-22	15:09	☑	☐
Flushing Zone H1	4635 Durian Lane (H1-DURI4635)	24-Jan-22	16:20	☑	☐
Flushing Zone H1	4636 Durian Lane (H1-DURI4636)	25-Jan-22	13:45	☑	☐
Flushing Zone H1	4637 Durian Lane (H1-DURI4637)	26-Jan-22	08:10	☑	☐
Flushing Zone H1	4638 Durian Lane (H1-DURI4638)	25-Jan-22	09:06	☑	☐
Flushing Zone H1	2511 Flame Lane (H1-FLAM2511)	24-Jan-22	17:07	☑	☐
Flushing Zone H1	2515 Flame Lane (H1-FLAM2515)	24-Jan-22	13:33	☑	☐
Flushing Zone H1	2519 Flame Lane (H1-FLAM2519)	25-Jan-22	08:16	☑	☐
Flushing Zone H1	2523 Flame Lane (H1-FLAM2523)	25-Jan-22	08:16	☑	☐
Flushing Zone H1	2527 Flame Lane (H1-FLAM2527)	29-Jan-22	08:06	☑	☐
Flushing Zone H1	2531 Flame Lane (H1-FLAM2531)	30-Jan-22	10:53	☑	☐
Flushing Zone H1	2535 Flame Lane (H1-FLAM2535)	01-Feb-22	12:50	☑	☐
Flushing Zone H1	4601 Gardenia Lane (H1-GARD4601)	25-Jan-22	12:20	☑	☐
Flushing Zone H1	4603 Gardenia Lane (H1-GARD4603)	25-Jan-22	10:57	☑	☐
Flushing Zone H1	4604 Gardenia Lane (H1-GARD4604)	27-Jan-22	12:20	☑	☐
Flushing Zone H1	4606 Gardenia Lane (H1-GARD4606)	27-Jan-22	15:29	☑	☐
Flushing Zone H1	4607 Gardenia Lane (H1-GARD4607)	25-Jan-22	08:23	☑	☐
Flushing Zone H1	4609 Gardenia Lane (H1-GARD4609)	25-Jan-22	08:35	☑	☐
Flushing Zone H1	4610 Gardenia Lane (H1-GARD4610)	28-Jan-22	10:55	☑	☐
Flushing Zone H1	4612 Gardenia Lane (H1-GARD4612)	24-Jan-22	12:10	☑	☐
Flushing Zone H1	4615 Gardenia Lane (H1-GARD4615)	28-Jan-22	08:38	☑	☐
Flushing Zone H1	4617 Gardenia Lane (H1-GARD4617)	28-Jan-22	13:06	☑	☐
Flushing Zone H1	6008 Gold Lane (H1-GOLD6008)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	6009 Gold Lane (H1-GOLD6009)	26-Jan-22	12:29	☑	☐
Flushing Zone H1	6010 Gold Lane (H1-GOLD6010)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	6011 Gold Lane (H1-GOLD6011)	26-Jan-22	12:06	☑	☐
Flushing Zone H1	6018 Gold Lane (H1-GOLD6018)	01-Feb-22	12:58	☑	☐
Flushing Zone H1	6020 Gold Lane (H1-GOLD6020)	01-Feb-22	15:40	☑	☐
Flushing Zone H1	6022 Gold Lane (H1-GOLD6022)	24-Jan-22	12:12	☑	☐
Flushing Zone H1	6024 Gold Lane (H1-GOLD6024)	24-Jan-22	15:25	☑	☐
Flushing Zone H1	6026 Gold Lane (H1-GOLD6026)	25-Jan-22	11:00	☑	☐
Flushing Zone H1	6028 Gold Lane (H1-GOLD6028)	25-Jan-22	13:46	☑	☐
Flushing Zone H1	6036 Gold Lane (H1-GOLD6036)	26-Jan-22	07:58	☑	☐
Flushing Zone H1	6037 Gold Lane (H1-GOLD6037)	02-Feb-22	07:48	☑	☐
Flushing Zone H1	6038 Gold Lane (H1-GOLD6038)	26-Jan-22	08:00	☑	☐
Flushing Zone H1	6039 Gold Lane (H1-GOLD6039)	02-Feb-22	10:51	☑	☐
Flushing Zone H1	6045 Gold Lane (H1-GOLD6045)	01-Feb-22	13:24	☑	☐
Flushing Zone H1	6047 Gold Lane (H1-GOLD6047)	02-Feb-22	07:50	☑	☐
Flushing Zone H1	3813 Guava Lane (H1-GUAV3813)	26-Jan-22	08:30	☑	☐
Flushing Zone H1	3815 Guava Lane (H1-GUAV3815)	26-Jan-22	08:21	☑	☐
Flushing Zone H1	3816 Guava Lane (H1-GUAV3816)	24-Jan-22	12:26	☑	☐
Flushing Zone H1	3818 Guava Lane (H1-GUAV3818)	24-Jan-22	16:49	☑	☐
Flushing Zone H1	3819 Guava Lane (H1-GUAV3819)	27-Jan-22	14:02	☑	☐
Flushing Zone H1	3821 Guava Lane (H1-GUAV3821)	27-Jan-22	14:03	☑	☐
Flushing Zone H1	3822 Guava Lane (H1-GUAV3822)	25-Jan-22	09:36	☑	☐
Flushing Zone H1	3824 Guava Lane (H1-GUAV3824)	26-Jan-22	15:07	☑	☐
Flushing Zone H1	3825 Guava Lane (H1-GUAV3825)	26-Jan-22	11:51	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

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Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1	3827 Guava Lane (H1-GUAV3827)	26-Jan-22	15:10	☑	☐
Flushing Zone H1	3836 Guava Lane (H1-GUAV3836)	01-Feb-22	11:33	☑	☐
Flushing Zone H1	3837 Guava Lane (H1-GUAV3837)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	3838 Guava Lane (H1-GUAV3838)	02-Feb-22	15:38	☑	☐
Flushing Zone H1	3839 Guava Lane (H1-GUAV3839)	27-Jan-22	10:46	☑	☐
Flushing Zone H1	3842 Guava Lane (H1-GUAV3842)	01-Feb-22	12:07	☑	☐
Flushing Zone H1	3843 Guava Lane (H1-GUAV3843)	28-Jan-22	11:26	☑	☐
Flushing Zone H1	3844 Guava Lane (H1-GUAV3844)	28-Jan-22	14:45	☑	☐
Flushing Zone H1	3845 Guava Lane (H1-GUAV3845)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	3279 Gum Lane (H1-GUM 3279)	24-Jan-22	12:29	☑	☐
Flushing Zone H1	3281 Gum Lane (H1-GUM 3281)	24-Jan-22	16:05	☑	☐
Flushing Zone H1	3287 Gum Lane (H1-GUM 3287)	25-Jan-22	08:40	☑	☐
Flushing Zone H1	3289 Gum Lane (H1-GUM 3289)	25-Jan-22	13:08	☑	☐
Flushing Zone H1	3293 Gum Lane (H1-GUM 3293)	26-Jan-22	08:30	☑	☐
Flushing Zone H1	3301 Gum Lane (H1-GUM 3301)	27-Jan-22	11:04	☑	☐
Flushing Zone H1	3303 Gum Lane (H1-GUM 3303)	27-Jan-22	11:10	☑	☐
Flushing Zone H1	3295 Gum Lane (H1-GUML3295)	26-Jan-22	12:06	☑	☐
Flushing Zone H1	6704 Hawthorne Place (H1-HAWT6704)	24-Jan-22	13:00	☑	☐
Flushing Zone H1	6706 Hawthorne Place (H1-HAWT6706)	24-Jan-22	17:00	☑	☐
Flushing Zone H1	6711 Hawthorne Place (H1-HAWT6711)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	6712 Hawthorne Place (H1-HAWT6712)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	6714 Hawthorne Place (H1-HAWT6714)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	6723 Hawthorne Place (H1-HAWT6723)	31-Jan-22	15:00	☑	☐
Flushing Zone H1	6724 Hawthorne Place (H1-HAWT6724)	26-Jan-22	14:45	☑	☐
Flushing Zone H1	6726 Hawthorne Place (H1-HAWT6726)	25-Jan-22	15:00	☑	☐
Flushing Zone H1	6727 Hawthorne Place (H1-HAWT6727)	01-Feb-22	10:00	☑	☐
Flushing Zone H1	6729 Hawthorne Place (H1-HAWT6729)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	6733 Hawthorne Place (H1-HAWT6733)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	6734 Hawthorne Place (H1-HAWT6734)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	6735 Hawthorne Place (H1-HAWT6735)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	6739 Hawthorne Place (H1-HAWT6739)	26-Jan-22	13:57	☑	☐
Flushing Zone H1	6741 Hawthorne Place (H1-HAWT6741)	26-Jan-22	15:47	☑	☐
Flushing Zone H1	6744 Hawthorne Place (H1-HAWT6744)	31-Jan-22	15:00	☑	☐
Flushing Zone H1	6747 Hawthorne Place (H1-HAWT6747)	26-Jan-22	14:50	☑	☐
Flushing Zone H1	6749 Hawthorne Place (H1-HAWT6749)	26-Jan-22	08:05	☑	☐
Flushing Zone H1	4804 Hilo Holly Lane (H1-HILO4804)	27-Jan-22	15:40	☑	☐
Flushing Zone H1	4805 Hilo Holly Lane (H1-HILO4805)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	4806 Hilo Holly Lane (H1-HILO4806)	28-Jan-22	07:45	☑	☐
Flushing Zone H1	4807 Hilo Holly Lane (H1-HILO4807)	28-Jan-22	14:25	☑	☐
Flushing Zone H1	4810 Hilo Holly Lane (H1-HILO4810)	28-Jan-22	10:39	☑	☐
Flushing Zone H1	4811 Hilo Holly Lane (H1-HILO4811)	29-Jan-22	08:07	☑	☐
Flushing Zone H1	4812 Hilo Holly Lane (H1-HILO4812)	30-Jan-22	10:48	☑	☐
Flushing Zone H1	4813 Hilo Holly Lane (H1-HILO4813)	02-Feb-22	14:49	☑	☐
Flushing Zone H1	4818 Hilo Holly Lane (H1-HILO4818)	30-Jan-22	13:17	☑	☐
Flushing Zone H1	4819 Hilo Holly Lane (H1-HILO4819)	30-Jan-22	13:17	☑	☐
Flushing Zone H1	4820 Hilo Holly Lane (H1-HILO4820)	30-Jan-22	10:51	☑	☐
Flushing Zone H1	4821 Hilo Holly Lane (H1-HILO4821)	30-Jan-22	13:41	☑	☐

Flushing Zone H1

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Flushing Zone H1	4689 Honeysuckle Lane (H1-HONE4689)	27-Jan-22	08:20	☑	☐
Flushing Zone H1	4691 Honeysuckle Lane (H1-HONE4691)	27-Jan-22	08:22	☑	☐
Flushing Zone H1	4695 Honeysuckle Lane (H1-HONE4695)	02-Feb-22	17:00	☑	☐
Flushing Zone H1	4697 Honeysuckle Lane (H1-HONE4697)	28-Jan-22	15:00	☑	☐
Flushing Zone H1	4003 Ironwood Loop (H1-IRON4003)	27-Jan-22	14:00	☑	☐
Flushing Zone H1	4005 Ironwood Loop (H1-IRON4005)	27-Jan-22	10:57	☑	☐
Flushing Zone H1	4009 Ironwood Loop (H1-IRON4009)	28-Jan-22	07:59	☑	☐
Flushing Zone H1	4011 Ironwood Loop (H1-IRON4011)	28-Jan-22	11:15	☑	☐
Flushing Zone H1	4015 Ironwood Loop (H1-IRON4015)	28-Jan-22	14:30	☑	☐
Flushing Zone H1	4017 Ironwood Loop (H1-IRON4017)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	4021 Ironwood Loop (H1-IRON4021)	30-Jan-22	10:38	☑	☐
Flushing Zone H1	4023 Ironwood Loop (H1-IRON4023)	30-Jan-22	13:50	☑	☐
Flushing Zone H1	4029 Ironwood Loop (H1-IRON4029)	31-Jan-22	07:45	☑	☐
Flushing Zone H1	4031 Ironwood Loop (H1-IRON4031)	30-Jan-22	17:20	☑	☐
Flushing Zone H1	4035 Ironwood Loop (H1-IRON4035)	31-Jan-22	07:41	☑	☐
Flushing Zone H1	4041 Ironwood Loop (H1-IRON4041)	31-Jan-22	10:26	☑	☐
Flushing Zone H1	4045 Ironwood Loop (H1-IRON4045)	27-Jan-22	07:50	☑	☐
Flushing Zone H1	4051 Ironwood Loop (H1-IRON4051)	31-Jan-22	12:50	☑	☐
Flushing Zone H1	4057 Ironwood Loop (H1-IRON4057)	31-Jan-22	15:09	☑	☐
Flushing Zone H1	4059 Ironwood Loop (H1-IRON4059)	27-Jan-22	07:55	☑	☐
Flushing Zone H1	4060 Ironwood Loop (H1-IRON4060)	31-Jan-22	10:40	☑	☐
Flushing Zone H1	4062 Ironwood Loop (H1-IRON4062)	27-Jan-22	16:14	☑	☐
Flushing Zone H1	4063 Ironwood Loop (H1-IRON4063)	02-Feb-22	17:38	☑	☐
Flushing Zone H1	4065 Ironwood Loop (H1-IRON4065)	31-Jan-22	08:03	☑	☐
Flushing Zone H1	4066 Ironwood Loop (H1-IRON4066)	31-Jan-22	10:45	☑	☐
Flushing Zone H1	4068 Ironwood Loop (H1-IRON4068)	31-Jan-22	14:15	☑	☐
Flushing Zone H1	4069 Ironwood Loop (H1-IRON4069)	31-Jan-22	07:45	☑	☐
Flushing Zone H1	4071 Ironwood Loop (H1-IRON4071)	31-Jan-22	13:07	☑	☐
Flushing Zone H1	4072 Ironwood Loop (H1-IRON4072)	31-Jan-22	15:35	☑	☐
Flushing Zone H1	4074 Ironwood Loop (H1-IRON4074)	28-Jan-22	08:08	☑	☐
Flushing Zone H1	4083 Ironwood Loop (H1-IRON4083)	28-Jan-22	11:17	☑	☐
Flushing Zone H1	4085 Ironwood Loop (H1-IRON4085)	28-Jan-22	13:41	☑	☐
Flushing Zone H1	6605 Ixora Lane (H1-IXOR6605)	01-Feb-22	13:00	☑	☐
Flushing Zone H1	6607 Ixora Lane (H1-IXOR6607)	01-Feb-22	16:00	☑	☐
Flushing Zone H1	6611 Ixora Lane (H1-IXOR6611)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	6613 Ixora Lane (H1-IXOR6613)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	6617 Ixora Lane (H1-IXOR6617)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	6619 Ixora Lane (H1-IXOR6619)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	6623 Ixora Lane (H1-IXOR6623)	25-Jan-22	14:00	☑	☐
Flushing Zone H1	6625 Ixora Lane (H1-IXOR6625)	24-Jan-22	16:00	☑	☐
Flushing Zone H1	6631 Ixora Lane (H1-IXOR6631)	25-Jan-22	10:00	☑	☐
Flushing Zone H1	6633 Ixora Lane (H1-IXOR6633)	25-Jan-22	13:00	☑	☐
Flushing Zone H1	6637 Ixora Lane (H1-IXOR6637)	01-Feb-22	11:00	☑	☐
Flushing Zone H1	6639 Ixora Lane (H1-IXOR6639)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	6643 Ixora Lane (H1-IXOR6643)	26-Jan-22	12:00	☑	☐
Flushing Zone H1	6645 Ixora Lane (H1-IXOR6645)	26-Jan-22	15:15	☑	☐
Flushing Zone H1	6649 Ixora Lane (H1-IXOR6649)	26-Jan-22	15:15	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

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Flushing Zone H1	6651 Ixora Lane (H1-IXOR6651)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	6655 Ixora Lane (H1-IXOR6655)	02-Feb-22	08:08	☑	☐
Flushing Zone H1	6657 Ixora Lane (H1-IXOR6657)	01-Feb-22	08:28	☑	☐
Flushing Zone H1	6104 Kahoohanohano Street (H1-	26-Jan-22	07:57	☑	☐
Flushing Zone H1	6106 Kahoohanohano Street (H1-	26-Jan-22	11:45	☑	☐
Flushing Zone H1	6110 Kahoohanohano Street (H1-	26-Jan-22	16:06	☑	☐
Flushing Zone H1	6112 Kahoohanohano Street (H1-	26-Jan-22	08:10	☑	☐
Flushing Zone H1	6116 Kahoohanohano Street (H1-	26-Jan-22	16:07	☑	☐
Flushing Zone H1	6118 Kahoohanohano Street (H1-	26-Jan-22	12:10	☑	☐
Flushing Zone H1	6119 Kahoohanohano Street (H1-	30-Jan-22	14:41	☑	☐
Flushing Zone H1	6121 Kahoohanohano Street (H1-	29-Jan-22	08:00	☑	☐
Flushing Zone H1	6125 Kahoohanohano Street (H1-	30-Jan-22	11:16	☑	☐
Flushing Zone H1	6127 Kahoohanohano Street (H1-	30-Jan-22	10:12	☑	☐
Flushing Zone H1	6128 Kahoohanohano Street (H1-	01-Feb-22	10:56	☑	☐
Flushing Zone H1	6130 Kahoohanohano Street (H1-	01-Feb-22	14:00	☑	☐
Flushing Zone H1	6134 Kahoohanohano Street (H1-	24-Jan-22	12:24	☑	☐
Flushing Zone H1	6136 Kahoohanohano Street (H1-	24-Jan-22	16:30	☑	☐
Flushing Zone H1	6140 Kahoohanohano Street (H1-	25-Jan-22	11:15	☑	☐
Flushing Zone H1	6142 Kahoohanohano Street (H1-	25-Jan-22	15:08	☑	☐
Flushing Zone H1	4603 Kamani Lane (H1-KAMA4603)	27-Jan-22	08:05	☑	☐
Flushing Zone H1	4605 Kamani Lane (H1-KAMA4605)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	4609 Kamani Lane (H1-KAMA4609)	28-Jan-22	07:45	☑	☐
Flushing Zone H1	4611 Kamani Lane (H1-KAMA4611)	28-Jan-22	11:00	☑	☐
Flushing Zone H1	4615 Kamani Lane (H1-KAMA4615)	04-Feb-22	13:45	☑	☐
Flushing Zone H1	4617 Kamani Lane (H1-KAMA4617)	31-Jan-22	14:00	☑	☐
Flushing Zone H1	4621 Ke Street (H1-KE S4621)	27-Jan-22	15:49	☑	☐
Flushing Zone H1	4623 Ke Street (H1-KE S4623)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	4625 Ke Street (H1-KE S4625)	28-Jan-22	15:22	☑	☐
Flushing Zone H1	4629 Ke Street (H1-KE S4629)	28-Jan-22	12:00	☑	☐
Flushing Zone H1	4635 Ke Street (H1-KE S4635)	29-Jan-22	07:55	☑	☐
Flushing Zone H1	4639 Ke Street (H1-KE S4639)	30-Jan-22	10:20	☑	☐
Flushing Zone H1	4645 Ke Street (H1-KE S4645)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	4649 Ke Street (H1-KE S4649)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	4655 Ke Street (H1-KE S4655)	30-Jan-22	15:00	☑	☐
Flushing Zone H1	4659 Ke Street (H1-KE S4659)	30-Jan-22	17:00	☑	☐
Flushing Zone H1	4663 Ke Street (H1-KE S4663)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	4667 Ke Street (H1-KE S4667)	31-Jan-22	15:00	☑	☐
Flushing Zone H1	4671 Ke Street (H1-KE S4671)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	4675 Ke Street (H1-KE S4675)	31-Jan-22	15:00	☑	☐
Flushing Zone H1	4685 Ke Street (H1-KE S4685)	24-Jan-22	13:00	☑	☐
Flushing Zone H1	4689 Ke Street (H1-KE S4689)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	4693 Ke Street (H1-KE S4693)	03-Feb-22	14:00	☑	☐
Flushing Zone H1	4612 Ke Street (H1-KEST4612)	27-Jan-22	12:05	☑	☐
Flushing Zone H1	4628 Kiawe Lane (H1-KIAW4628)	27-Jan-22	15:00	☑	☐
Flushing Zone H1	4630 Kiawe Lane (H1-KIAW4630)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	4636 Kiawe Lane (H1-KIAW4636)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	4638 Kiawe Lane (H1-KIAW4638)	28-Jan-22	11:00	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

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Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1	4642 Kiawe Lane (H1-KIAW4642)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	4644 Kiawe Lane (H1-KIAW4644)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	4410 Kobashigawa Street (H1-KOBA4410)	26-Jan-22	08:05	☑	☐
Flushing Zone H1	4414 Kobashigawa Street (H1-KOBA4414)	26-Jan-22	11:37	☑	☐
Flushing Zone H1	4415 Kobashigawa Street (H1-KOBA4415)	24-Jan-22	12:12	☑	☐
Flushing Zone H1	4419 Kobashigawa Street (H1-KOBA4419)	24-Jan-22	15:00	☑	☐
Flushing Zone H1	4420 Kobashigawa Street (H1-KOBA4420)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	4423 Kobashigawa Street (H1-KOBA4423)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	4424 Kobashigawa Street (H1-KOBA4424)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	4425 Kobashigawa Street (H1-KOBA4425)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	4429 Kobashigawa Street (H1-KOBA4429)	26-Jan-22	14:07	☑	☐
Flushing Zone H1	4430 Kobashigawa Street (H1-KOBA4430)	26-Jan-22	12:30	☑	☐
Flushing Zone H1	4431 Kobashigawa Street (H1-KOBA4431)	26-Jan-22	08:47	☑	☐
Flushing Zone H1	4434 Kobashigawa Street (H1-KOBA4434)	26-Jan-22	15:25	☑	☐
Flushing Zone H1	4435 Kobashigawa Street (H1-KOBA4435)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	4438 Kobashigawa Street (H1-KOBA4438)	28-Jan-22	16:23	☑	☐
Flushing Zone H1	4439 Kobashigawa Street (H1-KOBA4439)	28-Jan-22	17:00	☑	☐
Flushing Zone H1	4441 Kobashigawa Street (H1-KOBA4441)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	4444 Kobashigawa Street (H1-KOBA4444)	02-Feb-22	12:00	☑	☐
Flushing Zone H1	4445 Kobashigawa Street (H1-KOBA4445)	01-Feb-22	09:00	☑	☐
Flushing Zone H1	4447 Kobashigawa Street (H1-KOBA4447)	31-Jan-22	19:00	☑	☐
Flushing Zone H1	4448 Kobashigawa Street (H1-KOBA4448)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	4454 Kobashigawa Street (H1-KOBA4454)	26-Jan-22	08:10	☑	☐
Flushing Zone H1	4456 Kobashigawa Street (H1-KOBA4456)	26-Jan-22	13:04	☑	☐
Flushing Zone H1	4458 Kobashigawa Street (H1-KOBA4458)	26-Jan-22	16:36	☑	☐
Flushing Zone H1	4460 Kobashigawa Street (H1-KOBA4460)	27-Jan-22	16:00	☑	☐
Flushing Zone H1	4464 Kobashigawa Street (H1-KOBA4464)	26-Jan-22	08:15	☑	☐
Flushing Zone H1	4466 Kobashigawa Street (H1-KOBA4466)	25-Jan-22	15:05	☑	☐
Flushing Zone H1	4468 Kobashigawa Street (H1-KOBA4468)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	4470 Kobashigawa Street (H1-KOBA4470)	30-Jan-22	14:00	☑	☐
Flushing Zone H1	4474 Kobashigawa Street (H1-KOBA4474)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	4478 Kobashigawa Street (H1-KOBA4478)	26-Jan-22	13:06	☑	☐
Flushing Zone H1	4484 Kobashigawa Street (H1-KOBA4484)	25-Jan-22	13:00	☑	☐
Flushing Zone H1	4503 Kobashigawa Street (H1-KOBA4503)	24-Jan-22	12:43	☑	☐
Flushing Zone H1	4504 Kobashigawa Street (H1-KOBA4504)	26-Jan-22	15:31	☑	☐
Flushing Zone H1	4507 Kobashigawa Street (H1-KOBA4507)	24-Jan-22	16:16	☑	☐
Flushing Zone H1	4508 Kobashigawa Street (H1-KOBA4508)	26-Jan-22	14:13	☑	☐
Flushing Zone H1	4509 Kobashigawa Street (H1-KOBA4509)	25-Jan-22	08:15	☑	☐
Flushing Zone H1	4511 Kobashigawa Street (H1-KOBA4511)	25-Jan-22	08:15	☑	☐
Flushing Zone H1	4512 Kobashigawa Street (H1-KOBA4512)	26-Jan-22	10:59	☑	☐
Flushing Zone H1	4515 Kobashigawa Street (H1-KOBA4515)	26-Jan-22	07:54	☑	☐
Flushing Zone H1	4516 Kobashigawa Street (H1-KOBA4516)	26-Jan-22	08:22	☑	☐
Flushing Zone H1	4517 Kobashigawa Street (H1-KOBA4517)	26-Jan-22	04:02	☑	☐
Flushing Zone H1	4519 Kobashigawa Street (H1-KOBA4519)	27-Jan-22	04:45	☑	☐
Flushing Zone H1	4520 Kobashigawa Street (H1-KOBA4520)	29-Jan-22	07:54	☑	☐
Flushing Zone H1	4522 Kobashigawa Street (H1-KOBA4522)	30-Jan-22	10:14	☑	☐
Flushing Zone H1	4523 Kobashigawa Street (H1-KOBA4523)	30-Jan-22	17:45	☑	☐

Flushing Zone H1

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Flushing Zone H1	4526 Kobashigawa Street (H1-KOBA4526)	30-Jan-22	13:52	☑	☐
Flushing Zone H1	4527 Kobashigawa Street (H1-KOBA4527)	31-Jan-22	11:18	☑	☐
Flushing Zone H1	4528 Kobashigawa Street (H1-KOBA4528)	01-Feb-22	07:58	☑	☐
Flushing Zone H1	4531 Kobashigawa Street (H1-KOBA4531)	01-Feb-22	08:50	☑	☐
Flushing Zone H1	4532 Kobashigawa Street (H1-KOBA4532)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	4533 Kobashigawa Street (H1-KOBA4533)	28-Jan-22	15:42	☑	☐
Flushing Zone H1	4536 Kobashigawa Street (H1-KOBA4536)	28-Jan-22	11:32	☑	☐
Flushing Zone H1	4537 Kobashigawa Street (H1-KOBA4537)	27-Jan-22	16:20	☑	☐
Flushing Zone H1	4538 Kobashigawa Street (H1-KOBA4538)	27-Jan-22	08:01	☑	☐
Flushing Zone H1	4541 Kobashigawa Street (H1-KOBA4541)	26-Jan-22	13:17	☑	☐
Flushing Zone H1	4542 Kobashigawa Street (H1-KOBA4542)	26-Jan-22	08:41	☑	☐
Flushing Zone H1	4544 Kobashigawa Street (H1-KOBA4544)	26-Jan-22	11:50	☑	☐
Flushing Zone H1	4545 Kobashigawa Street (H1-KOBA4545)	26-Jan-22	15:17	☑	☐
Flushing Zone H1	4547 Kobashigawa Street (H1-KOBA4547)	26-Jan-22	08:05	☑	☐
Flushing Zone H1	4548 Kobashigawa Street (H1-KOBA4548)	25-Jan-22	03:17	☑	☐
Flushing Zone H1	4553 Kobashigawa Street (H1-KOBA4553)	26-Jan-22	08:03	☑	☐
Flushing Zone H1	4645 Kou Lane (H1-KOU 4645)	27-Jan-22	08:05	☑	☐
Flushing Zone H1	4647 Kou Lane (H1-KOU 4647)	27-Jan-22	10:39	☑	☐
Flushing Zone H1	4653 Kou Lane (H1-KOU 4653)	29-Jan-22	11:19	☑	☐
Flushing Zone H1	4663 Kou Lane (H1-KOU 4663)	28-Jan-22	15:50	☑	☐
Flushing Zone H1	4665 Kou Lane (H1-KOU 4665)	29-Jan-22	08:08	☑	☐
Flushing Zone H1	4673 Kou Lane (H1-KOU 4673)	30-Jan-22	10:15	☑	☐
Flushing Zone H1	4675 Kou Lane (H1-KOU 4675)	01-Feb-22	12:20	☑	☐
Flushing Zone H1	4683 Kou Lane (H1-KOU 4683)	26-Jan-22	08:12	☑	☐
Flushing Zone H1	4685 Kou Lane (H1-KOU 4685)	26-Jan-22	07:58	☑	☐
Flushing Zone H1	4691 Kou Lane (H1-KOU 4691)	27-Jan-22	13:00	☑	☐
Flushing Zone H1	4695 Kou Lane (H1-KOU 4695)	27-Jan-22	11:15	☑	☐
Flushing Zone H1	4697 Kou Lane (H1-KOU 4697)	27-Jan-22	13:45	☑	☐
Flushing Zone H1	4655 Kou Lane (H1-KOUL4655)	28-Jan-22	07:50	☑	☐
Flushing Zone H1	4689 Kou Lane (H1-KOUL4689)	26-Jan-22	13:00	☑	☐
Flushing Zone H1	2344 Kukui Lane (H1-KUKU2344)	26-Jan-22	14:10	☑	☐
Flushing Zone H1	2348 Kukui Lane (H1-KUKU2348)	27-Jan-22	13:45	☑	☐
Flushing Zone H1	2352 Kukui Lane (H1-KUKU2352)	28-Jan-22	07:55	☑	☐
Flushing Zone H1	2356 Kukui Lane (H1-KUKU2356)	28-Jan-22	12:00	☑	☐
Flushing Zone H1	2360 Kukui Lane (H1-KUKU2360)	29-Jan-22	08:31	☑	☐
Flushing Zone H1	2364 Kukui Lane (H1-KUKU2364)	29-Jan-22	08:12	☑	☐
Flushing Zone H1	2369 Kukui Lane (H1-KUKU2369)	31-Jan-22	07:41	☑	☐
Flushing Zone H1	2373 Kukui Lane (H1-KUKU2373)	01-Feb-22	11:57	☑	☐
Flushing Zone H1	2377 Kukui Lane (H1-KUKU2377)	26-Jan-22	11:00	☑	☐
Flushing Zone H1	2381 Kukui Lane (H1-KUKU2381)	26-Jan-22	11:23	☑	☐
Flushing Zone H1	2385 Kukui Lane (H1-KUKU2385)	26-Jan-22	15:32	☑	☐
Flushing Zone H1	2389 Kukui Lane (H1-KUKU2389)	26-Jan-22	17:07	☑	☐
Flushing Zone H1	2393 Kukui Lane (H1-KUKU2393)	02-Feb-22	08:06	☑	☐
Flushing Zone H1	4652 Lilikoi Lane (H1-LILI4652)	29-Jan-22	08:23	☑	☐
Flushing Zone H1	4654 Lilikoi Lane (H1-LILI4654)	29-Jan-22	10:59	☑	☐
Flushing Zone H1	4658 Lilikoi Lane (H1-LILI4658)	01-Feb-22	11:15	☑	☐
Flushing Zone H1	4660 Lilikoi Lane (H1-LILI4660)	30-Jan-22	10:18	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

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Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1	4664 Lilikoi Lane (H1-LILI4664)	30-Jan-22	14:40	☑	☐
Flushing Zone H1	4666 Lilikoi Lane (H1-LILI4666)	28-Jan-22	08:11	☑	☐
Flushing Zone H1	4672 Lilikoi Lane (H1-LILI4672)	28-Jan-22	10:40	☑	☐
Flushing Zone H1	4674 Lilikoi Lane (H1-LILI4674)	28-Jan-22	13:30	☑	☐
Flushing Zone H1	5013 Macadamia Lane (H1-MACA5013)	26-Jan-22	08:14	☑	☐
Flushing Zone H1	5015 Macadamia Lane (H1-MACA5015)	26-Jan-22	11:13	☑	☐
Flushing Zone H1	5019 Macadamia Lane (H1-MACA5019)	26-Jan-22	14:08	☑	☐
Flushing Zone H1	5021 Macadamia Lane (H1-MACA5021)	26-Jan-22	08:13	☑	☐
Flushing Zone H1	5025 Macadamia Lane (H1-MACA5025)	25-Jan-22	17:00	☑	☐
Flushing Zone H1	5027 Macadamia Lane (H1-MACA5027)	25-Jan-22	14:00	☑	☐
Flushing Zone H1	5031 Macadamia Lane (H1-MACA5031)	01-Feb-22	16:00	☑	☐
Flushing Zone H1	5033 Macadamia Lane (H1-MACA5033)	01-Feb-22	11:00	☑	☐
Flushing Zone H1	5040 Macadamia Lane (H1-MACA5040)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	5042 Macadamia Lane (H1-MACA5042)	24-Jan-22	15:00	☑	☐
Flushing Zone H1	5046 Macadamia Lane (H1-MACA5046)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	5048 Macadamia Lane (H1-MACA5048)	25-Jan-22	11:00	☑	☐
Flushing Zone H1	5054 Macadamia Lane (H1-MACA5054)	27-Jan-22	07:00	☑	☐
Flushing Zone H1	5055 Macadamia Lane (H1-MACA5055)	26-Jan-22	11:18	☑	☐
Flushing Zone H1	5056 Macadamia Lane (H1-MACA5056)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	5057 Macadamia Lane (H1-MACA5057)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	5060 Macadamia Lane (H1-MACA5060)	24-Jan-22	12:00	☑	☐
Flushing Zone H1	5061 Macadamia Lane (H1-MACA5061)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	5062 Macadamia Lane (H1-MACA5062)	24-Jan-22	15:00	☑	☐
Flushing Zone H1	5063 Macadamia Lane (H1-MACA5063)	28-Jan-22	15:00	☑	☐
Flushing Zone H1	5066 Macadamia Lane (H1-MACA5066)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	5068 Macadamia Lane (H1-MACA5068)	25-Jan-22	11:00	☑	☐
Flushing Zone H1	4565 Mamane Lane (H1-MAMA4565)	25-Jan-22	12:24	☑	☐
Flushing Zone H1	4569 Mamane Lane (H1-MAMA4569)	24-Jan-22	12:33	☑	☐
Flushing Zone H1	4573 Mamane Lane (H1-MAMA4573)	24-Jan-22	16:12	☑	☐
Flushing Zone H1	4577 Mamane Lane (H1-MAMA4577)	26-Jan-22	17:35	☑	☐
Flushing Zone H1	4579 Mamane Lane (H1-MAMA4579)	25-Jan-22	08:46	☑	☐
Flushing Zone H1	4582 Mamane Lane (H1-MAMA4582)	25-Jan-22	04:26	☑	☐
Flushing Zone H1	4583 Mamane Lane (H1-MAMA4583)	26-Jan-22	11:21	☑	☐
Flushing Zone H1	4586 Mamane Lane (H1-MAMA4586)	27-Jan-22	14:19	☑	☐
Flushing Zone H1	4589 Mamane Lane (H1-MAMA4589)	26-Jan-22	08:02	☑	☐
Flushing Zone H1	4590 Mamane Lane (H1-MAMA4590)	27-Jan-22	08:15	☑	☐
Flushing Zone H1	4591 Mamane Lane (H1-MAMA4591)	02-Feb-22	17:28	☑	☐
Flushing Zone H1	4594 Mamane Lane (H1-MAMA4594)	26-Jan-22	17:18	☑	☐
Flushing Zone H1	4595 Mamane Lane (H1-MAMA4595)	26-Jan-22	08:43	☑	☐
Flushing Zone H1	6804 Milo Lane (H1-MILO6804)	24-Jan-22	12:17	☑	☐
Flushing Zone H1	6805 Milo Lane (H1-MILO6805)	25-Jan-22	11:29	☑	☐
Flushing Zone H1	6806 Milo Lane (H1-MILO6806)	24-Jan-22	15:00	☑	☐
Flushing Zone H1	6807 Milo Lane (H1-MILO6807)	26-Jan-22	12:55	☑	☐
Flushing Zone H1	6810 Milo Lane (H1-MILO6810)	25-Jan-22	15:00	☑	☐
Flushing Zone H1	6811 Milo Lane (H1-MILO6811)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	6812 Milo Lane (H1-MILO6812)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	6813 Milo Lane (H1-MILO6813)	01-Feb-22	08:00	☑	☐

Flushing Zone H1

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Flushing Zone H1	6816 Milo Lane (H1-MILO6816)	26-Jan-22	08:14	☑	☐
Flushing Zone H1	6817 Milo Lane (H1-MILO6817)	26-Jan-22	14:50	☑	☐
Flushing Zone H1	6818 Milo Lane (H1-MILO6818)	26-Jan-22	13:04	☑	☐
Flushing Zone H1	6819 Milo Lane (H1-MILO6819)	26-Jan-22	16:57	☑	☐
Flushing Zone H1	6823 Milo Lane (H1-MILO6823)	01-Feb-22	11:00	☑	☐
Flushing Zone H1	6825 Milo Lane (H1-MILO6825)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	6829 Milo Lane (H1-MILO6829)	02-Feb-22	14:00	☑	☐
Flushing Zone H1	6831 Milo Lane (H1-MILO6831)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	6835 Milo Lane (H1-MILO6835)	02-Feb-22	12:00	☑	☐
Flushing Zone H1	6837 Milo Lane (H1-MILO6837)	01-Feb-22	11:00	☑	☐
Flushing Zone H1	6841 Milo Lane (H1-MILO6841)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	6843 Milo Lane (H1-MILO6843)	01-Feb-22	13:00	☑	☐
Flushing Zone H1	4702 Naio Lane (H1-NAIO4702)	26-Jan-22	16:24	☑	☐
Flushing Zone H1	4703 Naio Lane (H1-NAIO4703)	25-Jan-22	15:30	☑	☐
Flushing Zone H1	4704 Naio Lane (H1-NAIO4704)	27-Jan-22	11:25	☑	☐
Flushing Zone H1	4705 Naio Lane (H1-NAIO4705)	27-Jan-22	14:50	☑	☐
Flushing Zone H1	4708 Naio Lane (H1-NAIO4708)	26-Jan-22	13:33	☑	☐
Flushing Zone H1	4709 Naio Lane (H1-NAIO4709)	24-Jan-22	12:12	☑	☐
Flushing Zone H1	4710 Naio Lane (H1-NAIO4710)	26-Jan-22	11:20	☑	☐
Flushing Zone H1	4711 Naio Lane (H1-NAIO4711)	24-Jan-22	15:46	☑	☐
Flushing Zone H1	4714 Naio Lane (H1-NAIO4714)	26-Jan-22	08:15	☑	☐
Flushing Zone H1	4715 Naio Lane (H1-NAIO4715)	25-Jan-22	08:21	☑	☐
Flushing Zone H1	4716 Naio Lane (H1-NAIO4716)	26-Jan-22	08:23	☑	☐
Flushing Zone H1	4717 Naio Lane (H1-NAIO4717)	25-Jan-22	11:09	☑	☐
Flushing Zone H1	3163 Noni Lane (H1-NONI3163)	26-Jan-22	08:10	☑	☐
Flushing Zone H1	3165 Noni Lane (H1-NONI3165)	26-Jan-22	08:05	☑	☐
Flushing Zone H1	3169 Noni Lane (H1-NONI3169)	24-Jan-22	12:30	☑	☐
Flushing Zone H1	3171 Noni Lane (H1-NONI3171)	25-Jan-22	08:06	☑	☐
Flushing Zone H1	3175 Noni Lane (H1-NONI3175)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	3177 Noni Lane (H1-NONI3177)	25-Jan-22	14:20	☑	☐
Flushing Zone H1	2614 Okamura Street (H1-OKAM2614)	26-Jan-22	15:40	☑	☐
Flushing Zone H1	2618 Okamura Street (H1-OKAM2618)	27-Jan-22	11:47	☑	☐
Flushing Zone H1	2622 Okamura Street (H1-OKAM2622)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	2626 Okamura Street (H1-OKAM2626)	28-Jan-22	11:40	☑	☐
Flushing Zone H1	2630 Okamura Street (H1-OKAM2630)	28-Jan-22	15:21	☑	☐
Flushing Zone H1	2633 Okamura Street (H1-OKAM2633)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	2634 Okamura Street (H1-OKAM2634)	01-Feb-22	11:34	☑	☐
Flushing Zone H1	2637 Okamura Street (H1-OKAM2637)	30-Jan-22	09:53	☑	☐
Flushing Zone H1	2641 Okamura Street (H1-OKAM2641)	01-Feb-22	14:56	☑	☐
Flushing Zone H1	2645 Okamura Street (H1-OKAM2645)	30-Jan-22	14:02	☑	☐
Flushing Zone H1	2649 Okamura Street (H1-OKAM2649)	30-Jan-22	14:02	☑	☐
Flushing Zone H1	2655 Okamura Street (H1-OKAM2655)	25-Jan-22	13:12	☑	☐
Flushing Zone H1	2659 Okamura Street (H1-OKAM2659)	24-Jan-22	12:35	☑	☐
Flushing Zone H1	2663 Okamura Street (H1-OKAM2663)	24-Jan-22	16:15	☑	☐
Flushing Zone H1	2667 Okamura Street (H1-OKAM2667)	25-Jan-22	13:01	☑	☐
Flushing Zone H1	2674 Okamura Street (H1-OKAM2674)	31-Jan-22	08:04	☑	☐
Flushing Zone H1	2678 Okamura Street (H1-OKAM2678)	30-Jan-22	15:20	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

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Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1	2679 Okamura Street (H1-OKAM2679)	31-Jan-22	08:17	☑	☐
Flushing Zone H1	2682 Okamura Street (H1-OKAM2682)	31-Jan-22	07:58	☑	☐
Flushing Zone H1	2683 Okamura Street (H1-OKAM2683)	31-Jan-22	07:50	☑	☐
Flushing Zone H1	2686 Okamura Street (H1-OKAM2686)	31-Jan-22	12:25	☑	☐
Flushing Zone H1	2687 Okamura Street (H1-OKAM2687)	01-Feb-22	08:10	☑	☐
Flushing Zone H1	2690 Okamura Street (H1-OKAM2690)	31-Jan-22	13:49	☑	☐
Flushing Zone H1	2691 Okamura Street (H1-OKAM2691)	31-Jan-22	12:30	☑	☐
Flushing Zone H1	2694 Okamura Street (H1-OKAM2694)	31-Jan-22	17:00	☑	☐
Flushing Zone H1	2695 Okamura Street (H1-OKAM2695)	02-Feb-22	11:58	☑	☐
Flushing Zone H1	2699 Okamura Street (H1-OKAM2699)	02-Feb-22	08:05	☑	☐
Flushing Zone H1	4704 Oleander Street (H1-OLEA4704)	25-Jan-22	15:30	☑	☐
Flushing Zone H1	4705 Oleander Street (H1-OLEA4705)	27-Jan-22	07:54	☑	☐
Flushing Zone H1	4706 Oleander Street (H1-OLEA4706)	24-Jan-22	12:30	☑	☐
Flushing Zone H1	4707 Oleander Street (H1-OLEA4707)	27-Jan-22	12:19	☑	☐
Flushing Zone H1	4710 Oleander Street (H1-OLEA4710)	24-Jan-22	16:24	☑	☐
Flushing Zone H1	4711 Oleander Street (H1-OLEA4711)	27-Jan-22	11:44	☑	☐
Flushing Zone H1	4712 Oleander Street (H1-OLEA4712)	25-Jan-22	11:52	☑	☐
Flushing Zone H1	4713 Oleander Street (H1-OLEA4713)	28-Jan-22	10:49	☑	☐
Flushing Zone H1	4717 Oleander Street (H1-OLEA4717)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	4718 Oleander Street (H1-OLEA4718)	26-Jan-22	11:54	☑	☐
Flushing Zone H1	4719 Oleander Street (H1-OLEA4719)	31-Jan-22	07:48	☑	☐
Flushing Zone H1	4720 Oleander Street (H1-OLEA4720)	26-Jan-22	12:12	☑	☐
Flushing Zone H1	4723 Oleander Street (H1-OLEA4723)	26-Jan-22	08:18	☑	☐
Flushing Zone H1	4724 Oleander Street (H1-OLEA4724)	27-Jan-22	10:37	☑	☐
Flushing Zone H1	4725 Oleander Street (H1-OLEA4725)	26-Jan-22	08:17	☑	☐
Flushing Zone H1	4726 Oleander Street (H1-OLEA4726)	31-Jan-22	07:40	☑	☐
Flushing Zone H1	4729 Oleander Street (H1-OLEA4729)	27-Jan-22	15:00	☑	☐
Flushing Zone H1	4731 Oleander Street (H1-OLEA4731)	26-Jan-22	16:56	☑	☐
Flushing Zone H1	6304 Pamakani Lane (H1-PAMA6304)	26-Jan-22	11:25	☑	☐
Flushing Zone H1	6306 Pamakani Lane (H1-PAMA6306)	26-Jan-22	15:05	☑	☐
Flushing Zone H1	6310 Pamakani Lane (H1-PAMA6310)	26-Jan-22	12:00	☑	☐
Flushing Zone H1	6312 Pamakani Lane (H1-PAMA6312)	26-Jan-22	15:10	☑	☐
Flushing Zone H1	6326 Papaya Lane (H1-PAPA6326)	29-Jan-22	09:25	☑	☐
Flushing Zone H1	6328 Papaya Lane (H1-PAPA6328)	31-Jan-22	08:23	☑	☐
Flushing Zone H1	6332 Papaya Lane (H1-PAPA6332)	27-Jan-22	11:08	☑	☐
Flushing Zone H1	6333 Papaya Lane (H1-PAPA6333)	31-Jan-22	07:52	☑	☐
Flushing Zone H1	6334 Papaya Lane (H1-PAPA6334)	30-Jan-22	15:05	☑	☐
Flushing Zone H1	6335 Papaya Lane (H1-PAPA6335)	28-Jan-22	16:00	☑	☐
Flushing Zone H1	6338 Papaya Lane (H1-PAPA6338)	31-Jan-22	13:08	☑	☐
Flushing Zone H1	6340 Papaya Lane (H1-PAPA6340)	31-Jan-22	07:35	☑	☐
Flushing Zone H1	6343 Papaya Lane (H1-PAPA6343)	31-Jan-22	15:10	☑	☐
Flushing Zone H1	6344 Papaya Lane (H1-PAPA6344)	31-Jan-22	07:40	☑	☐
Flushing Zone H1	6345 Papaya Lane (H1-PAPA6345)	01-Feb-22	11:30	☑	☐
Flushing Zone H1	6346 Papaya Lane (H1-PAPA6346)	01-Feb-22	11:32	☑	☐
Flushing Zone H1	6352 Papaya Lane (H1-PAPA6352)	02-Feb-22	13:53	☑	☐
Flushing Zone H1	6354 Papaya Lane (H1-PAPA6354)	01-Feb-22	14:35	☑	☐
Flushing Zone H1	6355 Papaya Lane (H1-PAPA6355)	01-Feb-22	14:35	☑	☐

Flushing Zone H1

2021-12-28 - 2022-02-27

Flushing Zone H1	6357 Papaya Lane (H1-PAPA6357)	26-Jan-22	09:33	☑	☐
Flushing Zone H1	6358 Papaya Lane (H1-PAPA6358)	26-Jan-22	13:29	☑	☐
Flushing Zone H1	6360 Papaya Lane (H1-PAPA6360)	26-Jan-22	08:10	☑	☐
Flushing Zone H1	6361 Papaya Lane (H1-PAPA6361)	01-Feb-22	07:58	☑	☐
Flushing Zone H1	6363 Papaya Lane (H1-PAPA6363)	01-Feb-22	15:26	☑	☐
Flushing Zone H1	6364 Papaya Lane (H1-PAPA6364)	26-Jan-22	10:39	☑	☐
Flushing Zone H1	6366 Papaya Lane (H1-PAPA6366)	26-Jan-22	11:42	☑	☐
Flushing Zone H1	6367 Papaya Lane (H1-PAPA6367)	24-Jan-22	16:25	☑	☐
Flushing Zone H1	6369 Papaya Lane (H1-PAPA6369)	02-Feb-22	10:00	☑	☐
Flushing Zone H1	6373 Papaya Lane (H1-PAPA6373)	24-Jan-22	12:37	☑	☐
Flushing Zone H1	6375 Papaya Lane (H1-PAPA6375)	25-Jan-22	08:20	☑	☐
Flushing Zone H1	4505 Paperbark Lane (H1-PAPE4505)	26-Jan-22	12:14	☑	☐
Flushing Zone H1	4507 Paperbark Lane (H1-PAPE4507)	26-Jan-22	16:11	☑	☐
Flushing Zone H1	4511 Paperbark Lane (H1-PAPE4511)	26-Jan-22	16:11	☑	☐
Flushing Zone H1	4513 Paperbark Lane (H1-PAPE4513)	26-Jan-22	08:12	☑	☐
Flushing Zone H1	4517 Paperbark Lane (H1-PAPE4517)	27-Jan-22	13:41	☑	☐
Flushing Zone H1	4519 Paperbark Lane (H1-PAPE4519)	27-Jan-22	10:41	☑	☐
Flushing Zone H1	4523 Paperbark Lane (H1-PAPE4523)	24-Jan-22	12:27	☑	☐
Flushing Zone H1	4525 Paperbark Lane (H1-PAPE4525)	24-Jan-22	15:53	☑	☐
Flushing Zone H1	4529 Paperbark Lane (H1-PAPE4529)	25-Jan-22	12:25	☑	☐
Flushing Zone H1	4531 Paperbark Lane (H1-PAPE4531)	25-Jan-22	15:57	☑	☐
Flushing Zone H1	4537 Paperbark Lane (H1-PAPE4537)	28-Jan-22	11:30	☑	☐
Flushing Zone H1	4539 Paperbark Lane (H1-PAPE4539)	28-Jan-22	08:01	☑	☐
Flushing Zone H1	4543 Paperbark Lane (H1-PAPE4543)	28-Jan-22	14:56	☑	☐
Flushing Zone H1	4545 Paperbark Lane (H1-PAPE4545)	30-Jan-22	15:43	☑	☐
Flushing Zone H1	6615 Plumeria Loop (H1-PLUM6615)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	6617 Plumeria Loop (H1-PLUM6617)	02-Feb-22	14:00	☑	☐
Flushing Zone H1	6664 Plumeria Loop (H1-PLUM6664)	02-Feb-22	07:32	☑	☐
Flushing Zone H1	6667 Plumeria Loop (H1-PLUM6667)	25-Jan-22	15:40	☑	☐
Flushing Zone H1	6668 Plumeria Loop (H1-PLUM6668)	02-Feb-22	15:00	☑	☐
Flushing Zone H1	6670 Plumeria Loop (H1-PLUM6670)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	6671 Plumeria Loop (H1-PLUM6671)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	6673 Plumeria Loop (H1-PLUM6673)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	6675 Plumeria Loop (H1-PLUM6675)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	6677 Plumeria Loop (H1-PLUM6677)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	6679 Plumeria Loop (H1-PLUM6679)	26-Jan-22	14:30	☑	☐
Flushing Zone H1	6681 Plumeria Loop (H1-PLUM6681)	25-Jan-22	13:00	☑	☐
Flushing Zone H1	4918 Pohina Lane (H1-POHI4918)	26-Jan-22	11:30	☑	☐
Flushing Zone H1	4919 Pohina Lane (H1-POHI4919)	24-Jan-22	12:18	☑	☐
Flushing Zone H1	4920 Pohina Lane (H1-POHI4920)	25-Jan-22	16:14	☑	☐
Flushing Zone H1	4921 Pohina Lane (H1-POHI4921)	24-Jan-22	15:04	☑	☐
Flushing Zone H1	4924 Pohina Lane (H1-POHI4924)	27-Jan-22	11:25	☑	☐
Flushing Zone H1	4925 Pohina Lane (H1-POHI4925)	27-Jan-22	11:25	☑	☐
Flushing Zone H1	4926 Pohina Lane (H1-POHI4926)	27-Jan-22	14:20	☑	☐
Flushing Zone H1	4927 Pohina Lane (H1-POHI4927)	25-Jan-22	12:45	☑	☐
Flushing Zone H1	2374 Pomelaiki Lane (H1-POME2374)	26-Jan-22	08:15	☑	☐
Flushing Zone H1	2375 Pomelaiki Lane (H1-POME2375)	27-Jan-22	08:02	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Flushing Zone H1

2021-12-28 - 2022-02-27

Flushing Zone H1	2378 Pomelaiki Lane (H1-POME2378)	26-Jan-22	13:15	☑	☐
Flushing Zone H1	2379 Pomelaiki Lane (H1-POME2379)	26-Jan-22	15:20	☑	☐
Flushing Zone H1	2383 Pomelaiki Lane (H1-POME2383)	27-Jan-22	17:45	☑	☐
Flushing Zone H1	2312 Pomelaiki Street (H1-POME2312)	26-Jan-22	08:15	☑	☐
Flushing Zone H1	2316 Pomelaiki Street (H1-POME2316)	28-Jan-22	07:55	☑	☐
Flushing Zone H1	2320 Pomelaiki Street (H1-POME2320)	28-Jan-22	11:28	☑	☐
Flushing Zone H1	2324 Pomelaiki Street (H1-POME2324)	28-Jan-22	14:54	☑	☐
Flushing Zone H1	2328 Pomelaiki Street (H1-POME2328)	27-Jan-22	12:27	☑	☐
Flushing Zone H1	2332 Pomelaiki Street (H1-POME2332)	27-Jan-22	12:24	☑	☐
Flushing Zone H1	2336 Pomelaiki Street (H1-POME2336)	29-Jan-22	08:06	☑	☐
Flushing Zone H1	2340 Pomelaiki Street (H1-POME2340)	30-Jan-22	15:50	☑	☐
Flushing Zone H1	2344 Pomelaiki Street (H1-POME2344)	02-Feb-22	14:20	☑	☐
Flushing Zone H1	2348 Pomelaiki Street (H1-POME2348)	02-Feb-22	08:00	☑	☐
Flushing Zone H1	2352 Pomelaiki Street (H1-POME2352)	25-Jan-22	12:30	☑	☐
Flushing Zone H1	2356 Pomelaiki Street (H1-POME2356)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	2360 Pomelaiki Street (H1-POME2360)	25-Jan-22	15:05	☑	☐
Flushing Zone H1	2364 Pomelaiki Street (H1-POME2364)	24-Jan-22	12:53	☑	☐
Flushing Zone H1	6102 Potata Lane (H1-POTA6102)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	6104 Potata Lane (H1-POTA6104)	29-Jan-22	08:00	☑	☐
Flushing Zone H1	6107 Potata Lane (H1-POTA6107)	01-Feb-22	11:00	☑	☐
Flushing Zone H1	6109 Potata Lane (H1-POTA6109)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	6110 Potata Lane (H1-POTA6110)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	6112 Potata Lane (H1-POTA6112)	31-Jan-22	08:00	☑	☐
Flushing Zone H1	6113 Potata Lane (H1-POTA6113)	31-Jan-22	07:00	☑	☐
Flushing Zone H1	6115 Potata Lane (H1-POTA6115)	31-Jan-22	17:00	☑	☐
Flushing Zone H1	2446 Puakika Street (H1-PUAK2446)	24-Jan-22	12:30	☑	☐
Flushing Zone H1	2450 Puakika Street (H1-PUAK2450)	25-Jan-22	02:00	☑	☐
Flushing Zone H1	2454 Puakika Street (H1-PUAK2454)	25-Jan-22	08:25	☑	☐
Flushing Zone H1	2458 Puakika Street (H1-PUAK2458)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	2462 Puakika Street (H1-PUAK2462)	25-Jan-22	11:00	☑	☐
Flushing Zone H1	2466 Puakika Street (H1-PUAK2466)	02-Feb-22	08:00	☑	☐
Flushing Zone H1	2136 Rim Loop (H1-RIML2136)	29-Jan-22	09:00	☑	☐
Flushing Zone H1	2138 Rim Loop (H1-RIML2138)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	2142 Rim Loop (H1-RIML2142)	02-Feb-22	11:00	☑	☐
Flushing Zone H1	2144 Rim Loop (H1-RIML2144)	28-Jan-22	08:00	☑	☐
Flushing Zone H1	2148 Rim Loop (H1-RIML2148)	28-Jan-22	12:00	☑	☐
Flushing Zone H1	2150 Rim Loop (H1-RIML2150)	28-Jan-22	13:00	☑	☐
Flushing Zone H1	2154 Rim Loop (H1-RIML2154)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	2156 Rim Loop (H1-RIML2156)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	2164 Rim Loop (H1-RIML2164)	25-Jan-22	02:00	☑	☐
Flushing Zone H1	2166 Rim Loop (H1-RIML2166)	24-Jan-22	17:00	☑	☐
Flushing Zone H1	2172 Rim Loop (H1-RIML2172)	24-Feb-22	13:00	☑	☐
Flushing Zone H1	2174 Rim Loop (H1-RIML2174)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	2178 Rim Loop (H1-RIML2178)	25-Jan-22	08:00	☑	☐
Flushing Zone H1	2180 Rim Loop (H1-RIML2180)	26-Jan-22	12:35	☑	☐
Flushing Zone H1	2186 Rim Loop (H1-RIML2186)	25-Jan-22	13:00	☑	☐
Flushing Zone H1	2188 Rim Loop (H1-RIML2188)	24-Jan-22	16:00	☑	☐

Flushing Zone H1

2021-12-28 - 2022-02-27

Flushing Zone H1	2192 Rim Loop (H1-RIML2192)	25-Jan-22	09:00	☑	☐
Flushing Zone H1	2194 Rim Loop (H1-RIML2194)	25-Jan-22	12:00	☑	☐
Flushing Zone H1	201 Skyview Loop (H1-SKYV0201)	01-Feb-22	16:00	☑	☐
Flushing Zone H1	203 Skyview Loop (H1-SKYV0203)	01-Feb-22	07:00	☑	☐
Flushing Zone H1	245 Skyview Loop (H1-SKYV0245)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	247 Skyview Loop (H1-SKYV0247)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	349 Skyview Loop (H1-SKYV0349)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	351 Skyview Loop (H1-SKYV0351)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	383 Skyview Loop (H1-SKYV0383)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	385 Skyview Loop (H1-SKYV0385)	01-Feb-22	15:00	☑	☐
Flushing Zone H1	413 Skyview Loop (H1-SKYV0413)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	415 Skyview Loop (H1-SKYV0415)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	435 Skyview Loop (H1-SKYV0435)	01-Feb-22	08:00	☑	☐
Flushing Zone H1	437 Skyview Loop (H1-SKYV0437)	01-Feb-22	14:00	☑	☐
Flushing Zone H1	457 Skyview Loop (H1-SKYV0457)	31-Jan-22	14:00	☑	☐
Flushing Zone H1	459 Skyview Loop (H1-SKYV0459)	31-Jan-22	11:00	☑	☐
Flushing Zone H1	3251 Tecoma Lane (H1-TECO3251)	28-Jan-22	13:00	☑	☐
Flushing Zone H1	3253 Tecoma Lane (H1-TECO3253)	28-Jan-22	09:00	☑	☐
Flushing Zone H1	3257 Tecoma Lane (H1-TECO3257)	28-Jan-22	17:00	☑	☐
Flushing Zone H1	3259 Tecoma Lane (H1-TECO3259)	29-Jan-22	11:00	☑	☐
Flushing Zone H1	3263 Tecoma Lane (H1-TECO3263)	27-Jan-22	08:00	☑	☐
Flushing Zone H1	3265 Tecoma Lane (H1-TECO3265)	02-Feb-22	12:00	☑	☐
Flushing Zone H1	5605 Tulip Lane (H1-TULI5605)	27-Jan-22	14:00	☑	☐
Flushing Zone H1	5607 Tulip Lane (H1-TULI5607)	27-Jan-22	12:00	☑	☐
Flushing Zone H1	5611 Tulip Lane (H1-TULI5611)	02-Feb-22	07:00	☑	☐
Flushing Zone H1	5613 Tulip Lane (H1-TULI5613)	01-Feb-22	12:00	☑	☐
Flushing Zone H1	5617 Tulip Lane (H1-TULI5617)	26-Jan-22	08:07	☑	☐
Flushing Zone H1	5619 Tulip Lane (H1-TULI5619)	26-Jan-22	10:50	☑	☐
Flushing Zone H1	5623 Tulip Lane (H1-TULI5623)	26-Jan-22	10:50	☑	☐
Flushing Zone H1	5625 Tulip Lane (H1-TULI5625)	26-Jan-22	16:22	☑	☐

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residential Flushing

Key

- Not Started
- No Access
- In Progress
- Complete

Flushing Zone H1

2022-01-22 - 2022-01-27

Total Facilities	Total Facilities Flushed	Percent Complete	No Access	Flushed on Selected Dates
13	13	100.0 %	0	13

Zone	Neighborhood	Address	Appointment Date/Time	Arrive Date	Start Time	Certified	Summary General Notes	Unable To Access	Access Reason
Flushing Zone H1		AMR IPC Spray Park (H1-BLDG1788A)		24-Jan-22	08:36	☑		☐	
Flushing Zone H1		Building 142,AMR1 SPS (H1-BLDG0142)		23-Jan-22	13:10	☑		☐	
Flushing Zone H1		Building 1780,Physical Fitness Center (H1-		22-Jan-22	11:38	☑		☐	
Flushing Zone H1		Building 1781,Gym (H1-BLDG1781)		22-Jan-22	14:14	☑		☐	
Flushing Zone H1		Building 1782,CYS / Army Community		22-Jan-22	11:30	☑		☐	
Flushing Zone H1		Building 1783,CDC - Under 6 years (H1-		23-Jan-22	08:50	☑		☐	
Flushing Zone H1		Building 1785,Pool (H1-BLDG1785)		27-Jan-22	10:17	☑		☐	
Flushing Zone H1		Building 1788,Community Center (H1-		22-Jan-22	11:33	☑		☐	
Flushing Zone H1		Building 1790,Chapel (H1-BLDG1790)		22-Jan-22	13:30	☑		☐	
Flushing Zone H1		Building 1795,Youth Activities Center (H1-		22-Jan-22	14:22	☑		☐	
Flushing Zone H1		Building 880,AAFES Gas Station		26-Jan-22	06:14	☑		☐	
Flushing Zone H1		Building 884,AAFES (H1-BLDG0884)		27-Jan-22	06:59	☑		☐	
Flushing Zone H1		Building 888,Dominoes (H1-BLDG0888)		26-Jan-22	06:07	☑		☐	

Key

- Not Started
- No Access
- In Progress
- Complete

Section 2b.1 Flushing Records and Distribution System Pressure Logs During Residiential Flushing

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-ALIA0928	H1-ALIA0928	H1-AMAD3218	H1-AMAD3218	H1-AMAD3353	H1-AMAP3711	H1-AMAP3716	H1-AMAP3716
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	928 Aliamanu Drive	928 Aliamanu Drive	3218 Ama Drive	3218 Ama Drive	3353 Ama Drive	3711 Amapa Lane	3716 Amapa Lane	3716 Amapa Lane
Field Sample ID:	220128H1GT05	220130H1BT02	220127H1HT06	220129H1ET04	220201H1CT04	220127H1GT07	220130H1DT06	220130H1DT07
Sample Date:	2022-01-28	2022-01-30	2022-01-27	2022-01-29	2022-02-01	2022-01-27	2022-01-30	2022-01-30
Sample Type:	N	N (72 Hour Stagnation)	N	N (72 Hour Stagnation)	N	N	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: C22A061rev1	SDG: C22A071	SDG: C22A057	SDG: C22A064	SDG: C22B009	SDG: C22A057	SDG: C22A071	SDG: C22A071
Total Organic Carbon	2	None	None	None	**1.72**	**2.36**	**2.06**	**1.69**	**1.78**	0.200 U	**1.76**	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: 5801097541	SDG: 5801097891	SDG: 5801097491	SDG: DA41376	SDG: 5801098621	SDG: 5801097491	SDG: 5801097891	SDG: 5801097891
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	92.0 U	92.0 U	97.0 U	190 U	92.0 U	**98.0 J**	91.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	31.0 U	31.0 U	40.0 U	31.0 U	31.0 UJ	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	180 U	190 U	190 U	180 U	180 U	180 U	180 U

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: 810133921	SDG: 35693538	SDG: 810133831	SDG: DA41376	SDG: 35694113	SDG: 810133831	SDG: 35693538	SDG: 35693538
Mercury	0.025	0.025	2	2	0.0560 U	0.0900 U	0.0560 U	0.0250 U	0.0900 U	0.0560 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: 810133921	SDG: 35693538	SDG: 810133831	SDG: DA41376	SDG: 35694113	SDG: 810133831	SDG: 35693538	SDG: 35693538
Antimony	6	6	6	6	0.0570 U	0.210 U	0.0570 U	0.100 U	0.210 U	0.0570 U	0.210 U	0.210 U
Arsenic	10	10	10	10	0.890 U	0.500 U	0.890 U	0.500 U	0.500 U	0.890 U	0.500 U	0.500 U
Barium	220	220	2000	2000	**2.20**	**2.20**	**2.00**	**2.50**	**2.10**	**2.00**	**3.60**	**3.70**
Beryllium	0.66	0.66	4	4	0.0830 U	0.0700 U	0.0830 U	0.150 U	0.140 U	0.0830 U	0.0700 U	0.0700 U
Cadmium	3	3	5	5	0.140 U	0.120 U	0.140 U	0.0500 UJ	0.120 U	0.140 U	0.120 U	0.120 U
Chromium	11	11	100	100	**1.80**	**1.30 J**	**1.80**	**1.50 J**	**2.50 J**	**1.90**	**1.70 J**	**1.70 J**
Copper	2.9	2.9	1300	1300	**15.0**	**13.5**	**22.0**	**44.4**	**9.50**	**24.0**	**7.40**	**7.30**
Lead	15	5.6	15	15	**0.730**	**1.80**	**0.170 J**	**0.440 J**	**0.310 J**	**0.950**	**0.470 J**	**0.430 J**
Mercury	0.025	0.025	2	2	--	--	--	--	--	--	--	--
Selenium	5	5	50	50	1.60 U	**0.870 J**	1.60 U	0.300 UJ	0.830 U	1.60 U	**1.60**	**1.70**
Thallium	2	2	2	2	0.160 U	0.500 U	0.160 U	0.0500 U	0.500 U	0.160 U	0.500 U	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-AMAP3717	H1-AMAP3736	H1-AREC3313	H1-BAMB3606	H1-BAMB3625	H1-BAMB3649	H1-BAUH2726	H1-BAUH2726
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	3717 Amapa Lane	3736 Amapa Lane	3313 Areca Lane	3606 Bamboo Lane	3625 Bamboo Lane	3649 Bamboo Lane	2726 Bauhina Lane	2726 Bauhina Lane
Field Sample ID:	220130H1DT05	220201H1CT01	220129H1KT01	220128H1HT04	220131H1BT01	220202H1FT06	220127H1GT04	220127H1GT05
Sample Date:	2022-01-30	2022-02-01	2022-01-29	2022-01-28	2022-01-31	2022-02-02	2022-01-27	2022-01-27
Sample Type:	N	N	N	N	N	N	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: C22A071	SDG: C22B009	SDG: C22A064	SDG: C22A061rev1	SDG: C22B002	SDG: C22B012	SDG: C22A057	SDG: C22A057
Total Organic Carbon	2	None	None	None	0.200 U	0.200 U	**2.11**	0.200 U	**2.00**	**1.84 J**	0.200 U	**1.53**

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: 5801097891	SDG: 5801098621	SDG: 5801097551	SDG: 5801097551	SDG: 5801098161	SDG: DA41510	SDG: 5801097291	SDG: 5801097291
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	91.0 U	95.0 U	94.0 U	93.0 U	91.0 U	190 U	92.0 U	93.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	31.0 U	31.0 U	31.0 U	31.0 U	40.0 U	100 UJ	100 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	190 U	190 U	190 U	180 U	190 U	180 U	190 U

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: 35693538	SDG: 35694113	SDG: 810134391	SDG: 810133921	SDG: 35693853	SDG: DA41510	SDG: 810132981	SDG: 810132981
Mercury	0.025	0.025	2	2	0.0900 U	0.0900 U	0.0560 U	0.0560 U	0.0900 U	0.0250 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: 35693538	SDG: 35694113	SDG: 810134391	SDG: 810133921	SDG: 35693853	SDG: DA41510	SDG: 810132981	SDG: 810132981
Antimony	6	6	6	6	0.210 U	0.210 U	0.0570 U	0.0570 U	0.210 U	0.100 U	0.0570 U	0.0570 U
Arsenic	10	10	10	10	0.500 U	0.500 U	0.890 U	0.890 U	0.500 U	0.500 UJ	0.890 U	0.890 U
Barium	220	220	2000	2000	**3.10**	**2.30**	**2.90**	**2.20**	**2.40**	**2.00**	**2.80**	**2.70**
Beryllium	0.66	0.66	4	4	0.0700 U	0.140 U	0.0830 U	0.0830 U	0.0700 U	0.150 U	0.0830 U	0.0830 U
Cadmium	3	3	5	5	0.120 U	0.120 U	0.140 U	0.140 U	0.120 U	0.0500 UJ	0.140 U	0.140 U
Chromium	11	11	100	100	**1.50 J**	2.20 U	**2.00**	**1.60**	**1.40 J**	**1.50 J**	**1.80**	**1.80**
Copper	2.9	2.9	1300	1300	**7.20**	**9.80**	**9.90**	**11.0**	**10.8**	**8.70**	**13.0**	**12.0**
Lead	15	5.6	15	15	**1.40**	0.220 U	**0.260 J**	**0.190 J**	**0.320 J**	**0.180 J**	**0.250 J**	**0.210 J**
Mercury	0.025	0.025	2	2	--	--	--	--	--	--	--	--
Selenium	5	5	50	50	**1.20**	0.830 U	1.60 U	1.60 U	0.830 U	0.300 U	1.60 U	1.60 U
Thallium	2	2	2	2	0.500 U	0.500 U	0.160 U	0.160 U	0.500 U	0.0500 U	0.160 U	0.160 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:				H1-BEGO4164	H1-BEGO4170	H1-BLDG0880	H1-BLDG1782	H1-BLDG1782	H1-BLDG1782	H1-BLDG1783	H1-BLDG1783
Location Type:				Residence	Residence	Non-Residence	Non-Residence	Non-Residence	Non-Residence	Non-Residence	Non-Residence
Residence:				4164 Begonia Loop	4170 Begonia Loop	Building 880,AAFES Gas Station Shoppette	Building 1782,CYS / Army Community Center	Building 1782,CYS / Army Community Center	Building 1782,CYS / Army Community Center	Building 1783,CDC - Under 6 years	Building 1783,CDC - Under 6 years
Field Sample ID:				220201H1DT04	220202H1JT02	220129H1JT06	H1-TW-2201001-01024-A-01	H1-TW-2201001-22024-A-02	H1-TW-2201002-01024-A-01	H1-TW-2201044-22024-3-A-01	H1-TW-2201044-22024-A-01
Sample Date:				2022-02-01	2022-02-02	2022-01-29	2022-01-24	2022-01-24	2022-01-24	2022-01-25	2022-01-25
Sample Type:				N	N	N	N	N	N	FD	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: C22B009**	**SDG: C22B012**	**SDG: C22A064**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41305**	**SDG: DA41305**
Total Organic Carbon	2	None	None	None	**5.34**	**1.60 J**	0.200 U	0.200 U	0.200 U	0.200 U	**0.650**	**0.600**
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: 5801098621**	**SDG: DA41510**	**SDG: 5801097551**	**SDG: DA41269A**	**SDG: DA41269A**	**SDG: DA41269A**	**SDG: DA41305**	**SDG: DA41305**
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	92.0 U	190 U	92.0 U	190 U	190 UJ	190 U	--	190 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	40.0 U	31.0 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 U	180 U	190 UJ	190 UJ	190 UJ	190 UJ	190 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: 35694111**	**SDG: DA41510**	**SDG: 810133941**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41305**	**SDG: DA41305**
Mercury	0.025	0.025	2	2	0.0900 U	0.0250 U	0.0560 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: 35694111**	**SDG: DA41510**	**SDG: 810133941**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41305**	**SDG: DA41305**
Antimony	6	6	6	6	0.210 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 U	0.500 UJ	0.890 U	0.500 U	0.500 U	0.500 U	--	0.500 U
Barium	220	220	2000	2000	**2.20**	**2.10**	**3.00**	**2.30**	**2.40**	**2.20**	**2.30**	**2.30**
Beryllium	0.66	0.66	4	4	0.140 U	0.150 U	0.0830 U	0.150 U	0.150 U	0.150 U	0.150 UJ	0.150 UJ
Cadmium	3	3	5	5	0.120 U	0.0500 UJ	0.140 U	0.0500 U	0.0500 U	0.0500 U	--	0.0500 UJ
Chromium	11	11	100	100	**2.30 J**	**1.70 J**	**1.80**	**1.30 J**	**1.30 J**	**1.30 J**	**1.40 J**	**1.50 J**
Copper	2.9	2.9	1300	1300	**17.7**	**13.3**	**16.0**	**54.0**	**51.2**	**181**	--	**66.7**
Lead	15	5.6	15	15	**0.230 J**	**0.280 J**	**0.190 J**	**0.210 J**	**0.300 J**	**8.50**	**0.240 J**	**0.300 J**
Mercury	0.025	0.025	2	2	--	--	--	--	--	--	--	--
Selenium	5	5	50	50	0.830 U	0.300 U	**1.80 J**	0.300 U	0.300 U	0.300 U	--	0.300 U
Thallium	2	2	2	2	0.500 U	0.0500 U	0.160 U	0.0500 U	0.0500 U	**0.0950 J**	**0.0510 J**	**0.0670 J**

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:				H1-BLDG1783	H1-BLDG1795	H1-BLDG1875	H1-BLDG1875	H1-BOUG0140	H1-BOUG0158	H1-BOUG0158	H1-BOUG0258
Location Type:				Non-Residence	Non-Residence	Non-Residence	Non-Residence	Residence	Residence	Residence	Residence
Residence:				Building 1783,CDC - Under 6 years	Building 1795,Youth Activities Center	Building 1875,Private/Organizational Club	Building 1875,Private/Organizational Club	140 Bougainvillea Loop	158 Bougainvillea Loop	158 Bougainvillea Loop	258 Bougainvillea Loop
Field Sample ID:				H1-TW-2201044-22024-A-02	H1-TW-2201002-22024-A-02	220127H1KT05	220127H1LT02	220129H1GT04	220129H1MT03	220131H1HT04	220126H1JT09
Sample Date:				2022-01-25	2022-01-24	2022-01-27	2022-01-27	2022-01-29	2022-01-29	2022-01-31	2022-01-26
Sample Type:				N	N	N	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: DA41305**	**SDG: DA41269**	**SDG: DA41358**	**SDG: C22A057**	**SDG: C22A064**	**SDG: C22A064**	**SDG: C22B002**	**SDG: 810132961**
Total Organic Carbon	2	None	None	None	**0.270 J**	0.200 U	**0.640**	0.200 U	0.200 U	0.200 U	**2.13**	0.250 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: DA41305**	**SDG: DA41269A**	**SDG: 5801097491**	**SDG: 5801097491**	**SDG: DA41376**	**SDG: 5801097601**	**SDG: 5801098621**	**SDG: 5801097291**
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	190 U	91.0 U	92.0 U	190 UJ	91.0 U	91.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	40.0 U	31.0 U	31.0 UJ	40.0 U	31.0 U	31.0 U	100 UJ
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 UJ	190 UJ	180 U	180 U	190 UJ	180 U	180 U	180 U
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: DA41305**	**SDG: DA41269**		**SDG: 810133831**	**SDG: DA41376**	**SDG: 810133941**	**SDG: 35693856**	**SDG: 810132961**
Mercury	0.025	0.025	2	2	0.0250 U	0.0250 U	--	0.0560 U	0.0250 U	0.0560 U	0.0900 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: DA41305**	**SDG: DA41269**	**SDG: 983695**	**SDG: 810133831**	**SDG: DA41376**	**SDG: 810133941**	**SDG: 35693856**	**SDG: 810132961**
Antimony	6	6	6	6	0.100 U	0.100 U	**0.110 J**	0.0570 U	0.100 U	0.0570 U	0.210 U	0.0570 U
Arsenic	10	10	10	10	0.500 U	0.500 U	0.210 U	0.890 U	0.500 U	0.890 U	0.500 U	0.890 U
Barium	220	220	2000	2000	**2.40**	**2.20**	**2.90**	**2.80**	**2.30**	**3.60**	**2.70**	**2.20**
Beryllium	0.66	0.66	4	4	0.150 UJ	0.150 U	0.0910 U	0.0830 U	0.150 U	0.0830 U	0.0700 U	0.0830 U
Cadmium	3	3	5	5	0.0500 UJ	0.0500 U	0.0290 U	0.140 U	0.0500 UJ	0.140 U	0.120 U	0.140 U
Chromium	11	11	100	100	**1.40 J**	**1.30 J**	**1.40**	**1.90**	**1.30 J**	**2.10**	**1.50 J**	**1.40**
Copper	2.9	2.9	1300	1300	**36.7**	**41.8**	**68.0**	**31.0**	**23.5**	**41.0**	**39.5**	**160**
Lead	15	5.6	15	15	**0.290 J**	**0.310 J**	**0.570**	**0.570**	**0.270 J**	**0.900**	**0.670 J**	**0.680**
Mercury	0.025	0.025	2	2	--	--	0.0200 U	--	--	--	--	--
Selenium	5	5	50	50	0.300 U	0.300 U	**0.600 J**	1.60 U	0.300 UJ	**2.60**	0.830 U	1.60 U
Thallium	2	2	2	2	0.0500 U	**0.110 J**	0.0410 U	0.160 U	0.0500 U	0.160 U	0.500 U	0.160 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-BOUG0275	H1-BOUG0299	H1-BOUG0571	H1-BOUG0578	H1-CALA3016	H1-CALA3030	H1-CALA3089	H1-CALA3119
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	275 Bougainvillea Loop	299 Bougainvillea Loop	571 Bougainvillea Loop	578 Bougainvillea Loop	3016 Calamondin Way	3030 Calamondin Way	3089 Calamondin Way	3119 Calamondin Way
Field Sample ID:	220129H1GT03	220129H1MT04	220202H1IT02	220202H1IT03	220129H1LT01	220128H1IT02	220130H1ET04	220128H1IT01
Sample Date:	2022-01-29	2022-01-29	2022-02-02	2022-02-02	2022-01-29	2022-01-28	2022-01-30	2022-01-28
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: C22A064	SDG: C22A064	SDG: C22B012	SDG: C22B012	SDG: C22A064	SDG: DA41358	SDG: C22A071	SDG: DA41358
Total Organic Carbon	2	None	None	None	**1.56**	0.200 U	0.200 UJ	**2.05 J**	**1.59**	0.200 U	0.200 U	**0.550**

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: DA41376	SDG: 5801097601	SDG: DA41510	SDG: DA41510	SDG: 5801097541	SDG: 5801097541	SDG: 5801097891	SDG: 5801097541
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	93.0 U	190 U	190 U	91.0 U	92.0 U	93.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	31.0 U	40.0 U	40.0 U	31.0 U	31.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	190 U	190 U	190 U	180 U	180 U	190 U	180 U

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: DA41376	SDG: 810133941	SDG: DA41510	SDG: DA41510	SDG: 810134391		SDG: 35693538	
Mercury	0.025	0.025	2	2	0.0250 U	**0.0560 J**	0.0250 U	0.0250 U	0.0560 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: DA41376	SDG: 810133941	SDG: DA41510	SDG: DA41510	SDG: 810134391	SDG: 983843	SDG: 35693538	SDG: 983843
Antimony	6	6	6	6	0.100 U	0.0570 U	0.100 U	0.200 U	0.0570 U	0.110 U	0.210 U	0.110 U
Arsenic	10	10	10	10	0.500 U	0.890 U	0.500 UJ	1.00 UJ	0.890 U	**0.310 J**	0.500 U	**0.450 J**
Barium	220	220	2000	2000	**3.30**	**3.40**	**2.20**	**2.10 J**	**3.40**	**2.40**	**2.10**	**2.20**
Beryllium	0.66	0.66	4	4	0.150 U	0.0830 U	0.150 U	0.300 U	0.0830 U	0.0910 U	0.0700 U	0.0910 U
Cadmium	3	3	5	5	0.0500 UJ	0.140 U	0.0500 UJ	0.100 UJ	0.140 U	0.0290 U	0.120 U	0.0290 U
Chromium	11	11	100	100	**1.50 J**	**2.10**	**1.60 J**	**1.90 J**	**2.10**	**1.30**	**1.20 J**	**1.30**
Copper	2.9	2.9	1300	1300	**14.9**	**9.30**	**22.6**	**14.8**	**11.0**	**21.0**	**9.70**	**17.0**
Lead	15	5.6	15	15	**0.280 J**	**0.630**	**0.690**	**0.500 J**	**0.300 J**	**0.620**	**0.450 J**	**0.170 J**
Mercury	0.025	0.025	2	2	--	--	--	--	--	0.0200 U	--	0.0200 U
Selenium	5	5	50	50	0.300 UJ	**2.40**	0.300 U	0.600 U	1.60 U	**1.40 J**	**0.860 J**	**1.90 J**
Thallium	2	2	2	2	0.0500 U	0.160 U	0.0500 U	0.100 U	0.160 U	0.0410 U	0.500 U	0.0410 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-CALA3120	H1-CALA3156	H1-CENT2218	H1-CENT2218	H1-CENT2220	H1-CENT2268	H1-CENT2303	H1-CIGA6203
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	3120 Calamondin Way	3156 Calamondin Way	2218 Center Street	2218 Center Street	2220 Center Street	2268 Center Street	2303 Center Street	6203 Cigar Lane
Field Sample ID:	220128H1HT05	220203H1BT03	220128H1IT05	220130H1AT01	220126H1JT01	220204H1CT01	220129H1KT02	220129H1JT01
Sample Date:	2022-01-28	2022-02-03	2022-01-28	2022-01-30	2022-01-26	2022-02-04	2022-01-29	2022-01-29
Sample Type:	N	N	N	N (72 Hour Stagnation)	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: C22A061rev1	SDG: C22B017	SDG: DA41358	SDG: C22A071	SDG: 810132961	SDG: C22B020	SDG: C22A064	SDG: C22A064
Total Organic Carbon	2	None	None	None	0.200 U	**1.52**	**0.540**	**2.20**	0.250 U	**9.59**	**2.15**	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: 5801097551	SDG: DA41540	SDG: 5801097541	SDG: 5801097891	SDG: 5801097291	SDG: DA41569	SDG: 5801097551	SDG: 5801097551
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	92.0 U	190 U	94.0 U	92.0 U	93.0 U	190 U	95.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	40.0 U	100 UJ	31.0 U	100 UJ	40.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	190 U	190 U	180 U	190 U	190 U	190 U	180 U

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: 810133921	SDG: DA41540		SDG: 35693538	SDG: 810132961	SDG: DA41569	SDG: 810134391	SDG: 810133941
Mercury	0.025	0.025	2	2	0.0560 U	0.0250 U	--	0.0900 U	0.0560 U	0.0250 U	0.0560 U	**0.0600 J**

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: 810133921	SDG: DA41540	SDG: 983843	SDG: 35693538	SDG: 810132961	SDG: DA41569	SDG: 810134391	SDG: 810133941
Antimony	6	6	6	6	0.0570 U	0.100 U	0.110 U	0.210 U	0.0570 U	0.100 U	0.0570 U	0.0570 U
Arsenic	10	10	10	10	0.890 U	0.500 U	**0.330 J**	0.500 U	0.890 U	0.500 U	0.890 U	0.890 U
Barium	220	220	2000	2000	**2.30**	**2.00**	**2.40**	**2.40**	**1.10 J**	**2.10**	**2.90**	**2.20**
Beryllium	0.66	0.66	4	4	0.0830 U	0.150 U	0.0910 U	0.0700 U	0.0830 U	0.150 U	0.0830 U	0.0830 U
Cadmium	3	3	5	5	0.140 U	0.0500 U	0.0290 U	0.120 U	0.140 U	0.0500 U	0.140 U	0.140 U
Chromium	11	11	100	100	**1.70**	**1.50 J**	**1.30**	**1.50 J**	**0.480 J**	**1.80 J**	**2.00**	**1.70**
Copper	2.9	2.9	1300	1300	**19.0**	**6.90**	**92.0**	**25.4**	**74.0**	**18.4**	**12.0**	**13.0**
Lead	15	5.6	15	15	**0.180 J**	**0.240 J**	**0.900**	**0.250 J**	**0.580**	**0.220 J**	**0.790**	**0.330 J**
Mercury	0.025	0.025	2	2	--	--	0.0200 U	--	--	--	--	--
Selenium	5	5	50	50	1.60 U	0.300 U	**1.20 J**	**1.00**	1.60 U	0.300 U	1.60 U	1.60 U
Thallium	2	2	2	2	0.160 U	0.0500 U	0.0410 U	0.500 U	0.160 U	0.0500 U	0.160 U	0.160 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-CIGA6203	H1-CIGA6203	H1-CIGA6210	H1-CIGA6210	H1-CORA2143	H1-CORA2143	H1-CORA2151	H1-CROT4217
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	6203 Cigar Lane	6203 Cigar Lane	6210 Cigar Lane	6210 Cigar Lane	2143 Coral Lane	2143 Coral Lane	2151 Coral Lane	4217 Croton Street
Field Sample ID:	220129H1JT02	220131H1HT05	220127H1IT01	220127H1IT02	220128H1HT01	220128H1HT02	220203H1AT04	220131H1BT05
Sample Date:	2022-01-29	2022-01-31	2022-01-27	2022-01-27	2022-01-28	2022-01-28	2022-02-03	2022-01-31
Sample Type:	FD	N (72 Hour Stagnation)	N	FD	N	FD	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: C22A064	SDG: C22B002	SDG: DA41348	SDG: DA41348	SDG: C22A061rev1	SDG: C22A061rev1	SDG: C22B017	SDG: C22B002
Total Organic Carbon	2	None	None	None	0.200 U	**1.92**	**0.500**	**0.520**	0.200 U	0.200 U	**1.85**	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: 5801097551	SDG: 5801098621	SDG: 5801097291	SDG: 5801097291	SDG: 5801097551	SDG: 5801097551	SDG: DA41540	SDG: 5801098161
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	91.0 U	93.0 U	92.0 U	93.0 U	93.0 U	92.0 U	190 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	31.0 U	100 U	100 UJ	31.0 U	31.0 U	40.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	190 U	180 U	190 U	190 U	180 U	190 U	180 U

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: 810133941	SDG: 35693856			SDG: 810133921	SDG: 810133921	SDG: DA41540	SDG: 35693853
Mercury	0.025	0.025	2	2	**0.0720 J**	0.0900 U	--	--	0.0560 U	0.0560 U	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: 810133941	SDG: 35693856	SDG: 983698	SDG: 983698	SDG: 810133921	SDG: 810133921	SDG: DA41540	SDG: 35693853
Antimony	6	6	6	6	0.0570 U	0.210 U	0.110 U	0.110 U	0.0570 U	0.0570 U	0.100 U	0.210 U
Arsenic	10	10	10	10	0.890 U	0.500 U	**0.410 J**	**0.360 J**	0.890 U	0.890 U	0.500 U	0.500 U
Barium	220	220	2000	2000	**2.20**	**2.20**	**2.00**	**2.00**	**2.30**	**2.20**	**2.10**	**2.80**
Beryllium	0.66	0.66	4	4	0.0830 U	0.0700 U	0.0910 U	0.0910 U	0.0830 U	0.0830 U	0.150 U	0.0700 U
Cadmium	3	3	5	5	0.140 U	0.120 U	0.0290 U	0.0290 U	0.140 U	0.140 U	0.0500 U	0.120 U
Chromium	11	11	100	100	**1.70**	**1.40 J**	**1.50**	**1.50**	**1.70**	**1.80**	**1.60 J**	**1.20 J**
Copper	2.9	2.9	1300	1300	**15.0**	**15.5**	**13.0**	**14.0**	**20.0**	**20.0**	**17.7**	**17.7**
Lead	15	5.6	15	15	**0.330 J**	**0.530 J**	**0.230 J**	**0.260 J**	**0.260 J**	**0.230 J**	**0.260 J**	**0.400 J**
Mercury	0.025	0.025	2	2	--	--	0.0200 U	0.0200 U	--	--	--	--
Selenium	5	5	50	50	1.60 U	0.830 U	**1.50 J**	**1.20 J**	1.60 U	1.60 U	0.300 U	0.830 U
Thallium	2	2	2	2	0.160 U	0.500 U	0.0410 U	0.0410 U	0.160 U	0.160 U	0.0500 U	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-CROT4248	H1-CROT4292	H1-CROT4318	H1-FLAM2523	H1-FLAM2523	H1-GOLD6036	H1-GUAV3821	H1-GUAV3821
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	4248 Croton Street	4292 Croton Street	4318 Croton Street	2523 Flame Lane	2523 Flame Lane	6036 Gold Lane	3821 Guava Lane	3821 Guava Lane
Field Sample ID:	220202H1IT01	220202H1JT01	220203H1BT04	220203H1AT01	220203H1AT02	220128H1LT03	220129H1KT03	220131H1HT01
Sample Date:	2022-02-02	2022-02-02	2022-02-03	2022-02-03	2022-02-03	2022-01-28	2022-01-29	2022-01-31
Sample Type:	N	N	N	N	FD	N	N	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: C22B012	SDG: C22B012	SDG: C22B017	SDG: C22B017	SDG: C22B017	SDG: DA41358	SDG: C22A064	SDG: C22B002
Total Organic Carbon	2	None	None	None	0.200 UJ	0.200 UJ	**2.44**	0.200 U	0.200 U	**0.590**	**1.52**	**2.40**

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: DA41510	SDG: DA41510	SDG: DA41540	SDG: DA41540	SDG: DA41540	SDG: 5801097541	SDG: 5801097551	SDG: 5801098161
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	190 U	190 U	190 UJ	190 U	91.0 U	92.0 U	93.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	40.0 U	40.0 U	40.0 U	40.0 U	100 UJ	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	190 U	190 U	190 UJ	190 U	180 U	180 U	190 U

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: DA41510	SDG: DA41510	SDG: DA41540	SDG: DA41540	SDG: DA41540		SDG: 810134391	SDG: 35693858
Mercury	0.025	0.025	2	2	0.0250 U	0.0250 U	0.0250 U	0.0250 U	0.0250 U	--	0.0560 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: DA41510	SDG: DA41510	SDG: DA41540	SDG: DA41540	SDG: DA41540	SDG: 983846	SDG: 810134391	SDG: 35693858
Antimony	6	6	6	6	0.100 U	0.100 U	0.100 U	0.100 U	0.100 U	0.110 U	0.0570 U	0.210 U
Arsenic	10	10	10	10	0.500 UJ	0.500 UJ	0.500 U	0.500 U	0.500 U	**0.450 J**	0.890 U	0.500 U
Barium	220	220	2000	2000	**1.90 J**	**2.00**	**1.90 J**	**2.40**	**2.40**	**2.40**	**2.20**	**2.80**
Beryllium	0.66	0.66	4	4	0.150 U	0.150 U	0.150 U	0.150 U	0.150 U	0.0910 U	0.0830 U	0.0700 U
Cadmium	3	3	5	5	0.0500 UJ	0.0500 UJ	0.0500 U	0.0500 U	0.0500 U	0.0290 U	0.140 U	0.120 U
Chromium	11	11	100	100	**1.70 J**	**1.70 J**	**1.30 J**	**1.60 J**	**1.50 J**	**1.20**	**1.80**	**1.60 J**
Copper	2.9	2.9	1300	1300	**23.5**	**11.1**	**17.4**	**8.70**	**9.20**	**12.0**	**39.0**	**44.6**
Lead	15	5.6	15	15	**0.440 J**	0.130 U	0.130 U	**0.190 J**	**0.350 J**	**0.320 J**	**0.220 J**	**0.230 J**
Mercury	0.025	0.025	2	2	--	--	--	--	--	0.0200 U	--	--
Selenium	5	5	50	50	0.300 U	0.300 U	0.300 U	0.300 U	0.300 U	**1.90 J**	1.60 U	0.830 U
Thallium	2	2	2	2	**0.0680 J**	0.0500 U	0.0500 U	0.0500 U	0.0500 U	0.0410 U	0.160 U	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-GUAV3821	H1-GUAV3825	H1-GUAV3836	H1-GUAV3836	H1-GUAV3845	H1-GUAV3845	H1-GUM 3287	H1-GUM 3287
Location Type:					Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:					3821 Guava Lane	3825 Guava Lane	3836 Guava Lane	3836 Guava Lane	3845 Guava Lane	3845 Guava Lane	3287 Gum Lane	3287 Gum Lane
Field Sample ID:					220131H1HT02	220130H1ET03	220203H1BT01	220203H1BT02	220130H1ET01	220130H1ET02	220128H1JT08	220130H1AT02
Sample Date:					2022-01-31	2022-01-30	2022-02-03	2022-02-03	2022-01-30	2022-01-30	2022-01-28	2022-01-30
Sample Type:					FD (72 Hour Stagnation)	N	N	FD	N	FD	N	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: C22B002**	**SDG: C22A071**	**SDG: C22B017**	**SDG: C22B017**	**SDG: C22A071**	**SDG: C22A071**	**SDG: DA41376**	**SDG: C22A071**
Total Organic Carbon	2	None	None	None	**1.51**	0.200 U	0.200 U	**1.66**	0.200 U	**1.63**	**0.420 J**	**2.20**
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: 5801098161**	**SDG: 5801097891**	**SDG: DA41540**	**SDG: DA41540**	**SDG: 5801097891**	**SDG: 5801097891**	**SDG: 5801097541**	**SDG: 5801097891**
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	90.0 U	**160**	190 U	190 U	92.0 U	92.0 U	91.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	31.0 U	40.0 U	40.0 U	31.0 U	31.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	180 U	190 U	190 U	180 U	180 U	180 U	180 U
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: 35693858**	**SDG: 35693538**	**SDG: DA41540**	**SDG: DA41540**	**SDG: 35693538**	**SDG: 35693538**		**SDG: 35693538**
Mercury	0.025	0.025	2	2	0.0900 U	0.0900 U	0.0250 U	0.0250 U	0.0900 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: 35693858**	**SDG: 35693538**	**SDG: DA41540**	**SDG: DA41540**	**SDG: 35693538**	**SDG: 35693538**	**SDG: 983841**	**SDG: 35693538**
Antimony	6	6	6	6	0.210 U	0.210 U	0.100 U	0.100 U	0.210 U	0.210 U	0.110 U	0.210 U
Arsenic	10	10	10	10	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	**0.460 J**	0.500 U
Barium	220	220	2000	2000	**2.20**	**3.00**	**2.00**	**2.00**	**2.00**	**2.00**	**2.20**	**2.70**
Beryllium	0.66	0.66	4	4	0.0700 U	0.0700 U	0.150 U	0.150 U	0.0700 U	0.0700 U	0.0910 U	0.0700 U
Cadmium	3	3	5	5	0.120 U	0.120 U	0.0500 U	0.0500 U	0.120 U	0.120 U	0.0290 U	0.120 U
Chromium	11	11	100	100	**1.40 J**	**1.40 J**	**1.40 J**	**1.60 J**	**1.50 J**	**1.40 J**	**1.40**	**1.60 J**
Copper	2.9	2.9	1300	1300	**25.8**	**14.4**	**6.60**	**6.50**	**7.30**	**5.90**	**13.0**	**10.6**
Lead	15	5.6	15	15	0.220 U	**0.370 J**	**0.280 J**	**0.330 J**	**0.350 J**	**0.360 J**	**0.170 J**	**0.280 J**
Mercury	0.025	0.025	2	2	--	--	--	--	--	--	0.0200 U	--
Selenium	5	5	50	50	0.830 U	**1.30**	0.300 U	0.300 U	**1.00**	**0.920 J**	**2.10 J**	**1.30**
Thallium	2	2	2	2	0.500 U	0.500 U	0.0500 U	0.0500 U	0.500 U	0.500 U	0.0410 U	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-HAWT6706	H1-HAWT6706	H1-HAWT6739	H1-HILO4820	H1-IRON4015	H1-IXOR6649	H1-KAHO6106	H1-KAHO6134
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	6706 Hawthorne Place	6706 Hawthorne Place	6739 Hawthorne Place	4820 Hilo Holly Lane	4015 Ironwood Loop	6649 Ixora Lane	6106 Kahoohanohano Street	6134 Kahoohanohano Street
Field Sample ID:	220126H1IT01	220126H1IT02	220128H1LT05	220201H1DT01	220130H1LT01	220128H1LT01	220128H1LT02	220128H1JT07
Sample Date:	2022-01-26	2022-01-26	2022-01-28	2022-02-01	2022-01-30	2022-01-28	2022-01-28	2022-01-28
Sample Type:	N	FD	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: DA41348	SDG: DA41348	SDG: DA41358	SDG: C22B009	SDG: C22A071	SDG: DA41358	SDG: DA41358	SDG: DA41376
Total Organic Carbon	2	None	None	None	**0.530**	**0.450 J**	**0.550**	**5.65**	**2.03**	**0.620**	0.200 U	**0.460 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: DA41348	SDG: DA41348	SDG: 5801097541	SDG: 5801098621	SDG: 5801097891	SDG: 5801097541	SDG: 5801097541	SDG: 5801097541
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	190 U	92.0 U	92.0 U	90.0 U	91.0 U	**100 J**	91.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	40.0 U	31.0 U	31.0 U	31.0 U	100 U	100 UJ	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	190 U	180 U	180 U	180 U	180 U	180 U	180 U

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: DA41348	SDG: DA41348		SDG: 35694117	SDG: 810134411			
Mercury	0.025	0.025	2	2	0.0250 U	0.0250 U	--	0.0900 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: DA41348	SDG: DA41348	SDG: 983846	SDG: 35694117	SDG: 810134411	SDG: 983846	SDG: 983846	SDG: 983841
Antimony	6	6	6	6	0.100 U	0.100 U	0.110 U	0.210 U	0.0570 U	0.110 U	0.110 U	0.110 U
Arsenic	10	10	10	10	0.500 U	0.500 U	**0.400 J**	0.500 U	0.890 U	**0.340 J**	**0.370 J**	**0.380 J**
Barium	220	220	2000	2000	**1.90 J**	**2.00**	**2.20**	**2.00**	**2.40**	**2.60**	**2.30**	**2.20**
Beryllium	0.66	0.66	4	4	0.150 U	0.150 U	0.0910 U	0.0700 U	0.0830 U	0.0910 U	0.0910 U	0.0910 U
Cadmium	3	3	5	5	0.0500 U	0.0500 U	0.0290 U	0.120 U	0.140 U	0.0290 U	0.0290 U	0.0290 U
Chromium	11	11	100	100	**1.40 J**	**1.50 J**	**1.20**	**1.40 J**	**1.80**	**1.30**	**1.20**	**1.30**
Copper	2.9	2.9	1300	1300	**20.4**	**20.9**	**23.0**	**17.5**	**22.0**	**55.0**	**12.0**	**18.0**
Lead	15	5.6	15	15	**0.410 J**	**0.450 J**	**0.460 J**	**2.00**	**0.440 J**	**0.800**	**0.140 J**	**0.420 J**
Mercury	0.025	0.025	2	2	--	--	0.0200 U	--	--	0.0200 U	0.0200 U	0.0200 U
Selenium	5	5	50	50	0.300 U	0.300 U	**1.50 J**	0.830 U	1.60 U	**1.20 J**	**1.80 J**	**1.70 J**
Thallium	2	2	2	2	0.0500 U	0.0500 U	0.0410 U	0.500 U	0.160 U	0.0410 U	0.0410 U	0.0410 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:				H1-KAHO6134	H1-KEST4612	H1-KOBA4424	H1-KOBA4431	H1-KOBA4439	H1-KOBA4448	H1-KOBA4456	H1-KOBA4464
Location Type:				Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:				6134 Kahoohanohano Street	4612 Ke Street	4424 Kobashigawa Street	4431 Kobashigawa Street	4439 Kobashigawa Street	4448 Kobashigawa Street	4456 Kobashigawa Street	4464 Kobashigawa Street
Field Sample ID:				220130H1BT01	220129H1LT02	220129H1MT02	220128H1IT06	220130H1GT02	220202H1JT03	220128H1IT03	220128H1KT06
Sample Date:				2022-01-30	2022-01-29	2022-01-29	2022-01-28	2022-01-30	2022-02-02	2022-01-28	2022-01-28
Sample Type:				N (72 Hour Stagnation)	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: C22A071**	**SDG: C22A064**	**SDG: C22A064**	**SDG: DA41358**	**SDG: C22A071**	**SDG: C22B012**	**SDG: DA41358**	**SDG: DA41376**
Total Organic Carbon	2	None	None	None	**2.10**	0.200 U	0.200 U	**0.590**	0.200 U	0.200 UJ	**0.540**	**0.580**
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: 5801097891**	**SDG: 5801097541**	**SDG: 5801097601**	**SDG: 5801097541**	**SDG: 5801097891**	**SDG: DA41510**	**SDG: 5801097541**	**SDG: 5801097541**
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	91.0 U	92.0 U	92.0 U	92.0 U	93.0 U	190 U	92.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	31.0 U	31.0 U	100 U	31.0 U	40.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	180 U	180 U	180 U	190 U	190 U	180 U	180 U
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: 35693538**	**SDG: 810134391**	**SDG: 810133941**		**SDG: 35693538**	**SDG: DA41510**		
Mercury	0.025	0.025	2	2	0.0900 U	0.0560 U	0.0560 U	--	0.0900 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: 35693538**	**SDG: 810134391**	**SDG: 810133941**	**SDG: 983843**	**SDG: 35693538**	**SDG: DA41510**	**SDG: 983843**	**SDG: 983842**
Antimony	6	6	6	6	0.210 U	0.0570 U	0.0570 U	0.110 U	0.210 U	0.100 U	0.110 U	0.110 U
Arsenic	10	10	10	10	0.500 U	0.890 U	0.890 U	**0.390 J**	0.500 U	0.500 UJ	**0.440 J**	**0.240 J**
Barium	220	220	2000	2000	**2.10**	**2.30**	**4.10**	**2.60**	**2.30**	**2.00**	**2.40**	**2.20**
Beryllium	0.66	0.66	4	4	0.0700 U	0.0830 U	0.0830 U	0.0910 U	0.0700 U	0.150 U	0.0910 U	0.0910 U
Cadmium	3	3	5	5	0.120 U	0.140 U	0.140 U	0.0290 U	0.120 U	0.0500 UJ	0.0290 U	0.0290 U
Chromium	11	11	100	100	**1.30 J**	**1.90**	**2.10**	**1.20**	**1.40 J**	**1.60 J**	**1.30**	**1.40**
Copper	2.9	2.9	1300	1300	**29.1**	**18.0**	**6.20**	**8.90**	**9.00**	**15.9**	**4.60**	**96.0**
Lead	15	5.6	15	15	**0.990 J**	**0.550**	**0.390 J**	**0.180 J**	**0.270 J**	**0.230 J**	**0.120 J**	**0.160 J**
Mercury	0.025	0.025	2	2	--	--	--	0.0200 U	--	--	0.0200 U	0.0200 U
Selenium	5	5	50	50	0.830 U	1.60 U	**2.80**	**1.70 J**	0.830 U	0.300 U	**1.80 J**	**1.00 J**
Thallium	2	2	2	2	0.500 U	0.160 U	0.160 U	0.0410 U	0.500 U	0.0500 U	0.0410 U	0.0410 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-KOBA4466	H1-KOBA4522	H1-KOBA4522	H1-KOBA4537	H1-KOUL4689	H1-KOUL4689	H1-KUKU2352	H1-KUKU2377
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	4466 Kobashigawa Street	4522 Kobashigawa Street	4522 Kobashigawa Street	4537 Kobashigawa Street	4689 Kou Lane	4689 Kou Lane	2352 Kukui Lane	2377 Kukui Lane
Field Sample ID:	220127H1HT01	220201H1DT02	220201H1DT03	220129H1LT03	220128H1KT01	220128H1KT02	220130H1DT04	220128H1HT03
Sample Date:	2022-01-27	2022-02-01	2022-02-01	2022-01-29	2022-01-28	2022-01-28	2022-01-30	2022-01-28
Sample Type:	N	N	FD	N	N	FD	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: C22A057	SDG: C22B009	SDG: C22B009	SDG: C22A064	SDG: DA41358	SDG: DA41358	SDG: C22A071	SDG: C22A061rev1
Total Organic Carbon	2	None	None	None	0.200 U	**3.96**	**4.56**	0.200 U	0.200 U	**0.510**	0.200 U	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: 5801097491	SDG: 5801098621	SDG: 5801098621	SDG: 5801097541	SDG: 5801097491	SDG: 5801097491	SDG: 5801097891	SDG: 5801097551
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	97.0 U	91.0 U	93.0 U	93.0 U	96.0 U	95.0 U	90.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 UJ	31.0 U	31.0 U	31.0 U	31.0 UJ	31.0 U	31.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	180 U	190 U	190 U	190 U	190 U	180 U	180 U

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: 810133831	SDG: 35694117	SDG: 35694111	SDG: 810134391			SDG: 35693538	SDG: 810133921
Mercury	0.025	0.025	2	2	0.0560 U	0.0900 U	0.0900 U	0.0560 U	--	--	0.0900 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: 810133831	SDG: 35694117	SDG: 35694111	SDG: 810134391	SDG: 983845	SDG: 983845	SDG: 35693538	SDG: 810133921
Antimony	6	6	6	6	0.0570 U	0.210 U	0.210 U	0.0570 U	0.110 U	0.110 U	0.210 U	0.0570 U
Arsenic	10	10	10	10	0.890 U	0.500 U	0.500 U	0.890 U	**0.420 J**	**0.310 J**	0.500 U	0.890 U
Barium	220	220	2000	2000	**2.00**	**2.00**	**2.00**	**3.70**	**2.30**	**2.30**	**2.40**	**2.40**
Beryllium	0.66	0.66	4	4	0.0830 U	0.0700 U	0.140 U	0.0830 U	0.0910 U	0.0910 U	0.0700 U	0.0830 U
Cadmium	3	3	5	5	0.140 U	0.120 U	0.120 U	0.140 U	0.0290 U	0.0290 U	0.120 U	0.140 U
Chromium	11	11	100	100	**1.80**	**1.30 J**	**2.60 J**	**2.30**	**1.20**	**1.30**	**1.40 J**	**1.80**
Copper	2.9	2.9	1300	1300	**41.0**	**11.6**	**10.7**	**16.0**	**12.0**	**12.0**	**8.80**	**8.70**
Lead	15	5.6	15	15	**0.250 J**	**0.560 J**	**0.710 J**	**0.450 J**	**0.120 J**	**0.120 J**	**0.630 J**	**0.140 J**
Mercury	0.025	0.025	2	2	--	--	--	--	0.0200 U	0.0200 U	--	--
Selenium	5	5	50	50	1.60 U	0.830 U	0.830 U	**1.90 J**	**1.80 J**	**1.40 J**	**1.00**	**1.60 J**
Thallium	2	2	2	2	0.160 U	0.500 U	0.500 U	0.160 U	0.0410 U	0.0410 U	0.500 U	0.160 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-KUKU2381	H1-MACA5025	H1-MACA5040	H1-MACA5055	H1-MAMA4583	H1-MILO6804	H1-MILO6805	H1-MILO6807
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	2381 Kukui Lane	5025 Macadamia Lane	5040 Macadamia Lane	5055 Macadamia Lane	4583 Mamane Lane	6804 Milo Lane	6805 Milo Lane	6807 Milo Lane
Field Sample ID:	220128H1HT06	220127H1IT04	220126H1IT09	220128H1LT04	220128H1KT03	220126H1IT08	220127H1HT05	220128H1KT05
Sample Date:	2022-01-28	2022-01-27	2022-01-26	2022-01-28	2022-01-28	2022-01-26	2022-01-27	2022-01-28
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: C22A061rev1	SDG: DA41348	SDG: DA41348	SDG: DA41358	SDG: DA41358	SDG: DA41348	SDG: C22A057	SDG: DA41358
Total Organic Carbon	2	None	None	None	0.200 U	0.200 U	0.200 U	**0.550**	**0.530**	0.200 U	0.200 U	**0.600**

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: 5801097551	SDG: 5801097291	SDG: DA41348	SDG: 5801097541	SDG: 5801097491	SDG: DA41348	SDG: 5801097491	SDG: 5801097491
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	93.0 U	91.0 U	190 U	92.0 U	95.0 U	190 U	96.0 U	96.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	100 UJ	40.0 U	100 U	31.0 U	40.0 U	31.0 UJ	31.0 UJ
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	180 U	190 U	180 U	190 U	190 U	190 U	190 U

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: 810133921		SDG: DA41348			SDG: DA41348	SDG: 810133831	
Mercury	0.025	0.025	2	2	0.0560 U	--	0.0250 U	--	--	0.0250 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: 810133921	SDG: 983698	SDG: DA41348	SDG: 983846	SDG: 983845	SDG: DA41348	SDG: 810133831	SDG: 983845
Antimony	6	6	6	6	0.0570 U	0.110 U	0.100 U	0.110 U	0.110 U	0.100 U	0.0570 U	0.110 U
Arsenic	10	10	10	10	0.890 U	**0.240 J**	0.500 U	**0.350 J**	**0.410 J**	0.500 U	0.890 U	**0.380 J**
Barium	220	220	2000	2000	**2.40**	**2.10**	**1.80 J**	**2.00**	**2.10**	**1.90 J**	**3.00**	**2.30**
Beryllium	0.66	0.66	4	4	0.0830 U	0.0910 U	0.150 U	0.0910 U	0.0910 U	0.150 U	0.0830 U	0.0910 U
Cadmium	3	3	5	5	0.140 U	0.0290 U	0.0500 U	0.0290 U	0.0290 U	0.0500 U	0.140 U	0.0290 U
Chromium	11	11	100	100	**1.70**	**1.60**	**1.30 J**	**1.20**	**1.20**	**1.30 J**	**1.90**	**1.30**
Copper	2.9	2.9	1300	1300	**50.0**	**28.0**	**9.20**	**11.0**	**20.0**	**29.8**	**48.0**	**78.0**
Lead	15	5.6	15	15	**0.280 J**	**0.710**	**0.230 J**	**0.190 J**	**0.230 J**	0.130 U	**0.490 J**	**0.530**
Mercury	0.025	0.025	2	2	--	0.0200 U	--	0.0200 U	0.0200 U	--	--	0.0200 U
Selenium	5	5	50	50	**1.60 J**	**1.10 J**	0.300 U	**1.90 J**	**1.60 J**	0.300 U	1.60 U	**1.30 J**
Thallium	2	2	2	2	0.160 U	0.0410 U	0.0500 U	0.0410 U	0.0410 U	**0.0700 J**	0.160 U	0.0410 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-NAIO4704	H1-NAIO4704	H1-OKAM2634	H1-OKAM2649	H1-OKAM2682	H1-OKAM2682	H1-OKAM2691	H1-OLEA4717
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	4704 Naio Lane	4704 Naio Lane	2634 Okamura Street	2649 Okamura Street	2682 Okamura Street	2682 Okamura Street	2691 Okamura Street	4717 Oleander Street
Field Sample ID:	220129H1HT01	220129H1HT02	220203H1AT03	220201H1CT05	220202H1FT01	220202H1FT02	220202H1FT07	220129H1LT04
Sample Date:	2022-01-29	2022-01-29	2022-02-03	2022-02-01	2022-02-02	2022-02-02	2022-02-02	2022-01-29
Sample Type:	N	FD	N	N	N	FD	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: C22A064	SDG: C22A064	SDG: C22B017	SDG: C22B009	SDG: C22B012	SDG: C22B012	SDG: C22B012	SDG: C22A064
Total Organic Carbon	2	None	None	None	0.200 U	0.200 U	**9.72**	0.200 U	0.200 UJ	0.200 UJ	0.200 UJ	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: DA41376	SDG: DA41376	SDG: DA41540	SDG: 5801098621	SDG: DA41510	SDG: DA41510	SDG: DA41510	SDG: 5801097541
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	190 U	190 U	92.0 U	190 U	190 U	190 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	40.0 U	40.0 U	31.0 U	40.0 U	40.0 U	40.0 U	31.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	190 U	190 U	180 U	190 U	190 U	190 U	180 U

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: DA41376	SDG: DA41376	SDG: DA41540	SDG: 35694113	SDG: DA41510	SDG: DA41510	SDG: DA41510	SDG: 810134391
Mercury	0.025	0.025	2	2	0.0250 U	0.0250 U	0.0250 U	0.0900 U	0.0250 U	0.0250 U	0.0250 U	**0.0630 J**

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: DA41376	SDG: DA41376	SDG: DA41540	SDG: 35694113	SDG: DA41510	SDG: DA41510	SDG: DA41510	SDG: 810134391
Antimony	6	6	6	6	0.100 U	0.100 U	0.100 U	0.210 U	0.100 U	0.100 U	0.100 U	**0.0580 J**
Arsenic	10	10	10	10	0.500 U	0.500 U	0.500 U	0.500 U	0.500 UJ	0.500 UJ	0.500 UJ	0.890 U
Barium	220	220	2000	2000	**2.80**	**2.70**	**2.10**	**2.20**	**2.10**	**2.20**	**2.10**	**2.70**
Beryllium	0.66	0.66	4	4	0.150 U	0.150 U	0.150 U	0.140 U	0.150 U	0.150 U	0.150 U	0.0830 U
Cadmium	3	3	5	5	0.0500 UJ	0.0500 UJ	0.0500 U	0.120 U	0.0500 UJ	0.0500 UJ	0.0500 UJ	0.140 U
Chromium	11	11	100	100	**1.30 J**	**1.40 J**	**1.50 J**	2.20 U	**1.50 J**	**1.60 J**	**1.40 J**	**1.90**
Copper	2.9	2.9	1300	1300	**23.6**	**23.4**	**7.10**	**16.9**	**5.20**	**5.70**	**25.7**	**64.0**
Lead	15	5.6	15	15	**0.260 J**	**0.290 J**	**0.200 J**	**0.310 J**	**0.300 J**	**0.310 J**	**0.490 J**	**0.450 J**
Mercury	0.025	0.025	2	2	--	--	--	--	--	--	--	--
Selenium	5	5	50	50	0.300 UJ	0.300 UJ	0.300 U	0.830 U	0.300 U	0.300 U	0.300 U	1.60 U
Thallium	2	2	2	2	0.0500 U	0.0500 U	0.0500 U	0.500 U	**0.0900 J**	0.0500 U	0.0500 U	0.160 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-OLEA4717	H1-OLEA4729	H1-PAPA6326	H1-PAPA6366	H1-PAPE4519	H1-PAPE4539	H1-PAPE4543	H1-PLUM6671
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	4717 Oleander Street	4729 Oleander Street	6326 Papaya Lane	6366 Papaya Lane	4519 Paperbark Lane	4539 Paperbark Lane	4543 Paperbark Lane	6671 Plumeria Loop
Field Sample ID:	220131H1HT03	220128H1IT04	220201H1ET06	220128H1KT04	220129H1MT01	220130H1GT01	220130H1GT03	220127H1IT03
Sample Date:	2022-01-31	2022-01-28	2022-02-01	2022-01-28	2022-01-29	2022-01-30	2022-01-30	2022-01-27
Sample Type:	N (72 Hour Stagnation)	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: C22B002	SDG: DA41358	SDG: C22B009	SDG: DA41358	SDG: C22A064	SDG: C22A071	SDG: C22A071	SDG: DA41348
Total Organic Carbon	2	None	None	None	**1.51**	0.200 U	**1.71**	**0.370 J**	0.200 U	**2.20**	0.200 U	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: 5801098161	SDG: 5801097541	SDG: 5801098621	SDG: 5801097491	SDG: 5801097601	SDG: 5801097891	SDG: 5801097891	SDG: 5801097291
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	92.0 U	92.0 U	91.0 U	93.0 U	90.0 U	92.0 U	91.0 U	92.0 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	31.0 U	100 U	31.0 U	31.0 U	31.0 U	31.0 U	31.0 U	100 UJ
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	180 U	180 U	180 U	190 U	180 U	180 U	180 U	180 U

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: 35693858		SDG: 35694110		SDG: 810133941	SDG: 35693538	SDG: 35693538	
Mercury	0.025	0.025	2	2	0.0900 U	--	0.0900 U	--	0.0560 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: 35693858	SDG: 983843	SDG: 35694110	SDG: 983845	SDG: 810133941	SDG: 35693538	SDG: 35693538	SDG: 983698
Antimony	6	6	6	6	0.210 U	0.110 U	0.210 U	0.110 U	0.0570 U	0.210 U	0.210 U	0.110 U
Arsenic	10	10	10	10	0.500 U	**0.340 J**	0.500 U	**0.360 J**	0.890 U	0.500 U	0.500 U	**0.350 J**
Barium	220	220	2000	2000	**2.40**	**2.30**	**2.10**	**2.20**	**2.70**	**2.40**	**2.40**	**2.10**
Beryllium	0.66	0.66	4	4	0.0700 U	0.0910 U	0.140 U	0.0910 U	0.0830 U	0.0700 U	0.0700 U	0.0910 U
Cadmium	3	3	5	5	0.120 U	0.0290 U	0.120 U	0.0290 U	0.140 U	0.120 U	0.120 U	0.0290 U
Chromium	11	11	100	100	**1.50 J**	**1.40**	**3.50**	**1.20**	**1.90**	**1.20 J**	**1.20 J**	**1.40**
Copper	2.9	2.9	1300	1300	**17.5**	**74.0**	**17.1**	**31.0**	**17.0**	**5.60**	**10.1**	**13.0**
Lead	15	5.6	15	15	0.220 U	**0.300 J**	0.220 U	**0.100 J**	**0.650**	0.220 U	**0.310 J**	**0.290 J**
Mercury	0.025	0.025	2	2	--	0.0200 U	--	0.0200 U	--	--	--	0.0200 U
Selenium	5	5	50	50	0.830 U	**1.30 J**	0.830 U	**1.40 J**	**2.30**	**0.920 J**	**0.860 J**	**1.20 J**
Thallium	2	2	2	2	0.500 U	0.0410 U	0.500 U	0.0410 U	0.160 U	0.500 U	0.500 U	0.0410 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:				H1-POHI4918	H1-POHI4920	H1-POHI4921	H1-POHI4921	H1-POHI4921	H1-RIML2174	H1-TECO3259
Location Type:				Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:				4918 Pohina Lane	4920 Pohina Lane	4921 Pohina Lane	4921 Pohina Lane	4921 Pohina Lane	2174 Rim Loop	3259 Tecoma Lane
Field Sample ID:				220204H1CT03	220127H1HT07	220126H1JT07	220126H1JT08	220128H1JT06	220127H1GT06	220204H1CT02
Sample Date:				2022-02-04	2022-01-27	2022-01-26	2022-01-26	2022-01-28	2022-01-27	2022-02-04
Sample Type:				N	N	N	N	N (72 Hour Stagnation)	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: C22B020	SDG: C22A057	SDG: 810132961	SDG: 810132961	SDG: DA41376	SDG: C22A057	SDG: C22B020
Total Organic Carbon	2	None	None	None	**3.08**	**1.83**	0.250 U	0.250 U	**0.430 J**	**1.58**	**1.94**

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: DA41569	SDG: 5801097491	SDG: 5801097291	SDG: 5801097291	SDG: 5801097541	SDG: 5801097291	SDG: DA41569
Petroleum Hydrocarbons (as Diesel)	200	400	None	None	190 U	96.0 U	94.0 U	92.0 U	92.0 U	92.0 U	190 U
Petroleum Hydrocarbons (as Gasoline)	200	300	None	None	40.0 U	31.0 U	100 U	100 U	31.0 U	100 UJ	40.0 U
Petroleum Hydrocarbons (as Motor Oil)	200	500	None	None	190 U	190 U	190 U	180 U	180 U	180 U	190 U

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: DA41569	SDG: 810133831	SDG: 810132961	SDG: 810132961		SDG: 810132981	SDG: DA41569
Mercury	0.025	0.025	2	2	0.0250 U	0.0560 U	0.0560 U	**0.0560 J**	--	**0.0690 J**	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: DA41569	SDG: 810133831	SDG: 810132961	SDG: 810132961	SDG: 983841	SDG: 810132981	SDG: DA41569
Antimony	6	6	6	6	0.100 U	0.0570 U	0.0570 U	0.0570 U	0.110 U	0.0570 U	0.100 U
Arsenic	10	10	10	10	0.500 U	0.890 U	0.890 U	0.890 U	**0.370 J**	0.890 U	0.500 U
Barium	220	220	2000	2000	**2.10**	**2.00**	**2.10**	**2.10**	**2.20**	**2.20**	**2.10**
Beryllium	0.66	0.66	4	4	0.150 U	0.0830 U	0.0830 U	0.0830 U	0.0910 U	0.0830 U	0.150 U
Cadmium	3	3	5	5	0.0500 U	0.140 U	0.140 U	0.140 U	0.0290 U	0.140 U	0.0500 U
Chromium	11	11	100	100	**1.60 J**	**1.80**	**1.40**	**1.40**	**1.90**	**1.70**	**1.60 J**
Copper	2.9	2.9	1300	1300	**16.0**	**18.0**	**46.0**	**35.0**	**32.0**	**13.0**	**9.90**
Lead	15	5.6	15	15	**0.320 J**	**0.330 J**	**0.530**	**0.400 J**	**0.370 J**	**0.180 J**	**0.150 J**
Mercury	0.025	0.025	2	2	--	--	--	--	0.0200 U	--	--
Selenium	5	5	50	50	0.300 U	1.60 U	1.60 U	1.60 U	**1.70 J**	1.60 U	0.300 U
Thallium	2	2	2	2	0.0500 U	0.160 U	0.160 U	0.160 U	0.0410 U	0.160 U	0.0500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-ALIA0928	H1-ALIA0928	H1-AMAD3218	H1-AMAD3218	H1-AMAD3353	H1-AMAP3711	H1-AMAP3716	H1-AMAP3716
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	928 Aliamanu Drive	928 Aliamanu Drive	3218 Ama Drive	3218 Ama Drive	3353 Ama Drive	3711 Amapa Lane	3716 Amapa Lane	3716 Amapa Lane
Field Sample ID:	220128H1GT05	220130H1BT02	220127H1HT06	220129H1ET04	220201H1CT04	220127H1GT07	220130H1DT06	220130H1DT07
Sample Date:	2022-01-28	2022-01-30	2022-01-27	2022-01-29	2022-02-01	2022-01-27	2022-01-30	2022-01-30
Sample Type:	N	N (72 Hour Stagnation)	N	N (72 Hour Stagnation)	N	N	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: 810133921	SDG: 35693538	SDG: 810133831	SDG: DA41376	SDG: 35694113	SDG: 810133831	SDG: 35693538	SDG: 35693538
1-Methylnaphthalene	2.1	10	None	None	0.0190 U	0.180 U	0.0200 U	0.240 U	0.180 U	0.0200 U	0.170 U	0.170 U
2-Methylnaphthalene	4.7	10	None	None	0.0190 U	0.190 U	0.0200 U	0.240 U	0.190 U	0.0200 U	0.180 U	0.180 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00970 U	0.0200 U	0.0100 U	0.00960 U	0.0200 U	0.00980 U	0.0190 U	0.0190 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.580 U	0.480 U	0.600 U	0.380 U	0.480 U	0.590 U	0.460 U	0.460 U
Naphthalene	12	17	None	None	0.0190 U	0.180 U	0.0200 U	0.240 U	0.180 U	0.0200 U	0.170 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: C22A061rev1	SDG: C22A071	SDG: C22A057	SDG: C22A064	SDG: C22B009	SDG: C22A057	SDG: C22A071	SDG: C22A071
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	--	--	--	--	--	--	--	--

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-AMAP3717	H1-AMAP3736	H1-AREC3313	H1-BAMB3606	H1-BAMB3625	H1-BAMB3649	H1-BAUH2726	H1-BAUH2726
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	3717 Amapa Lane	3736 Amapa Lane	3313 Areca Lane	3606 Bamboo Lane	3625 Bamboo Lane	3649 Bamboo Lane	2726 Bauhina Lane	2726 Bauhina Lane
Field Sample ID:	220130H1DT05	220201H1CT01	220129H1KT01	220128H1HT04	220131H1BT01	220202H1FT06	220127H1GT04	220127H1GT05
Sample Date:	2022-01-30	2022-02-01	2022-01-29	2022-01-28	2022-01-31	2022-02-02	2022-01-27	2022-01-27
Sample Type:	N	N	N	N	N	N	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: 35693538	SDG: 35694113	SDG: 810134391	SDG: 810133921	SDG: 35693853	SDG: DA41510R	SDG: 810132981	SDG: 810132981
1-Methylnaphthalene	2.1	10	None	None	0.170 U	0.190 U	0.0200 U	0.0190 U	0.170 U	0.240 U	0.0190 U	0.0200 U
2-Methylnaphthalene	4.7	10	None	None	0.180 U	0.200 U	0.0200 U	0.0190 U	0.180 U	0.240 U	0.0190 U	0.0200 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0190 U	0.0210 U	0.00990 U	0.00960 U	0.0190 U	0.00950 U	0.00970 U	0.00980 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.470 U	0.500 U	0.590 U	0.580 U	0.470 U	0.380 U	0.580 U	0.590 U
Naphthalene	12	17	None	None	0.170 U	0.190 U	0.0200 U	0.0190 U	0.170 U	0.240 U	0.0190 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: C22A071	SDG: C22B009	SDG: C22A064	SDG: C22A061rev1	SDG: C22B002	SDG: C22B012	SDG: C22A057	SDG: C22A057
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	--	--

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:				H1-BEGO4164	H1-BEGO4170	H1-BLDG0880	H1-BLDG1782	H1-BLDG1782	H1-BLDG1782	H1-BLDG1783	H1-BLDG1783
Location Type:				Residence	Residence	Non-Residence	Non-Residence	Non-Residence	Non-Residence	Non-Residence	Non-Residence
Residence:				4164 Begonia Loop	4170 Begonia Loop	Building 880,AAFES Gas Station Shoppette	Building 1782,CYS / Army Community Center	Building 1782,CYS / Army Community Center	Building 1782,CYS / Army Community Center	Building 1783,CDC - Under 6 years	Building 1783,CDC - Under 6 years
Field Sample ID:				220201H1DT04	220202H1JT02	220129H1JT06	H1-TW-2201001-01024-A-01	H1-TW-2201001-22024-A-02	H1-TW-2201002-01024-A-01	H1-TW-2201044-22024-3-A-01	H1-TW-2201044-22024-A-01
Sample Date:				2022-02-01	2022-02-02	2022-01-29	2022-01-24	2022-01-24	2022-01-24	2022-01-25	2022-01-25
Sample Type:				N	N	N	N	N	N	FD	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: 35694111**	**SDG: DA41510R**	**SDG: 810133941**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41305**	**SDG: DA41305**
1-Methylnaphthalene	2.1	10	None	None	0.180 U	0.250 U	0.0200 U	0.240 U	0.240 U	0.240 U	0.250 U	0.240 U
2-Methylnaphthalene	4.7	10	None	None	0.180 U	0.250 U	0.0200 U	0.240 U	0.240 U	0.240 U	--	0.240 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0190 U	0.00990 U	0.00980 U	0.00950 U	0.00950 U	0.00950 U	0.00980 U	0.00970 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.470 U	0.400 U	0.590 U	0.380 U	0.380 U	0.380 U	--	0.390 U
Naphthalene	12	17	None	None	0.180 U	0.250 U	0.0200 U	0.240 U	0.240 U	0.240 U	0.250 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: C22B009**	**SDG: C22B012**	**SDG: C22A064**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41269**	**SDG: DA41305**	**SDG: DA41305**
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.288 U	0.500 U	0.500 U	0.500 U	--	0.500 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.128 U	0.500 U	0.500 U	0.500 U	--	0.500 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.318 U	0.500 U	0.500 U	0.500 U	--	0.500 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.272 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.0884 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.129 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.245 U	0.500 U	0.500 U	0.500 U	--	0.500 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.165 U	0.500 U	0.500 U	0.500 U	--	0.500 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.500 U	0.500 U	0.500 U	--	0.500 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.0570 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.141 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.317 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	2.15 U	0.500 U	0.500 U	0.500 U	--	0.500 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.157 U	0.500 U	0.500 U	0.500 U	--	0.500 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.500 U	0.500 U	0.500 U	--	0.500 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.125 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.120 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.0958 U	0.500 U	0.500 U	0.500 U	--	0.500 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.0574 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.611 U	0.500 U	0.500 U	0.500 U	--	0.500 U
Xylenes, Total	10000	13	10000	10000	--	0.472 U	--	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
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Location ID:				H1-BLDG1783	H1-BLDG1795	H1-BLDG1875	H1-BLDG1875	H1-BOUG0140	H1-BOUG0158	H1-BOUG0158	H1-BOUG0258
Location Type:				Non-Residence	Non-Residence	Non-Residence	Non-Residence	Residence	Residence	Residence	Residence
Residence:				Building 1783,CDC - Under 6 years	Building 1795,Youth Activities Center	Building 1875,Private/Organizational Club	Building 1875,Private/Organizational Club	140 Bougainvillea Loop	158 Bougainvillea Loop	158 Bougainvillea Loop	258 Bougainvillea Loop
Field Sample ID:				H1-TW-2201044-22024-A-02	H1-TW-2201002-22024-A-02	220127H1KT05	220127H1LT02	220129H1GT04	220129H1MT03	220131H1HT04	220126H1JT09
Sample Date:				2022-01-25	2022-01-24	2022-01-27	2022-01-27	2022-01-29	2022-01-29	2022-01-31	2022-01-26
Sample Type:				N	N	N	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: DA41305**	**SDG: DA41269**	**SDG: 810133831**	**SDG: 810133831**	**SDG: DA41376R**	**SDG: 810133941**	**SDG: 35693856**	**SDG: 810132961**
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.240 U	0.0190 U	0.0190 U	0.240 U	0.0200 U	0.180 U	0.0190 U
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.240 U	0.0190 U	0.0190 U	0.240 U	0.0200 U	0.190 U	0.0190 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00950 U	0.00970 U	0.00970 U	0.00950 U	0.00980 U	0.0200 U	0.00960 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.380 U	0.580 U	0.580 U	1.20 U	0.590 U	0.480 U	0.580 U
Naphthalene	12	17	None	None	0.240 U	0.240 U	0.0190 U	0.0190 U	0.240 U	0.0200 U	0.180 U	0.0190 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: DA41305**	**SDG: DA41269**	**SDG: DA41358**	**SDG: C22A057**	**SDG: C22A064**	**SDG: C22A064**	**SDG: C22B002**	**SDG: 810132961**
1,1,1-Trichloroethane	11	11	200	200	0.500 U	0.500 U	0.500 U	0.119 U	0.119 U	0.119 U	0.119 U	0.200 U
1,1,2-Trichloroethane	5	5	3	5	0.500 U	0.500 U	0.500 U	0.288 U	0.288 U	0.288 U	0.288 U	0.200 U
1,1-Dichloroethene	7	7	7	7	0.500 U	0.500 U	0.500 U	0.128 U	0.128 U	0.128 U	0.128 U	0.200 U
1,2,4-Trichlorobenzene	70	70	70	70	0.500 U	0.500 U	0.500 U	0.318 U	0.318 U	0.318 U	0.318 U	0.200 U
1,2-Dichlorobenzene	10	10	600	600	0.500 U	0.500 U	0.500 U	0.272 U	0.272 U	0.272 U	0.272 U	0.200 U
1,2-Dichloroethane	5	5	5	5	0.500 U	0.500 U	0.500 U	0.0884 U	0.0884 U	0.0884 U	0.0884 U	0.200 U
1,2-Dichloropropane	5	5	5	5	0.500 U	0.500 U	0.500 U	0.129 U	0.129 U	0.129 U	0.129 U	0.200 U
1,4-Dichlorobenzene	5	5	75	None	0.500 U	0.500 U	0.500 U	0.245 U	0.245 U	0.245 U	0.245 U	0.200 U
Benzene	5	5	5	5	0.500 U	0.500 U	0.500 U	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.200 U
Carbon Tetrachloride	5	5	5	5	0.500 U	0.500 U	0.500 U	0.165 U	0.165 U	0.165 U	0.165 U	0.100 U
Chlorobenzene	25	25	100	100	0.500 U	0.500 U	0.500 U	0.146 U	0.146 U	0.146 U	0.146 U	0.200 U
cis-1,2-Dichloroethene	70	70	70	70	0.500 U	0.500 U	0.500 U	0.0570 U	0.0570 U	0.0570 U	0.0570 U	0.200 U
Ethylbenzene	700	7.3	700	700	0.500 U	0.500 U	0.500 U	0.141 U	0.141 U	0.141 U	0.141 U	0.200 U
m,p-Xylene	10000	13	None	None	0.500 U	0.500 U	0.500 U	0.317 U	0.317 U	0.317 U	0.317 U	0.500 U
Methylene chloride	5	5	5	5	0.500 U	0.500 U	0.500 U	2.15 U	2.15 U	2.15 U	2.15 U	0.400 U
o-Xylene	10000	13	None	None	0.500 U	0.500 U	0.500 U	0.157 U	0.157 U	0.157 U	0.157 U	0.200 U
Styrene	10	10	100	100	0.500 U	0.500 U	0.500 U	0.224 U	0.224 U	0.224 U	0.224 U	0.200 U
Tetrachloroethene (PCE)	5	5	5	5	0.500 U	0.500 U	0.500 U	0.125 U	0.125 U	0.125 U	0.125 U	0.200 U
Toluene	1000	9.8	1000	1000	0.500 U	0.500 U	0.500 U	0.120 U	0.120 U	0.120 U	0.120 U	0.200 U
trans-1,2-Dichloroethene	100	100	100	100	0.500 U	0.500 U	0.500 U	0.0958 U	0.0958 U	0.0958 U	0.0958 U	0.200 U
Trichloroethene (TCE)	5	5	5	5	0.500 U	0.500 U	0.500 U	0.0574 U	0.0574 U	0.0574 U	0.0574 U	0.200 U
Vinyl chloride	2	2	2	2	0.500 U	0.500 U	0.500 U	0.611 U	0.611 U	0.611 U	0.611 U	0.200 U
Xylenes, Total	10000	13	10000	10000	0.500 U	0.500 U	0.500 U	--	--	--	--	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
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Location ID:					H1-BOUG0275	H1-BOUG0299	H1-BOUG0571	H1-BOUG0578	H1-CALA3016	H1-CALA3030	H1-CALA3089	H1-CALA3119
Location Type:					Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:					275 Bougainvillea Loop	299 Bougainvillea Loop	571 Bougainvillea Loop	578 Bougainvillea Loop	3016 Calamondin Way	3030 Calamondin Way	3089 Calamondin Way	3119 Calamondin Way
Field Sample ID:					220129H1GT03	220129H1MT04	220202H1IT02	220202H1IT03	220129H1LT01	220128H1IT02	220130H1ET04	220128H1IT01
Sample Date:					2022-01-29	2022-01-29	2022-02-02	2022-02-02	2022-01-29	2022-01-28	2022-01-30	2022-01-28
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: DA41376**	**SDG: 810133941**	**SDG: DA41510**	**SDG: DA41510**	**SDG: 810134391**	**SDG: 810133921**	**SDG: 35693538**	**SDG: 810133921**
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.0200 U	0.240 U	0.240 U	0.0200 U	0.0190 U	0.180 UJ	0.0200 U
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.0200 U	0.240 U	0.240 U	0.0200 U	0.0190 U	0.190 UJ	0.0200 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00980 U	0.00950 U	0.00950 U	0.00990 U	0.00970 U	0.0200 UJ	0.0100 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.590 U	0.380 U	0.570 U	0.590 U	**0.720**	0.470 UJ	0.610 U
Naphthalene	12	17	None	None	0.240 U	0.0200 U	0.240 U	0.240 U	0.0200 U	0.0190 U	0.180 UJ	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: C22A064**	**SDG: C22A064**	**SDG: C22B012**	**SDG: C22B012**	**SDG: C22A064**	**SDG: DA41358**	**SDG: C22A071**	**SDG: DA41358**
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 U	0.611 U	0.500 U
Xylenes, Total	10000	13	10000	10000	--	--	0.472 U	0.472 U	--	0.500 U	--	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
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Location ID:				H1-CALA3120	H1-CALA3156	H1-CENT2218	H1-CENT2218	H1-CENT2220	H1-CENT2268	H1-CENT2303	H1-CIGA6203
Location Type:				Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:				3120 Calamondin Way	3156 Calamondin Way	2218 Center Street	2218 Center Street	2220 Center Street	2268 Center Street	2303 Center Street	6203 Cigar Lane
Field Sample ID:				220128H1HT05	220203H1BT03	220128H1IT05	220130H1AT01	220126H1JT01	220204H1CT01	220129H1KT02	220129H1JT01
Sample Date:				2022-01-28	2022-02-03	2022-01-28	2022-01-30	2022-01-26	2022-02-04	2022-01-29	2022-01-29
Sample Type:				N	N	N	N (72 Hour Stagnation)	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: 810133921	SDG: DA41540	SDG: 810133921	SDG: 35693538	SDG: 810132961	SDG: DA41569	SDG: 810134391	SDG: 810133941
1-Methylnaphthalene	2.1	10	None	None	0.0200 U	0.240 U	0.0200 U	0.170 U	0.0200 U	0.240 U	0.0190 U	0.0200 U
2-Methylnaphthalene	4.7	10	None	None	0.0200 U	0.240 U	0.0200 U	0.180 U	0.0200 U	0.240 U	0.0190 U	0.0200 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00980 U	0.00950 U	0.00980 U	0.0190 U	0.00980 U	0.00950 U	0.00970 U	0.00980 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.590 U	0.380 U	0.590 U	0.460 U	0.590 U	0.380 U	0.580 U	0.590 U
Naphthalene	12	17	None	None	0.0200 U	0.240 U	0.0200 U	0.170 U	0.0200 U	0.240 U	0.0190 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: C22A061rev1	SDG: C22B017	SDG: DA41358	SDG: C22A071	SDG: 810132961	SDG: C22B020	SDG: C22A064	SDG: C22A064
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.500 U	0.119 U	0.200 U	0.119 U	0.119 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.500 U	0.288 U	0.200 U	0.288 U	0.288 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.500 U	0.128 U	0.200 U	0.128 U	0.128 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.500 U	0.318 U	0.200 U	0.318 U	0.318 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.500 U	0.272 U	0.200 U	0.272 U	0.272 U	0.272 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.500 U	0.0884 U	0.200 U	0.0884 U	0.0884 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.500 U	0.129 U	0.200 U	0.129 U	0.129 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.500 U	0.245 U	0.200 U	0.245 U	0.245 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.500 U	0.0846 U	0.200 U	0.0846 U	0.0846 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.500 U	0.165 U	0.100 U	0.165 U	0.165 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.500 U	0.146 U	0.200 U	0.146 U	0.146 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.500 U	0.0570 U	0.200 U	0.0570 U	0.0570 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.500 U	0.141 U	0.200 U	0.141 U	0.141 U	0.141 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.500 U	0.317 U	0.500 U	0.317 U	0.317 U	0.317 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	0.500 U	2.15 U	0.400 U	2.15 U	2.15 U	2.15 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.500 U	0.157 U	0.200 U	0.157 U	0.157 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.500 U	0.224 U	0.200 U	0.224 U	0.224 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.500 U	0.125 U	0.200 U	0.125 U	0.125 U	0.125 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.500 U	0.120 U	0.200 U	0.120 U	0.120 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.500 U	0.0958 U	0.200 U	0.0958 U	0.0958 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.500 U	0.0574 U	0.200 U	0.0574 U	0.0574 U	0.0574 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.500 U	0.611 U	0.200 U	0.611 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	--	0.472 U	0.500 U	--	0.500 U	0.472 U	--	--

H1 Zone Residential DW Sampling
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Location ID:				H1-CIGA6203	H1-CIGA6203	H1-CIGA6210	H1-CIGA6210	H1-CORA2143	H1-CORA2143	H1-CORA2151	H1-CROT4217
Location Type:				Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:				6203 Cigar Lane	6203 Cigar Lane	6210 Cigar Lane	6210 Cigar Lane	2143 Coral Lane	2143 Coral Lane	2151 Coral Lane	4217 Croton Street
Field Sample ID:				220129H1JT02	220131H1HT05	220127H1IT01	220127H1IT02	220128H1HT01	220128H1HT02	220203H1AT04	220131H1BT05
Sample Date:				2022-01-29	2022-01-31	2022-01-27	2022-01-27	2022-01-28	2022-01-28	2022-02-03	2022-01-31
Sample Type:				FD	N (72 Hour Stagnation)	N	FD	N	FD	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: 810133941**	**SDG: 35693856**	**SDG: 810133831**	**SDG: 810133831**	**SDG: 810133921**	**SDG: 810133921**	**SDG: DA41540**	**SDG: 35693853**
1-Methylnaphthalene	2.1	10	None	None	0.0200 U	0.170 U	0.0190 U	0.0200 U	0.0190 U	0.0200 U	0.240 U	0.170 U
2-Methylnaphthalene	4.7	10	None	None	0.0200 U	0.180 U	0.0190 U	0.0200 U	0.0190 U	0.0200 U	0.240 U	0.180 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00990 U	0.0190 U	0.00970 U	0.00980 U	0.00970 U	0.00980 U	0.00960 U	0.0190 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.590 U	0.460 U	0.580 U	0.590 U	0.580 U	0.590 U	0.380 U	0.460 U
Naphthalene	12	17	None	None	0.0200 U	0.170 U	0.0190 U	0.0200 U	0.0190 U	0.0200 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: C22A064**	**SDG: C22B002**	**SDG: DA41348**	**SDG: DA41348**	**SDG: C22A061rev1**	**SDG: C22A061rev1**	**SDG: C22B017**	**SDG: C22B002**
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 U	0.500 U	0.611 U	0.611 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	--	--	0.500 U	0.500 U	--	--	0.472 U	--

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-CROT4248	H1-CROT4292	H1-CROT4318	H1-FLAM2523	H1-FLAM2523	H1-GOLD6036	H1-GUAV3821	H1-GUAV3821
Location Type:					Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:					4248 Croton Street	4292 Croton Street	4318 Croton Street	2523 Flame Lane	2523 Flame Lane	6036 Gold Lane	3821 Guava Lane	3821 Guava Lane
Field Sample ID:					220202H1IT01	220202H1JT01	220203H1BT04	220203H1AT01	220203H1AT02	220128H1LT03	220129H1KT03	220131H1HT01
Sample Date:					2022-02-02	2022-02-02	2022-02-03	2022-02-03	2022-02-03	2022-01-28	2022-01-29	2022-01-31
Sample Type:					N	N	N	N	FD	N	N	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: DA41510**	**SDG: DA41510R**	**SDG: DA41540**	**SDG: DA41540**	**SDG: DA41540**	**SDG: 810133921**	**SDG: 810134391**	**SDG: 35693858**
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.240 U	0.240 U	0.240 U	0.240 U	0.0200 U	0.0200 U	0.170 U
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.240 U	0.240 U	0.240 U	0.240 U	0.0200 U	0.0200 U	0.180 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00960 U	0.00950 U	0.00960 U	0.00970 U	0.00980 U	0.00980 U	0.0190 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.380 U	0.380 U	0.380 U	0.390 U	0.590 U	0.590 U	0.460 U
Naphthalene	12	17	None	None	0.240 U	0.240 U	0.240 U	0.240 U	0.240 U	0.0200 U	0.0200 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: C22B012**	**SDG: C22B012**	**SDG: C22B017**	**SDG: C22B017**	**SDG: C22B017**	**SDG: DA41358**	**SDG: C22A064**	**SDG: C22B002**
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.119 U	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 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	0.500 U	--	--

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:					H1-GUAV3821	H1-GUAV3825	H1-GUAV3836	H1-GUAV3836	H1-GUAV3845	H1-GUAV3845	H1-GUM 3287	H1-GUM 3287
Location Type:					Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:					3821 Guava Lane	3825 Guava Lane	3836 Guava Lane	3836 Guava Lane	3845 Guava Lane	3845 Guava Lane	3287 Gum Lane	3287 Gum Lane
Field Sample ID:					220131H1HT02	220130H1ET03	220203H1BT01	220203H1BT02	220130H1ET01	220130H1ET02	220128H1JT08	220130H1AT02
Sample Date:					2022-01-31	2022-01-30	2022-02-03	2022-02-03	2022-01-30	2022-01-30	2022-01-28	2022-01-30
Sample Type:					FD (72 Hour Stagnation)	N	N	FD	N	FD	N	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: 35693858**	**SDG: 35693538**	**SDG: DA41540**	**SDG: DA41540**	**SDG: 35693538**	**SDG: 35693538**	**SDG: 810133921**	**SDG: 35693538**
1-Methylnaphthalene	2.1	10	None	None	0.180 U	0.180 U	0.240 U	0.240 U	0.170 U	0.180 U	0.0190 U	0.170 U
2-Methylnaphthalene	4.7	10	None	None	0.180 U	0.190 U	0.240 U	0.240 U	0.180 U	0.190 U	0.0190 U	0.180 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0190 U	0.0200 U	0.00950 U	0.00950 U	0.0190 U	0.0200 U	0.00970 UJ	0.0190 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.470 U	0.470 UJ	0.380 U	0.380 U	0.470 U	0.470 U	0.580 U	0.470 U
Naphthalene	12	17	None	None	0.180 U	0.180 U	0.240 U	0.240 U	0.170 U	0.180 U	0.0190 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: C22B002**	**SDG: C22A071**	**SDG: C22B017**	**SDG: C22B017**	**SDG: C22A071**	**SDG: C22A071**	**SDG: DA41376**	**SDG: C22A071**
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	--	--	0.500 U	--

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:				H1-HAWT6706	H1-HAWT6706	H1-HAWT6739	H1-HILO4820	H1-IRON4015	H1-IXOR6649	H1-KAHO6106	H1-KAHO6134
Location Type:				Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:				6706 Hawthorne Place	6706 Hawthorne Place	6739 Hawthorne Place	4820 Hilo Holly Lane	4015 Ironwood Loop	6649 Ixora Lane	6106 Kahoohanohano Street	6134 Kahoohanohano Street
Field Sample ID:				220126H1IT01	220126H1IT02	220128H1LT05	220201H1DT01	220130H1LT01	220128H1LT01	220128H1LT02	220128H1JT07
Sample Date:				2022-01-26	2022-01-26	2022-01-28	2022-02-01	2022-01-30	2022-01-28	2022-01-28	2022-01-28
Sample Type:				N	FD	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: DA41348**	**SDG: DA41348**	**SDG: 810133921**	**SDG: 35694117**	**SDG: 810134411**	**SDG: 810133921**	**SDG: 810133921**	**SDG: 810133921**
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.240 U	0.0200 U	0.180 U	0.0190 U	0.0190 U	0.0200 U	0.0200 U
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.240 U	0.0200 U	0.180 U	0.0190 U	0.0190 U	0.0200 U	0.0200 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00950 U	0.00980 U	0.0190 U	0.00970 U	0.00970 U	0.00980 U	0.00980 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.570 U	0.570 U	0.590 U	0.470 U	0.580 U	0.580 U	0.590 U	0.590 U
Naphthalene	12	17	None	None	0.240 U	0.240 U	0.0200 U	0.180 U	0.0190 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: DA41348**	**SDG: DA41348**	**SDG: DA41358**	**SDG: C22B009**	**SDG: C22A071**	**SDG: DA41358**	**SDG: DA41358**	**SDG: DA41376**
1,1,1-Trichloroethane	11	11	200	200	0.500 U	0.500 U	0.500 U	0.119 U	0.119 U	0.500 U	0.500 U	0.500 U
1,1,2-Trichloroethane	5	5	3	5	0.500 U	0.500 U	0.500 U	0.288 U	0.288 U	0.500 U	0.500 U	0.500 U
1,1-Dichloroethene	7	7	7	7	0.500 U	0.500 U	0.500 U	0.128 U	0.128 U	0.500 U	0.500 U	0.500 U
1,2,4-Trichlorobenzene	70	70	70	70	0.500 U	0.500 U	0.500 U	0.318 U	0.318 U	0.500 U	0.500 U	0.500 U
1,2-Dichlorobenzene	10	10	600	600	0.500 U	0.500 U	0.500 U	0.272 U	0.272 U	0.500 U	0.500 U	0.500 U
1,2-Dichloroethane	5	5	5	5	0.500 U	0.500 U	0.500 U	0.0884 U	0.0884 U	0.500 U	0.500 U	0.500 U
1,2-Dichloropropane	5	5	5	5	0.500 U	0.500 U	0.500 U	0.129 U	0.129 U	0.500 U	0.500 U	0.500 U
1,4-Dichlorobenzene	5	5	75	None	0.500 U	0.500 U	0.500 U	0.245 U	0.245 U	0.500 U	0.500 U	0.500 U
Benzene	5	5	5	5	0.500 U	0.500 U	0.500 U	0.0846 U	0.0846 U	0.500 U	0.500 U	0.500 U
Carbon Tetrachloride	5	5	5	5	0.500 U	0.500 U	0.500 U	0.165 U	0.165 U	0.500 U	0.500 U	0.500 U
Chlorobenzene	25	25	100	100	0.500 U	0.500 U	0.500 U	0.146 U	0.146 U	0.500 U	0.500 U	0.500 U
cis-1,2-Dichloroethene	70	70	70	70	0.500 U	0.500 U	0.500 U	0.0570 U	0.0570 U	0.500 U	0.500 U	0.500 U
Ethylbenzene	700	7.3	700	700	0.500 U	0.500 U	0.500 U	0.141 U	0.141 U	0.500 U	0.500 U	0.500 U
m,p-Xylene	10000	13	None	None	0.500 U	0.500 U	0.500 U	0.317 U	0.317 U	0.500 U	0.500 U	0.500 U
Methylene chloride	5	5	5	5	0.500 U	0.500 U	0.500 U	2.15 U	2.15 U	0.500 U	0.500 U	0.500 U
o-Xylene	10000	13	None	None	0.500 U	0.500 U	0.500 U	0.157 U	0.157 U	0.500 U	0.500 U	0.500 U
Styrene	10	10	100	100	0.500 U	0.500 U	0.500 U	0.224 U	0.224 U	0.500 U	0.500 U	0.500 U
Tetrachloroethene (PCE)	5	5	5	5	0.500 U	0.500 U	0.500 U	0.125 U	0.125 U	0.500 U	0.500 U	0.500 U
Toluene	1000	9.8	1000	1000	0.500 U	0.500 U	0.500 U	0.120 U	0.120 U	0.500 U	0.500 U	0.500 U
trans-1,2-Dichloroethene	100	100	100	100	0.500 U	0.500 U	0.500 U	0.0958 U	0.0958 U	0.500 U	0.500 U	0.500 U
Trichloroethene (TCE)	5	5	5	5	0.500 U	0.500 U	0.500 U	0.0574 U	0.0574 U	0.500 U	0.500 U	0.500 U
Vinyl chloride	2	2	2	2	0.500 U	0.500 U	0.500 U	0.611 U	0.611 U	0.500 U	0.500 U	0.500 U
Xylenes, Total	10000	13	10000	10000	0.500 U	0.500 U	0.500 U	--	--	0.500 U	0.500 U	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-KAHO6134	H1-KEST4612	H1-KOBA4424	H1-KOBA4431	H1-KOBA4439	H1-KOBA4448	H1-KOBA4456	H1-KOBA4464
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	6134 Kahoohanohano Street	4612 Ke Street	4424 Kobashigawa Street	4431 Kobashigawa Street	4439 Kobashigawa Street	4448 Kobashigawa Street	4456 Kobashigawa Street	4464 Kobashigawa Street
Field Sample ID:	220130H1BT01	220129H1LT02	220129H1MT02	220128H1IT06	220130H1GT02	220202H1JT03	220128H1IT03	220128H1KT06
Sample Date:	2022-01-30	2022-01-29	2022-01-29	2022-01-28	2022-01-30	2022-02-02	2022-01-28	2022-01-28
Sample Type:	N (72 Hour Stagnation)	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: 35693538	SDG: 810134391	SDG: 810133941	SDG: 810133921	SDG: 35693538	SDG: DA41510	SDG: 810133921	SDG: 810133921
1-Methylnaphthalene	2.1	10	None	None	0.180 U	0.0200 U	0.0190 U	0.0200 U	0.180 U	0.250 U	0.0190 U	0.0190 U
2-Methylnaphthalene	4.7	10	None	None	0.190 U	0.0200 U	0.0190 U	0.0200 U	0.190 U	0.250 U	0.0190 U	0.0190 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0200 U	0.00980 U	0.00970 U	0.00980 U	0.0200 U	0.0100 U	0.00970 U	0.00970 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.470 U	0.590 U	0.580 U	0.590 U	0.470 U	0.400 U	0.580 U	0.580 U
Naphthalene	12	17	None	None	0.180 U	0.0200 U	0.0190 U	0.0200 U	0.180 U	0.250 U	0.0190 U	0.0190 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: C22A071	SDG: C22A064	SDG: C22A064	SDG: DA41358	SDG: C22A071	SDG: C22B012	SDG: DA41358	SDG: DA41376
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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.500 U	0.0846 U	0.0846 U	0.500 U	0.500 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	0.500 U	0.500 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.500 U	0.146 U	0.146 U	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.500 U	0.224 U	0.224 U	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 U
Xylenes, Total	10000	13	10000	10000	--	--	--	0.500 U	--	0.472 U	0.500 U	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-KOBA4466	H1-KOBA4522	H1-KOBA4522	H1-KOBA4537	H1-KOUL4689	H1-KOUL4689	H1-KUKU2352	H1-KUKU2377
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	4466 Kobashigawa Street	4522 Kobashigawa Street	4522 Kobashigawa Street	4537 Kobashigawa Street	4689 Kou Lane	4689 Kou Lane	2352 Kukui Lane	2377 Kukui Lane
Field Sample ID:	220127H1HT01	220201H1DT02	220201H1DT03	220129H1LT03	220128H1KT01	220128H1KT02	220130H1DT04	220128H1HT03
Sample Date:	2022-01-27	2022-02-01	2022-02-01	2022-01-29	2022-01-28	2022-01-28	2022-01-30	2022-01-28
Sample Type:	N	N	FD	N	N	FD	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: 810133831	SDG: 35694117	SDG: 35694111	SDG: 810134391	SDG: 810133921	SDG: 810133921	SDG: 35693538	SDG: 810133921
1-Methylnaphthalene	2.1	10	None	None	0.0200 U	0.180 U	0.180 U	0.0200 U	0.0190 U	0.0190 U	0.170 U	0.0190 U
2-Methylnaphthalene	4.7	10	None	None	0.0200 U	0.190 U	0.190 U	0.0200 U	0.0190 U	0.0190 U	0.180 U	0.0190 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00980 U	0.0200 U	0.0200 U	0.00980 U	0.00970 U	0.00970 U	0.0190 U	0.00970 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.590 U	0.470 U	0.480 U	0.590 U	0.580 U	0.580 U	0.460 U	0.580 U
Naphthalene	12	17	None	None	0.0200 U	0.180 U	0.180 U	0.0200 U	0.0190 U	0.0190 U	0.170 U	0.0190 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: C22A057	SDG: C22B009	SDG: C22B009	SDG: C22A064	SDG: DA41358	SDG: DA41358	SDG: C22A071	SDG: C22A061rev1
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.119 U	0.119 U	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 U	0.245 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.0846 U	0.0846 U	0.500 U	0.500 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	0.500 U	0.500 U	0.165 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.146 U	0.146 U	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 U	0.157 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.224 U	0.224 U	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 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	0.500 U	0.500 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	--	--	--	--	0.500 U	0.500 U	--	--

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-KUKU2381	H1-MACA5025	H1-MACA5040	H1-MACA5055	H1-MAMA4583	H1-MILO6804	H1-MILO6805	H1-MILO6807
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	2381 Kukui Lane	5025 Macadamia Lane	5040 Macadamia Lane	5055 Macadamia Lane	4583 Mamane Lane	6804 Milo Lane	6805 Milo Lane	6807 Milo Lane
Field Sample ID:	220128H1HT06	220127H1IT04	220126H1IT09	220128H1LT04	220128H1KT03	220126H1IT08	220127H1HT05	220128H1KT05
Sample Date:	2022-01-28	2022-01-27	2022-01-26	2022-01-28	2022-01-28	2022-01-26	2022-01-27	2022-01-28
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: 810133921	SDG: 810133831	SDG: DA41348	SDG: 810133921	SDG: 810133921	SDG: DA41348	SDG: 810133831	SDG: 810133921
1-Methylnaphthalene	2.1	10	None	None	0.0190 U	0.0190 U	0.240 U	0.0190 U	0.0190 U	0.240 U	0.0200 U	0.0200 U
2-Methylnaphthalene	4.7	10	None	None	0.0190 U	0.0190 U	0.240 U	0.0190 U	0.0190 U	0.240 U	0.0200 U	0.0200 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00970 U	0.00970 U	0.00950 U	0.00970 U	0.00970 U	0.00950 U	0.00980 U	0.00980 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.580 U	0.580 U	0.380 U	0.580 U	0.580 U	0.380 U	0.590 U	0.590 U
Naphthalene	12	17	None	None	0.0190 U	0.0190 U	0.240 U	0.0190 U	0.0190 U	0.240 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: C22A061rev1	SDG: DA41348	SDG: DA41348	SDG: DA41358	SDG: DA41358	SDG: DA41348	SDG: C22A057	SDG: DA41358
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.119 U	0.500 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.288 U	0.500 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.128 U	0.500 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.318 U	0.500 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.272 U	0.500 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0884 U	0.500 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.129 U	0.500 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.245 U	0.500 U
Benzene	5	5	5	5	0.0846 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0846 U	0.500 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.165 U	0.500 U
Chlorobenzene	25	25	100	100	0.146 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.146 U	0.500 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0570 U	0.500 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.141 U	0.500 U
m,p-Xylene	10000	13	None	None	0.317 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.317 U	0.500 U
Methylene chloride	5	5	5	5	2.15 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	2.15 U	0.500 U
o-Xylene	10000	13	None	None	0.157 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.157 U	0.500 U
Styrene	10	10	100	100	0.224 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.224 U	0.500 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.125 U	0.500 U
Toluene	1000	9.8	1000	1000	0.120 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.120 U	0.500 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0958 U	0.500 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.0574 U	0.500 U
Vinyl chloride	2	2	2	2	0.611 U	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	0.611 U	0.500 U
Xylenes, Total	10000	13	10000	10000	--	0.500 U	0.500 U	0.500 U	0.500 U	0.500 U	--	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-NAIO4704	H1-NAIO4704	H1-OKAM2634	H1-OKAM2649	H1-OKAM2682	H1-OKAM2682	H1-OKAM2691	H1-OLEA4717
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	4704 Naio Lane	4704 Naio Lane	2634 Okamura Street	2649 Okamura Street	2682 Okamura Street	2682 Okamura Street	2691 Okamura Street	4717 Oleander Street
Field Sample ID:	220129H1HT01	220129H1HT02	220203H1AT03	220201H1CT05	220202H1FT01	220202H1FT02	220202H1FT07	220129H1LT04
Sample Date:	2022-01-29	2022-01-29	2022-02-03	2022-02-01	2022-02-02	2022-02-02	2022-02-02	2022-01-29
Sample Type:	N	FD	N	N	N	FD	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: DA41376	SDG: DA41376	SDG: DA41540	SDG: 35694113	SDG: DA41510R	SDG: DA41510	SDG: DA41510	SDG: 810134391
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.240 U	0.240 U	0.180 U	0.240 U	0.240 U	0.240 U	0.0200 U
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.240 U	0.240 U	0.190 U	0.240 U	0.240 U	0.240 U	0.0200 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00950 U	0.00950 U	0.00960 U	0.0200 U	0.00950 U	0.00950 U	0.00960 U	0.00980 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.380 U	0.380 U	0.480 U	0.380 U	**0.660 J**	**0.710 J**	0.590 U
Naphthalene	12	17	None	None	0.240 U	0.240 U	0.240 U	0.180 U	0.240 U	0.240 U	0.240 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: C22A064	SDG: C22A064	SDG: C22B017	SDG: C22B009	SDG: C22B012	SDG: C22B012	SDG: C22B012	SDG: C22A064
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	--

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:	H1-OLEA4717	H1-OLEA4729	H1-PAPA6326	H1-PAPA6366	H1-PAPE4519	H1-PAPE4539	H1-PAPE4543	H1-PLUM6671
Location Type:	Residence	Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:	4717 Oleander Street	4729 Oleander Street	6326 Papaya Lane	6366 Papaya Lane	4519 Paperbark Lane	4539 Paperbark Lane	4543 Paperbark Lane	6671 Plumeria Loop
Field Sample ID:	220131H1HT03	220128H1IT04	220201H1ET06	220128H1KT04	220129H1MT01	220130H1GT01	220130H1GT03	220127H1IT03
Sample Date:	2022-01-31	2022-01-28	2022-02-01	2022-01-28	2022-01-29	2022-01-30	2022-01-30	2022-01-27
Sample Type:	N (72 Hour Stagnation)	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: 35693858	SDG: 810133921	SDG: 35694110	SDG: 810133921	SDG: 810133941	SDG: 35693538	SDG: 35693538	SDG: 810133831
1-Methylnaphthalene	2.1	10	None	None	0.170 U	0.0190 U	0.170 U	0.0190 U	0.0200 U	0.180 U	0.180 UJ	0.0190 U
2-Methylnaphthalene	4.7	10	None	None	0.180 U	0.0190 U	0.180 U	0.0190 U	0.0200 U	0.190 U	0.190 UJ	0.0190 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.0190 U	0.00970 UJ	0.0190 U	0.00970 U	0.00980 U	0.0200 U	0.0200 UJ	0.00970 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.470 U	0.580 U	0.460 U	0.580 U	0.590 U	0.470 U	0.470 UJ	0.580 U
Naphthalene	12	17	None	None	0.170 U	0.0190 U	0.170 U	0.0190 U	0.0200 U	0.180 U	0.180 UJ	0.0190 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: C22B002	SDG: DA41358	SDG: C22B009	SDG: DA41358	SDG: C22A064	SDG: C22A071	SDG: C22A071	SDG: DA41348
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.500 U	0.119 U	0.500 U	0.119 U	0.119 U	0.119 U	0.500 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.500 U	0.288 U	0.500 U	0.288 U	0.288 U	0.288 U	0.500 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.500 U	0.128 U	0.500 U	0.128 U	0.128 U	0.128 U	0.500 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.500 U	0.318 U	0.500 U	0.318 U	0.318 U	0.318 U	0.500 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.500 U	0.272 U	0.500 U	0.272 U	0.272 U	0.272 U	0.500 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.500 U	0.0884 U	0.500 U	0.0884 U	0.0884 U	0.0884 U	0.500 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.500 U	0.129 U	0.500 U	0.129 U	0.129 U	0.129 U	0.500 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.500 U	0.245 U	0.500 U	0.245 U	0.245 U	0.245 U	0.500 U
Benzene	5	5	5	5	0.0846 U	0.500 U	0.0846 U	0.500 U	0.0846 U	0.0846 U	0.0846 U	0.500 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.500 U	0.165 U	0.500 U	0.165 U	0.165 U	0.165 U	0.500 U
Chlorobenzene	25	25	100	100	0.146 U	0.500 U	0.146 U	0.500 U	0.146 U	0.146 U	0.146 U	0.500 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.500 U	0.0570 U	0.500 U	0.0570 U	0.0570 U	0.0570 U	0.500 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.500 U	0.141 U	0.500 U	0.141 U	0.141 U	0.141 U	0.500 U
m,p-Xylene	10000	13	None	None	0.317 U	0.500 U	0.317 U	0.500 U	0.317 U	0.317 U	0.317 U	0.500 U
Methylene chloride	5	5	5	5	2.15 U	0.500 U	2.15 U	0.500 U	2.15 U	2.15 U	2.15 U	0.500 U
o-Xylene	10000	13	None	None	0.157 U	0.500 U	0.157 U	0.500 U	0.157 U	0.157 U	0.157 U	0.500 U
Styrene	10	10	100	100	0.224 U	0.500 U	0.224 U	0.500 U	0.224 U	0.224 U	0.224 U	0.500 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.500 U	0.125 U	0.500 U	0.125 U	0.125 U	0.125 U	0.500 U
Toluene	1000	9.8	1000	1000	0.120 U	0.500 U	0.120 U	0.500 U	0.120 U	0.120 U	0.120 U	0.500 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.500 U	0.0958 U	0.500 U	0.0958 U	0.0958 U	0.0958 U	0.500 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.500 U	0.0574 U	0.500 U	0.0574 U	0.0574 U	0.0574 U	0.500 U
Vinyl chloride	2	2	2	2	0.611 U	0.500 U	0.611 U	0.500 U	0.611 U	0.611 U	0.611 U	0.500 U
Xylenes, Total	10000	13	10000	10000	--	0.500 U	--	0.500 U	--	--	--	0.500 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

Location ID:				H1-POHI4918	H1-POHI4920	H1-POHI4921	H1-POHI4921	H1-POHI4921	H1-RIML2174	H1-TECO3259
Location Type:				Residence	Residence	Residence	Residence	Residence	Residence	Residence
Residence:				4918 Pohina Lane	4920 Pohina Lane	4921 Pohina Lane	4921 Pohina Lane	4921 Pohina Lane	2174 Rim Loop	3259 Tecoma Lane
Field Sample ID:				220204H1CT03	220127H1HT07	220126H1JT07	220126H1JT08	220128H1JT06	220127H1GT06	220204H1CT02
Sample Date:				2022-02-04	2022-01-27	2022-01-26	2022-01-26	2022-01-28	2022-01-27	2022-02-04
Sample Type:				N	N	N	N	N (72 Hour Stagnation)	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: DA41569**	**SDG: 810133831**	**SDG: 810132961**	**SDG: 810132961**	**SDG: 810133921**	**SDG: 810132981**	**SDG: DA41569**
1-Methylnaphthalene	2.1	10	None	None	0.240 U	0.0200 U	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.240 U
2-Methylnaphthalene	4.7	10	None	None	0.240 U	0.0200 U	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.240 U
Benzo(a)pyrene	0.06	0.06	0.2	0.2	0.00960 U	0.00980 U	0.00970 U	0.00970 U	0.00970 U	0.00970 U	0.00950 U
Bis(2-ethylhexyl)phthalate	3	3	6	6	0.380 U	0.590 U	0.580 U	0.580 U	0.580 U	0.580 U	0.380 U
Naphthalene	12	17	None	None	0.240 U	0.0200 U	0.0190 U	0.0190 U	0.0190 U	0.0190 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: C22B020**	**SDG: C22A057**	**SDG: 810132961**	**SDG: 810132961**	**SDG: DA41376**	**SDG: C22A057**	**SDG: C22B020**
1,1,1-Trichloroethane	11	11	200	200	0.119 U	0.119 U	0.200 U	0.200 U	0.500 U	0.119 U	0.119 U
1,1,2-Trichloroethane	5	5	3	5	0.288 U	0.288 U	0.200 U	0.200 U	0.500 U	0.288 U	0.288 U
1,1-Dichloroethene	7	7	7	7	0.128 U	0.128 U	0.200 U	0.200 U	0.500 U	0.128 U	0.128 U
1,2,4-Trichlorobenzene	70	70	70	70	0.318 U	0.318 U	0.200 U	0.200 U	0.500 U	0.318 U	0.318 U
1,2-Dichlorobenzene	10	10	600	600	0.272 U	0.272 U	0.200 U	0.200 U	0.500 U	0.272 U	0.272 U
1,2-Dichloroethane	5	5	5	5	0.0884 U	0.0884 U	0.200 U	0.200 U	0.500 U	0.0884 U	0.0884 U
1,2-Dichloropropane	5	5	5	5	0.129 U	0.129 U	0.200 U	0.200 U	0.500 U	0.129 U	0.129 U
1,4-Dichlorobenzene	5	5	75	None	0.245 U	0.245 U	0.200 U	0.200 U	0.500 U	0.245 U	0.245 U
Benzene	5	5	5	5	0.0846 U	0.0846 U	0.200 U	0.200 U	0.500 U	0.0846 U	0.0846 U
Carbon Tetrachloride	5	5	5	5	0.165 U	0.165 U	0.100 U	0.100 U	0.500 U	0.165 U	0.165 U
Chlorobenzene	25	25	100	100	0.146 U	0.146 U	0.200 U	0.200 U	0.500 U	0.146 U	0.146 U
cis-1,2-Dichloroethene	70	70	70	70	0.0570 U	0.0570 U	0.200 U	0.200 U	0.500 U	0.0570 U	0.0570 U
Ethylbenzene	700	7.3	700	700	0.141 U	0.141 U	0.200 U	0.200 U	0.500 U	0.141 U	0.141 U
m,p-Xylene	10000	13	None	None	0.317 U	0.317 U	0.500 U	0.500 U	0.500 U	0.317 U	0.317 U
Methylene chloride	5	5	5	5	2.15 U	2.15 U	0.400 U	0.400 U	0.500 U	2.15 U	2.15 U
o-Xylene	10000	13	None	None	0.157 U	0.157 U	0.200 U	0.200 U	0.500 U	0.157 U	0.157 U
Styrene	10	10	100	100	0.224 U	0.224 U	0.200 U	0.200 U	0.500 U	0.224 U	0.224 U
Tetrachloroethene (PCE)	5	5	5	5	0.125 U	0.125 U	0.200 U	0.200 U	0.500 U	0.125 U	0.125 U
Toluene	1000	9.8	1000	1000	0.120 U	0.120 U	0.200 U	0.200 U	0.500 U	0.120 U	0.120 U
trans-1,2-Dichloroethene	100	100	100	100	0.0958 U	0.0958 U	0.200 U	0.200 U	0.500 U	0.0958 U	0.0958 U
Trichloroethene (TCE)	5	5	5	5	0.0574 U	0.0574 U	0.200 U	0.200 U	0.500 U	0.0574 U	0.0574 U
Vinyl chloride	2	2	2	2	0.611 U	0.611 U	0.200 U	0.200 U	0.500 U	0.611 U	0.611 U
Xylenes, Total	10000	13	10000	10000	0.472 U	--	0.500 U	0.500 U	0.500 U	--	0.472 U

H1 Zone Residential DW Sampling
Chemistry Results
Drinking Water Sampling, JBPHH, Oahu Hawaii

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

February 27, 2022

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

SUBJ: ZONE H1 EXCEEDANCE INVESTIGATION SUMMARY AND RESULTS

Ref: (a) Drinking Water Sampling Plan, December 2021
(b) Zone H1 Distribution Sample Results from EDMS, RAR Section 2a.6
(c) Zone H1 Residential Sample Results from EDMS, RAR Section 2b.2
(d) Laboratory Report, SDG 580-109239-1, Level 4, Eurofins FGS, Seattle, 2022-02-09

Encl: (1) AECOM Technical Review of BCEE in sample results
(2) DoH Zone H1 Distribution Sample Results
(3) Zone H1 Sample Distribution Map
(4) Hawaii State Department of Health Petroleum Hydrocarbons in Water Health Effects

1. This letter documents the development of a plan of action and milestones (POAM) for the Zone H1 detection of bis (2-chloroethyl) ether and the DoH distribution sample TPH exceedance in accordance with the reference (a) Drinking Water Investigation/Decision Flow-Chart.

2. Reference (b) contains the Zone H1 distribution results from samples taken by the Navy with oversight by DoH and the EPA. Based on these sample results, the IDWST approved moving forward with the flushing of residences. The residence samples were collected between January 24,2022 and February 4, 2022 for this zone.

3. Bis (2-chloroethyl) ether (BCEE) was detected in the Zone H1 screening sample taken on January 11, 2022 as shown in reference (b). 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 6 of reference (d) 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 four hydrants that were previously taken and the results were non-detect for BCEE. This is fully documented in reference (b) which reflects the corrected BCEE sample results for the screening sample taken on January 11, 2022. During the IDWST, it was realized that there was a missing number from the field sample ID in the tables due

to an administrative error. The Navy has requested that AECOM correct the memo. The updated memo will be provided to the IDWST upon receipt and for inclusion in future RAR submissions where BCEE was initially detected in distribution samples. For this zone, the field sample ID was correct in the tables and attachment of enclosure (1). 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. Reference (d) will be made publicly available at https://jbphh-safewaters.org/ once the health advisory for Zone H1 is amended by DoH.

4. On February 22, 2022, the DoH provided its Zone H1 distribution sample result for FH 1416 as shown in enclosure (2). The result showed a TPH exceedance above the incident specific parameter of 211 ppb. In accordance with the Drinking Water Investigation/Decision Flow-Chart, after step 4 if a sample result does not comply with MCLs, specified EALs, and/or table 2 ISPs, the IDWST must agree on a POAM which may include performing additional flushing, performing targeted flushing at specific houses or buildings or other remedial actions.

The table below shows the results of the samples collected at fire hydrant 1416 by DoH and the Navy.

Date	1/11/2022	1/11/2022	1/11/2022
Sample ID	011122-25-04	20220111-H1-YT08	20220111-H1-YT09
Sample Location	FH 1416	FH 1416	FH 1416
TPH Sample Result	310 ppb	Non-detect	Non-detect

On February 23, 2022, the IDWST met to review the sample data for zones H1, H2, and H3. As a result of the TPH exceedance of the ISP in zone H1, the IDWST conducted the following analysis and developed a specific POAM to address the TPH exceedance.. The team reviewed sample results, data validation reports, and mapped the sample locations to determine if there were enough data points to assess the weight of this single exceedance. Enclosure (3) shows the distribution map. The following key factors were considered;

- The three samples were collected on the same day at the same location. Samples 20220111-H1-YT08 and 20220111-H1-YT09 were non-detect for TPH. Sample 011122-25-04 data validation sheet found in enclosure (2) was qualified as estimated with a possible high bias (flagged J+). A J flag represents a number that is an estimated concentration because something in the sample interfered with the analysis. The plus sign indicates that that the estimated value is biased towards a higher estimated value.
- The distribution and residential sample shown in references (b) and (c) had no MCL or Table 2 exceedances. These samples were taken on the same day as the TPH exceedance sample result of January 11, 2022 and on subsequent days during the period between January 24, 2022 and February 4, 2022 for this zone.
- The Zone H1 sample distribution map as shown in enclosure (3), showed adequate sampling in the vicinity of FH 1416 with sample results that were non-detect for TPH.

As a result of the key factors above, the IDWST members decided on a POAM that includes long term monitoring sampling that will be taken in the vicinity of the hydrant with no additional remedial activities required. Enclosure (4) provides information on the health effects from petroleum hydrocarbons in water.

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: 2022.02.27 12:35:59 -10'00'

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

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21 Feb 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: 15 Jan 2022

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.

Table 1 below summarizes the sample delivery groups (SDGs) initially issued reporting of Bis(2-chloroethyl)ether (BC2EE) form 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. As a result of the findings, Eurofins Seattle concurred with the finding conclusions and implemented the required corrective action in accordance with the laboratories standard operating procedure (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	20220208-B1-ZT04	B1-8	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	20220107-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	2022011-H2-YT02	FH377	BC2EE	1.2 F1	µg/L
580-109243-3	01/11/22	2022011-H2-YT04	FH1331	BC2EE	1.7	µg/L
580-109243-4	01/11/22	2022011-H2-YT06	FH1646	BC2EE	2.3	µg/L
580-109289-1	01/12/22	2022112-H3-ZT13	FH1651	BC2EE	1.7	µg/L
580-109289-3	01/12/22	2022112-H3-ZT09	FH1641	BC2EE	2.4	µg/L
580-109289-5	01/12/22	2022112-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	20220208-B1-ZT04	B1-8	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	20220107-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	0.031 U	µg/L

Laboratory Sample ID	Sampling Date	Field Sample ID	LOC ID	Analyte	Result	Unit
580-109243-1	01/11/22	2022011-H2-YT02	FH377	BC2EE	0.032 F1	µg/L
580-109243-3	01/11/22	2022011-H2-YT04	FH1331	BC2EE	0.032 U	µg/L
580-109243-4	01/11/22	2022011-H2-YT06	FH1646	BC2EE	0.030 U	µg/L
580-109289-1	01/12/22	2022112-H3-ZT13	FH1651	BC2EE	0.031	µg/L
580-109289-3	01/12/22	2022112-H3-ZT09	FH1641	BC2EE	0.031 U	µg/L
580-109289-5	01/12/22	2022112-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 1/6/2022 through 1/11/2022. 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 samples 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 2/3/2022 through 2/4/2022 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	SA-FLH2	BC2EE	0.029 U	µg/L
580-110026-8	02/04/22	A3-TW-HYDLFH2-22035-1	SA-FLH2	BC2EE	0.029 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	PEAR0315	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	FH 512	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	B1-8	BC2EE	0.029 U	µg/L

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, Reid Campbell.

Yours sincerely,

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Attachments

Attachment 1*:* *Bis(2-chloroethyl)ether Fire Hydrant Zone Screening Sample Resolution Cross Walk*.

cc:
Reid Campbell, AECOM Task Manager
Ken Vinson, AECOM Senior VP Program Manager
Jim Refermat, AECOM Senior Program Chemist
Contracting Officer
Victor Gonzalez, NAVFAC

Attachment 1*:* *Bis(2-chloroethyl)ether Fire Hydrant Zone Screening Sample Resolution Cross Walk*.

Field Sample ID	Original Sampling Date	Zone	Lab SDG	EDMS Status	Analyte	Originial Result**	Restated Results	Unit	Loc Id	Field Sample ID	Sample Type	Sampling Date	Zone	Lab SDG	EDMS Status	Analyte	Result	Unit	Loc Id
20220108-A3-ZT01	1/8/2022	A3	580-109117-5	Approved	BC2EE	3	0.030 U	µg/L	SA-LFH2	A3-TW-HYDLFH2-22035	Unpreserved	2/4/2022	A3	580-110026-2	Approved	BC2EE	0.029 U	µg/L	SA-LFH2
										A3-TW-HYDLFH2-22035-1*	Preserved	2/4/2022					0.029 U	µg/L	
2022011-H2-YT02	1/11/2022	H2	580-109243-1	Approved	BC2EE	1.2 F1	0.032 F1	µg/L	FH377	220204H2HT02	Unpreserved	2/4/2022	H2	580-110026-1	Finalized (Not Approved)	BC2EE	0.029 U	µg/L	FH377
										220204H2HT02-1*	Preserved	2/4/2022					0.029 U	µg/L	
2022011-H2-YT04	1/11/2022	H2	580-109243-1	Approved	BC2EE	1.7	0.032 U	µg/L	FH1331	220204H2HT03	Unpreserved	2/4/2022	H2	580-110026-1	Finalized (Not Approved)	BC2EE	0.029 U	µg/L	FH1331
										220204H2HT03-1*	Preserved	2/4/2022					0.029 U	µg/L	
2022011-H2-YT06	1/11/2022	H2	580-109243-1	Approved	BC2EE	2.3	0.030 U	µg/L	FH1646	220204H2HT04	Unpreserved	2/4/2022	H2	580-110026-1	Finalized (Not Approved)	BC2EE	0.029 U	µg/L	FH1646
										220204H2HT04-1*	Preserved	2/4/2022					0.029 U	µg/L	
20220111-H1-YT12	1/11/2022	H1	580-109239-1	Approved	BC2EE	3.3	0.031 U	µg/L	FH1396	220204H1HT01	Unpreserved	2/4/2022	H1	580-110035-1	Approved	BC2EE	0.029 U	µg/L	FH1396
										220204H1HT01-1*	Preserved	2/4/2022					0.029 U	µg/L	
2022112-H3-ZT09	1/12/2022	H3	580-109289-1	Certified (Not Approved	BC2EE	2.4	0.031 U	µg/L	FH1641	220204H3IT01	Unpreserved	2/4/2022	H3	580-110029-1	Approved	BC2EE	0.028 U	µg/L	FH1641
										220204H3IT01-1*	Preserved	2/4/2022					0.028 U	µg/L	
										220204H3IT02 (FD)	Unpreserved	2/4/2022					0.028 U	µg/L	
										220204H3IT02-1* (FD)	Preserved	2/4/2022					0.028 U	µg/L	
2022112-H3-ZT13	1/12/2022	H3	580-109289-1	Certified (Not Approved	BC2EE	1.7	0.031	µg/L	FH1651	220204H3IT03	Unpreserved	2/4/2022	H3	580-110029-1	Approved	BC2EE	0.028 U	µg/L	FH1651
										220204H3IT03-1*	Preserved	2/4/2022					0.028 U	µg/L	
2022112-H3-ZT05	1/12/2022	H3	580-109289-1	Certified (Not Approved	BC2EE	1.7	0.031 U	µg/L	FH1676	220204H3IT04-1*	Preserved	2/4/2022	H3	580-110029-1	Approved	BC2EE	0.028 U	µg/L	FH1676
										220204H3IT04	Unpreserved	2/4/2022					0.028 U	µg/L	
20220105-C1-ZT03	1/5/2022	C1	580-109054	Certified (Not Approved	BC2EE	0.1	0.031 U	µg/L	FH512	220203C1ZT03	Unpreserved	2/3/2022	C1	580-110036-1	Certified (Not Approved)	BC2EE	0.029 U	µg/L	FH512
20220106-F2-ZT08	1/6/2022	F2	580-109090	Loaded	BC2EE	1.6	0.031 U	µg/L	FH17	220203F2ZT01	Unpreserved	2/3/2022	F2	580-110037-1	Approved	BC2EE	0.029 U	µg/L	FH17
20220107-C2-YT02	1/7/2022	C2	580-109117-4	Loaded (Not Approved	BC2EE	0.76	0.031 U	µg/L	FH315	220203C2ZT02	Unpreserved	2/3/2022	C2	580-110034-1	Loaded (Not Approved)	BC2EE	0.029 U	µg/L	FH315
20220208-B1-ZT04	1/8/2022	B1	580-109117-8	Loaded (Not Approved	BC2EE	2.6	0.031 U	µg/L	B1-8	220203B1ZT04	Unpreserved	2/3/2022	B1	580-110038-1	Approved	BC2EE	0.029 U	µg/L	B1-8

(FD) = Field Duplicate

* - Preserved with sodium sulfite

** - Lab retracted results and restated as non-detections.

1) Revision Log:

Revision: 1	**Effective Date:** This version	
Section	**Justification**	**Changes**
Throughout	Required	Replaced TestAmerica Seattle with EFGS
Section 2	Required	Updated DoD QSM reference to Version 5.3
Section 7	Addition	Added definition for Isotopic Dilution analog
Section 9.2	Addition	Added Acetone to the Materials list
Section 6	Correction	Removed reference to pesticide surrogate
Table 1	Required	Updated SIM list
Throughout	Correction	Fixed incorrect links to SOP CW-E-M-001
Section 13.2	Correction	Replaced erroneous pesticide calibration standards with 8270 standards

2) Reference:

2.1 SW-846, Test Methods for Evaluating Solid Waste, Update VI, June 2018, Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry, Method 8270E.

2.2 U.S. Department of Defense (DoD)/Department of Energy (DOE) Consolidated Quality Systems Manual (QSM) for Environmental Laboratories, *Version 5.3, 2019*

3) Cross Reference:

Document	**Document Title**
EFGS-Q-QM-QM5805	QA Manual
EFGS-S-HS-12066	Chemical Hygiene Plan
EFGS-T-OP-SOP41411	Liquid-Liquid Extraction by Separatory Funnel, SW846 3510C and EPA 600 Series
EFGS-T-OP-SOP41432	Microwave Extraction Procedure, SW846 3546
EFGS-S-HS-SOP2991	Waste Disposal Procedures for Client Sample Waste
EFGS-T-OP-SOP41420	Waste Dilution [Method 3580A]
EFGS-Q-QD-SOP41922	Receipt, Preparation, Storage and Verification of Standards and Reagents and Traceability Protocols
CW-E-M-001	Corporate Environmental Health and Safety Manual

Document	Document Title
EFGS-Q-QD-SOP41889	Quality Control Program
EFGS-Q-QD-SOP2835	Incident Reports, Out-of-Specification Reports and Client Complaints
EFGS-WC-SOP41035	Percent Moisture/Percent Solids
EFGS-P-DR-SOP2801	Data Review and Validation and Monthly Logbook Reviews
EFGS-M-MC-SOP42521	Manual Integrations
EFGS-QP42518	Calibration Curves & Selection of Calibration Points
EFGS-M-MC-SOP42524	Detection and Quantitation Limits
EFGS-Q-QD-SOP2814	Personnel Training and Demonstration of Capability Procedures

4) Purpose:

4.1 Aqueous samples are extracted with methylene chloride using a continuous extractor or Separatory Funnel. The extract is dried, concentrated, and analyzed by GC/MS.

4.2 Solid samples are extracted with methylene chloride / acetone using microwave extraction. The extract is dried, concentrated, and analyzed by GC/MS.

4.3 Waste dilution is used for samples that are miscible with the solvent.

4.4 Extraction procedures are detailed in the following SOPs:

EFGS-T-OP-SOP41411 Separatory Funnel Extraction (3510C)
EFGS-T-OP-SOP41432 Microwave Extraction (3546)

4.5 Qualitative identification of the analytes in the extract is performed using the retention time and the relative abundance of characteristic ions. Quantitative analysis is performed using the internal standard technique with a single characteristic ion.

5) Scope:

5.1 This method is based upon standard method SW846 8270E, and is applicable to the determination of the concentration of semivolatile organic compounds in extracts prepared from solid and aqueous matrices.

5.1.1 Direct injection of a sample may be used in limited applications.

5.1.2 Refer to Table 1 for the list of compounds applicable for this method. This method may be amenable to additional compounds. If non-standard analytes are required, they must be validated by the procedures described in section 17 before sample analysis.

5.2 The following compounds may require special treatment when being determined by this method:

- Benzidine can be subject to oxidative losses during solvent concentration and exhibits poor chromatography.
- Hexachlorocyclopentadiene is subject to thermal decomposition in the inlet of the gas chromatograph, chemical reaction in acetone solution, and photochemical decomposition.
- N-Nitrosodiphenylamine decomposes in the gas chromatographic inlet and cannot be distinguished from diphenylamine.
- Pentachlorophenol, 2,4-dinitrophenol, 4-nitrophenol, 4,6-dinitro-2-methylphenol, 4-chloro-3-methylphenol, benzoic acid, 2-nitroaniline, 3-nitroaniline, 4-chloroaniline, and benzyl alcohol are subject to erratic chromatographic behavior, especially if the GC system is contaminated with high boiling material.
- 3-Methylphenol cannot be separated from 4-methylphenol by the conditions specified in this method. They are reported as 3- and 4-methylphenol.
- Hexachlorophene and famphur analysis are not quantitatively reliable by this method.

5.1 The reporting limit (RL) of this method for determining an individual compound is approximately 10 ug/kg to 4,000 ug/kg for soil/sediment samples and 0.02 µg/L to 15 µg/L for water samples. Some compounds have higher reporting limits. The current reporting limits are all updated in TALS. Reporting limits will be proportionately higher for sample extracts that require dilution.

5.2 On occasion clients may request modifications to this SOP. These modifications are handled following the procedures outlined in Section 14.2.1 in the Quality Assurance Manual.

6) Reference Modifications:

Item	Method	Modification
1	8270D/8270E	Calibration verification criteria will be set at +25% due to the low level concentrations analyzed

7) Definitions:

7.1 Batch - The batch is a set of up to 20 samples of the same matrix processed using the same procedures and reagents within the same time period. The Quality Control batch must contain a matrix spike / matrix spike duplicate (MS/MSD), a Laboratory Control Sample (LCS), and a method blank (MB). In some cases, at client request, the MS/MSD may be replaced with a matrix spike and sample duplicate. Batches are defined at the sample preparation stage. Batches should be kept together through the whole analytical process to the extent possible, but it is not mandatory to analyze prepared extracts on the same instrument or in the same sequence. Refer to the TestAmerica Seattle SOP *EFGS-Q-QD-SOP41889* Quality Control Program for further details of the batch definition.

7.2 Method Blank (MB) - An analytical control consisting of all reagents, internal standards and surrogate standards that is carried through the entire analytical procedure. The method blank is used to define the level of laboratory background and reagent contamination.

7.3 Laboratory Control Sample (LCS) - A blank matrix (reagent water or Ottawa Sand) spiked with the analytes of interest that is carried through the entire analytical procedure. Analysis of this sample with acceptable recoveries of the spiked analytes demonstrates that the laboratory techniques for this method are acceptable.

7.4 Matrix Spike (MS) – An aliquot of a matrix (water or soil) fortified (spiked) with known amounts of specific analytes and subjected to the entire analytical procedure in order to indicate the appropriateness of the method for the matrix by measuring recovery.

7.5 Matrix Spike Duplicate (MSD) - A second aliquot of the same sample as the matrix spike (above) that is spiked in order to determine the precision of the method by measuring the relative percent difference (RPD) between the MS and MSD results.

7.6 Surrogates - Organic compounds which are similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which are not normally found in environmental samples. Each sample, blank, LCS, MS, and MSD is spiked with surrogate standards. Surrogate spike recoveries must be evaluated by determining whether the concentration (measured as percent recovery) falls within the required recovery limits.

8) Interferences:

8.1 Matrix interferences may be caused by contaminants that are co-extracted from the sample. The extent of matrix interferences will vary considerably from source to source, depending upon the nature of the sample. Dilution or cleanup procedures may help to eliminate select interferences

8.2 Contaminants in solvents, reagents, glassware, and other processing apparatus that lead to discrete artifacts may cause method interferences. All of these materials must be routinely demonstrated to be free from interferences under conditions of the analysis by running laboratory method blanks as described in the Quality Control section (Section 18.0). Raw GC/MS data from all blanks, samples, and spikes must be evaluated for interferences. If interference is detected, it is necessary to determine if the source of interference is in the preparation and/or cleanup of the samples; then take corrective action to eliminate the problem.

8.3 The use of high purity reagents, solvents, and gases helps to minimize interference problems.

8.4 Contamination by carryover can occur whenever high-level and low-level samples are sequentially analyzed. To reduce carryover, the sample syringe must be rinsed with solvent between samples. Whenever an unusually concentrated sample is encountered, it should be followed by the analysis of solvent to check for cross contamination.

9) Safety Precautions, Pollution Prevention and Waste Handling:

Employees must abide by the policies and procedures in the Corporate Environmental Health and Safety Manual (CW-E-M-001) and this document. This procedure may involve hazardous material, operations and equipment. This SOP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of the method to follow appropriate safety, waste disposal and health practices under the assumption that all samples and reagents are potentially hazardous. Safety glasses, gloves, lab coats and closed-toe, nonabsorbent shoes are a minimum. Cut resistant gloves must be worn when using sharp tools or when washing glassware.

9.1 Specific Safety Concerns

9.1.1 Disposable gloves that have been contaminated must be removed and discarded; non-disposable gloves must be cleaned immediately.

NOTE: Latex and vinyl gloves provide no protection against the organic solvents used in this method. Nitrile or similar gloves must be used.

9.1.2 The gas chromatograph and mass spectrometer contain zones that have elevated temperatures. The analyst needs to be aware of the locations of those zones, and must cool them to room temperature prior to working on them.

9.1.3 The mass spectrometer is under deep vacuum. The mass spectrometer must be brought to atmospheric pressure prior to working on the source.

9.1.4 There are areas of high voltage in both the gas chromatograph and the mass spectrometer. Depending on the type of work involved, either turn the power to the instrument off, or disconnect it from its source of

power before performing any maintenance.

9.1.5 The toxicity or carcinogenicity of each reagent used in this method has not been fully established. Each chemical should be regarded as a potential health hazard and exposure should be as low as reasonably achievable. Cautions are included for known extremely hazardous materials.

9.2 Primary Materials Used

The following is a list of the materials used in this method, which have a serious or significant hazard rating. **Note: This list does not include all materials used in the method. The table contains a summary of the primary hazards listed in the SDS for each of the materials listed in the table.** A complete list of materials used in the method can be found in the reagents and materials section. Employees must review the information in the SDS for each material before using it for the first time or when there are major changes to the SDS.

Materials with Significant or Serious Hazard Rating

Material (1)	Hazards	Exposure Limit (2)	Signs and Symptoms of Exposure
Methanol	Flammable Poison Irritant	200 ppm-TWA	A slight irritant to the mucous membranes. Toxic effects exerted upon nervous system, particularly the optic nerve. Symptoms of overexposure may include headache, drowsiness and dizziness. Methyl alcohol is a defatting agent and may cause skin to become dry and cracked. Skin absorption can occur; symptoms may parallel inhalation exposure. Irritant to the eyes.
Methylene Chloride	Carcinogen Irritant	25 ppm-TWA 125 ppm-STEL	Causes irritation to respiratory tract. Has a strong narcotic effect with symptoms of mental confusion, light-headedness, fatigue, nausea, vomiting and headache. Causes irritation, redness and pain to the skin and eyes. Prolonged contact can cause burns. Liquid degreases the skin. May be absorbed through skin.
(1) Always add acid to water to prevent violent reactions. (2) Exposure limit refers to the OSHA regulatory exposure limit.			

9.3 Pollution Control

It is Eurofins Frontier Global Sciences policy to evaluate each method and look for opportunities to minimize waste generated (i.e., examine recycling options, ordering chemicals based on quantity needed, preparation of reagents based on anticipated usage and reagent stability). Employees must abide by the policies in Section 13 of the Corporate Environmental Health and Safety Manual (CW-E-M-001) for "Waste Management and Pollution Prevention".

9.4 Waste Management

Waste management practices are conducted consistent with all applicable rules and regulations. Excess reagents, samples and method process wastes are disposed of in an accepted manner. Waste description rules and land disposal restrictions are followed. Waste disposal procedures are incorporated by reference to SOP *EFGS-S-HS-SOP2991*.

9.4.1 Waste Streams Produced by the Method

9.4.1.1 Extracted sample and QC wastewater. After the extraction has been completed the spent water is collected into the organics extraction water conical reservoir. The collected wastewater is then purged with air to remove any remaining methylene chloride. The wastewater can then be discarded down the drain.

9.4.1.2 Methylene chloride waste. Solvent/Methylene Chloride waste. Any waste solvents are collected in beakers and then poured into a 4-liter amber bottle labeled "Hazardous Waste" located in the hood. After the extraction has been completed the MeCl2 collected in the 4 L bottles is emptied into the MeCl2 satellite waste barrel located next to the neutralization tank in lab hood #17. The funnel lid on the drum must be closed after each use At or before the satellite waste reaches 55 gallons the barrel is transferred to the waste disposal room from where it is sent out for recycling or fuel blending.

9.4.1.3 Vialed extract waste. Sample extracts that have been placed in vials for analysis are discarded into plastic satellite waste buckets labeled "Hazardous Waste" located underneath the bench top. Once the buckets are full the GC vials are bulked into the non-PCB GC vial waste barrel located in the waste room and sent out for incineration.

9.4.1.4 Extract waste. Unused sample extracts are held for at least 40 days, in case further testing is deemed necessary. After at least 40 days has passed these extracts are transported to the waste room in racks of 100 were they are bulked into a flammable loose pack waste stream and sent out for incineration.

10) Personnel Training and Qualifications:

10.1 An analyst must perform an initial demonstration of capability (IDOC) that includes four replicates of a secondary source before being qualified to analyze samples without supervision. Continuing DOC will be maintained and monitored via performance on LCSs and other QC samples, as well as obtaining acceptable results on proficiency testing exercises.

10.2 Training is documented by the employee and supervisor, and is kept on file in the QA Office. The employee must read, understand, and by signing the training document, agree to perform the procedures as stated in all Standard Operating Procedures (SOPs) related to this method.

10.3 All employees must also, on a yearly basis, read the Quality Manual (QM), and complete the yearly Ethics training.

10.4 All training documents including IDOCs, CDOCs, Initial QA orientation, and Ethics training are stored by the Quality Assurance Manager in the employees training file for ten years after the employee is no longer working for Eurofins Frontier Global Sciences.

10.5 Chemical Safety Training, Compressed Gas Training, Chemical Hygiene Plan documentation, and Shipping of Hazardous goods, are stored by the Health and Safety Officer for ten years after the employee is no longer working for Eurofins Frontier Global Sciences.

11) Sample Collection, Preservation and Handling:

11.1 Water samples are collected in pre-cleaned, amber glass bottles fitted with a Teflon-lined cap. To achieve routine reporting limits, a full one-liter of sample is required. Additional one-liter portions are needed to satisfy the requirements for matrix spikes and duplicate matrix spikes.

11.2 Samples and extracts are stored at 0-6°C.

Matrix	Sample Container	Min. Sample Size	Preservation	Extraction Holding Time	Analysis Holding Time	Reference
Waters	Amber glass	1 Liter	Cool 0-6ºC	7 Days	40 Days from extraction	40 CFR Part 136.3

12) Apparatus and Equipment:

12.1 Instrumentation

- Gas chromatograph- Agilent 6890 or equivalent
- Mass spectrometer Agilent 5973 Inert or 5975 w/turbo pump – 70 volt electron ionization source capable of scanning m/z range of 50 to 550 amu once every 1 second or less, operating in a selected ion monitoring (SIM) mode, and meeting the tuning requirements listed in Table 3 when 25 ng of the GC/MS tuning standard is injected through the GC.
- Gas chromatograph/mass spectrometer system: an analytical system complete with a
- Autosampler: LEAP Technologies CTC A200S, HP7683 Autosampler or equivalent
- Computer with a minimum 1GB memory, Pentium 4 processor, 80 G hard drive or equivalent or as recommended by instrument manufacturer.
- GC/MS Interface: Any GC-to-MS interface that gives acceptable calibration points and achieves acceptable tuning performance criteria may be used
- Data System: A computer system must be interfaced to the mass spectrometer. The system must allow the continuous acquisition and storage on machine-readable media of all mass spectra obtained throughout the duration of the chromatographic program. The computer must have software that can search any GC/MS data file for ions of a specific mass and that can plot such ion abundances versus time or scan number. This type of plot is defined as the Extracted Ion Current Profile (EICP). Software must also be available that allows integrating the abundances in any EICP between specified time or scan-number limits. The most recent version of the NIST Mass Spectral Library is recommended. Agilent (Hewlett Packard) ChemStation for Windows 95 (version G1701AA) or equivalent. Agilent's ChemStation, is used for data acquisition and storage on machine-readable media. Since no processing is done by ChemStation and since there are no audit trail functions associated with data acquisition, the audit trail feature for ChemStation may be either enabled or disabled. The other component, Chrom, is used for data processing such as the measurement of peak area or peak height. By design, the audit trail feature for Chrom is always enabled.
- Data processing: Chrom version 1.2 or higher.
- LIMS system: TALS version 1.0 or higher

12.2 Supplies

- Column – Phenomenex part number 7HG-G030-11-GGA 30 m x 0.25 mm x 0.25 µm film thickness fused-silica capillary column, or equivalent.
  Note: Other columns may be used. This was the column in place at the time the SOP was prepared. The serial number of the column used is documented in the instrument maintenance logbook.

- Gas-tight syringes (Hamilton 1700 Series, or 1000 Series or equivalent).
- 10 ml scintillation vials with polypropylene closures or 10, 20, 40 or 60 ml VOA vials with Teflon-lined silicone septa enclosures (or equivalent).
- 2 mL crimp top glass vials with PTFE lined caps.
- 100 µL Tri-spring inserts for 2 mL crimp top glass vials.
- Restek Gooseneck Splitless liners P/N 22406 or equivalent
- Analytical balance, capable of reading to 0.0001g. Analysts must verify calibration has been preformed on the balance before using it. The calibration must bracket the weights to be determined.
- Class A volumetric flasks; 10 mL, 25 mL, 50 mL, 100 mL, 250 mL.
- Carrier gas: Ultra high-purity helium

13) Reagents and Standards:

13.1 Document reagent/standards and reagent/standard preparation in TALS using the reagent module as described in SOP *EFGS-Q-QD-SOP41922*.

13.2 A minimum five-point calibration curve is prepared when average response factors or linear regression curve fitting is used. Six calibration points are required for second-order curve fits. The low point should be at or below the reporting limit. Other calibration levels may be used, depending on instrument capability, but the low standard must support the reporting limit and the high standard defines the range of the calibration.

13.2.1 8270 Calibration standards.

13.2.1.1 8270 Initial calibration stock standards

1000 ug/ml 8270 List 1 / Std#1 MegaMix – Restek 571995
2000 ug/ml 8270 List 1 / Std#9 - Restek 569730
2000 ug/ml 8270 List 1 / Std#10 - Restek 569731
2000 ug/ml 8270 List 1 / Std#11 - Restek 569732
5000 ug/ml Surrogate stock – Phenova AL0-130489

13.2.1.2 8270 Intermediate calibration standard
Dilute 1.0-mL of stock solutions listed in section 13.2.1.1. For the surrogate standard, dilute 200 uL. Mix to a final volume of 10-mL to make a 100-500 µg/mL intermediate stock solution.

13.2.1.3 From the intermediate stock solution make the following calibration levels:

Level	uL of stock	Final Volume (mL)	Final Concentration (ug/L)
1	5	50	10
2	10	50	20
3	25	50	50
4	50	50	100
5	100	50	200
6	250	50	500
7	500	50	1000
8	1000	50	2000
9	2500	50	5000
10	5000	50	10000

13.2.2 DDT breakdown/GCMS tuning standard

13.2.2.1 A methylene chloride solution containing 25 µg/mL of decafluorotriphenylphosphine (DFTPP) is prepared. Pentachlorophenol, benzidine, and DDT should also be included in the Tuning Standard at 25 µg/mL. 2uL of this solution should be injected for an on column concentration of 50ng.

13.2.3 ICV Standard

13.2.3.1
8270 List 1 / Std#1 MegaMix – Restek 571995.SEC
8270 List 1 / Std#9 - Restek 569730.SEC
8270 List 1 / Std#10 - Restek 569731.SEC
8270 List 1 / Std#11 - Restek 569732.SEC
8270 Surrogate mix – Phenova 13489 (MUST be a different lot than what is present in the calibration mix)

13.2.3.2 1.0ug/mL working ICV standard is prepared by diluting 100uL of each standard in section 13.2.3.1 to 100mL final volume with methylene chloride.

13.3 An internal standard (IS) solution is prepared. Compounds in the IS Mix are acenaphthene-d10, chrysene-d12, 1,4-dichlorobenzene-d4, naphthalene-d8, perylene-d12, and phenanthrene-d10.

13.3.1 4000 ug/ml 8270 Internal Standard Restek# 31006; 100 ug/ml 8270 Internal Standard is prepared by diluting 5.0 ml of the 2000 ug/ml Restek Standard to 100 ml with methylene chloride.

13.3.2 Internal standards are added to all standards and extracts to result in a final concentration of 1000 µg/L for full scan and 100 µg/L for SIM. For example, if the volume of an extract aliquot used was 1 mL, 10 µL of a 100 µg/mL internal standard solution would be added to the aliquot.

13.4 Laboratory Control Spiking Solution, Matrix Spike Solution, and surrogate spike solutions: Prepare as indicated in the extraction SOPs.

13.5 The standards listed in sections 13.1 to 13.4 must be refrigerated at 0-6°C. Stock standards expire 1 year after preparation.

13.6 ICAL reagents should be replaced after one month if the vials have been opened frequently (more than 5 times in a month).

13.7 Managers/supervisors or a designee are expected to check their areas on a monthly basis for expired standards and dispose of them according to SOP *EFGS-S-HS-SOP2991*.

14) Calibration:

14.1 Instrument Operating Conditions

14.1.1 Typical instrument operating conditions are listed in Table 2. Actual instrument operating conditions are posted in each maintenance logbook.

14.1.2 The instrument is tuned for DFTPP, calibrated initially with a minimum of a five levels, and verified each 12-hour shift with one or more continuing calibration standard(s).

14.1.3 All standards and extracts are allowed to warm to room temperature before injecting.

14.2 SIM

14.2.1 SIM (selected ion monitoring) is an alternative to analyzing samples under full scan mode. SIM selects specific target ions for analysis. SIM can be up to ten times more sensitive. In order to achieve maximum sensitivity the selected ions should be broken up in to several groups. Each of the target analytes should have 1 ion used for quantitation and 2 qualifier ions. The suggested ions are in Table 1. Other parameters can be used as long as sufficient sensitivity is achieved.

14.2.1.1 The internal standards and surrogates do not need to have 2 qualifier ions.

14.3 Instrument Tuning

14.3.1 A MS tuning compound (DFTPP) is analyzed every twelve hours during instrument operation, prior to analysis of standards, samples, or QC samples. Method tuning criteria must be met before sample analysis can proceed.

14.3.2 Tuning Procedure: 2.0 ul of a 25 ng/uL solution of decafluorotriphenylphosphine (DFTPP) must be analyzed in a scanning mode of 40 - 450 m/z.

14.3.3 Inject the GC/MS tuning/breakdown standard (Section 13.2.2) into the GC/MS system. Obtain background-corrected mass spectra of DFTPP and confirm that all the key m/z criteria are achieved. If all the criteria are not achieved, the analyst must retune the mass spectrometer and repeat the test until all criteria are achieved. The performance criteria must be achieved before any samples, blanks, or standards are analyzed. DFTPP Tuning Criteria (per EPA method 525.1):

Mass	Ion Abundance Criteria
51	10 - 80% of base peak
68	< 2% of mass 69
69	present
70	< 2% of mass 69
127	10 - 80% of base peak
197	< 2% of mass 198
198	Base peak or > 50% of 442
199	5 - 9% of mass 198
275	10 - 60% of base peak
365	> 1% of base peak
441	Present, but less than mass 443
442	Base peak or > 50% of mass 198
443	15 - 24% of mass 442

14.3.4 The results of the analysis of the GC/MS tuning/breakdown standard standard solution are used to calculate column degradation in terms of DDT percent breakdown (%B) are as follows:

$$\text{DDT } \%B = \frac{A_{DDD} + A_{DDE}}{A_{DDD} + A_{DDE} + A_{DDT}} \times 100\%$$

Where A_{DDD}, A_{DDE}, and A_{DDT} are the peak responses for 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT, respectively, in the EVAL B chromatogram.

14.3.5 Acceptance Criteria**:** The %Breakdown for DDT must be less than 20%.

14.3.6 Corrective Action: If the breakdown of DDT exceeds the 20% limit, corrective action must be taken. This action may include any or all of the following:

- Replacing the injection port liner
- Replacing the septa.
- Cutting off a portion of the injection end of the column or guard column.
- Replacing the GC column or guard column
- Replace inlet seal

After taking the appropriate corrective action, the degradation evaluation standard must be reanalyzed and must pass acceptance criteria before conducting any calibration events.

14.4 Initial Calibration

14.4.1 Internal Standard (IS) Calibration Procedure: Internal standards are listed in Section 13.3. Use the base peak m/z as the primary m/z for quantitation of the standards. If interferences are noted, use one of the next two most intense masses for quantitation. 10 uL of internal standard solution is added for every 1 mL of extract to all calibration standards, QC samples, and samples prior to analysis. The autosampler injects up to 5 uL of standard and extract volumes into the instrument for analysis.

14.4.2 Compounds are assigned to the IS with the closest retention time.

14.4.3 Prepare calibration standards at a minimum of five concentration levels for each parameter of interest when average response factors or linear regression curve fits are used. Six standards must be used for a quadratic least-squares calibration. It may also be useful to analyze six calibration levels and use the lower five for most analytes and the upper five for analytes that have poor response.

14.4.4 Rejection of Calibration Points

14.4.4.1 Generally, it is NOT acceptable to remove points from a calibration. If calibration acceptance criteria are not met, the normal corrective action is to examine conditions such as instrument maintenance and accuracy of calibration standards. Any problems must be fixed and documented in the run log or maintenance log. Then the calibration standard(s) must be reanalyzed.

14.4.4.2 If no problems are found or there is documented evidence of a problem with a calibration point (e.g., obvious misinjection explained in the run log), then points may be rejected, but only if all of the following conditions are met:

- The rejected point(s) are the highest or lowest on the curve, i.e., the remaining points used for calibration must be contiguous; and
- The lowest remaining calibration point is still at or below the project reporting limit; and
- The highest remaining calibration point defines the upper concentration of the working range, and all samples producing results above this concentration are diluted and reanalyzed; and
- The calibration must still have the minimum number of calibration levels required by the method, i.e. five levels for calibrations modeled with average response factors or linear regressions, or six levels for second-order curve fits.

14.4.5 Add the internal standard mixture to result in a 1,000-µg/L final concentration. (For example, if the volume of the calibration standard used is 0.5 mL, add 5 µL of the 100 µg/L internal standard).

14.4.6 Analyze each calibration standard and tabulate the area of the primary characteristic m/z against the concentration for each compound and internal standard. Calculate the response factors (RF), average response factors, and the percent RSD of the response factors for each compound using the equations in section 12 and Corporate SOP *EFGS-QP42518*. No sample analysis may be performed unless these criteria are met.

14.4.7 If the software in use is capable of routinely reporting curve coefficients for data validation purposes, and the necessary calibration reports can be generated, then the analyst should evaluate analytes with RSD > 15% for calibration on a curve. If it appears that substantially better accuracy would be obtained using quantitation from a curve fit, then the appropriate curve should be used for quantitation.

14.4.8 If the RSD for a compound in the initial calibration is > 15%, then calibration using a curve fit, must be used. Linear or quadratic curve fits may be used. Use of 1/Concentration2 weighting is recommended to improve the accuracy of quantitation at the low end of the curve. The analyst should consider instrument maintenance to improve the linearity of response.

14.4.9 If a linear regression equation is used, the correlation coefficient (r) must be greater than 0.995.

14.4.10 Use of second-order equations (quadratic) may be used on rare occasions and must consist of a minimum of six data points. In these cases, the intercept and degree of curvature should be examined to be sure that results will be reliable throughout the working range, and the coefficient of determination (r2) must be greater than 0.990.

14.4.11 Weighting of Calibration Data Points

14.4.12 In a linear or quadratic calibration fit, the points at the lower end of the calibration curve have less weight in determining the curve generated than points at the high concentration end of the curve. However, in environmental analysis, accuracy at the low end of the curve is very important. For this reason, it is preferable to increase the weighting of the lower concentration points. 1/Concentration2 weighting (often called 1/X2 weighting) will improve accuracy at the low end of the curve and should be used if the data system has this capability.

14.4.13 In addition to meeting %RSD requirements, each analyte must meet a minimum RF requirement of 0.020. Method 8270 states the minimum acceptable average RF for SPCC compounds is 0.050; however, as the analytes and the system are different, a minimum of 0.020 will be used as the cutoff.

14.4.14 See Corporate SOP *EFGS-QP42518* for information on acceptable initial calibration models and associated algorithms.

14.4.15 An initial calibration verification containing all components from a second source (an alternate vendor or a unique lot from the same vendor) must be analyzed after the initial calibration. Acceptance criteria for ICV percent recovery (%R) are 70-130% of all target analytes.

14.4.16 If the percent difference for the second-source verification falls outside acceptance criteria, then sample analysis cannot be performed. Reanalyze the second-source verification standard to confirm the original result. If the second result fails, then re-prepare the verification standard, and/or re-prepare and rerun the ICAL.

14.4.17 If time remains in the 12-hour period initiated by the DFTPP injection before the initial calibration, samples may be analyzed. Otherwise, proceed to continuing calibration, Section 15.2.

NOTE: Quantitation is performed using the calibration curve or average response factor from the initial curve, not the continuing calibration.

14.4.18 If a calibration is in use for greater than 3 months a check at the low and high ends of the calibration will be performed once per month of continued use and the %D and evidence of saturation for the high end check will be used to evaluate the continued effectiveness of the calibration.

15) Procedure:

Procedural variations are allowed only if deemed necessary in the professional judgment of the supervisor to accommodate variation in sample matrix, radioactivity, chemistry, sample size, or other parameters. Any variation in procedure shall be completely documented using a Nonconformance Memo (NCM). The NCM is approved by the supervisor and then automatically sent to the laboratory Project Manager by e-mail so that the client can be notified as appropriate. The QA department also receives NCMs by e-mail for tracking and trending purposes. The nonconformance shall be addressed in the case narrative, and the NCM shall be filed in the project file. The NCM process is described in more detail in SOP *EFGS-Q-QD-SOP2835*.

15.1 Sample Preparation

Samples are prepared according to the following organic preparation SOPs, as applicable:

EFGS-T-OP-SOP41411 Separatory Funnel Extraction (3510C)
EFGS-T-OP-SOP41432 Microwave Extraction (3546)
EFGS-T-OP-SOP41420 Waste Dilution (3580A)

15.2 Continuing Calibration Verification (CCV)

15.2.1 Prior to sample analysis, or following a successful DFTPP analysis (if required), the continuing calibration verification (CCV) standard(s) are analyzed. The standard(s) must contain all semivolatile analytes, including all required surrogates. A mid level calibration standard is used for the CCV.

15.2.2 The following criteria must be met for the CCV to be acceptable:

- For DOD samples, the percent difference or drift (%D) must be within ± 20% for all reported analytes. Any samples associated with a continuing calibration verification standard where the response for an analyte in the verification standard is above the acceptance limit and the analyte is not detected in any of the samples analyzed in the 12-hour window, do not need to be reanalyzed, as the verification standard has demonstrated that the analyte would have been detected if it were present (for DOD samples this requires client pre-approval). If a compound in the CCV fails low, the analyst may elect to analyze a RL (CCVL)standard immediately after the CCV. If the compounds of concern are detected in the RL standard,

it demonstrates that they would be detected in the samples, if present. This allows for the reporting of non detect sample results. Any compounds using a linear calibration fit in the initial calibration must undergo a low level readback on the CCVL. The readback concentration must be within 30% of the true value unless the analyte has been identified as a poor performer in which case the readback value must be within 50% of the true value. Compounds failing the readback value must be re-analyzed. For situations where the failed compound is present in a sample, the results must be qualified or the problem must be fixed and the CCV and affected samples must be re-analyzed. Possible problems include standard mixture degradation, column contamination and active sites.

If the subsequent calibration verification injection fails, a new initial calibration curve must be processed. (i.e., no more than two consecutive injections of the calibration verification may be processed.

- Analysis of DOD samples also requires a closing CCV to be analyzed at the end of the analytical run. Closing CCV requirements are 50%D for all analytes.
- For non-DOD samples, >80% of target compounds listed in Table 1 must meet 20%D except those listed as poorly performing compounds in Table 5 which must be within ± 50%D. (See Section 12 for calculations)
- For SIM PAH analysis of samples analyzed under the BP Lamp program, all target analytes must meet ± 15% D. See above for corrective actions.
- For non BP SIM samples, the percent drift must be ± 20% for all compounds.
- NOTE: Some analytes are included in both Tables 1 and 5. Those analytes that are in Table 1 will be controlled to ± 20% for projects reported under the DoD QSM and will be controlled to ± 50%D for commercial projects.
- The internal standard response of the CCV must be within 50 - 200% of the response in the same level of the corresponding calibration.
- If any internal standard retention time in the CCV changes by more than 30 seconds from that of the same level of the corresponding initial calibration, the chromatographic system must be inspected for malfunctions and corrections made, as required.

15.2.3 Once the above criteria have been met, sample analysis may begin. Initial calibration average RFs (or the calibration curve) will be used for sample quantitation, not the continuing calibration RFs. Analysis may proceed until 12 hours from the injection of the CCV have passed. A sample injected less than or equal to 12 hours after the CCV is acceptable.

15.2.3.1 If multiple CCVs are required for sample analysis, the analysis window ends 12 hours after the injection time of the first CCV.

15.3 Sample Analysis

15.3.1 Calibrate the instrument as described in Section 14. Depending on the target compounds required by the client, it may be necessary to use more than one set of calibration standards.

15.3.2 All samples must be analyzed using the same instrument conditions as the preceding continuing calibration verification (CCV) standard.

15.3.3 Add internal standard to an aliquot of the extract to result in a 1000-µg/L concentration (for example, 10 µL of internal standard solution at 100 µg/mL in 1000 µL of extract). Mix thoroughly before injection into the instrument. The internal standard response must be within 50-200% of the response in the daily CCVIS.

15.3.4 Inject the aliquot into the GC/MS system using the same injection technique as used for the standards.

15.3.5 The data system will determine the concentration of each analyte in the extract using calculations equivalent to those in Section 16. Quantitation is based on the initial calibration, not the continuing calibration verification.

15.3.6 Identified compounds are reviewed for proper integration. Manual integrations are performed if necessary and are documented by the analyst (see Corporate SOP *EFGS-M-MC-SOP42521*) or automatically by the data system. Chrom generates a report of the before and after chromatograms.

15.3.7 Target compounds identified by the data system are evaluated using the criteria listed in Section 16.1.

15.3.8 Library searches of peaks present in the chromatogram that are not target compounds, i.e., Tentatively Identified Compounds (TIC), may be performed if required by the client. They are evaluated using the criteria in Section 16.2.

15.4 Dilutions

If the response for any compound exceeds the working range of the GC/MS system, a dilution of the extract is prepared and analyzed. An appropriate dilution should be in the midrange of the calibration range. Samples may be screened to determine the appropriate dilution for the initial run. If the initial diluted run has no hits and the matrix allows for analysis at a lesser dilution, the sample may be reanalyzed at a lesser dilution.

15.4.1 Guidance for Dilutions Due to Matrix

If the sample is initially run at a dilution and the baseline rise is less than the height of the internal standards, or if individual non-target peaks are significantly less than two times the height of the internal standards, the sample may be reanalyzed at a more concentrated dilution. **This requirement is approximate and subject to analyst judgment.** For example, samples containing organic acids may need to be analyzed at a higher dilution to avoid destroying the column.

15.4.2 Reporting Dilutions

The most concentrated dilution with no target compounds above the calibration range will be reported. Other dilutions will be reported only at client request.

15.5 Perform all qualitative and quantitative measurements. When the extracts are not being used for analyses, refrigerate them at 0-6°C, protected from light in screw cap vials equipped with unpierced Teflon lined septa.

15.6 Retention Time Criteria for Samples

If the retention time for any internal standard changes by more than 0.5 minutes from the last continuing calibration standard, the chromatographic system must be inspected for malfunctions and corrected. Reanalysis of samples analyzed while the system was malfunctioning is required.

15.7 Percent Moisture

Analytical results may be reported as dry or wet weight, as required by the client. Percent moisture must be determined if results will be reported as dry weight. Refer to SOP EFGS-WC-SOP41035 for determination of percent moisture.

15.8 Procedural Variations

One-time procedural variations are allowed only if deemed necessary in the professional judgment of supervision to accommodate variation in sample matrix, chemistry, sample size, or other parameters. Any variation in procedure shall be completely documented using an NCM. The NCM is approved by the supervisor and then automatically sent to the laboratory Project Manager by e-mail so that the client can be notified as appropriate. The QA department also receives NCMs by e-mail for tracking and trending purposes. The NCM process is described in more detail in SOP *EFGS-Q-QD-SOP2835*. The NCM shall be filed in the project file and addressed in the case narrative. Any unauthorized deviations from this procedure must also be documented as a nonconformance, with a cause and corrective action described.

15.9 Maintenance Guide for GC/MS systems

15.9.1 Routine Instrument Maintenance

In addition to the schedules listed in Appendix A, the following activities constitute routine maintenance procedures and are performed as necessary.

- Clip Column;
- Install new injection port liner;
- Install new septum;
- Install new inlet seal and washer, or equivalent;

15.9.2 Injector port maintenance is performed whenever the following conditions exist:

- High column bleed
- Peak broadening and/or tailing for polar analytes such as phenols
- Loss of sensitivity
- Calibration failures due to a loss of response
- Retention time drift
- Long or training solvent tail
- Overall loss of instrument response

15.9.2.1 Turn the GC oven off and let the system cool to room temperature. Remove the column nut and column from the injector body. Remove the injector nut, removing the septum and liner from the injector body. (See Illustration 6-10 in the instrument manual).

15.9.2.2 Clean the inside of the injector body with a cotton swab dipped in methanol. Follow with a wash of methanol, collecting the washings below at the column inlet port. Allow to air dry, and then replace the liner with a new or reconditioned liner that has been boiled in mineral acid, solvent rinsed, and muffled at 400°C. Replace the septum and tighten the nut just past finger tight.

15.9.2.3 Using a ceramic column cutter, remove at least 4 cm of the column end, depending on the severity of the system contamination. Place a column nut and new ferrule over the end of the column and re-cut one inch from the column end to ensure that no ferrule fragments remain in the column. Feed the column into the tapered liner until seated, then hold pressure on the column while the nut is tightened to one turn past finger tight. At this point, the GC oven is turned on and brought up to operating temperature. The system should then be leak checked.

15.9.3 Column installation is performed when the following conditions are encountered;

- Heavy column bleed that cannot be eliminated by thermal conditioning.
- Loss of early eluting peaks due to column cutting.
- Inability to chromatographically resolve method performance compound peaks (i.e. chrysene from benzo(a)anthracene).
- Distortion of peak shapes i.e.; broadening, ghost peaks, split peaks that can't be resolved by injection port maintenance or flow control.

15.9.3.1 Turn the GC oven off and let the system cool to room temperature. Remove the column nut, liner, septum, and presstight inlet connector. Dispose of old column appropriately.

15.9.3.2 Cut approximately six inches off of the end of new columns. Attach the column to the presstight inlet connector on the injector end and proceed as in 5.3.1.4 to connect to the injector.

15.9.3.3 Turn the GC on and set the injector temperature to 280°C. Allow helium to flow through the column for a couple minutes, and then turn the oven to 310°C and condition for at least an hour.

15.9.3.4 Perform a leak check on the system following the instructions contained in the operator's manual chapter on **Miscellaneous Procedures of Operation**. When the air water spectrum shows acceptable levels, proceed with the mass calibration procedure. For additional information of column replacement see the operator's manual chapter on **Selected Routine GC Maintenance** (pages 6-33 to 6-41).

15.9.4 Major Maintenance

A new initial calibration is necessary following certain maintenance procedures. These maintenance procedures include changing the column, cleaning the ion volume or repeller, cleaning the source, replacing the multiplier, and replacing the "top board" or RF-related electronics. Refer to the manufacturer's manual for specific guidance.

15.9.5 Tuning the MS

After major maintenance an re-tune of the MS must be performed. Using an Agilent 5973 or equivalent MS, Select whatever tune parameters are used by the laboratory and run a tune to tune the MS.

All maintenance and repairs need to be documented in the instrument's maintenance logbook. The logbook must include the instrument name, serial number for each major component (e.g., GC, autosampler, column) and the date of start-up. When an instrument is not capable of analyzing samples, it needs to be tagged "Out of Service". Logbook entries must include a description of the problem and what actions were taken to address the problem. After an instrument has undergone maintenance or repairs, the system is evaluated using a tune, CCV or ICAL. If the evaluation is successful, the analyst documents in the logbook that the "System returned to control as indicated by a passing CCV" (or ICAL, MB, tune, etc as may be the case).

If columns were replaced during maintenance procedures the specific make, model and serial numbers of the columns installed need to be entered in the instruments maintenance logbook.

15.10 Troubleshooting

1. If a DFTPP tune fails spectra, replace vial with fresh tuning solution and reanalyze the tune sample
   a. If it fails a second time, evaluate MS conditions
   b. Continued failures may result in retuning the instrument (10.13.5)
2. If tailing fails for either benzidine or PCP, minimum routine maintenance is required (see section 10.13.)
   a. Continued failure. Check column positioning into the source
   b. Replace column if all other options are exhausted
3. If DDT breakdown fails, minimum routine maintenance is required
   a. Continued failure. Check column positioning into the source
   b. Replace column if all other options are exhausted
4. IF CCV fails for TC target analytes, re-analyze a fresh CCV, if it fails a second time minimum routine maintenance is required. If the 2nd CCV is acceptable, the samples may be analyzed
   a. A second CCV failure requires additional instrument maintenance and possibly generating a new ICAL.

15.11 Examples of Analytical Sequences:

Example 1

RB
DFTPP
STD IC 10 8270
STD IC 20 8270
STD IC 50 8270
STD IC 100 8270
STD IC 200 8270
STD IC 500 8270
STD IC 1000 8270

STD IC 2000 8270
STD IC 5000 8270
STD IC 10000 8270
ICV
QC and Samples (up to a 12 hour time limit)

Example 2

RB
DFTPP
CCV
QC and Samples (and CCVC if DOD) up to a 12 hour time limit

16) Calculations:

16.1 Qualitative Identification

An analyte is identified by retention time and by comparison of the sample mass spectrum with the mass spectrum of a standard of the suspected compound (standard reference spectrum). Mass spectra for standard reference may be obtained on the user's GC/MS by analysis of the calibration standards or from the NIST library**.** Two criteria must be satisfied to verify identification: (1) elution of sample component at the same GC retention time as the standard component; and (2) correspondence of the sample component and the standard component characteristic ions.

NOTE: Sometimes extract matrix and high targets can cause the analytes to shift outside the retention time found in the CCV. Identification can still be determined using the characteristic ions. Also, dilutions to lessen the matrix effects may be necessary to verify the identification.

NOTE: Care must be taken to ensure that spectral distortion due to co-elution is evaluated.

16.1.1 Full Scan Analysis

16.1.1.1 The sample component retention time must compare to within ± 0.06 min. of the retention time of the standard component. For reference, the standard must be run within the same twelve hours as the sample.

16.1.1.2 All ions present in the standard mass spectra at a relative intensity greater than 10% (most abundant ion in the spectrum equals 100%) should be present in the sample spectrum.

16.1.1.3 The characteristic ions of a compound must maximize in the same scan or within one scan of each other.

16.1.1.4 The relative intensities of ions should agree to within ±30% between the standard and sample spectra. (Example: For an ion with an abundance of 50% in the standard spectra, the corresponding sample abundance must be between 20% and 80%).

16.1.1.5 If a compound cannot be verified by all the above criteria, but in the technical judgment of the analyst the identification is correct, the analyst shall report that identification and proceed with quantitation.

16.1.2 SIM Analysis

The reference mass spectrum must be generated using the conditions of this method on the same instrument used for sample analysis. The characteristic ions from the reference mass spectrum are defined as the three ions of greatest relative intensity, or any ions >30% relative intensity, if less than three such ions occur in the reference spectrum. The mass spectrum of the peak is evaluated to confirm the presence of the compound. Spectra are compared against the reference spectra of each compound by an analyst competent in the interpretation of mass spectra. The following requirements must be met:

16.1.2.1 DFTTP tune (run in SCAN mode) runs before a 12 hour clock.

16.1.2.2 The quantitation and qualifier ions must be used for the identification of target compounds. Characteristic ions for the target compounds are presented in Table 7. The monitoring ions must agree within 20% of the relative intensities of the same ions in the reference standard.

16.1.2.3 The RT of the secondary ion must elute within 2 seconds of the primary ion in the sample.

16.1.2.4 The relative RT (RRT) of the compound in the sample must be within ±0.006 RRT of the standard compound. Matrix may affect the RT and the analyst should use their technical judgement for identification. Further dilutions may be necessary to verify identification.

16.1.2.5 A result should be reported as non-detect if, after careful review and in the technical judgment of the mass spectral interpretation specialist, the GC/MS identification cannot be considered a qualitatively confident mass spectral identification (regardless of the concentration).

16.2 For samples containing components not associated with the calibration standards, a library search may be made for the purpose of tentative identification. The necessity to perform this type of identification will be determined by the type of analyses being conducted. Computer generated library search routines should not use normalization routines that would misrepresent the library or unknown spectra when compared to each other. Only after visual comparison of sample spectra with the nearest library searches shall the mass spectral interpretation specialist assign a tentative identification. Following are guidelines for making tentative identification:

16.2.1 Relative intensities of major ions in the reference spectrum (ions >10% of the most abundant ion) should be present in the sample spectrum.

16.2.2 The relative intensities of the major ions should agree to within ±20%. (Example: For an ion with an abundance of 50% in the standard spectrum, the corresponding sample ion abundance should be between 30% and 70%.)

16.2.3 Molecular ions present in the reference spectrum should be present in the sample spectrum.

16.2.4 Ions present in the sample spectrum, but not in the reference spectrum, should be reviewed for possible background contamination or the presence of co-eluting compounds.

16.2.5 Ions present in the reference spectrum, but not in the sample spectrum, should be reviewed for possible subtraction from the sample spectrum because of background contamination or co-eluting peaks. Data system library reduction programs can sometimes create these discrepancies.

16.2.6 Automatic background subtraction can severely distort spectra from samples with unresolved hydrocarbons.

16.3 Isomers with identical mass spectra and close elution times pose problems for definitive identification. The following compounds fall into this category:

Aniline and bis(2-chloroethyl) ether
Dichlorobenzenes
Methylnaphthalenes
Methylphenols
Trichlorophenols
Tetrachlorophenols
Phenanthrene, anthracene
Fluoranthene, pyrene
Benzo(b), (k), and (j)fluoranthene
Chrysene, benzo(a)anthracene

Identification of these compounds requires both experience and extra precautions on the part of the analyst. To begin, the isomers in a standard mix must be completely resolved (i.e., the baseline to valley height between the isomers is less than 50% of the sum of the two peak heights). Otherwise, the isomers must be identified as isomeric pairs. Next, the analyst must carefully compare the retention times between the unknown and the calibration standard.

16.4 A second category of problem compounds consist of the poor responders or compounds that exhibit poor chromatography. The integrations for these types of compounds should be checked manually. *These compounds are listed in Table 5.*

16.5 Calculating the Percent Relative Standard Deviation for Initial Calibration

$$\%RSD = \frac{SD}{RF} \times 100\%$$

Where:
RF = Mean of RFs from the initial calibration for a compound
SD = Standard deviation for the mean RF from the initial calibration for a compound

$$SD = \sqrt{\frac{\sum_{i=1}^{n}\left(RF_i - \overline{RF}\right)^2}{n-1}}$$

RFi = RF for each of the calibration levels
n = Number of RF values

16.6 Calculating the Continuing Calibration Percent Drift

$$\%Drift = \frac{C_{actual} - C_{found}}{C_{actual}} \times 100\%$$

Where:
Cactual = Known concentration in standard

Cfound = Measured concentration using selected quantitation method

16.7 Calculating the Concentration in the Extract

The concentration of each identified analyte and surrogate in the extract is calculated from the linear or quadratic curve fitted to the initial calibration points, or from the average RF of the initial calibration.

16.7.1 Average Response Factor Calibration

If the average of all the RSDs of the response factors in the initial calibration is £ 15%, the average response factor from the initial calibration may be used for quantitation.

$$C_{ex} = \frac{R_x C_{is}}{R_{is} \overline{RF}}$$

Where:
Cex = Concentration in the extract, µg/mL
Rx = Response for the analyte
Ris = Response for the internal standard
Cis = Concentration of the internal standard
$\overline{RF}$ = Average response factor

16.7.2 Linear Fit Calibration

$$C_{ex} = A + B\frac{(R_x C_{is})}{R_{is}}$$

Where:
Cex = Concentration in the extract, µg/mL
Rx = Response for the analyte
Ris = Response for the internal standard
Cis = Concentration of the internal standard
A = Intercept of linear calibration line
B = Slope of linear calibration line

16.7.3 Quadratic Fit Calibration

$$C_{ex} = A + B\left(\frac{R_x C_{is}}{R_{is}}\right) + C\left(\frac{R_x C_{is}}{R_{is}}\right)$$

Where:
Cex = Concentration in the extract, µg/mL
Rx = Response for the analyte
Ris = Response for the internal standard
Cis = Concentration of the internal standard
A = Intercept
B = Factor for the linear term of the quadratic calibration function
C = Factor for the curvature term of the quadratic calibration function

16.8 Calculating the Concentration in the Sample

16.8.1 Calculation for Aqueous Samples

$$\text{Concentration, } \mu g / L = \frac{C_{ex} V_t}{V_o}$$

Where:
Cex = Concentration in the extract
Vt = Volume of total extract in µL, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean that Vt = 10,000 µL. If half of the base/neutral extract and half of the acid extract are combined, then Vt = 2,000.)
Vo = Volume of the sample that was extracted (mL)

16.8.2 Calculation for Sediment, Soil, Sludge, and Waste Samples

Results for sediments, sludges, and soils are usually calculated on a dry-weight basis, and for waste, on a wet-weight basis.

$$\text{Concentration, } \mu g / kg = \frac{C_{ex} V_t}{W_s D}$$

Where:

Cex = Concentration in the extract
Vt = Volume of total extract in µL, taking into account dilutions (i.e., a 1-to-10 dilution of a 1-mL extract will mean that Vt = 10,000 µL. If half of the base/neutral extract and half of the acid extract are combined, then Vt = 2,000.)
Ws = Weight of sample extracted or diluted in grams
D = (100 - % moisture in sample)/100, for a dry-weight basis or 1 for a wet-weight basis

16.9 MS/MSD Percent Recovery Calculation

$$\text{Matrix Spike Recovery} = \frac{S_{SR} - S_R}{S_A} \times 100\%$$

Where:
SSR = Spike sample result
SR = Sample result
SA = Spike added

16.10 Calculating the Relative Percent Difference (RPD) MS/MSD Pair

$$RPD = \frac{MS_R - MSD_R}{1/2(MS_R + MSD_R)} \times 100$$

Where:
RPD = Relative percent difference
MSR = Matrix spike result
MSDR = Matrix spike duplicate result

16.11 Relative Response Factor Calculation

$$RF = \frac{A_x C_{is}}{A_{is} C_x}$$

Where:
Ax = Area of the characteristic ion for the compound being measured
Ais = Area of the characteristic ion for the specific internal standard
Cx = Concentration of the compound being measured (µg/L)
Cis = Concentration of the specific internal standard (µg/L)

16.12 Calculation of TICs

The calculation of TICs (tentatively identified compounds) is identical to the above calculation (0) with the following exceptions:

Ax = Area of the total ion chromatogram for the compound being measured
Ais = Area of the total ion chromatogram for the nearest internal standard without interference
RF = 1

16.13 Calculating Percent DDT Breakdown

$$\%\,\text{DDT breakdown} = \frac{\text{DDEarea} + \text{DDDarea}}{\text{DDTarea} + \text{DDEarea} + \text{DDDarea}}$$

The areas for the 235 ion are used for this calculation.

16.14 Calculating the Peak Tailing Factor

$$TailingFactor = \frac{BC}{AB}$$

Where:
Peak width (AC) is measured at 10% peak height, and divided into two line segments at the peak centroid, so that.
AC = AB + BC, with
AB = left-hand segment
BC = right-hand segment

16.15 Upon completion of the analytical sequence:

16.15.1 Create a worklist on Chrom that reflects the machine run sequence. The Chrom worklist will serve as the instrument sequence logbook. For the Rinse Blank in the sequence, add the solvent to the sample reagent tab. This will serve as the record of the solvent lot used to dilute the samples.

16.15.2 Review chromatograms online and determine whether manual data manipulations are necessary.

16.15.3 All manual integrations must be justified and documented. See Corporate SOP *EFGS-M-MC-SOP42521* for requirements for manual integration.

16.15.4 Manual integrations are processed using Chrom which saves the before and after chromatograms, the reason for the change, and attaches the analyst's electronic signature.

16.16 Compile the raw data for all the samples and QC samples in an analytical batch.

16.16.1 Perform a level 1 data review, acknowledge any Data Review Checker (DRC) findings, and document the review on the data review checklist.

16.16.2 Submit the review checklist to the peer reviewer for the level 2 review. The data review process is explained in SOP *EFGS-P-DR-SOP2801*.

17) Statistical Information and Method Performance:

17.1 Method Detection Limit Study (MDL)

The method detection limit (MDL) is the lowest concentration that can be detected for a given analytical method and sample matrix with 99% confidence that the analyte is present. The MDL is determined according to the laboratory's MDL procedure (see SOP *EFGS-M-MC-SOP42524*). MDLs reflect a calculated (statistical) value determined under ideal laboratory conditions in a clean matrix, and may not be achievable in all environmental matrices. The laboratory maintains MDL studies for analyses performed; these are verified at least annually unless method requirements require a greater frequency.

17.1.1 Instrumentation software must have each target limit set to the lowest MDL. CHROM (DL)

17.2 Non-standard Analytes

For non-standard analytes, an MDL study must be performed and calibration curve generated before analyzing any samples, unless lesser requirements are previously agreed to with the client. In any event, the minimum initial demonstration should include the analysis of an extracted standard at the reporting limit and a single point calibration.

18) Quality Assurance/Quality Control and Corrective Action:

18.1 The minimum quality controls (QC), acceptance criteria, and corrective actions are described in this section and in Table 6. The process of establishing control limits, and the use of control charts are described more completely in *EFGS-Q-QD-SOP41889*, Quality Control Program. When processing samples in the laboratory, use the LIMS QC program code and special instructions to determine specific QC requirements that apply.

18.1.1 The laboratory's standard QC requirements, the process of establishing control limits, and the use of control charts are described more completely in SOP *EFGS-Q-QD-SOP41889*, Quality Control Program.

18.1.2 Project-specific requirements can override the requirements presented in this section when there is a written agreement between the laboratory and the client, and the source of those requirements should be described in the project documents. Project-specific requirements are communicated to the analyst via instructions in the LIMS.

18.1.3 Any QC result that fails to meet control criteria must be documented in a Nonconformance Memo (NCM). The NCM is approved by the supervisor and then automatically sent to the laboratory Project Manager by e-mail so that the client can be notified as appropriate. The QA group also receives NCMs by e-mail for tracking and trending purposes. The NCM process is described in more detail in SOP *EFGS-Q-QD-SOP2835*. This is in addition to the corrective actions described in the following sections.

18.2 Quality Control Batch

The batch is a set of up to 20 samples of the same matrix processed together using the same reagents and standards. Each quality control batch must contain a method blank (MB), a laboratory control sample (LCS), matrix spike (MS), and/or matrix spike duplicate (MSD) or duplicate (DUP) pair. For more details see SOP *EFGS-Q-QD-SOP41889*.

18.3 Method Blank (MB)

For aqueous sample batches, the method blank is reagent water; for solid sample batches, the method blank is clean sand. In either case, the method blank is free of the analytes of interest and is spiked with the surrogates. At least one method blank must be processed with each preparation batch.

Acceptance Criteria: The result for the method blank must be less than the reporting limit or less than 10% of the analyte concentration found in the associated samples, whichever is higher.

NOTE: Some programs (e.g., DOD and BP) require that the maximum blank concentration must be less than one-half of the reporting limit or less than 10% of the lowest sample concentration.

Corrective Action: Re-preparation and reanalysis of all samples associated with an unacceptable method blank. If the analyte was not detected in the samples, the data may be reported with qualifiers (check project requirements to be sure this is allowed) and it must be addressed in the project narrative.

18.4 Laboratory Control Sample (LCS)

The LCS is prepared using reagent water for aqueous methods and Ottawa sand for solid sample methods. A laboratory control sample (LCS) is prepared and analyzed with every batch of samples. For DOD and BP, an LCSD must be analyzed if there is not sufficient volume for a MS/MSD. The LCSD must pass the same control criteria as the LCS. Ongoing monitoring of the LCS provides evidence that the laboratory is performing the method within accepted QC guidelines for accuracy and precision.

Acceptance Criteria: All analytes must be within established control limits. See QC SOP *EFGS-Q-QD-SOP41889* for details on establishing control limits.

Corrective Action: If any analyte in the LCS is outside the laboratory-established historical control limits or project-specific control limits, as applicable, corrective action must occur. Corrective action may include re-extraction and reanalysis of the batch.

- If the LCS recovery is high and there are non-detect samples. An NCM is initiated. The non-detect samples are flagged and reported.

NOTE: DOD programs do not allow reporting data from high LCS's with sample non-detects. If data is to be reported, it must be authorized by the client via a variance on a site by site basis.

- If the batch is not re-extracted and reanalyzed, the reasons for accepting the batch must be clearly presented in the project records and the report. An example of acceptable reasons for not reanalyzing might be that the matrix spike and matrix spike duplicate are acceptable, and sample surrogate recoveries are good, demonstrating that the problem was confined to the LCS. This type of justification should be reviewed and documented with the client before reporting.
- If re-extraction and reanalysis of the batch are not possible due to limited sample volume or other constraints, the LCS is reported, all associated samples are flagged, and appropriate comments are made in a narrative to provide further documentation.

18.5 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

The matrix spike is a second aliquot of one of the samples in the batch. The matrix spike duplicate is a third aliquot of the same sample. The MS and MSD are spiked with the same analytes as the LCS. An MS/MSD pair is prepared and analyzed with every batch of samples when sufficient sample volume is available.

Acceptance Criteria: The percent recovery (%R) must fall within either historical limits or project-specific limits, as applicable. The relative percent difference (RPD) between the MS and MSD results must be less than or equal to the established historical or project-specific limit. See QC SOP *EFGS-Q-QD-SOP41889* for details on establishing control limits

Corrective Action: If any individual recovery or RPD fails the acceptance criteria, then corrective action must occur. Initially check the recovery of the analyte in question in the LCS. Generally, if the recovery of the analyte in the LCS is within limits, then the laboratory operation is considered to be in control and analysis may proceed. The reasons for accepting the batch must be documented.

- If the recovery for any analyte fails acceptance criteria for the MS, MSD, and the LCS, the laboratory operation is considered to be out of out of control and corrective action must be taken. Corrective action will normally include re-preparation and reanalysis of the batch.
- If it is not possible to prepare both an MS and MSD due to limitations of sample amount, then a duplicate LCS should be prepared and analyzed. The RPD between the LCS and LCSD must be less than or equal to the RPD limit established for the MS/MSD.
- The MS/MSD pair must be analyzed at the same dilution as the unspiked sample, even if the matrix spike compounds will be diluted to concentrations below the calibration range.

18.6 Surrogates

18.6.1 Each sample, blank, and QC sample is spiked with the surrogate standards. Surrogate compounds are spiked at 100 µg/mL. The compounds routinely included in the surrogate spiking solution, along with recommended standard concentrations, are listed in Table 4.

Acceptance Criteria: Surrogate spike recoveries must be evaluated by determining whether the concentration (measured as percent recovery) falls within the required recovery limits.

Corrective Action: For particular sublists, such as PAH only, acid surrogates may fail with no corrective action required. However, the failure must be documented in an NCM if the surrogates are reported. Otherwise, if any surrogates are outside of the limits, then the following corrective actions must take place (except for dilutions):

- Check all calculations for error.
- Ensure that instrument performance is acceptable.

- Recalculate the data and/or reanalyze the extract if either of the above checks reveals a problem.
- Re-extract and reanalyze the sample or flag the data as "Estimated Concentration" if neither of the above resolves the problem.

Note: For BP LaMP samples, if the surrogate %R fails, the recovery must be confirmed by re-extraction and reanalysis with the following exceptions:

- The lab has unequivocally demonstrated a sample matrix effect and informed the BP representative.
- The recovery exceeds upper control limits and all target analytes in the sample are non-detect.

NOTE: The decision to reanalyze or flag the data should be made in consultation with the client. It is only necessary to reprepare/ reanalyze a sample once to demonstrate that poor surrogate recovery is due to matrix effect, unless the analyst believes that the repeated out-of-control results are not due to matrix effect.

18.6.2 If the sample with failed surrogate recoveries was a sample used for an MS/MSD pair and the surrogate recoveries in the MS/MSD are also outside of the control limits, then the sample and the MS and the MSD do not require reanalysis. This phenomenon indicates a possible matrix problem.

18.6.3 If the sample is reanalyzed and the surrogate recoveries in the reanalysis are acceptable, then the problem was within the analyst's control and only the reanalyzed data should be reported. (Unless the reanalysis was outside holding times, in which case reporting both sets of results may be appropriate).

18.6.4 If the reanalysis does confirm the original results, the original analysis is reported and the data flagged as estimated due to matrix effects.

18.7 Instrument QC

Any extra QC that is analyzed in a batch or sequence must be evaluated using the same criteria as the corresponding QC above.

18.7.1 Instrument Control Blanks

18.7.1.1 After a calibration has been performed and prior to analysis of samples, an Instrument Control Blank must be analyzed to prove the instrument is free from contamination. An ICB must meet the same requirements as a Method blank as specified in section 18.3.

21) List of Attachments:

Table 1: Current Compounds Applicable to Method
Table 2: Suggested Instrument Conditions
Table 3: DFTPP Key Ions and Ion Abundance Criteria
Table 4: 8270E Surrogate Compounds
Table 5: Table of Poorly Performing Compounds
Table 6: Summary of QC Requirements
Table 7: Characteristic Ions – SIM
Table 8: 8270E Minimum RF criteria

Attachment 1: Example Internal Standard Evaluation Custom Report
Attachment 2: Example Breakdown Evaluation Custom Report
Attachment 3: Example Tailing Evaluation Custom Report

APPENDIX A: Instrument Maintenance Schedules - Mass Spectrometer & Gas Chromatograph

Table 1: Current Compounds Applicable to Method

8270E Full Scan

1,1'-Biphenyl	2-Fluorophenol	Atrazine1	Di-n-octyl phthalate
1,2,4,5-Tetrachlorobenzene	2-Methylnaphthalene	Azobenzene	Fluoranthene
1,2,4-Trichlorobenzene	2-Methylphenol	Benzidine	Fluorene
1,2-Dichlorobenzene	2-Nitroaniline	Benzo[a]anthracene	Hexachlorobenzene
1,3-Dichlorobenzene	2-Nitrophenol	Benzo[a]pyrene	Hexachlorobutadiene
1,3-Dinitrobenzene	3 & 4 Methylphenol	Benzo[b]fluoranthene	Hexachlorocyclopentadiene
1,4-Dichlorobenzene	3,3'-Dichlorobenzidine	Benzo[g,h,i]perylene	Hexachloroethane
1,4-Dioxane1	3-Nitroaniline	Benzo[k]fluoranthene	Hexadecane
1-Methylnaphthalene	4,4'-DDD1	Benzofluoranthene	Indene
2,2'-oxybis[1-chloropropane]	4,4'-DDE1	Benzoic acid	Indeno[1,2,3-cd]pyrene
2,3,4,6-Tetrachlorophenol	4,4'-DDT1	Benzyl alcohol	Isophorone
2,4,5-Trichlorophenol	4,6-Dinitro-2-methylphenol	Bis(2-chloroethoxy)methane	Naphthalene
2,4,6-Trichlorophenol	4-Bromophenyl phenyl ether	Bis(2-chloroethyl)ether	n-Decane1
2,4'-DDE1	4-Chloro-3-methylphenol	Bis(2-ethylhexyl) phthalate	Nitrobenzene
2,4-Dichlorophenol	4-Chloroaniline	Butyl benzyl phthalate	N-Nitrosodimethylamine
2,4-Dimethylphenol	4-Chlorophenyl phenyl ether	Caprolactam1	N-Nitrosodi-n-propylamine
2,4-Dinitrophenol	4-Nitroaniline	Carbazole	N-Nitrosodiphenylamine
2,4-Dinitrotoluene	4-Nitrophenol1	Chrysene	n-Octadecane1
2,6-Dichlorophenol1	Acenaphthene	Dibenz(a,h)anthracene	Pentachlorophenol
2,6-Dinitrotoluene	Acenaphthylene	Dibenzofuran	Phenanthrene
2-Chloronaphthalene	Acetophenone	Diethyl phthalate	Phenol
2-Chlorophenol	Aniline	Dimethyl phthalate	Pyrene
2-Fluorobiphenyl	Anthracene	Di-n-butyl phthalate	Pyridine1

1: Non-standard compounds

8270E SIM

1-Methylnaphthalene	Benzo[g,h,i]perylene
2-Methylnaphthalene	Benzo[k]fluoranthene
4,4'-DDD1	Bis(2-ethylhexyl) phthalate
4,4'-DDE1	Chrysene
4,4'-DDT1	Dibenz(a,h)anthracene
1,4-Dioxane	Fluoranthene
Acenaphthene	Fluorene
Acenaphthylene	Indeno[1,2,3-cd]pyrene
Anthracene	Naphthalene
Benzo[a]anthracene	Pentachlorophenol
Benzo[a]pyrene	Phenanthrene
Benzo[b]fluoranthene	Pyrene

Table 2: Suggested Instrument Conditions

Mass Range:	35 - 550 amu for SCAN, select ions for SIM
Scan Time:	About 3 scan/sec
Initial Column Temperature/Hold Time:	45 °C hold 3 min
Column Temperature Program:	30 °C/min to 280 °C 9 °C/min to 325 °C
Final Column Temperature/Hold Time:	325 °C hold for 2 min
Injector Temperature:	260 °C
Transfer Line Temperature:	280 °C
Source Temperature:	According to manufacturer's specifications
Injector:	Pulsed splitless
Sample Volume:	1.0 µl or 2.0 µl
Carrier Gas:	Helium at 3.3 mL/min.

Current instrument conditions can be found noted in the maintenance logbook for each instrument.

Table 3: DFTPP Key Ions and Ion Abundance Criteria

Mass	**Ion Abundance Criteria**
51	10 - 80% of base peak
68	<2% of mass 69
69	Present
70	<2% of mass 69
127	10 - 80% of base peak
197	<2% of mass 198
198	Base peak or >50% of mass 442
199	5 - 9% of mass 198
275	10 - 60% of base Peak
365	>1% of base Peak
441	Present and < mass 443
442	Base peak or >50% of mass 198
443	15 - 24% of mass 442

Table 4: Surrogate Compounds

8270E Full Scan

Surrogate Compounds	Spiking Level, µg/mL in standard
Nitrobenzene-d5	100
2-Fluorobiphenyl	100
Terphenyl-d14	100
Phenol-d5	100
2-Fluorophenol	100
2,4,6-Tribromophenol	100

Recovery limits for surrogates are generated from historical data and are maintained in the LIMS.

8270E SIM PAH

Surrogate Compounds	Spiking Level, µg/mL in standard
Terphenyl-d14	100
2,4,6-Tribromophenol2	100
2-methylnaphthalene-d101	100
Fluoroanthene-d101	100

Recovery limits for surrogates are generated from historical data and are maintained in the LIMS.
1. Included in standard mix, but not routinely evaluated for method 8270C SIM PAH list, non-DoD projects.
2. Included in standard mix, but not routinely evaluated for method 8270C, unless Pentachlorophenol or other associated compound is a target analyte.

8270E SIM Alternative Analyte List

Surrogate Compounds	Spiking Level, µg/mL in standard
1,4-Dioxane-d8 (Isotope Dilution Analog)	500
Nitrobenzene-d5	100
2-Fluorobiphenyl	100
Terphenyl-d14	100
2-Fluorophenol	100
2,4,6-Tribromophenol	100
2-methylnaphthalene-d101	100
Fluoroanthene-d101	100

Recovery limits for surrogates are generated from historical data and are maintained in the LIMS.
1. Included in standard mix, but not routinely evaluated for method 8270D SIM PAH list, non-DoD projects.

Table 5: Table of Poor Performing Compounds*

2,3,4,6-Tetrachlorophenol	4-Nitrophenol
2,3,5,6-Tetrachlorophenol	Aniline
2,4-Dinitrophenol	Benzidine
3-Nitroaniline	Benzoic Acid
3,3' Dichlorobenzidine	Carbazole
4-Chloroaniline	N-Nitrosodimethylamine
4-Nitroaniline	

* - This is not a comprehensive list and is subject to change. Each project's target list should be evaluated for poor performers.

Table 6: Summary of QC Requirements

QC Parameter	Frequency	Acceptance Criteria	Corrective Action
DFTPP Tune	Prior to ICAL and at the beginning of each 12-hour period.	See Section 14.5	Retune instrument and verify. Rerun affected samples.
Breakdown Check	At the beginning of each 12-hour period and prior to analyzing samples.	Degradation ≤ 20% for DDT. Benzidine tailing < 2.0 and PCP tailing < 2.0. **For DoD:** Benzidine and PCP should be present at their normal responses, and should not exceed a tailing factor of 2.	Correct problem then repeat breakdown check. No samples can be run until degradation is acceptable.
Minimum 5-point Initial Calibration	Initial calibration prior to sample analysis	Option 1: RSD for each analyte ≤ 20% (<15% for DOD) Option 2: Linear regression r ≥ 0.990 **Option 2 for DOD:** Linear regression r ≥ 0.995. Option 3: Non linear regression r2 ≥ 0.990 and 6 points must be used.	Terminate analysis; correct the problem; recalibrate. Problem must be corrected. No samples may be run until ICAL has passed.
ICV	Following initial calibration.	70-130% for non-DoD projects (e.g., 8270D HSL components); and 50-150% for poor performers **For DoD:** 80 - 120% recovery	Terminate analysis; correct the problem; recalibrate.
Relative Retention Times (RRT)	With each sample	RRT of each target analyte within ± 0.06 RRT units.	Correct problem, then rerun ICAL. Laboratory may update RTs based on the CCV to account for minor performance fluctuations or after routine system maintenance (e.g. column clipping).
CCV	Daily before sample analysis and every 12 hours of analysis time.	**For non-DoD projects:** 80-120% recovery for all 8270 standard compounds in Table 1 and surrogates; 50-150% recovery for 8270 poor performing compounds in Table 5. **For DoD/BP LaMP projects:** ; 1. %D/Drift for all standard target compounds in Table 1 and surrogates ≤ 20%D; 2. Closing CCV requires 50-150%D for all compounds.	Correct problem, then rerun CCV. If that fails, then repeat ICAL. Reanalyze all samples since the last successful CCV.

QC Parameter	Frequency	Acceptance Criteria	Corrective Action
Internal Standards (IS) verification	Every field sample, standard, and QC sample	Retention time ± 30 seconds from RT of the midpoint standard in ICAL; EICP area within -50% to +100% of ICAL midpoint standard. **For DOD:** Retention time must be + or – 10 seconds from the RT of the midpoint standard in the ICAL.	Inspect mass spectrometer and GC for malfunctions. Reanalysis of samples while system was malfunctioning is mandatory.
Method Blank	One per batch of 20 field samples or fewer.	The result must be < RL or < 1/10 the amount measured in any sample or 1/10 the regulatory limit. **For DoD:** No analytes detected > ½ RL and > 1/10 the amount measured in any sample or 1/10 the regulatory limit. For common laboratory contaminants no analytes detected > RL.	Re-extract and reanalyze samples. Note exceptions under criteria section. See Section 18.3 for additional requirements.
LCS	One per batch of 20 field samples or fewer.	Must be within laboratory control limits. **For DoD:** Must contain all analytes to be reported. Must be within acceptance criteria specified by DOD, if available. Otherwise, use in-house control limits.	See Section 18.4 for additional requirements.
Surrogate	All field and QC samples.	Must be within laboratory control limits, **For DoD:** Must be within acceptance criteria specified by DOD, if available. Otherwise, use in-house control limits.	See Section 18.6 for additional requirements.
Matrix Spike/Laboratory Fortified Matrix	One per lot of 20 field samples or fewer.	Must be within laboratory control limits. **For DoD:** Must contain all analytes to be reported. Must be within acceptance criteria specified by DOD, if available. Otherwise, use in-house control limits.	See Section 18.5 for additional requirements.

Table 7A: Characteristic Ions – SIM PAHs

SIM Group	Quantitation Ion	Qualifier Ions	Compound
1	136	108	Naphthalene-d8 (istd)
1	128	102, 127	Naphthalene
2	152	122	2-methylnaphthalene-d10 (surr)
2	142	141, 115	2-methylnaphthalene
2	142	141, 115	1-methylnaphthalene
3	152	151, 153	Acenaphthylene
3	164	162	Acenapthene-d10 (istd)
3	153	154, 152	Acenaphthene
4	166	165, 167	Fluorene
4	330	141	2,4,6-Tribromophenol (surr)
5	266	264, 268	Pentachlorophenol
5	188		Phenanthrene-d10 (istd)
5	178	179, 176	Phenanthrene
5	178	179, 176	Anthracene
6	212	106	Fluoranthene-d10
6	202	101, 203	Fluoranthene
6	202	101, 203	Pyrene
6	244	122	Terphenyl-d14 (surr)
7	228	229, 226	Benzo(a)anthracene
7	240	236	Chrysene-d12 (istd)
7	228	226, 229	Chrysene
8	252	253, 126	Benzo(b)fluoranthene
8	252	253, 126	Benzo(k)fluoranthene
8	252	253, 126	Benzo(a)pyrene
8	264	260	Perylene-d12 (istd)
9	276	138, 277	Indeno(1,2,3-cd)pyrene
9	278	276, 138	Dibenz(a,h)anthracene
9	276	138, 277	Benzo(g,h,i)perylene

Table 7B: Characteristic Ions – Alternative SIM Method

SIM Group	Quantitation Ion	Qualifier Ions	Compound
1	88	58, 43	1,4-Dioxane
1	74	42, 43	N-Nitrosodimethylamine
1	112	64	2-Fluorophenol (surr)
2	99	71	Phenol-d5 (surr)
2	93	63, 95	Bis(2-chloroethyl)ether
2	152	150	1,4-Dichlorobenzene-d4 (istd)
3	70	42, 130	N-Nitrosodi-n-propylamine
3	117	201, 199	Hexachloroethane
3	82	128	Nitrobenzene-d5 (surr)
3	77	123, 65	Nitrobenzene
4	136	108	Napthalene-d8 (istd)
4	127	129, 65	4-Chloroaniline
4	225	190, 118	Hexachlorobutadiene
5	152	122	2-methylnaphthalene-d10 (surr)
5	237	235, 272	Hexachlorocyclopentadiene
5	196	198, 200	2,4,6-Trichlorophenol
5	172	171	2-Fluorobiphenyl (surr)
6	168	122, 76	1,3-Dintrobenzene
6	165	89, 63	2,6-Dinitrotoluene
6	164	162	Acenaphthene-d10 (istd)
6	184	63, 154	2,4-Dinitrophenol
6	165	89, 63	2,4-Dinitrotoluene
7	330	332	2,4,6-Tribromophenol (surr)
7	284	142, 249	Hexachlorobenzene
7	266	264, 268	Pentachlorophenol
7	188	94	Phenanthrene-d10 (istd)
8	212	106	Fluoranthene-d10 (surr)
8	244	122	Terphenyl-d14 (surr)
9	252	254, 154	3,3'-Dichlorobenzidine
9	240	236	Chrysene-d12 (istd)
10	252	253, 126	Benzo(a)pyrene
10	264	260	Perylene-d12 (istd)
11	278	276, 138	Dibenz(a,h)anthracene

Table 8: 8270E Minimum RF criteria

Analyte	Minimum RF for initial and continuing calibration
1,2,4-Trichlorobenzene	0.01
Acenaphthene	0.9
2,4-Dinitrotoluene	0.2
Pyrene	0.6
N-Nitroso-di-n-propylamine	0.5
1,4-Dichlorobenzene	0.01
Pentachlorophenol	0.05
Phenol	0.8
2-Chlorophenol	0.8
4-Chloro-3-methylphenol	0.2
N-Nitrosodimethylamine	0.01
Bis(2-chloroethyl)ether	0.7
n-Decane	0.01
1,3-Dichlorobenzene	0.01
Benzyl alcohol	0.01
1,2-Dichlorobenzene	0.01
2-Methylphenol	0.7
2,2'-oxybis[1-chloropropane]	0.01
3 & 4-Methylphenol	0.6
Hexachloroethane	0.3
Nitrobenzene	0.2
Isophorone	0.4
2-Nitrophenol	0.1
2,4-Dimethylphenol	0.2
Benzoic Acid	0.01
Bis(2-chloroethoxy)methane	0.3
2,4-Dichlorophenol	0.2
Naphthalene	0.7
4-Chloroaniline	0.01
Acetophenone	0.01
Hexachlorobutadiene	0.01
4-Nitrophenol	0.01
2-Methylnaphthalene	0.4
1-Methylnaphthalene	0.4
Hexachlorocyclopentadiene	0.05
2,4,6-Trichlorophenol	0.2
2,4,5-Trichlorophenol	0.2
2-Chloronaphthalene	0.8
2-Nitroaniline	0.01
Dimethyl phthalate	0.01
2,6-Dinitrotoluene	0.2
Acenaphthylene	0.9
3-Nitroaniline	0.01
2,4-Dinitrophenol	0.01
Dibenzofuran	0.8
2,3,4,6-Tetrachlorophenol	0.01
Diethyl phthalate	0.01
4-Chlorophenyl phenyl ether	0.4
4-Nitroaniline	0.01
Fluorene	0.9
4,6-Dinitro-2-methylphenol	0.01
N-Nitrososdiphenylamine	0.01
Azobenzene	0.01
4-Bromophenyl phenyl ether	0.1
Hexachlorobenzene	0.1
n-Octadecane	0.01
Phenanthrene	0.7
Anthracene	0.7
Di-n-butyl phthalate	0.01
Fluoranthene	0.6
Butyl benzyl phthalate	0.01
3,3'-Dichlorobenzidine	0.01
Bis(2-ethylhexyl) phthalate	0.01
Benzo(a)anthracene	0.8
Chrysene	0.7
Di-n-octyl phthalate	0.01
Benzo(b)fluoranthene	0.7

Benzo(k)fluranthene	0.7
Benzo(a)pyrene	0.7
Indeno(1,2,3-cd)pyrene	0.5
Dibenz(a,h)anthracene	0.4
Benzo(g,h,i)perylene	0.5
Carbazole	0.01

Attachment 1: Example Internal Standard Evaluation Custom Report

FORM VIII
GC/MS SEMI VOA INTERNAL STANDARD AREA AND RETENTION TIME SUMMARY

Lab Name: TestAmerica Tacoma Job No.: 580-12197-1

SDG No.:

Sample No.: CCVIS 580-39026/2 Date Analyzed: 12/10/2008 13:19

Instrument ID: TAC040 GC Column: ZB-5MS ID: 0.25(mm)

Lab File ID (Standard): ak018739.D Heated Purge: (Y/N) N

		DCB		NPT		ACN	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
12 HOUR STD		11172	3.20	17716	4.18	11176	5.59
UPPER LIMIT							
LOWER LIMIT							
LAB SAMPLE ID	CLIENT SAMPLE ID						
MB 580-38946/1-A		7654	3.20	18328	4.18	11486	5.59
LCS 580-38946/2-A		8484	3.20	19108	4.18	11938	5.59
580-12197-3	08FTW336B-32	7980	3.20	19016	4.18	11411	5.59
580-12197-3 MS	08FTW336B-32 MS	7765	3.20	17983	4.18	11310	5.59
580-12197-3 MSD	08FTW336B-32 MSD	7232	3.20	18301	4.18	11655	5.59

DCB = 1,4-Dichlorobenzene-d4
NPT = Naphthalene-d8
ACN = Acenaphthene-d10

Area Upper Limit = 200% of Internal Standard Area
Area Lower Limit = 50% of Internal Standard Area

Column used to flag values outside QC limits

FORM VIII 8270C

Attachment 2: Example Breakdown Evaluation Custom Reports

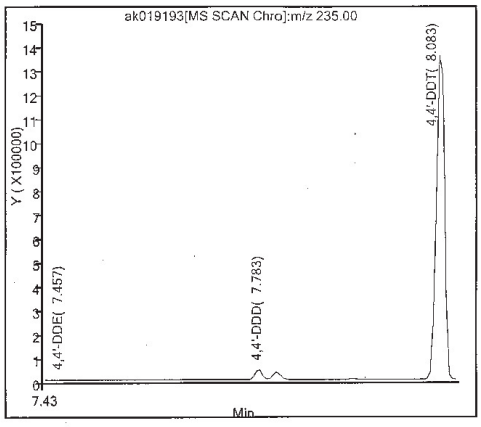
Report Date: 01-Apr-2009 15:08:23 Chrom Revision: 1.0.2009.312

Preliminary Report

Breakdown Report

Data File:	\\TACSVR5\Chromdata\TAC040\20090401-1.b\ak019193.D		
Inj Date:	01-Apr-2009 07:56:30	Limit Group:	8270C Standard
Lims Batch ID:	42046	Lims Sample ID:	1
Client ID:		Instrument:	TAC040
Sample Info:	dftpp		
Sample Amount:	1.00 uL	Operator:	RBF

93 4,4'-DDT, Detector: MS SCAN



SW-846 Method

%Breakdown =
(Area Breakdown Cpnds/
Total Area Breakdown Cpnds) * 100

93 4,4'-DDT Area = 1276732
89 4,4'-DDE Area = 2208
91 4,4'-DDD Area = 33705

%Breakdown: 2.74%, Max Limit: 20.00%
Passed

Attachment 3: Example Tailing Evaluation Custom Reports

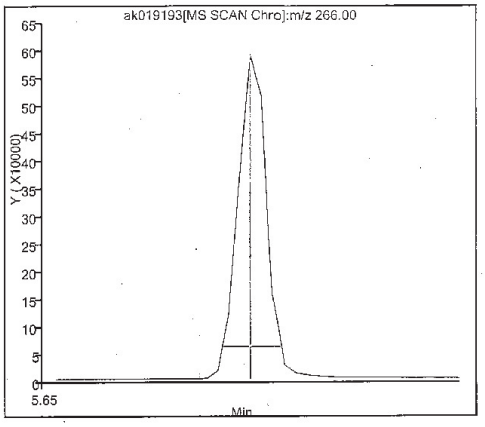
Report Date: 01-Apr-2009 15:09:32 Chrom Revision: 1.0.2009.312

Preliminary Report

Peak Tailing Report

Data File: \\TACSVR5\Chromdata\TAC040\20090401-1.b\ak019193.D
Inj Date: 01-Apr-2009 07:56:30 Limit Group: 8270C Standard
Lims Batch ID: 42046 Lims Sample ID: 1
Client ID: Instrument: TAC040
Sample Info: dftpp
Sample Amount: 1.00 uL Operator: RBF

60 Pentachlorophenol_T, Detector: MS SCAN

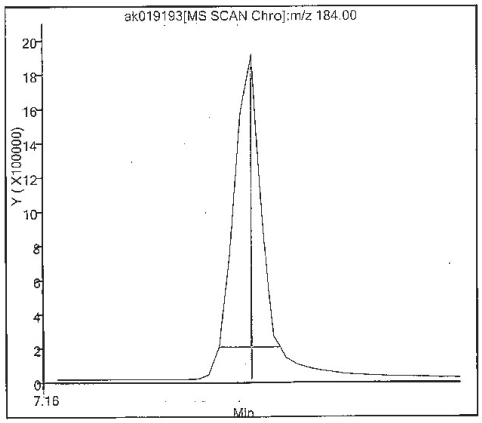


Peak Tailing Factor =
BackWidth/FrontWidth @ 10% Peak Height

Back Width = 0.015 (min.)
Front Width = 0.014 (min.)

Tailing Factor = 1.1, Max. Tailing < 5.00
Passed

85 Benzidine_T, Detector: MS SCAN



Peak Tailing Factor =
BackWidth/FrontWidth @ 10% Peak Height

Back Width = 0.013 (min.)
Front Width = 0.016 (min.)

Tailing Factor = 0.8, Max. Tailing < 3.00
Passed

APPENDIX A
Instrument Maintenance Schedules - Mass Spectrometer & Gas Chromatograph

MASS SPECTROMETER Instrument Maintenance Schedule				
Daily	**Weekly**	**As Needed**	**Quarterly**	**Annually**
Check for sufficient gas supply. Check for correct column flow and/or inlet pressure	Check mass calibration (PFTBA or FC-43).	Check level of oil in mechanical pumps and diffusion pump if vacuum is insufficient. Add oil if needed between service contract maintenance.	Check vacuum, relays, gas pressures, and flows.	Replace the exhaust filters on the mechanical rough pump every 1 to 2 years.
Check temperatures of injector, detector. Verify temperature programs.		Replace electron multiplier when the tuning voltage approaches the maximum and/or when sensitivity falls below required levels.		Change the oil in the mechanical rough pump.
Check inlets, septa.		Clean source, including all ceramics and lenses. Source cleaning is indicated by a variety of symptoms, including inability of the analyst to tune the instrument to specifications, poor response, and high background contamination.		Relubricate the turbomolecular pump-bearing wick.
Check baseline level.		Repair/replace jet separator.		
Check values of lens voltages, electron multiplier, and relative abundance and mass assignments of the calibration compounds.		Replace filaments when both filaments burn out or performance indicates the need for replacement.		

APPENDIX A (continued)
Instrument Maintenance Schedules - Mass Spectrometer & Gas Chromatograph

GAS CHROMATOGRAPH Instrument Maintenance Schedule (For GC/MS only.)	
Daily	**As Needed**
Check for sufficient supply of carrier and detector gases. Check for correct column flow and/or inlet pressures.	Replace front portion of column packing or guard column or break off front portion of capillary columns. Replace column if this fails to restore column performance or when column performance indicates it is required (e.g., peak tailing, poor resolution, high backgrounds, etc.).
Check temperatures of injectors and detectors. Verify temperature programs.	Change glass wool plug in injection port and/or replace injection port liner when front portion of column packing is changed or front portion of capillary column is removed.
Check inlets, septa. Clean injector port.	Replace septa.
Check baseline level.	Perform gas purity check (if high baseline indicates that impure carrier gas may be in use).
Inspect chromatogram to verify symmetrical peak shape and adequate resolution between closely eluting peaks.	Repair or replace flow controller if constant gas flow cannot be maintained.
	Reactivate flow controller filter dryers when the presence of moisture is suspected.
	Autosampler: Replace syringe, fill wash bottle, dispose of waste bottle contents.

EFGS-M-MC-SOP42521 Manual Integrations
EFGS-M-MC-SOP42524 Detection and Quantitation Limits
EFGS-P-DR-SOP2801 Data Review and Validation and Monthly Logbook Reviews
EFGS-Q-QD-SOP2814 Personnel Training and Demonstration of Capability Procedures
EFGS-Q-QD-SOP2835 Incident Reports, Out-of-Specification Reports and Client Complaints
EFGS-Q-QD-SOP41889 Quality Control Program
EFGS-Q-QD-SOP41922 Receipt, Preparation, Storage and Verification of Standards and Reagents and Traceability Protocols
EFGS-Q-QM-QM5805 Quality Assurance Manual
EFGS-QP42518 Calibration Curves and the Selection of Calibration Points
EFGS-S-HS-SOP2991 Waste Disposal Procedures for Client Sample Waste
EFGS-T-OP-SOP41411 Liquid-Liquid Extraction by Separatory Funnel [Methods EPA 3510C and 600 Series]
EFGS-T-OP-SOP41420 Waste Dilution [Method 3580A]
EFGS-T-OP-SOP41432 Microwave Extraction Procedure [Method 3546]
EFHS-S-HS-12066.0004 Chemical Hygiene Plan

End of document

Version history

Version	Approval	Revision information	
1	27.AUG.2021		

eurofins | Eaton Analytical

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1 800 566 LABS (1 800 566 5227)

A2LA ACCREDITED
CERTIFICATE #'s 5890.01 & 5890.02

Laboratory Report

for

State of Hawaii DOH
2385 Waimano Home Road
Pearl City, HI 96782
Attention: Melvin Tokuda
Fax: 808-586-4351

Date of Issue
01/23/2022

EUROFINS EATON
ANALYTICAL, LLC

NELAP ACCREDITED TNI LABORATORY
Utah ELCP CA00006

DEB: Debbie L Frank
Project Manager

Report: 980768
Project: RED-HILL-INCIDENT
Group: RUSH TPH 8015 - (Extractable GRO-DRO-ORO-Response Sampling)

* Accredited in accordance with TNI 2016 and ISO/IEC 17025:2017.
* Laboratory certifies that the test results meet all **TNI 2016 and ISO/IEC 17025:2017** requirements unless noted under the individual analysis.
* As applicable, this report consists of the cover page, State Certification List, ISO 17025 Accredited Method List, Acknowledgement of Samples Received, Comments, Hits Report, Data Report, QC Summary, QC Report and Regulatory Forms.
* Test results relate only to the sample(s) tested.
* Test results apply to the sample(s) as received, unless otherwise noted in the comments report (ISO/IEC 17025:2017).
* This report shall not be reproduced except in full, without the written approval of the laboratory.
* This report includes ISO/IEC 17025 and non-ISO 17025 accredited methods.

STATE CERTIFICATION LIST

State	Certification Number	State	Certification Number
Alabama	41060	Montana	Cert 0035
Arizona	AZ0778	Nebraska	NE-OS-21-13
Arkansas	CA00006	Nevada	CA00006
California	2813	New Hampshire *	2959
Colorado	CA00006	New Jersey *	CA 008
Connecticut	PH-0107	New Mexico	CA00006
Delaware	CA 006	New York *	11320
Florida *	E871024	North Carolina	06701
Georgia	947	North Dakota	R-009
Guam	21-008R	Ohio - 537.1	87786
Hawaii	CA00006	Oregon *	4034
Idaho	CA00006	Pennsylvania *	68-00565
Illinois	200033	Puerto Rico	CA00006
Indiana	C-CA-01	Rhode Island	LAO00326
Iowa – Asbestos	413	South Carolina	87016
Kansas *	E-10268	South Dakota	CA11320
Kentucky	90107	Tennessee	TN02839
Louisiana *	LA008	Texas *	T104704230-20-18
Maine	CA00006	Utah (Primary AB) *	CA00006
Maryland	224	Vermont	VT0114
Marianas Islands	MP0004	Virginia *	460260
Massachusetts	M-CA006	Washington	C838
Michigan	9906	EPA Region 5	CA00006
Mississippi	CA00006	Los Angeles County Sanitation Districts	10264

* NELAP/TNI Recognized Accreditation Bodies

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750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629
T | 626-386-1100
F | 866-988-3757
www.EurofinsUS.com/Eaton

ISO/IEC 17025:2917 Accredited Method List

The test listed below are accredited and met the requirements of ISO/IEC 17025 as verify by A2LA.

Refer to our certificates and scope of accreditations (no. 5890-1 and 5890-2) found at:

https://www.eurofinsus.com/Eaton

Test(s)	Method(s)	Potable Water *	Waste Water
Enterococci	Enterolert	x	x
Escherichia coli (Enumeration)	SM 9221 B.1 SM 9221 F	x	
Fecal Coliform (P/A and Enumeration)	SM 9221 C (MTF/EC), SM 9221 E (MTF/EC)	x	x
Fecal Streptococci and Enterococci	SM 9230 B	x	x
Heterotrophic Bacteria	SM 9215 B	x	
Legionella	Legiolert®	x	
Pseudomonas aeruginosa	Idexx Pseudalert	x	
Total Coliform (P/A and Enumeration)	SM 9221A, SM 9221B, SM 9221 C	x	x
Total Coliform, Total Coliform with Chlorine Present	SM 9221 B	x	x
Total Coliform/E. coli (P/A and Enumeration, Idexx Colilert, Idexx Colilert 18, Colisure)	SM 9223	x	
Total Microcystins and Nodularins	EPA 546	X	
Yeast and Mold	SM 9610	x	
1,2,3-Trichloropropane (TCP) at 5 PPT	CA SRL 524M-TCP	x	
1,4-Dioxane	EPA 522	x	
2,3,7,8-TCDD	Modified EPA 1613 B	X	
Acrylamide	+LCMS 2440)	x	
Algal Toxins/Microcystin	+ LCMS 3570	x	
Alkalinity	SM 2320B	x	x
Ammonia	EPA 350.1, SM 4500-NH3 H		x
Asbestos	EPA 100.2	x	x
Bicarbonate Alkalinity as HCO3	SM 2330 B	x	x
BOD/CBOD	SM 5210 B		x
Bromate	+LCMS- 2447	x	
Carbonate as CO3	SM 2330 B	x	x
Carbonyls	EPA 556	x	x
Chemical Oxygen Demand	EPA 410.4, SM 5220D		x
Chlorinated Acids	EPA 515.4	x	
Chlorine Dioxide	Palin Test Chlordio X Plus, SM 4500-CLO2 D	x	
Chlorine, Free, Combined, Total Residual, Chloramines	SM 4500-Cl G	x	
Color	SM2120B	x	
Conductivity	EPA 120.1, SM 2510B	x	x
Corrosivity (Langelier Index), Carbonate as CO3, Hydroxide as OH Calculated	SM 2330 B	x	
Cyanide (Amenable)	SM 4500-CN G	x	x
Cyanide (Free)	SM 4500CN F	x	x
Cyanide (Total)	EPA 335.4	x	x
Cyanogen Chloride (Screen)	+335 Mod (WC-24467)	x	
Diquat and Paraquat	EPA 549.2	x	
DBP and HAA	SM 6251 B	x	
Dissolved Organic Carbon	SM 5310 C	x	
Dissolved Oxygen	SM 4500-O G		x
EDB/DCBP/TCP	EPA 504.1	x	
EDB/DBCP and Disinfection Byproducts	EPA 551.1	x	
EDTA and NTA	+ WC-2454	x	
Endothall	EPA 548.1, +(LCMS-2445)	x	
Fluoride	SM 4500F C	x	x
Glyphosate	EPA 547	x	
Glyphosate and AMPA	+LCMS-3618	x	
Gross Alpha and Gross Beta	EPA 900.0	x	x

Test(s)	Method(s)	Potable Water *	Waste Water
Gross Alpha coprecipitation	SM 7110 C	x	x
Hardness	SM 2340 B	x	x
Hexavalent Chromium	EPA 218.6,	x	x
Hexavalent Chromium	EPA 218.7,	x	
Hexavalent Chromium	SM 3500-Cr B		x
Inorganic Anions and DBPs	EPA 300.0	x	x
Norganic Anions and DBPs	EPA 300.1	x	
Kjeldahl Nitrogen	EPA 351.2		x
Metals	EPA 200.7, EPA200.8	x	x
Nitrosamines	EEA-Agilent 521.1 (GCMS-24250)	x	
Nitrate/Nitrite Nitrogen	EPA 353.2	x	x
Odor	SM2150B	x	
Organohalide Pesticides and PCB	EPA 505	x	
Ortho Phosphate	SM 4500P E	x	
Oxyhalides Disinfection Byproducts	EPA 317.0	x	
Perchlorate	EPA 331.0	x	
Perchlorate (Low and High Levels)	EPA 314.0	x	
Perfluorinated Alkyl Acids	EPA 533, EPA 537, EPA 537.1	x	
PPCP and EDC	+LCMS-2443	x	
pH	EPA 150.1 SM 4500-H+ B	x	x
Phenolics – Low Level	+WC 2493 (EPA 420.2 and EPA 420.4 MOD)	x	x
Phenylurea Pesticides/Herbicides	+LCMS-2448	x	
Radium-226, Radium-228	GA Tech (Rad-2374)	x	
Radon-222	SM 7500RN	x	
Residue (Filterable)	SM 2540C	x	x
Residue (Non-Filterable)	SM 2540D		x
Residue (Total)	SM 2540B		x
Residue (Volatile)	EPA 160.4		x
Semi-Volatile Compounds	EPA 525.2	x	
Silica	SM 4500-SiO2 C	x	x
Sulfide	SM 4500-S D		x
Sulfite	SM 4500-SO3 B	x	x
Surfactants	SM 5540C	x	x
Taste and Odor	SM 6040 E	x	
Total Organic Carbon	SM 5310 C	x	x
Total Phenols	EPA 420.1		x
Total Phenols	EPA 420.4	x	x
Triazine Pesticides and their Degradates	+LCMS-3617	x	
Turbidity	EPA 180.1	x	x
Uranium by ICP/MS	EPA 200.8	x	
UV 254 Organic Constituents	SM 5910B	x	
VOCs	EPA 524.2	x	
VOCs	+(GCMS 2412) by EPA 524.2 modified	x	

(*) includes: Bottled Water, Drinking Water and Water as Component of Food & Beverage.

(+) In-House Method

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Acknowledgement of Samples Received

Addr: **State of Hawaii DOH**
2385 Waimano Home Road
Pearl City, HI 96782

Attn: Melvin Tokuda
Phone: 808-586-4280

Client ID: HAWAII-DOH
Folder #: 980768
Project: RED-HILL-INCIDENT
Sample Group: RUSH TPH 8015 - (Extractable GRO-DRO-ORO-Response Sampling)
Project Manager: Debbie L Frank
Phone: (626) 386-1149
PO #: P-CARD

The following samples were received from you on **January 13, 2022** at **0948**. They have been scheduled for the tests listed below each sample. If this information is incorrect, please contact your service representative. Thank you for using Eurofins Eaton Analytical, LLC.

Sample #	Sample ID	Sample Date
202201170036	011122-25-04	01/11/2022 1423
	@8015_C8-C44_ASSETS	
202201170037	RUSH	01/11/2022 1423
	RUSH	

Test Description

@8015_C8-C44_ASSETS -- 8015 C8-C44

980768

B6AN011722

EUROF01 C: 1/17/2022 12:00 AM
FOLDER R: 1/13/2022
N048811-002A 1 of 1

eurofins

CHAIN OF CUSTODY RECORD

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629
Phone: 626 386 1100
Fax: 626 386 1101
800 566 LABS (800 566 5227)

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS: ASSET Labs

SAMPLES CHECKED AGAINST COC BY:

SAMPLES LOGGED IN BY:

SAMPLES REC'D DAY OF COLLECTION? ☐ (check for yes)

SAMPLE TEMP RECEIVED AT:
☐ Colton / No. California / Arizona 2.8 °C (Compliance: 4 ± 2 °C)
☐ Monrovia IR#3 °C (Compliance: 4 ± 2 °C)

CONDITION OF BLUE ICE: Frozen ____ Partially Frozen ____ Thawed ____ Wet Ice ____ No Ice ____

METHOD OF SHIPMENT: Pick-Up / Walk-In / (FedEx) / UPS / DHL / Area Fast / Top Line / Other: ____ FedEx #: 8986

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: State of Hawaii DOH

PROJECT CODE: HAWAII-DOH

EEA CLIENT CODE: HAWAII

Job#: P-CARD

SAMPLE GROUP: RED-HILL-INCIDENT

Standard TAT — STD __ 1 wk __ 3 dayX_ 2 day ___ 1 day ___

COMPLIANCE SAMPLES (check for yes) ☐
- Requires state EDD ☐

NON-COMPLIANCE SAMPLES (check for yes) x
REGULATION INVOLVED: Response Sampling (eg. SDWA, Phase V, NPDES, FDA, ..)

Type of samples (circle one): ROUTINE SPECIAL CONFIRMATION

SEE ATTACHED BOTTLE ORDER FOR ANALYSES ☐ (check for yes), OR

list ANALYSES REQUIRED (enter number of bottles sent for each test for each sample)

SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX	Field pH	Source Temp (Celsius)	TPH 8015 Diesel and Motor oil	TPH 8015 Diesel and Motor oil (chlorinated)	SAMPLER COMMENTS
1/11/22	2:25 pm	011122-25-04		Water			1	1	ZONE H1 HYDRANT 14/16

* **MATRIX TYPES:** **RSW** = Raw Surface Water; **RGW** = Raw Ground Water; **CFW** = Chlor(am)inated Finished Water; **FW** = Other Finished Water; **SEAW** = Sea Water; **WW** = Waste Water; **BW** = Bottled Water; **SW** = Storm Water; **SO** = Soil; **SL** = Sludge; **O** = Other - Please Identify

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
SAMPLED BY:	Signature	AL JEROME NATAC	Hawaii Department of Health	1/11/22	2:25 pm
RELINQUISHED BY:	Signature	AL JEROME NATAC	Hawaii Department of Health	1/11/22	6:90 pm
RECEIVED BY:	Signature	D. KAWAHARA		1/12/22	1030
RELINQUISHED BY:	Signature	D. KAWAHARA		1/12/22	1024
RECEIVED BY:	Signature	Yeandow Rodriguez	ASSET Labs	1/13/22	0948

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Section 2b.3 Exceedance Investigation Summary and Results

Page 5 of 19 pages

ENCL (2)

980768

B6AN011722

EUROF01 C: 1/17/2022 12:00 AM
FOLDER R: 1/13/2022
N048811-002A 1 of 1

eurofins

CHAIN OF CUSTODY RECORD

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629
Phone: 626 386 1100
Fax: 626 386 1101
800 566 LABS (800 566 5227)

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS: ASSET Labs

SAMPLES CHECKED AGAINST COC BY:

SAMPLES LOGGED IN BY:

SAMPLES REC'D DAY OF COLLECTION? ☐ (check for yes)

SAMPLE TEMP RECEIVED AT:
☐ Colton / No. California / Arizona 2.8 °C (Compliance: 4 ± 2 °C)
☐ Monrovia MA 3 °C (Compliance: 4 ± 2 °C)

CONDITION OF BLUE ICE: Frozen ____ Partially Frozen ____ Thawed ____ Wet Ice ____ No Ice ____

METHOD OF SHIPMENT: Pick-Up / Walk-In / (FedEx) / UPS / DHL / Area Fast / Top Line / Other: ____ FedEx #: 8986

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: State of Hawaii DOH

PROJECT CODE: HAWAII-DOH

EEA CLIENT CODE: HAWAII

Job#: P-CARD

SAMPLE GROUP: RED-HILL-INCIDENT

COMPLIANCE SAMPLES (check for yes) ☐
- Requires state EDD ☐

NON-COMPLIANCE SAMPLES (check for yes) x
REGULATION INVOLVED: Response Sampling (eg. SDWA, Phase V, NPDES, FDA, ..)

Type of samples (circle one): ROUTINE SPECIAL CONFIRMATION

SEE ATTACHED BOTTLE ORDER FOR ANALYSES ☐ (check for yes), OR

list ANALYSES REQUIRED (enter number of bottles sent for each test for each sample)

Standard TAT STD __ 1 wk __ 3 dayX_ 2 day ___ 1 day ___

SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX	Field pH	Source Temp (Celsius)	TPH 8015 Diesel and Motor oil	TPH 8015 Diesel and Motor oil (chlorinated)	SAMPLER COMMENTS
1/11/22	2:25 pm	011122-25-04		Water			1	1	ZONE H1 HYDRANT 1416

* **MATRIX TYPES:** **RSW** = Raw Surface Water; **RGW** = Raw Ground Water; **CFW** = Chlor(am)inated Finished Water; **FW** = Other Finished Water; **SEAW** = Sea Water; **WW** = Waste Water; **BW** = Bottled Water; **SW** = Storm Water; **SO** = Soil; **SL** = Sludge; **O** = Other - Please Identify

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
SAMPLED BY:	Signature	AL JEROME NATAC	Hawaii Department of Health	1/11/22	2:25 pm
RELINQUISHED BY:	Signature	AL JEROME NATAC	Hawaii Department of Health	1/11/22	6:90 pm
RECEIVED BY:	Signature	D. KAWAHARA		1/12/22	1030
RELINQUISHED BY:	Signature	D. KAWAHARA		1/12/22	1024
RECEIVED BY:	Signature	Yeandow Rodriguez	ASSET Labs	1/13/22	0948

PAGE ____ OF ____

Section 2b.3 Exceedance Investigation Summary and Results

ENCL (2)

eurofins | Eaton Analytical

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Comments

Report: 980768
Project: RED-HILL-INCIDENT
Group: RUSH TPH 8015 - (Extractable GRO-DRO-ORO-Response Sampling)

State of Hawaii DOH
Melvin Tokuda
2385 Waimano Home Road
Pearl City, HI 96782

Folder Comments

Results for TPH Carbon Chain 8015 are submitted by Asset Laboratories

The Comments Report may be blank if there are no comments for this report.

eurofins | Eaton Analytical

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Hits

Report: 980768
Project: RED-HILL-INCIDENT
Group: RUSH TPH 8015 - (Extractable GRO-DRO-ORO-Response Sampling)

State of Hawaii DOH
Melvin Tokuda
2385 Waimano Home Road
Pearl City, HI 96782

Samples Received on:
01/13/2022 0948

Analyzed	Analyte	Sample ID	Result	Federal MCL	Units	MRL
	202201170036	**011122-25-04**				
01/14/2022 22:32	C8		260		ug/L	50
01/14/2022 22:32	C8-C44		310		ug/L	50
01/14/2022 22:32	Gas Range Organics C8-C10		270		ug/L	50

SUMMARY OF POSITIVE DATA ONLY

eurofins | Eaton Analytical

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 980768
Project: RED-HILL-INCIDENT
Group: RUSH TPH 8015 - (Extractable GRO-DRO-ORO-Response Sampling)

State of Hawaii DOH
Melvin Tokuda
2385 Waimano Home Road
Pearl City, HI 96782

Samples Received on:
01/13/2022 0948

011122-25-04 (202201170036) — **Sampled on 01/11/2022 1423**

EPA 8015 - 8015 C8-C44

Prepared	Analyzed	Prep Batch	Analyzed Batch	Method	Analyte	Result	Units	MDL	MRL	Dilution
	01/14/22 22:32			(EPA 8015)	C11-C12	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C13-C14	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C15-C16	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C17-C18	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C19-C20	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C21-C22	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C23-C24	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C25-C26	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C29-C32	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C33-C36	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C37-C40	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C41-C44	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C8	260	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C8-C44	310	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	C9-C10	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	Diesl Range Organics (DRO) -C10-C28	ND	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	Gas Range Organics C8-C10	270	ug/L	33	50	1
	01/14/22 22:32			(EPA 8015)	Oil Range Organics (C28-C40)	ND	ug/L	33	50	1

Rounding on totals after summation.
ND - Analyte was not detected at the calculated MDL.
J - The analyte was either detected at or greater than the MDL and less than the MRL, or did not meet any one of the required QC criteria.
(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

January 17, 2022

Debbie Frank
Eurofins
750 Royal Oaks Drive Suite 100
Monrovia, CA 91016-3629

TEL: (626) 386-1158
FAX:

Workorder No.: N048811

RE: HAWAII-DOH

Attention: Debbie Frank

Enclosed are the results for sample(s) received on January 13, 2022 by ASSET Laboratories. The sample(s) are tested for the parameters as indicated in the enclosed chain of custody in accordance with the applicable laboratory certifications.

Thank you for the opportunity to service the needs of your company.

Please feel free to call me at (702) 307-2659 if I can be of further assistance to your company.

Sincerely,

Nancy Sibucao
Laboratory Director

CLIENT: Eurofins
Project: HAWAII-DOH
Lab Order: N048811

CASE NARRATIVE

SAMPLE RECEIVING/GENERAL COMMENTS:

All sample containers were received intact with proper chain of custody documentation.

Information on sample receipt conditions including discrepancies can be found in attached Sample Receipt Checklist Form.

Cooler temperature and sample preservation were verified upon receipt of samples if applicable.

Samples were analyzed within method holding time.

Results were J-Flag. "J" is used to flag those results that are between the PQL (Practical Quantitation Limit) and the calculated MDL (Method Detection Limit). Results that are "J" Flagged are estimated values since it becomes difficult to accurately quantitate the analyte near the MDL.

ASSET Laboratories

Date: *17-Jan-22*

CLIENT: Eurofins
Project: HAWAII-DOH
Lab Order: N048811
Contract No:

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date	Date Received	Date Reported
N048811-001A	980768_202201170036_0111 22-25-04	Water	1/11/2022 2:25:00 PM	1/13/2022	1/17/2022

CLIENT: Eurofins
Lab Order: N048811
Project: HAWAII-DOH
Lab ID: N048811-001

Client Sample ID: 980768_202201170036_011122-25-04
Collection Date: 1/11/2022 2:25:00 PM
Matrix: WATER

Analyses	Result	MDL	PQL	Qual	Units	DF	Date Analyzed
TPH CARBON CHAIN EPA 8015							
EPA 3510C			**EPA 8015B(M)**				
RunID: **NV00922-GC3_220114B** QC Batch: **91044**				PrepDate:	**1/14/2022**		Analyst: **MCC**
Diesel Range Organics (C10-C28)	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C11-C12	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C13-C14	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C15-C16	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C17-C18	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C19-C20	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C21-C22	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C23-C24	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C25-C26	ND	33	50		ug/L	1	1/14/2022 10:32 PM
Oil Range Organics (C28-C40)	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C29-C32	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C33-C36	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C37-C40	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C41-C44	ND	33	50		ug/L	1	1/14/2022 10:32 PM
C8 as C8	260	33	50		ug/L	1	1/14/2022 10:32 PM
Gas Range Organics (extractable) (C8-C10)	270	33	50		ug/L	1	1/14/2022 10:32 PM
C8-C44	310	33	50		ug/L	1	1/14/2022 10:32 PM
C9-C10	ND	33	50		ug/L	1	1/14/2022 10:32 PM
Surr: p-Terphenyl	93.4	0	33-138		%REC	1	1/14/2022 10:32 PM

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range
H	Holding times for preparation or analysis exceeded	J	Analyte detected below quantitation limits
ND	Not Detected at the Reporting Limit	S	Spike/Surrogate outside of limits due to matrix interference
	Results are wet unless otherwise specified	DO	Surrogate Diluted Out

CLIENT: Eurofins
Work Order: N048811
Project: HAWAII-DOH

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015DM_W_CC

Sample ID: **LCS-91044**	SampType: **LCS**	TestCode: **8015DM_W_C**	Units: **ug/L**	Prep Date: **1/14/2022**	RunNo: **159567**
Client ID: **LCSW**	Batch ID: **91044**	TestNo: **EPA 8015B(M EPA 3510C**		Analysis Date: **1/14/2022**	SeqNo: **4499182**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (C10-C28)	652.701	50	1000	0	65.3	48	120				
Surr: p-Terphenyl	66.145		80.00		82.7	33	138				

Sample ID: **MB-91044**	SampType: **MBLK**	TestCode: **8015DM_W_C**	Units: **ug/L**	Prep Date: **1/14/2022**	RunNo: **159567**
Client ID: **PBW**	Batch ID: **91044**	TestNo: **EPA 8015B(M EPA 3510C**		Analysis Date: **1/14/2022**	SeqNo: **4499183**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (C10-C28)	ND	50									
C11-C12	ND	50									
C13-C14	ND	50									
C15-C16	ND	50									
C17-C18	ND	50									
C19-C20	ND	50									
C21-C22	ND	50									
C23-C24	ND	50									
C25-C26	ND	50									
Oil Range Organics (C28-C40)	ND	50									
C29-C32	ND	50									
C33-C36	ND	50									
C37-C40	ND	50									
C41-C44	ND	50									
C8 as C8	ND	50									
Gas Range Organics (extractable) (C8-C	ND	50									
C8-C44	34.821	50									J
C9-C10	ND	50									
Surr: p-Terphenyl	72.451		80.00		90.6	33	138				

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike/Surrogate outside of limits due to matrix interference	DO	Surrogate Diluted Out		Calculations are based on raw values

CLIENT: Eurofins
Work Order: N048811
Project: HAWAII-DOH

ANALYTICAL QC SUMMARY REPORT

TestCode: 8015DM_W_CC

Sample ID: **N048789-001B-MS**	SampType: **MS**	TestCode: **8015DM_W_C**	Units: **ug/L**	Prep Date: **1/14/2022**	RunNo: **159567**
Client ID: **ZZZZZZ**	Batch ID: **91044**	TestNo: **EPA 8015B(M**	**EPA 3510C**	Analysis Date: **1/14/2022**	SeqNo: **4499185**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (C10-C28)	590.515	50	1000	0	59.1	48	120				
Surr: p-Terphenyl	63.856		80.00		79.8	33	138				

Sample ID: **N048789-001B-MSD**	SampType: **MSD**	TestCode: **8015DM_W_C**	Units: **ug/L**	Prep Date: **1/14/2022**	RunNo: **159567**
Client ID: **ZZZZZZ**	Batch ID: **91044**	TestNo: **EPA 8015B(M**	**EPA 3510C**	Analysis Date: **1/14/2022**	SeqNo: **4499186**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	RPD Ref Val	%RPD	RPDLimit	Qual
Diesel Range Organics (C10-C28)	630.281	50	1000	0	63.0	48	120	590.5	6.51	20	
Surr: p-Terphenyl	69.627		80.00		87.0	33	138		0	0	

Qualifiers:

B	Analyte detected in the associated Method Blank	E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit	R	RPD outside accepted recovery limits
S	Spike/Surrogate outside of limits due to matrix interference	DO	Surrogate Diluted Out		Calculations are based on raw values

N048811

eurofins

CHAIN OF CUSTODY RECORD

750 Royal Oaks Drive, Suite 100
Monrovia, CA 91016-3629

Phone: 626 386 1100
Fax: 626 386 1101

800 566 LABS (800 566 5227)

EUROFINS EATON ANALYTICAL USE ONLY:

LOGIN COMMENTS: _____

SAMPLE TEMP RECEIVED AT: ASSET Labs
☐ Colton / No. California / Arizona 2.8 °C (Compliance: 4 ± 2 °C)
☐ Monrovia TMP 3 °C (Compliance: 4 ± 2 °C)

CONDITION OF BLUE ICE: Frozen _____ Partially Frozen _____ Thawed _____ Wet Ice _____ No Ice _____

METHOD OF SHIPMENT: Pick-Up / Walk-In / (FedEx) / UPS / DHL / Area Fast / Top Line / Other: _____ FedEx #: 8986

SAMPLES CHECKED AGAINST COC BY: _____

SAMPLES LOGGED IN BY: _____

SAMPLES REC'D DAY OF COLLECTION? ☐ (check for yes)

TO BE COMPLETED BY SAMPLER:

COMPANY/AGENCY NAME: State of Hawaii DOH

PROJECT CODE: HAWAII-DOH

COMPLIANCE SAMPLES ☐ (check for yes)
- Requires state EDD ☐

NON-COMPLIANCE SAMPLES x (check for yes)
REGULATION INVOLVED: Response Sampling (eg. SDWA, Phase V, NPDES, FDA, ..)

Type of samples (circle one): ROUTINE SPECIAL CONFIRMATION

EEA CLIENT CODE: HAWAII

Job# P-CARD

SAMPLE GROUP: RED-HILL-INCIDENT

SEE ATTACHED BOTTLE ORDER FOR ANALYSES ☐ (check for yes), OR

list ANALYSES REQUIRED (enter number of bottles sent for each test for each sample)

Standard TAT — STD __ 1 wk __ 3 dayX_ 2 day ___ 1 day ___

SAMPLE DATE	SAMPLE TIME	SAMPLE ID	CLIENT LAB ID	MATRIX	Field pH	Source Temp (Celsius)	TPH 8015 Diesel and Motor oil	TPH 8015 Diesel and Motor oil (chlorinated)	SAMPLER COMMENTS
1/11/22	2:25 pm	Oil122-25-04	N048811-01	Water			1	1	ZONE H1 HYDRANT 1416

* **MATRIX TYPES:** **RSW** = Raw Surface Water; **RGW** = Raw Ground Water; **CFW** = Chlor(am)inated Finished Water; **FW** = Other Finished Water; **SEAW** = Sea Water; **WW** = Waste Water; **BW** = Bottled Water; **SW** = Storm Water; **SO** = Soil; **SL** = Sludge; **O** = Other - Please Identify

	SIGNATURE	PRINT NAME	COMPANY/TITLE	DATE	TIME
SAMPLED BY:	Signature	AL JEROME NATAC	Hawaii Department of Health	1/11/22	2:25 pm
RELINQUISHED BY:	Signature	AL JEROME NATAC	Hawaii Department of Health	1/11/22	6:40 pm
RECEIVED BY:	Signature	D. FAWNHARA		1/12/22	1030
RELINQUISHED BY:	Signature	D. FAWNHARA		1/12/22	1024
RECEIVED BY:	Signature	Jeanine Rodriguez	ASSET Labs	1/13/22	0948

PAGE ____ OF ____

Section 2b.3 Exceedance Investigation Summary and Results

ENCL (2)

ASSET Laboratories

Please review the checklist below. Any NO signifies non-compliance. Any non-compliance will be noted and must be understood as having an impact on the quality of the data. All tests will be performed as requested regardless of any compliance issues.

If you have any questions or further instruction, please contact our Project Coordinator at (702) 307-2659.

Cooler Received/Opened On:	1/13/2022	Workorder:	N048811
Rep sample Temp (Deg C):	2.8	IR Gun ID:	3
Temp Blank:	☐ Yes ☑ No		
Carrier name:	FedEx		
Last 4 digits of Tracking No.:	8986	Packing Material Used:	Bubble Wrap
Cooling process:	☑ Ice ☐ Ice Pack ☐ Dry Ice ☐ Other ☐ None		

Sample Receipt Checklist

1. Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
2. Custody seals intact, signed, dated on shippping container/cooler?	Yes ☐	No ☐	Not Present ☑
3. Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
4. Chain of custody present?	Yes ☑	No ☐	
5. Sampler's name present in COC?	Yes ☑	No ☐	
6. Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
7. Chain of custody agrees with sample labels?	Yes ☑	No ☐	
8. Samples in proper container/bottle?	Yes ☑	No ☐	
9. Sample containers intact?	Yes ☑	No ☐	
10. Sufficient sample volume for indicated test?	Yes ☑	No ☐	
11. All samples received within holding time?	Yes ☑	No ☐	
12. Temperature of rep sample or Temp Blank within acceptable limit?	Yes ☑	No ☐	NA ☐
13. Water - VOA vials have zero headspace?	Yes ☐	No ☐	NA ☑
14. Water - pH acceptable upon receipt? Example: pH > 12 for (CN,S); pH<2 for Metals	Yes ☐	No ☐	NA ☑
15. Did the bottle labels indicate correct preservatives used?	Yes ☐	No ☐	NA ☑
16. Were there Non-Conformance issues at login?	Yes ☐	No ☐	NA ☑
Was Client notified?	Yes ☐	No ☐	NA ☑

Comments:

For:

Checklist Completed By: YR GGarcia 1/13/2022

Reviewed By: MBC 1/17/2022

ASSET Laboratories

WORK ORDER Summary

17-Jan-22

WorkOrder: N048811

Client ID: EUROF01

Project: HAWAII-DOH **QC Level:** RTNE **Date Received:** 1/13/2022

Comments: J-flag results

Sample ID	Client Sample ID	Date Collected	Date Due	Matrix	Test No	Test Name	Hld	MS	Sub	Storage
N048811-001A	980768_202201170036_0111 22 25 04	1/11/2022 2:25:00 PM	1/17/2022	Water	EPA 3510C	SEPARATORY FUNNEL EXTRACTION: EXTRACTABLE FUELS	☐	☐	☐	WW
			1/17/2022		EPA 8015B(M)	TPH Carbon Chain EPA 8015	☐	☐	☐	WW
N048811-002A	FOLDER	1/17/2022	1/17/2022		Folder	Folder	☐	☐	☐	LAB
			1/17/2022		Folder	Folder	☐	☐	☐	LAB

ORIGIN ID:NAXA (808) 586-4258
SEILA ARONI
DEPARTMENT OF HEALTH/SDWB
2385 WAIMANO HOME RD.
ULUAKUPU BLDG. 4
PEARL CITY, HI 96782
UNITED STATES US

SHIP DATE: 12JAN22
ACTWGT: 40.00 LB
CAD: 101971153/INET4400

BILL SENDER

TO MARLON CARTIN
ASSET LABORATORIES
3151 W POST RD

LAS VEGAS NV 89118
(702) 307-2659 REF:
INV:
PO: DEPT:

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DATA VALIDATION CHECKLIST – STAGE 2A

Site Name	Joint Base Pearl Harbor - Hickam	**Project Name**	Red Hill Incident
Data Reviewer (signature and date)	2/2/2022	**Technical Reviewer (signature and date)**	2/3/2022
Laboratory Report No.	980768	**Laboratory**	Eurofins Eaton Analytical, LLC and ASSET Laboratories
Analyses	Extractable C8-C44 by EPA 8015B (modified) including GRO, DRO, and ORO		
Samples and Matrix	One water sample (011122-25-04)		
Field Duplicate Pairs	None		
Field Blanks	None		

INTRODUCTION

This checklist summarizes the Stage 2A validation performed on the subject laboratory report, in accordance with the U.S. Environmental Protection Agency (EPA) *Guidance for Labeling Externally Validated Laboratory Analytical Data for Superfund Use* (January 2009). Analytical data were evaluated in general accordance with the EPA *National Functional Guidelines for Organic Superfund Methods Data Review* (November 2020).

OVERALL EVALUATION

No results were rejected for this data package. All results are usable with the qualifications described in this checklist.

Data completeness:

Within Criteria	Exceedance/Notes
N	TPH-diesel and TPH-motor oil by EPA 8015 are requested on the chain-of-custody (COC) form. The laboratory analyzed the sample by EPA 8015B modified for C8-C44 with GRO (extractable-range only), DRO, and ORO. No qualifications were applied.

Sample preservation, receipt, and holding times:

Within Criteria	Exceedance/Notes
Y	All sample containers were received intact and with proper chain of custody (COC) documentation. Cooler temperature and sample preservation (as applicable) were verified upon receipt of the samples. No custody seals were present on sample or shipping containers, but no qualifications were applied for this field oversight.

DATA VALIDATION CHECKLIST – STAGE 2A

Method blanks:

Within Criteria	Exceedance/Notes
N	**MB-91044:** The method blank contained C8-C44 at a concentration of 34.821 ug/L, which is above the method detection limit (MDL) but below the minimum reporting limit (MRL). The C8-C44 result for sample 011122-25-04 was qualified as estimated with a possible high bias (flagged J+).

Field blanks:

Within Criteria	Exceedance/Notes
NA	

System monitoring compounds (surrogates and labeled compounds):

Within Criteria	Exceedance/Notes
Y	Only surrogate compound p-terphenyl was used for system monitoring. The percent recovery is in control.

MS/MSD:

Within Criteria	Exceedance/Notes
NA	MS/MSDs performed on samples from other data packages were not evaluated.

Laboratory duplicates:

Within Criteria	Exceedance/Notes
NA	No laboratory duplicate results are provided in the laboratory report.

Field duplicates:

Within Criteria	Exceedance/Notes
NA	

LCSs/LCSDs:

Within Criteria	Exceedance/Notes
N	The LCS was only spiked with DRO. No qualifications were applied because the DRO percent recovery is within control limits and the DRO carbon range C10-C28 represents the extractable hydrocarbon range, but the data user should be aware that the LCS did not include the requested hydrocarbon range C8-C44. Additionally, it should be noted that only an LCS was performed; however, there is a non-client MS/MSD present to provide adequate batch precision.

Sample dilutions:

Within Criteria	Exceedance/Notes
Y	Sample 011122-25-04 was analyzed undiluted.

Re-extraction and reanalysis:

Within Criteria	Exceedance/Notes
NA	

MDLs/RLs:

Within Criteria	Exceedance/Notes
Y	Detections between the MRL and MDL (if present) were qualified as estimated (flagged J) by the laboratory.

Tentatively identified compounds:

Within Criteria	Exceedance/Notes
NA	

Other [none]:

Within Criteria	Exceedance/Notes
NA	

Overall Qualifications:

See results summary pages attached for changes to the laboratory qualifiers based upon this validation. The following is a list of qualifiers and definitions that may be used for the validation of this data package:

J	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample.
J+	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased high.
J-	The analyte was positively identified; the associated value is the approximate concentration of the analyte in the sample and may be biased low.
NJ	The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated value is the approximate concentration of the analyte in the sample.
R	The sample result is rejected as unusable due to serious deficiencies in one or more quality control criteria. The analyte may or may not be present in the sample.
U	The analyte was analyzed for but was not detected at or above the associated value (reporting limit).
UJ	The analyte was analyzed for but was not detected at or above the associated value (reporting limit), which is considered approximate due to deficiencies in one or more quality control criteria.

eurofins | Eaton Analytical

Tel: (626) 386-1100
Fax: (866) 988-3757
1 800 566 LABS (1 800 566 5227)

Laboratory Data

Report: 980768
Project: RED-HILL-INCIDENT
Group: RUSH TPH 8015 - (Extractable GRO-DRO-ORO-Response Sampling)

State of Hawaii DOH
Melvin Tokuda
2385 Waimano Home Road
Pearl City, HI 96782

Samples Received on:
01/13/2022 0948

011122-25-04 (202201170036) — **Sampled on 01/11/2022 1423**

EPA 8015 - 8015 C8-C44

Prepared	Analyzed	Prep Batch	Analyzed Batch	Method	Analyte	Result	Units	MDL	MRL	Dilution
01/14/22 22:32				(EPA 8015)	C11-C12	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C13-C14	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C15-C16	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C17-C18	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C19-C20	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C21-C22	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C23-C24	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C25-C26	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C29-C32	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C33-C36	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C37-C40	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C41-C44	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	C8	260	ug/L	33	50	1
01/14/22 22:32				(EPA 8015)	C8-C44	310 J+	ug/L	33	50	1
01/14/22 22:32				(EPA 8015)	C9-C10	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	Diesl Range Organics (DRO) -C10-C28	ND	ug/L	33	50 U	1
01/14/22 22:32				(EPA 8015)	Gas Range Organics C8-C10	270	ug/L	33	50	1
01/14/22 22:32				(EPA 8015)	Oil Range Organics (C28-C40)	ND	ug/L	33	50 U	1

Maura McAleese 2/2/2022

Rounding on totals after summation.
ND - Analyte was not detected at the calculated MDL.
J - The analyte was either detected at or greater than the MDL and less than the MRL, or did not meet any one of the required QC criteria.
(c) - indicates calculated results. Analysis is a calculated result. Reported results are not rounded until the final step before reporting. Therefore methods that use a test result with further calculation may have slight differences in final result than the component analyses.

Zone H1, RAR, 2a6

Navy Sample (Non-Detect for TPH)
DOH Sample (Non-Detect for TPH)
Navy and DOH Sampled Location (Non-Detect & Detect)

Zone H1, RAR, 2a6

Petroleum Hydrocarbons in Water: Health Effects

What happens if I swallow water with petroleum?

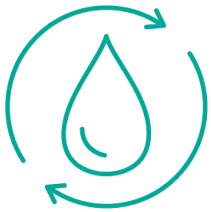
Drinking water containing petroleum hydrocarbons can cause an upset stomach, stomach cramping, nausea, vomiting, and diarrhea. Your throat and mouth may also get irritated.

What happens if water with petroleum gets on my skin?

Petroleum hydrocarbons can irritate the skin (dermal exposure). Continuous exposure can cause itchy rash with red and peeling skin. After skin contact, always wash with soap and clean water.

What happens if I breathe air that smells like petroleum?

Breathing petroleum vapors (also called inhalational exposure) can cause headaches, dizziness, tiredness and respiratory problems like cough and difficulty breathing. Nosebleeds are possible.



How can this affect my future health?

Evaluation of the possibility of long-term health effects is ongoing. Based on current information, people exposed to contaminated drinking water from the Joint Base Pearl Harbor-Hickam Drinking Water System in this incident are not expected to experience long-term health effects.

What should I do if I have symptoms after exposure to contaminated water?

- If there is a strong petroleum smell, **leave the area and get fresh air.**
- If you develop respiratory problems or other severe symptoms, **seek urgent medical evaluation.**
- **Contact your primary care doctor** for an appointment.
- **Avoid exposure to the water.** Do not drink or use the water for cooking or brushing teeth. Do not bathe in the water. If skin contact, always wash with soap and clean water
- **Call the Hawaii Poison Center (800) 222-1222 for questions.**

- **Primary Care Doctor**
- **Hawaii Poison Center (800) 222-1222**

For more information, visit health.hawaii.gov/NavyWater

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

Nisit A. Gainey
Director
Public Works, USAG-HI

Encls
1. Irrigation Line Flushing Plan

Enclosures

Enclosure 1	Irrigation Line 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

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.