



Drinking Water Long-Term Monitoring Plan

Joint Base Pearl Harbor-Hickam Public Water System #HI0000360
and Aliamanu Military Reservation PWS #HI0000337
O‘ahu, Hawai‘i

June 2022

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This Drinking Water Long-Term Monitoring (DW LTM) Plan was prepared by the State of Hawaii Department of Health, the United States Navy (Navy) for Joint Base Pearl Harbor-Hickam (JBPHH) Public Water System (PWS) #HI0000360, and the United States Army (Army) Aliamanu Military Reservation (AMR) PWS #HI0000337.

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2. ACRONYMS AND ABBREVIATIONS

µg/L	micrograms per liter
AECOM	AECOM Technical Services, Inc.
CDC	child development center
CDH	child development home
COC	chain of custody
CTO	contract task order
DBP	disinfection byproducts
DOC	dissolved organic carbon
DOH	State of Hawaii, Department of Health
DW	drinking water
EAL	Environmental Action Level
EDMS	Environmental Data Management System
EPA	United States Environmental Protection Agency
HCl	hydrochloric acid
HNO ₃	nitric acid
HPC	heterotrophic plate count
IDWST	Interagency Drinking Water System Team
JBPHH	Joint Base Pearl Harbor-Hickam
LOD	Limit of Detection
LOQ	Limit of Quantification
LTM	Long-Term Monitoring
MCL	Maximum Contaminant Level
MDL	method detection limit
MDV	medical, dental, and veterinary clinics
mg	milligram
mL	milliliter
NAVFAC	Naval Facilities Engineering Systems Command
POC	point of contact
PWS	Public Water System
QC	quality control
RAR	removal action report
SAP	sampling analysis plan
SDWB	Safe Drinking Water Branch, State of Hawaii, Department of Health
SOP	standard operating procedure
TAT	turn-around time
TOC	total organic carbon
TPH	total petroleum hydrocarbons
U.S.	United States
VOA	volatile organic analysis

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3. INTRODUCTION

This Drinking Water Long-Term Monitoring (DW LTM) Plan (Plan) was developed jointly by representatives of the State of Hawaii, Department of Health (DOH), the Navy, the Army, and a team of technical and subject matter experts. This Plan is designed to fulfill the post advisory requirements stated in the Sampling Analysis Plan (SAP) titled *Drinking Water Sampling Plan for JBPHH, O'ahu, Hawai'i, Addendum 3, Version 10, dated February 25, 2022 (DOH 2022)* and the 19 Removal Action Reports (RAR) for each zone established for Joint Base Pearl Harbor-Hickam (JBPHH) Public Water System (PWS #HI0000360) and the Aliamanu Military Reservation (AMR) PWS (PWS #HI0000337). For the purposes of this Plan, PWS #HI0000360 and PWS #HI0000337 will be considered a single distribution system divided into zones (System). Adoption of this document by the signatories formalizes the agreements detailed in this Plan for the remainder of Long Term Monitoring. During the period between the amendment of the zone and the adoption of this document, the System has complied with DW LTM section as generally described in the previously signed SAP and as directed by SDWB.

On November 20, 2021, an unknown quantity of petroleum, a hazardous substance, was released into the Red Hill Shaft. Both the Navy and DOH received complaints of a chemical or fuel odor and taste to the drinking water served by the System that serves approximately 93,000 consumers. On November 29, 2021, DOH issued a public health advisory recommending Navy water system consumers to avoid using the water for drinking, cooking, or oral hygiene. The water distribution system was divided into 19 manageable zones where systematic remedial action was conducted to remove petroleum contamination from the system through comprehensive flushing of the water distribution lines and premise plumbing. In order for DOH to amend its public health advisory, evidentiary benchmarks were developed, which included (among other things) sampling for indicators of contamination and response by-products as well as cross-connection surveys to understand the potential for contaminants to spread through the System. Within the SAP, a preliminary construct of a long-term approach to monitor and ensure the safety of the System is presented. Elements of the SAP approach is incorporated into this Plan. The basic elements of this Plan requires the Navy and Army to:

- 1) Sample the source, distribution lines, and houses/buildings for an additional 24 months to February 2024 to ensure that the drinking water does not exceed EPA drinking water standards, DOH drinking water standards and Incident Specific Parameters (ISPs);
- 2) Conduct the requirements and conditions included in the RAR of each zone; and
- 3) Ensure that its current drinking water source(s) are protected from future contamination.

The sampling portion of this Plan was initially drafted by AECOM Technical Services, Inc. (AECOM) under Comprehensive Long-Term Environmental Action Navy V, contract task order (CTO) N6274222F0106, to support the sampling of the System. DOH modified the initial draft to its final form, in collaboration with the Navy and Army.

This Plan supersedes the DW LTM section of the previously signed SAP. The surveillance metrics are applied to ensure that the water is safe to drink, meets all State and Federal drinking water standards and continues to be non-detectable or below the designed incident specific limit for petroleum and other response by-product contamination. DW LTM Round 1 has already been completed for all zones and DW LTM Round 2 is partially complete. The sampling for these rounds were conducted under the previously signed SAP. Therefore, these "DW LTM Rounds" are not subject to the additional sampling requirements presented in this Plan. However, all DW LTM Rounds performed after this Plan has been signed/adopted will be subject to the requirements of this Plan. The Plan will be implemented in two phases as further described below.

- *0-3 Months After Initial Drinking Water Sampling:* Samples will be collected pursuant to the Plan every month from 5% of the houses/buildings in a zone, with a minimum of 5 houses/buildings sampled in each zone. All schools, child development centers (CDCs), child development homes (CDHs), medical, dental, and veterinary (MDV) clinics, and distribution system sample locations (also referred to throughout this document as fire hydrants, hydrants, hydrant locations, or distribution samples, or similar) previously sampled in Step 4 of the Red Hill response are to be sampled in each of the first 3 months (See Table 2). The 0-3 months phase will result in samples collected from a total of 15% of the houses/buildings in each zones during the 3-month period.
- *4-24 Months After Initial Drinking Water Sampling:* Samples will be collected pursuant to the Plan during four periods from 10% of the houses/buildings in each zone. Four periods will be separated as three 6-month periods and one 3-month period to reach 24 months. All schools, CDCs, CDHs, MDV clinics, and distribution system sample locations previously sampled in Step 4 of the Red Hill response are to be sampled in each of the 6-month and 3-month periods (See Table 2). The 4-24 month phase will result in samples collected from a total of 40% of the houses/buildings in each zone.

Building facilities to be included in the effort include high public health risk entities, such as schools, CDCs, CDHs, and MDV clinics.

Unless otherwise noted, all samples will be analyzed as listed in Table 5 of this Plan, aka “Compliance Monitoring.”

Schools, CDCs, CDHs, MDV clinics, and distribution samples do not count towards the percentage of houses/buildings sampled in each round.

4. DW LTM SAMPLING PURPOSE AND IMPLEMENTATION

4.1 PURPOSE

The DW LTM is a surveillance tool intended to continuously ensure that the water is safe to drink, meets all State and Federal drinking water standards and is free of petroleum and response by-product contamination. A single water sample will be collected from each of the houses/buildings and fire hydrants selected for sampling in the zone. If the tap water results collected from all the representative houses/buildings that were sampled comply with [Table 5](#) of this Plan, then it will be confirmed that the drinking water in the area remains safe to drink.

If the drinking water results collected from any of the sampled representative houses/buildings and fire hydrants do not comply with [Table 5](#) of this Plan, go to Section 8 of this Plan (Response to a Detection or an Exceedance).

4.2 IMPLEMENTATION

This Plan will be implemented through drinking water sampling and completion of the conditions identified in the RAR as listed in Section 6 of this Plan.

4.2.1 0-3 Months After Initial Drinking Water Sampling

In the first three months¹, DW LTM samples will be collected every month from 5% of the houses/buildings² in a zone, with a minimum of five houses/buildings sampled in each zone (Table 2 of this Plan). These houses/buildings will be geographically distributed throughout the zone to provide spatial coverage along the water supply line and will not be the same houses/buildings that were sampled in Step 4, unless otherwise agreed upon by SDWB. New houses/buildings will be sampled to achieve more robust spatial/geographic coverage.

Drinking water samples shall be collected from the taps in these houses/buildings and analyzed for parameters listed in Table 5 using EPA Methods 524.2, 525.2/525.3, 200.8/245.1, supplemented with 8015 (Total Petroleum Hydrocarbon-Diesel (TPH-D) and TPH-Oil (TPH-O)), 8260 (TPH-Gasoline (TPH-G)), total organic carbon (TOC), and 8021 for Free Chlorine (field test).

Distribution system sample locations will be sampled and analyzed for parameters listed in [Table 5](#).

Additional details on the 0-3 months sample site selection process are provided in Section 5.1 of this Plan and in Appendix A, Standard Operating Procedure (SOP) 3 for Scheduling and Sample Site Selection. The 0-3 month phase will collect samples from a total of 15% of the houses/buildings in each zone. **Wherever there is a conflict between the SOP and this Plan, this Plan governs.**

Within each sampling round, the Navy shall collect one (1) sample at the Entry Point to Distribution (EPD) from the Waiawa Shaft and analyze for the constituents shown in [Table 1](#).

¹ For planning purposes, it was assumed that all the zones would start the 0-3 Month phase simultaneously, however in actuality the DOH advisory for each zone was amended in a staggered procession creating different DW LTM start dates per zone.

² House and building sampling shall ensure the ratio of houses and buildings sampled are proportional to the proportions in each zone; however, repeat samples from houses and buildings over the duration of DW LTM sampling shall be minimized. Additionally, and not included in the percentage calculation, all schools, CDCs, CDHs, MDV clinics and hydrant locations will be sampled in each period of the long-term monitoring (a total of 7 times).

In accordance with Section 5.1 of this Plan, the Navy shall provide a schedule and location of these samples to SDWB³ for SDWB review and approval at least 1 week before the collection of these samples and will provide customer notification of this sample collection. SDWB may collect splits and/or stratified samples at these locations.

4.2.2 4-24 Months After Initial Drinking Water Sampling

Beginning in month 4 of this Plan, 4 additional sampling periods will be completed. There will be three (3) 6-month periods followed by a single 3-month period. During each of these four (4) periods, samples will be collected from 10% of the houses/buildings in a Zone (Table 2 of this Plan).⁴ These houses/buildings will be geographically distributed throughout the area to provide spatial coverage along the water supply line and will not be the same houses/buildings that were sampled in Step 4. As much as possible, new houses/buildings should be sampled to achieve more robust spatial/geographic coverage.

Drinking water samples will be collected from the taps in these houses/buildings and analyzed for parameters listed in Table 5 using EPA Methods 524.2, 525.2/525.3, 200.8/245.1, supplemented with 8015 (TPH-D, TPH-O), 8260 (TPH-G), TOC, and 8021 for Free Chlorine (field test).

Distribution samples will be sampled and analyzed for parameters listed in [Table 5](#).

Additional details on the 4- to 24-months sample site selection process are provided in Section 5.1 of this Plan and in Appendix A, SOP 3 Scheduling and Sample Site Selection. The 4-to-24-month phase will collect samples from a total of 40% of the houses/buildings in each zone. **Wherever there is a conflict between the SOP and this Plan, this Plan governs.**

In accordance with Section 5.1 of this Plan, the Navy shall provide a schedule and location of these samples to SDWB⁵ for SDWB review and approval **at least 1 week** before the collection of these samples and will prepare customer notices of this sample collection. SDWB may collect splits and/or stratified samples at these locations.

³ The schedule shall be provided to SDWB in PDF format for map(s) of prospective/actual sampling locations and Excel format for chart of prospective sampling locations.

⁴ House and building sampling shall ensure the ratio of houses and buildings sampled are proportional to the proportions in each zone; however, repeat samples from houses and buildings over the duration of DW LTM sampling shall be minimized. Additionally, and not included in the percentage calculation, all schools, CDCs, CDHs, MDV clinics and hydrant locations will be sampled in each period of the long-term monitoring (a total of 7 times).

⁵ The schedule shall be provided to SDWB in PDF format for map(s) of prospective/actual sampling locations and Excel format for chart of prospective sampling locations.

TABLE 1 ENTRY POINT TO THE DISTRIBUTION SYSTEM SAMPLING

Analytical Method	Analyte	CAS_RN	DOH / EPA MCL (µg/L)	DOH EAL (µg/L)	Incident Specific Parameter (µg/L)	Method Detection Limit (µg/L)
524.2	1,1,1-Trichloroethane	71-55-6	200/200	11	11	0.5
524.2	1,1,2-Trichloroethane	79-00-5	5/5	5	5	0.5
524.2	1,1-Dichloroethylene	75-35-4	7/7	7	7	0.5
524.2	1,2,4-Trichlorobenzene	120-82-1	70/70	70	70	0.5
524.2	1,2-Dichlorobenzene	95-50-1	600/600	10	10	0.5
524.2	1,2-Dichloroethane (EDC)	107-06-2	5/5	5	5	0.5
524.2	1,2-Dichloropropane (DCP)	78-87-5	5/5	5	5	0.5
524.2	1,4-Dichlorobenzene	106-46-7	75/75	5	5	0.5
524.2	Benzene	71-43-2	5/5	5	5	0.5
524.2	Carbon tetrachloride (CTC)	56-23-5	5/5	5	5	0.5
524.2	Chlorobenzene	108-90-7	100/100	25	25	0.5
524.2	cis-1,2-Dichloroethylene	156-59-2	70/70	70	70	0.5
524.2	Dichloromethane (aka methylene chloride)	75-09-2	5/5	5	5	0.5
524.2	Ethylbenzene	100-41-4	700/700	7.3	700	0.5
524.2	Styrene	100-42-5	100/100	10	10	0.5
524.2	Tetrachloroethylene	127-18-4	5/5	5	5	0.5
524.2	Toluene	108-88-3	1000/1000	9.8	1000	0.5
524.2	trans-1,2-Dichloroethylene	156-60-5	100/100	100	100	0.5
524.2	Trichloroethylene (TCE)	79-01-6	5/5	5	5	0.5
524.2	Vinyl Chloride	75-01-4	2/2	2	2	0.3
524.2	m,p-Xylenes	1330-20-7	10000/10000	13	10000**	0.5**
524.2	o-Xylenes	95-47-6	10000/10000	13	10000**	0.5**
525.2	1-Methylnaphthalene	90-12-0	—	10	2.1	
525.2	2-Methylnaphthalene	91-57-6	—	10	4.7	
525.2	Naphthalene	91-20-3	—	17	12	
525.2	Benzo[a]pyrene	50-32-8	0.2/0.2	0.06	0.06	0.02
525.2	Di(2-ethylhexyl)ph Di(2-ethylhexyl)phthalate (DEHP aka BEHP)	117-81-7	6/6	3	3	0.6
200.8	Antimony	7440-36-0	6	6	6	0.4
200.8	Arsenic	7440-38-2	10	10	10	1.4
200.8	Barium	7440-39-3	2000	220	220	2
200.8	Beryllium	7440-41-7	4	0.66	0.66	0.3
200.8	Cadmium	7440-43-9	5	3	3	1
200.8	Chromium	7440-47-3	100	11	11	7
200.8	Copper	7440-50-8	1300	2.9	2.9	50
200.8	Lead	7439-92-1	15*			1
245.1	Mercury	7487-94-7	2	0.025	0.025	0.2
200.8	Selenium	7782-49-2	50	5	5	2
200.8	Thallium	7440-28-0	2	2	2	0.3
EPA Approved	Total Organic Carbon (TOC)	TOC	—	—	2000	1500—
8260 PCHG 8015 PCHD 8015 MOIL	JP-5 as Combined Total Petroleum Hydrocarbons (TPH)-Gasoline, Diesel, and Oil Ranges ² [Incident Specific Parameter]	PCHG PCHD MOIL	Not Applicable	266	266	GRO, DRO, ORO = 50
8021	Chlorine, Free (Field Test)	CHLORINE	—	—	4000	—

Table 1 Notes:

Method Detection Limit is the limit that determines when an analyte can be detected (either the LOD or the MDL). Detections above this level and below the Method Reporting Level (MRL or LOQ) are deemed “detected” and will be qualified as estimated (J).

* Action Level for Lead.

** 10,000 ug/L is the MCL for Total Xylenes.

MCLs: DOH regulatory constituents

DOH EALs: Table D-1a. Groundwater Action Levels (Drinking Water, Surface Water <150 meters) (DOH 2017).

<https://health.hawaii.gov/heer/files/2019/11/HDOH-EAL-Surfer-Fall-2017.xlsx>; Volume 2 Appendix 1, Section 6.6.

5. DW LTM SAMPLING OPERATIONS

DW LTM sampling operations are executed by three Navy core teams and further detailed in the subsections below:

- Sampling preparation, supply inventory and management, and sample shipping operations
- Field sampling operations
- Chemists, data managers, and data quality control (QC) managers

Sampling operations, including field operations, sample scheduling and tracking, site notification, sample preparation, sample shipment, and sample transportation to the laboratory are outlined in detail in Appendix A, SOP 4.

5.1 SAMPLE SITE SELECTION

The quantity and locations of samples will be identified through the guidance in this section as well as discussed in Appendix A, SOP 3. The number of samples by zone, monitoring phase, and by month are summarized in Table 2. Zone, neighborhood, and address information for all associated schools, CDCs, CDHs, and MDV clinics are presented in [Table 3](#).

5.1.1 Scheduling and Sample Site Selection

The Navy will propose to SDWB the selected sampling sites for review **at least 1 week** in advance of commencement of sampling, unless an alternate schedule is approved by DOH. Failure to meet this requirement may delay DW LTM sampling schedules. The Navy will issue notices to building occupants and residents. This process is further discussed in Appendix A, SOP 3 of this Plan. Procedures for site selection are detailed in Appendix A, SOP 3 Scheduling and Sample Site Selection.

DW LTM sample sites will be preferentially selected proximal to locations where there were exceedances during the previous sampling round(s).

MDV clinics and compromised communities (i.e., Long-Term Facilities, Retirement Communities, Independent Communities, Residential Care Home) which service vulnerable populations shall be included/listed in the DW LTM as priority building sampling locations. No compromised community facilities are currently connected to the System.

TABLE 2 ESTIMATE OF THE NUMBER OF SAMPLES BY ZONE AND BY MONTH OR MONITORING PERIOD

Zone Name	Zone	Residences ¹	Non-residences ¹	CDHs ²	CDCs ³	Schools ⁴	MDVs ⁵	Distribution (Hydrants) ⁶	Total Buildings	Samples (M0-M3) ⁷	Samples (M4-M24) ⁸		
Pearl City Peninsula	A1	635	32	1	-	-	-	6	667	41	74		
Ford Island	A2	411	112	3	-	-	-	10	523	42	68		
Iroquois Point	A3	1,459	33	-	-	2	-	8	1,492	93	168		
McGrew/Halawa	B1	227	38	-	-	-	-	2	265	16	29		
Sub Base	C1	-	183	-	2	-	4	6	183	24	33		
Hale Alii, Marine Barracks, Hospital Point	C2	32	126	-	-	-	1	7	158	16	24		
Shipyards Hospital Point	C3	6	137	-	-	-	-	2	143	10	17		
Hale Moku Hukulani	D1	508	74	-	2	1	-	6	582	45	74		
Hickam Hale, Na Koa Officer Field Area, Onizuka Village	D2	1,577	224	-	1	1	2	11	1,801	111	201		
Earhart Village	D3	912	115	-	6	4	1	8	1,027	93	144		
Hawaii Air National Guard	D4	0	148	-	-	-	1	2	148	11	18		
Makalapa	E1	89	63	-	1	1	-	4	152	19	27		
NEX Moanalua Terrace	F1	752	91	-	1	1	2	8	843	60	102		
Catlin Park, Maloelap, Doris Miller, Halsey Terrace, Radford Terrace	F2	1,435	59	2	2	-	-	14	1,494	95	170		
Camp Smith	G1	10	49	-	-	-	-	1	59	4	7		
Aliamanu Military Reservation (AMR)	H1	918	12	2	4	-	-	3	931	60	106		
AMR	H2	230	1	2	-	-	-	3	230	17	29		
AMR	H3	379	-	-	-	-	-	3	379	22	41		
Red Hill Housing	I1	135	6	-	-	1	-	1	141	14	21		
Total		9,715	1,503	10	20	11	11	105	11,218	793	1,353		
										Samples/Month	793	226	
										Resamples	119	34	
										Samples/Month	912	260	
										Samples/Day	46	13	
										# Teams	10	3	
										M0-M3	M4-M24	Total	
										Total # anticipated samples	2,736	6,224	8,960

Resamples, Field Duplicate (FD), Trip Blank (TB)	15%
Samples / Team / Day	5
Working Days / Month	20

Footnotes:

1. Samples will be taken from 5% of houses/buildings in each of the first 3 months; samples will be taken from 10% of houses/buildings for each period of sampling from Month 4-24 (three 6-month periods; one 3-month period).
2. One sample will be taken from each CDH each sampling period and will not be included as part of the houses/buildings percentage. Quantities subject to change based on resident participation in CDH program.
3. Two samples will be taken from each CDC each sampling period and will not be included as part of the houses/buildings percentage.
4. Five samples will be taken from each School each sampling period and will not be included as part of the houses/buildings percentage.
5. One sample will be taken from each Medical/Dental/Veterinary clinic each sampling period and will not be included as part of the houses/buildings percentage.
6. One sample will be taken from each hydrant each sampling period; samples collected from hydrants previously sampled in Step 4.
7. Samples required per month in Phase 1 (Months 0-3).
8. Samples required per period in Phase 2 (Months 4-24); three 6-month periods and one 3-month period.

TABLE 3 LOCATION INFORMATION FOR SCHOOLS, CDCs, CDHs, AND MEDICAL, DENTAL, & VETERINARY (MDV) CLINICS

Zone	Neighborhood / Bldg. Description	Category
A1	Pearl City Peninsula	CDH
A2	BLDG 350 - Ford Island CDC	CDC
A2	Ford Island	CDH
A2	Ford Island	CDH
A2	Ford Island	CDH
A3	Iroquois Point Elementary	School
A3	Iroquois Point Preschool	School
C1	BLDG 1655 - Pier Side CDC	CDC
C1	BLDG 679 - Armed Services YMCA	CDC
C1	BLDG 1535 – Medical Clinic/SARP – Pearl Harbor	MDV
C1	BLDG 1407 – Naval Station Pearl Harbor Dental & Navy Branch Health Clinic	MDV
C1	BLDG 1514 – Navy Medical Readiness Clinic (MRC)	MDV
C1	BLDG 584 – CNSG MIDPAC Clinic	MDV
C2	BLDG 1750 – Pearl Harbor Navy Shipyard Environmental (Occ. Health) Clinic	MDV
D1	Kids Cove 24/7 CDC	CDC
D1	Center Drive CDC LE	CDC
D1	Pearl Harbor Kai Elementary School	School
D2	Hickam Elementary	School
D2	Hickam Harbor CDC	CDC
D2	BLDG 559H – 15th Medical Group & Hickam Pharmacy	MDV
D2	BLDG 554H – Occupational Health Clinic	MDV
D3	Hickam Main CDC	CDC
D3	Hickam West CDC	CDC
D3	Trinity "Missionary" Baptist Church	CDC
D3	Pearl Harbor Church of Christ	CDC
D3	BLDG 1330 - Hickam Youth Center	CDC
D3	Hickam School Age Center	CDC
D3	Chester Nimitz Elementary School	School
D3	Holy Family Catholic Academy (Holy Trinity School)	School
D3	Assets School	School
D3	Mokulele Elementary School	School
D3	BLDG 1864H – Public Health Command – Pacific Veterinary Clinic	MDV
D4	BLDG 3365H – Clinical Lab – Epidemiology	MDV
E1	BLDG 80 - Montessori Center	CDC
E1	Hale Keiki School	School
F1	Pearl Harbor Elementary	School
F1	Moanalua Pre-School - Kama'aina Kids	CDC
F1	Hook Orthodontics, Moanalua Shopping Center	MDV
F1	Pearl Family Dental Care, Moanalua Shopping Center	MDV
F2	Catlin School Age Children	CDC
F2	Peltier CDC	CDC
F2	Halsey Terrace	CDH
F2	Doris Miller	CDH
H1	BLDG 1783 - AMR CDC	CDC

Zone	Neighborhood / Bldg. Description	Category
H1	BLDG 1782 - AMR Child Youth Services Center	CDC
H1	BLDG 1795 - AMR Youth Activities Center	CDC
H1	Rim Loop	CDH
H1	Bougainville	CDH
H1	BLDG 1875 - AMR YMCA	CDC
H2	Skyview	CDH
H2	Skyview	CDH
I1	Red Hill Elementary School	School

5.1.2 Alternate Sample Sites and Event Changes

Alternate sample site locations may be required for instances such as, but not limited to:

- High ambient photoionization detector (PID) reading
- Vacant location with no water or stagnant water
- Loose pets
- No key available from facility maintenance
- Ill resident in home
- Unaccompanied minor in home
- Continued missed appointments by tenant
- Tenants unwilling to support sampling
- Other unsafe conditions

In these instances, an alternate sample location and event change is required. Sampling teams have the capability to reprint labels in the field and update field logs to accommodate sample location changes. Procedures for selecting an alternate site, adjusting sample labels and chain of custody (COC) forms, and creating an EDMS event change is presented in Appendix A, SOP 3 Scheduling and Sample Site Selection. Sample sites and event changes will be documented to include the reason why a location was not sampled.

5.2 FIELD SAMPLING OPERATIONS

Field staff are responsible for collecting samples each day according to assignments prepared by the scheduling team. Field staff begin their day at the sample staging area to receive their assignments and sample collection kits. The sampling teams end their day at the sample staging area to return the sample collection containers so they can be prepared for transport to the analytical laboratories.

5.2.1 Field Sampling Team Staffing and Schedule

Field sampling operations are controlled by a senior operations manager, with assistance from a deputy operations manager. Each sampling team will consist of two (2) staff, a vehicle, and a sampling kit.

Prior to sampling, the field team will inspect all supplies and consumables to ensure that they are acceptable for use. DW LTM sample collection procedures are detailed in Appendix A Drinking Water Sample Collection SOPs (SOP 1A and SOP 1B).

5.2.2 DOH Field Oversight Team

The DOH field oversight team shall be provided with Defense Biometric Identification System (DBIDS) access to JBPHH to randomly inspect the field sampling and/or sampling operations for quality assurance. The Navy and Army must provide base access to DOH personnel engaged in this oversight. Upon receipt of the sampling plan, if DOH representatives desire to inspect, DOH shall submit for DBIDS installation

access to allow for a week of processing. The Department of Defense must either provide DOH staff or DOH contractor with DBIDS credentials, for the duration of the DW LTM, or escort upon request.

5.3 CHEMISTRY AND DATA MANAGEMENT

A team of chemists and data managers will track and verify the laboratory data as it is uploaded into EDMS. Dedicated staff and redundant chemist lab coordinators will focus on communicating with each lab. Lab coordinators serve as the primary liaison with the water quality labs, and their daily contact with the labs results in quicker lab processing of samples.

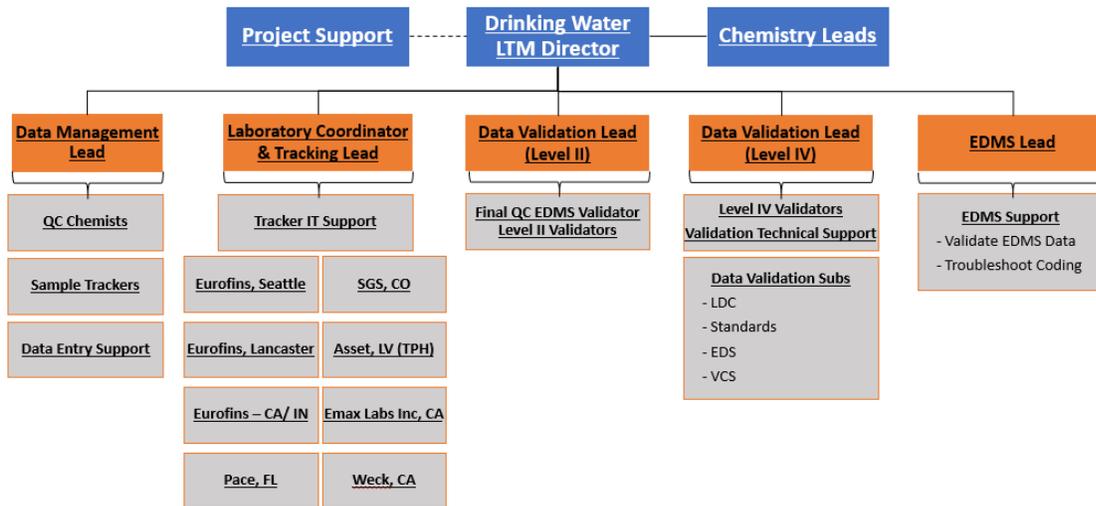
Lab coordinator responsibilities are listed below:

1. Coordinate with the lab
2. Act as the lab point of contact (POC)
3. Input samples status into tracker
4. Check that the lab uploaded data
5. Review initial lab data

Additional dedicated staff will serve in support and back-up roles for each of the lab coordinators, in many cases assigning people from the labs or other time zones, to promote full-time coordination.

The team of chemists and data managers is presented in Figure 1.

FIGURE 1 CHEMISTRY TEAM



5.3.1 Laboratory Analytical

Analytical laboratories are currently under contract to provide an expedited turn-around-time (TAT) on sample analytical results. However, there may be instances when the requested TAT is exceeded and will have to be individually managed.

Table 4 below lists, for each analyte group, the sample containers, preservatives, and applicable hold times as required by SW-846 and state and federal drinking water methods. All analytical required supplies, sample containers and preservatives, and shipping supplies will be provided by the analytical laboratory.

TABLE 4 SAMPLE CONTAINERS, PRESERVATIVES, AND HOLDING TIMES

Parameter	Analytical Method	Container	Preservative	Holding Time
Volatile Organic Compounds	524.2	3 x 40 mL Glass VOA	0.5 mL HCl (Unchlorinated); 25 mg Ascorbic / 3 drops HCl (Chlorinated)	14 days
Synthetic Organic Compounds	525.2/ 525.3	2 x 1 L Amber Glass	525.2 2 mL HCl (unchlorinated); 45 mg Sodium Sulfite / 2 mL HCl (chlorinated) 525.3 Ascorbic Acid, EDTA, KH ₂ Citrate	14 days
Metals	200.8/245.1	250 mL Poly	1 mL HNO ₃ , pH<2	6 months /28 days
JP-5 (Total Petroleum Hydrocarbon [TPH], Diesel/Oil Ranges)	8015	2 x 1 L Amber Glass	0.5 mL HCl	14 days
JP-5 (TPH-Gasoline Range)	8260	3 x 40 mL Glass VOA	0.5 mL HCl	14 days
Total Organic Carbon (TOC)	EPA Approved	3 x 40 mL Glass VOA	Acidify to pH < 2 with H ₂ SO ₄ or H ₃ PO ₄ immediately after collection and cool to ≤ 6°C, but not frozen.	28 days
Chlorine, Free (Field Test)	8021			
Haloacetic Acids (HAA5)	552.2/552.3	2 x Amber Glass	Ammonium Chloride	14 days
HPC	SM9215B Pour Plate/SM9215E SimPlate	125 ml or 150 ml Plastic Bottles		24 hours

Note: All samples will be chilled to < 6°C.

Table 5 of this Plan presents the analytical methods and associated analytes, action levels, and method detection limits (MDL) along with regulatory standards, including the Federal and State Maximum Contaminant Levels (MCL) for drinking water and SW-846 analytical methods, respectively. Any updates of these parameters will be provided in addendums to this document.

COC documentation will be maintained for samples during all phases of sample collection, transport, and receipt and internal transfer within the laboratory.

5.3.2 Data Quality

Field QC samples will be collected during each sampling event to include field duplicates, field reagent blanks, and trip blanks. Field duplicates will be collected at a frequency of 10% the number of the normal samples and field reagent blanks, and trip blanks will be collected daily for each sampling event in accordance to the procedures described in Naval Facilities Engineering Systems Command (NAVFAC)

Pacific Environmental Restoration Program Project Procedure III-B, *Field QC Samples (Water, Soil)* (Navy 2015) and as specified in the respective drinking water methods.

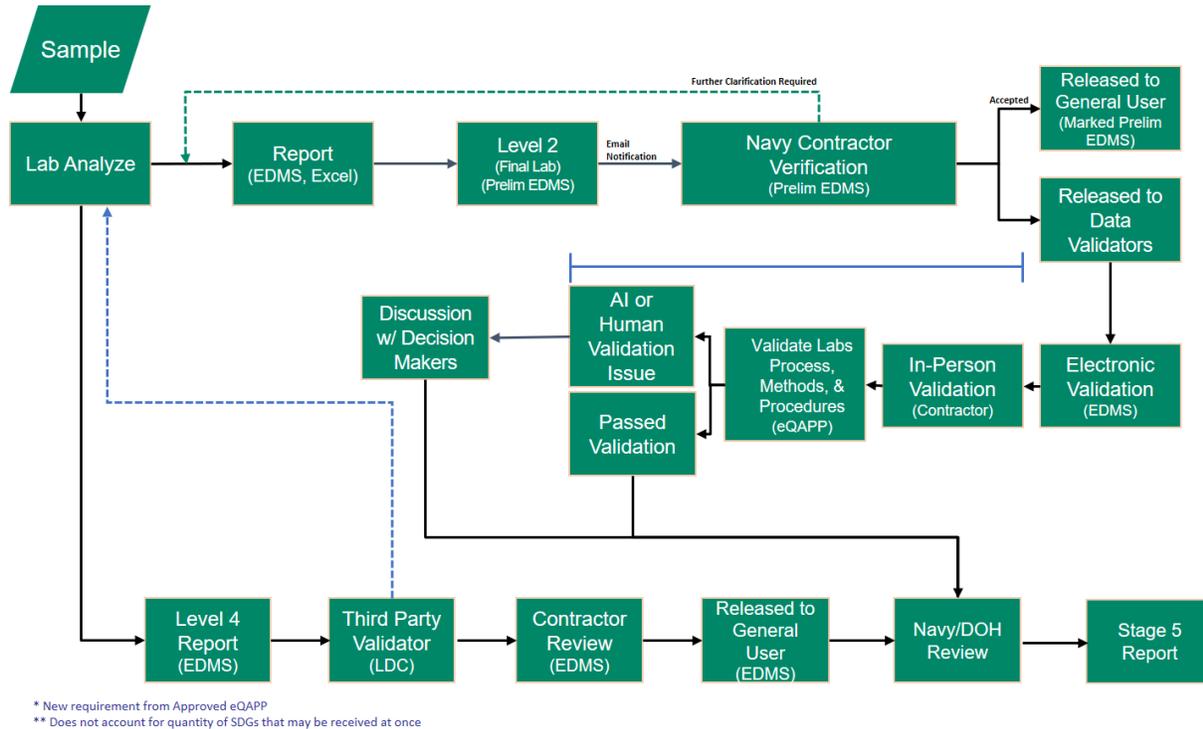
The analytical laboratory will report non-detected results to the method detecting limit. Detections between the method detection limit (MDL) and the method reporting limit (MRL) are detections and should be flagged as estimated (J).

Level 2 and Level 4 data packages will be provided by the laboratory for all DW LTM samples that are collected according to the schedule in Figure 4. Ten percent of the drinking water compliance samples will undergo Level 4 data validation by an independent validator (i.e., the validator will be independent of the laboratory who performed the analyses). This percentage of samples requiring Level 4 validation is per zone and period and may be increased depending on the number, type, and severity of corrective actions that are identified by the data validator; however, the percentage per zone in each period can fluctuate to accommodate the number of samples collected. The remaining samples will undergo Level 2A data validation.

5.3.3 Laboratory Data Review Process

Figure 2 illustrates the laboratory data analysis and validation process. As shown in Figure 2, once lab data is entered into the EDMS and verified, Level 2 and Level 4 validation efforts start. Level 2A validation includes both a computerized validation and manual review and validation by chemists. Both processes generally act together to produce the Level 2A validation in a timely manner. However, as is the case with any laboratory analyses, some samples will not pass this QC step and will be singled out for further discussion with the Navy/Army Team. A record of the discussion and decision must be memorialized and submitted to DOH. Level 4 validation is a separate process that starts with the labs providing Level 4 data packages, reports that are hundreds or thousands of pages long. Those packages are validated by a data validator contractor, an independent third-party validator, and further reviewed for approval by the Navy/Army Team.

FIGURE 2 LAB DATA REVIEW PROCESS FLOWCHART



5.4 PRESENTATION OF DATA

Data must be uploaded to EDMS and be available in a comprehensive, full system view, as well as per zone. All field sample results associated with the DW LTM program shall also be included in EDMS.

The following is an excerpt from page 1 of the Interagency Drinking Water System Team – Data Management Plan, dated January 24, 2022:

“This Site-Specific Data Management plan (SSDMP) is intended to provide guidance for data collection and subsequent data management activities associated with the activity detailed below. The data collection and management practices identified in this plan are designed to ensure data integrity and consistency throughout the response activity. The SSDMP is not intended to be all encompassing regarding data management. Additionally, this document is intended to be updated as data management practices change. If there is a substantial change in activity or phase of the response, i.e. necessitates a new sampling plan, a new SSDMP should be written or updated upon written agreement with all parties involved.

Data collected under this SSDMP only applies to the emergency response related to the November 20, 2021 release of a mixture of jet fuel/water into the Red Hill Shaft and subsequent transport to the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water distribution system. Only data obtained after the Drinking Water Sampling Plan was signed by the Interagency Drinking Water System Team (i.e., Navy, Army, Hawaii Department of Health [HDOH], and United States Environmental Protection Agency [EPA]) on December 14, 2021 will be included in this SSDM. Historical Data and data from other events that are not associated with the Red Hill/JBPHH Drinking Water System Site (as defined herein) will not be included in the site-specific

database without prior written consensus of the signees of the Interagency Drinking Water System Team (IDWST).

All validated (Level 2 or Level 4, as appropriate) drinking water data/information that is collected/developed under this plan is subject to Uniform Information Practices Act (HRS 92F) and the Freedom of Information Act (FOIA).¹ All members of this team will have equal access to the data and management of access/permissions to the database management system. The IDWST Communications Plan(s) will identify the process and schedule to approve release of data. All Approvals/Disapprovals will be documented in the daily IDWST Meeting Minutes or IDWST Decision Memos. All members are allowed to access and download data from the system at any point. **Data is owned by the individual agency that submitted the data. However, all data in the EDMS/database will be shared with all parties of the IDWST without restriction. [emphasis added]**

This SSDMP is an Evergreen document—meaning that it is intended to be updated/modified, as necessary, to fulfill the mission of the IDWST. All revisions/edits of this plan require prior approval of the signees of the IDWST (or their designees), which will be documented in the daily IDWST Meeting Minutes.”

¹ The US EPA has guidance documents for environmental data verification and data validation which can be generally summarized by the following levels of data quality:

Level I Data Validation: Verification is made to confirm that analytical methods, analytes, and reporting levels are consistent with project objectives as well as applicable state and federal regulations.

- *Level II Data Validation: In addition to a Level I data validation, these data are reviewed to verify that supporting QA/QC are of a level of quality necessary to support sample results.*
- *Level III Data Validation: In addition to a Level I and II data validation, these data undergo a detailed review to ensure reported results have valid laboratory procedures and documentation underpinnings. This includes all evaluations that are not derived exclusively from raw instrument data.*
- *Level IV Data Validation: These data undergo full review and evaluation of a complete Data Validation Package (DVP) according to DQO/QAPP specific criteria, and National Functional Guidelines. This level of review includes all summaries, and raw data associated with the data package, and ensures the highest level of defensibility.*

6. REMOVAL ACTION REPORT CONDITIONS

As stated in DOH's *Guidance on the Approach to Amending the Public Health Advisory, Addendum 1*, dated February 12, 2022, "DOH's priority is to protect the public health of the people of Hawaii. The guidance is based on "lines of evidence" (Table 1 [of the referenced guidance]) that must be met before DOH will amend the health advisory and issue notices that the water can be used for drinking. The Navy must also commit to following the [DW] LTM of system water quality for this incident under the IDWST Drinking Water Sampling Plan, as amended." References made to "Memo" in Sections 6.1 – 6.3 refer to the memorandum for record provided in the identified sections of the RAR submitted by the Navy to the IDWST for each zone. These RAR provided the framework for the lines of evidence used by DOH to amend each zone per the previously stated guidance.

In connection with DOH's amendment of the Public Health Advisory, prospective actions were required for certain Zones. Those conditions and, where appropriate, the steps for fulfilling them are set forth in this Plan.

6.1 TANK CLEANING

In accordance with the RAR, Section 2a.5 Memo, dated February 26, 2022:

...regarding the 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, "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. The planned work is scheduled to be completed before the end of this calendar year." See also Section 2a.5 Memo Enclosure (3) for the Memorandum for Record, dated 25 February 2022, regarding Inspection, Maintenance, and Cleaning of Potable Water Tanks.

The above commitment will be fulfilled with successful completion of this Plan.

6.2 CROSS CONNECTION CONTROL FEDERAL FISCAL YEAR 2022 SURVEY

In accordance with the RAR, Section 1c.1 Memo, dated March 7, 2022:

The Navy has committed to the funding and performance in FY2022 of a comprehensive cross connection control survey of the entire JBPHH water system per the December 2021 AH Engineers & Scientists Water Quality CAT Memorandum.

Comply with the COMNAVREG HAWAII INSTRUCTION 11330.2D, dated 19 Sep 2016, Backflow Prevention and Cross-Connection Control Program.

The above commitment will be fulfilled with successful completion of this Plan.

6.3 CLOSED INACTIVE UNDERWATER INTERCONNECTIONS OR DISTRIBUTION LINES

6.3.1 Closed Inactive Underwater Distribution Line - Secured

The currently inactive underwater distribution line at JBPHH Bishop Pt-Iroquois Pt (Zone D2 – Zone A3) is closed and secured. In accordance with the RAR, Section 2a.5 Memo Enclosure (5), dated 25 February 2022:

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....

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

In accordance with the mentioned Memo, when reactivating this underwater distribution line, the Navy shall fulfill this commitment with the successful completion of this Plan.

6.3.2 Closed Inactive Underwater Distribution Line - Broken

The inactive underwater transmission line, at Ford Island-Hospital Point (Zone A2 – Zone C3) is broken. As described in the RAR, Section 2a.5 Memo Enclosure (4), dated 22 February 2022, the 24-inch underwater crossing was damaged by a contractor who drilled through the casing and pipe. **Design of the repairs to remedy the broken line is subject to review and approval by DOH under Hawaii Administrative Rules (HAR) §11-20-30.**

6.4 LEAD AND COPPER MONITORING

Lead and Copper Rule monitoring will continue under normal SDWB regulatory authorities.

6.5 FLUSHING PLAN

The development of a comprehensive, working hydraulic model; a valve inventory and maintenance program; and a flushing plan is a necessary component of a large, regulated water system's continuous obligation to ensure a safe, compliant and reliable supply of drinking water to its customers. During normal operations, routine flushing can significantly improve aesthetic water quality and help restore consumer trust in water quality at their taps.

Both the Navy and Army PWS, previous to the emergency, did not have: 1) an established routine flushing plan; 2) a complete inventory of valves in good working order, and 3) possessed a completed hydraulic model. These tools and practices can help the JBPHH PWS quickly respond to future contamination events in an efficient manner.

DOH acknowledges that the execution of these critical components of a water system's management and operations may extend beyond the time frame of the Plan's 24 months and can therefore be addressed under DOH Safe Drinking Water Act (SDWA) jurisdiction.

6.6 WATER RESPONSE TEAM OPERATION

The Water Response Team Operation was turned over to the Joint Base Pearl Harbor-Hickam Public Works Department for action on April 1, 2022, incorporating requirements within their steady state operations. While the DW LTM is ongoing, calls and correspondence from customers of the water system will be received with a continued focus on providing timely response on system flushing and testing for TPH.

6.7 CONDITION OF REMOVAL ACTION REPORT FOR ZONE D2

Hickam Officers Club, Building 901H, in Zone D2 is located at 2000 Signer Boulevard, Honolulu, Hawaii 96818. Samples taken at the facility on January 16 and January 18, 2022, exceeded the Maximum Contaminant Level of five (5) parts per billion or 0.005 mg/L of methylene chloride (also known as dichloromethane). This building has been closed for renovations as of April 2022. DOH is requiring the Navy to conduct the following as stated below to ensure that public health is protected:

1. Continue the isolation of the facility from the distribution system through a backflow preventer or by securing a valve to ensure that the source of the contamination would not impact the rest of the JBPHH Public Water System;
2. Maintain “RESTROOMS CLOSED” signs and prevent use of water;
3. Conduct an assessment, workplan, and implementation of locating and removing the source of methylene chloride;
4. Prior to the initiation of the renovations, develop and implement a health and safety plan for worker safety to include, but not be limited to, handling, protection from and potential health effects of methylene chloride;
5. Sample and analyze for Volatile Organic Compounds to include methylene chloride at same locations[outdoor spigot with no aerator];
6. Report the sample results to DOH;
7. Conduct further corrective actions as needed;
8. Notify and provide documentation to DOH once the corrective actions have been completed; and
9. Only reopen the facility following DOH approval.

6.8 CONDITION OF REMOVAL ACTION REPORT FOR ZONE G1

Several residential homes in Zone G1 (Camp Smith) exceeded DOH’s TOC ISP set at two (2) parts per million (ppm) during Stage 4. Although there are no health-based standards for TOC, it is important for DOH to evaluate TOC in water distribution systems when levels are at or above DOH’s ISP. TOC can also be an indicator of other issues within a water distribution system that can impact drinking water quality and potentially public health. In addition, TOC analysis is used as a marker of the possible presence of regulated disinfection byproducts. TOC are naturally occurring organic molecules found in water and when elevated levels of these organic molecules come in contact with chlorine, disinfection byproducts can be formed. These disinfection byproducts do have health-based standards and if not monitored and managed effectively, could exceed regulatory Maximum Contaminant Levels. Investigating TOC levels are appropriate management controls when operating a water system. Therefore, due to the cluster of elevated TOC results found at locations 2133, 2151, 2165, and 2173 Baugh Road and 739, 749, 751, 755, 761, and 763 Anderson Road at a range of 7.22 – 12.6 ppm, DOH is requiring Navy to complete the following investigative procedures within 75 calendar days after amendment of this zone and in chronological order as stated below:

1. Perform a cross-connection survey representing the above cluster of buildings;
2. Sample for TOC at same locations identified above;
3. Sample for free chlorine at same locations identified above;
4. Re-flush according to the building flushing plan;
5. Sample for TOC at same locations identified above; and
6. Sample for free chlorine at same locations identified above.

Because TOC was detected above four (4) ppm, the public water system must analyze for the additional parameters listed in COA 2 for TOC in Section 8.2.2.

7. DW LTM SCHEDULE

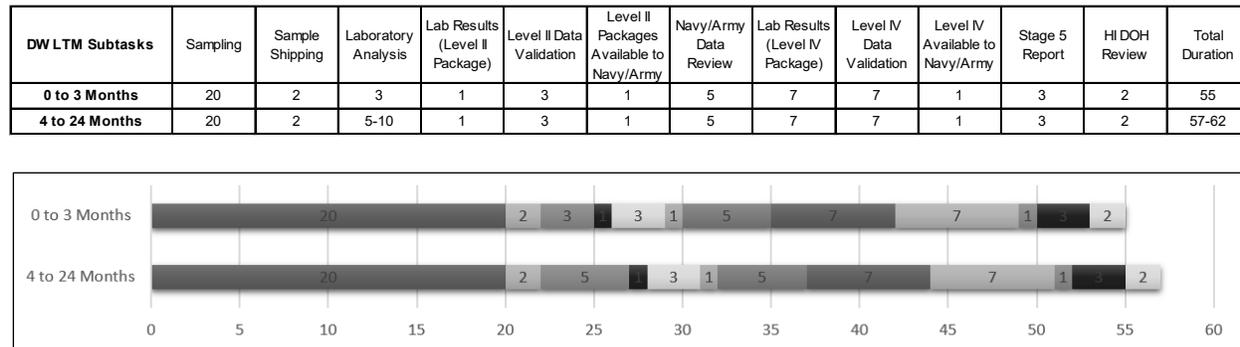
Actual start dates for DW LTM were determined by the staggered amendment of the public health advisories in each separate zone; however, the schedule below assumes that months 1-3 of the DW LTM in all zones will begin on day zero and be repeated day zero +30 and day zero +60. It is assumed that Months 4-24 of the DW LTM will occur in all zones beginning in June 2022. Sampling during the six-month blocks may be, as practicable, spread out across the block to equalize the workload from month to month. The schedule is subject to change with the approval of DOH.

FIGURE 3 0-24 MONTHS DW LTM SCHEDULE

1 Mar '22 Sample 5%	2 Apr '22 Sample 5%	3 May '22 Sample 5%	4 June '22 Sample 1/4th	5 July '22 Sample 1/4th	6 Aug '22 Sample 1/4th	7 Sept '22 Sample 1/4th	8 Oct '22 Analysis & Reports	9 Nov '22 Analysis & Reports	10 Dec '22 Plan & Schedule	11 Jan '23 Sample 1/4th	12 Feb '23 Sample 1/4th
13 Mar '23 Sample 1/4th	14 Apr '23 Sample 1/4th	15 May '23 Analysis & Reports	16 June '23 Sample 1/4th	17 July '23 Sample 1/4th	18 Aug '23 Sample 1/4th	19 Sept '23 Sample 1/4th	20 Oct '23 Analysis & Reports	21 Nov '23 Analysis & Reports	22 Dec '23 Plan & Schedule	23 Jan '24 Sample 1/2nd	24 Feb '24 Sample 1/2nd

The subtasks and assumed days to complete are presented in Figure 4.

FIGURE 4 0-24 MONTHS DW LTM SUBTASKS AND ASSUMED BUSINESS DAYS TO COMPLETE



8. RESPONSE TO A DETECTION OR AN EXCEEDANCE

8.1 SAMPLE RESULT EXCEEDANCE DATA PACKAGE

In the situation where the monitoring identifies an exceedance of the parameter limits defined in [Table 5](#), the System will provide DOH an information package on the sample of concern. The information package will include, but not be limited to:

1. Notify SDWB via sdwb@doh.hawaii.gov within 24 hours of receipt of a report of an exceedance from the laboratory (preliminary, DO NOT wait until level 2 validation is complete);
2. Provide location address and Zone;
3. Field crew notes (which shall be scanned daily and posted to EDMS);
4. Select information from the Sample Tracker Spreadsheet (or its replacement when the tracker is moved to EDMS); and

Proceed to Section 8.2 for the COA scenarios that the System will execute within five (5) calendar days of reporting the exceedance. The schedules and milestones within this section are subject to change with the approval of DOH.

8.2 NEXT STEPS AFTER DETECTION OR EXCEEDANCE

Following receipt of data indicating a detection or an exceedance, System will comply with the applicable COA provided in this section. Four (4) COAs were developed to cover the following scenarios:

- Distribution System (i.e., Hydrant) Exceedance
- House/Building Exceedance
- Distribution System or House/Building Detection of BTEX⁶ Less than MCL
- Detection of Other Analytes at Concentrations Less than the MCL

Please note that SDWB reserves the right, as the regulatory authority to modify specific COAs/requirements as warranted by the scenario. Contingent on where (distribution system or building) and what analyte was detected/exceeded, an associated COA is applied. A list of analytes and the associated COA is provided in Table 5. The schedules and milestones within this section are subject to change with the approval of DOH. SDWB will notify the Navy/Army to request site access, should SDWB decide to collect samples for any of the following COAs. The Navy/Army must provide access within 7 calendar days.

8.2.1 COA 1 – Distribution System (i.e., Hydrant) Exceedance

This COA is for all analyte exceedance reported within a water distribution system at a hydrant during DW LTM. The Navy must inform SDWB regarding actions to be taken prior to each step below.

1. Notify SDWB via sdwb@doh.hawaii.gov within 24 hours of receipt of the lab report (lab preliminary, DO NOT wait until Level 2 validation is complete);
2. Provide SDWB an information package consisting of items 1-5 in Section 8.1;
3. Navy will identify a minimum of 2 bracketing hydrant points in addition to the original exceedance location (3 total); Flush each hydrant sufficiently to bring fresh water from the nearest mainline junction;

⁶ BTEX stands for benzene, toluene, ethylbenzene, and xylene. These are four specific compounds found in the Total Petroleum Hydrocarbons – Gasoline Range (TPH-g) category. BTEX chemicals are used in many products including JP-5.

4. Re-Sample;
5. Analyze for the method(s) specified for each exceeded analyte(s), instruct lab to report all [Table 5](#) contaminants for the specified method(s); and
6. If result of re-sampling of initial hydrant is above AL, but results from bracketed samples are below AL, repeat sampling of initial hydrant for analyte(s) in question
7. Refer to “Remedial Actions” for different re-sampling result outcomes for the associated response.

For TOC exceedances, in addition to the above, the Navy shall:

1. Analyze for TOC/dissolved organic carbon (DOC), HPC, DBP, and chlorine residual.

8.2.2 COA 2 – House/Building Exceedance

This COA is for all analyte exceedance reported within a house/building premise plumbing during DW LTM. The Navy must inform SDWB regarding actions to be taken prior to each step below.

1. Notify SDWB via sdwb@doh.hawaii.gov within 24 hours of receipt of the lab report (lab preliminary, DO NOT wait until Level 2 validation is complete);
2. Provide information package items 1-5 in Section 8.1;
3. Provide additional investigator information with 24 hours of a reported exceedance to include the following items, pending availability:
 - a. Available plumbing as-builts; and
 - b. Maintenance records for the subject facility or residence;
4. Notify house/building tenant of the exceedance and provide a recommendation regarding water use.
5. If the Navy/Army suspects the contaminant of exceedance originated from the fixture, the Navy/Army may elect to: 1) replace the fixture if indicated by analyte detected (i.e., lead/copper [consult with DOH for other analytes]); 2) sample⁷; 3) flush for a minimum of 15 minutes; and 4) re-sample, as practiced in prior exceedances during the emergency response. Notification must be provided to SDWB prior to executing this option. If the post flush confirmation sampling results do not exceed MCLs/DOH Screening Levels in [Table 5](#) then the COA may stop at this step. If the post flush confirmation sampling results exceed MCLs/DOH Screening Levels in [Table 5](#), proceed to step 6. If Step 5 is not implemented, then proceed to step 6.
6. The Navy/Army will direct sampling for the original fixture location plus a minimum of one additional interior fixture in the subject building.
7. The Navy/Army will consult with DOH to determine if bracketed sampling (i.e., sampling one house upstream and one house downstream of the subject home) is required based on Steps 1 – 7. Re-sample without pre-flushing.
8. Analyze for the method(s) specified for each exceeded analyte(s) from Table 5, instruct lab to report all contaminants for the specified method(s).
9. Refer to “Remedial Actions” for different re-sampling result outcomes for the associated response.
10. Once the Navy verifies that the exceedance is cleared with validated laboratory data, the Navy will notify the tenant and DOH that the house/building can resume water use with no recommended restrictions.

⁷ Pre-flush sampling may be skipped with DOH approval.

For TOC exceedances, in addition to the above, the System shall analyze for TOC/DOC, HPC, DBP, and chlorine residual.

8.2.3 COA 3 –Distribution System or House/Building BTEX Detection Less than the MCL

This COA 3 is for BTEX detected at concentrations greater than those listed below, but less than the MCL, for all locations whether it be within the premise plumbing of a house/building or at a hydrant for a water distribution system. Refer to Table 5 for select analytes applicable to COA 3, if detected.

Analytes	Target Detection Level (ppb)
Benzene	0.5 *
Ethylbenzene	30 ‡
Toluene	40 ‡
Xylenes	20 ‡

*: The common minimum reporting level for EPA method 524.2

‡: denotes the gross contamination level

1. Notify SDWB via sdwb@doh.hawaii.gov within 24 hours of receipt of the lab report (lab preliminary, DO NOT wait until Level 2 validation is complete);
2. The Navy must collect sample as applicable for building or hydrant location:
 - a. House/Building – First flush collection according to SOP 1B in Appendix A;
 - b. Hydrant – Flush hydrant sufficiently to bring fresh water from the nearest mainline junction;
3. Re-sample at original hydrant/fixture;
4. Analyze for the method(s) specified for each detected analyte(s), instruct lab to report all [Table 5](#) contaminants for the specified method(s); and
5. No further action needed if the result is either non-detected or remains below the MCLs. If an exceedance is now present, proceed to COA 1 or 2 as applicable.

8.2.4 COA 4 – Detection of Other Analytes at Concentrations Less than the MCL in Distribution System

This COA is for any analyte detected in the distribution system meeting all of the following criteria:

- a. Below, MCL, ISP, and AL;
- b. Does not meet COA 1;
- c. Does not meet COA 2; and
- d. Does not meet COA 3.

Refer to Table 5 for select analytes applicable to COA 4, if detected.

1. Notify SDWB via sdwb@doh.hawaii.gov within 24 hours of receipt of the lab report (lab preliminary, DO NOT wait until Level 2 validation is complete); and
2. For detections of VOCs in distribution samples
 - a. Flush hydrant sufficiently to bring fresh water from the nearest mainline junction;
 - b. Re-sample at original hydrant;
 - c. Analyze for the method(s) specified for each exceeded analyte(s) from [Table 5](#), instruct lab to report all contaminants for the specified method(s);

- d. If the re-sample result:
 - i. Exceeds the MCL, then proceed to COA 1.
 - ii. Is Detected but does not Exceed the MCL, then SDWB will require quarterly sampling at that location as stipulated under HAR §11-20-12(f)(11)(A). Under SDWB, quarterly sampling at those locations will be required by the System until the sampling requirement is removed by SDWB during this period covered by the LTM Plan.
 - iii. Is Not Detected, then no additional sampling is required during this event.

8.3 REMEDIAL ACTIONS

This section provides response guidance post re-sampling results. Should the re-sample indicate either non-detect or below the exceedance levels, no further action is needed. Should the re-sample indicate continuing exceedance, an attempt to provide remedial action shall be made within 48 hours of preliminary re-sample results. If the re-sampled exceedance is at the:

- Original Location only – Re-flush house/building/hydrant only, investigate fixture or hydrant.
- Original Location and at the Additional interior fixture – Re-flush house/building only, investigate premise plumbing materials.
- Original Location and at the Bracketed samples – SDWB to direct further actions.
- Additional interior fixture only – Re-flush house/building only, investigate fixture.
- Bracketed samples only – SDWB to direct further actions.

8.4 RE-SAMPLING METHOD(S)

Table 5 provides re-sampling methods required for each detected or exceeded analyte. Analyze for the method(s) specified for each detected analyte(s). Instruct the lab to report all [Table 5](#) contaminants for the specified method(s).

TABLE 5 LONG TERM MONITORING CONTAMINANTS AND COA FOR EXCEEDANCES/DETECTS

Contaminant	Chemical Abstracts Service (CAS) Number	DOH MCL ¹ (µg/L)	DOH Project Screening Level (µg/L)	Method Detection Limits (µg/L)	Method Reporting Limits (µg/L)	Sampling Method	Re-Sampling Method(s)	Distribution COA	Building COA	Detection COA
From Table 2 of the Guidance										
JP-5 as Combined Total Petroleum Hydrocarbons (TPH)-Gasoline, Diesel, and Oil Ranges ² [Incident Specific Parameter]	PCHG	Not Applicable	266	GRO, DRO, ORO = 50	GRO =100; DRO, ORO = 95	8260 PCHG / 8015 PCHD/O	8260 PCHG / 8015 PCHD/O / 524.2	1	2	4
	PCHD									
	MOIL									
Benzene	71-43-2	5	5	0.5	0.5	524.2	524.2	1	2	3
Toluene	108-88-3	1,000	1,000	0.5	0.5	524.2	524.2	1	2	3
Ethylbenzene	100-41-4	700	700	0.5	0.5	524.2	524.2	1	2	3
Xylenes (total)	1330-20-7	10,000	10,000	0.5	0.5	524.2	524.2	1	2	3
	95-47-6									
1,1,1-Trichloroethane	71-55-6	200	200	0.5	0.5	524.2	524.2	1	2	4
1,1,2-Trichloroethane	79-00-5	5	5	0.5	0.5	524.2	524.2	1	2	4
1,1-Dichloroethylene	75-35-4	7	7	0.5	0.5	524.2	524.2	1	2	4
1,2,4-Trichlorobenzene	120-82-1	70	70	0.5	0.5	524.2	524.2	1	2	4
1,2-Dichlorobenzene	95-50-1	600	600	0.5	0.5	524.2	524.2	1	2	4
1,2-Dichloroethane (EDC)	107-06-2	5	5	0.5	0.5	524.2	524.2	1	2	4
1,2-Dichloropropane (DCP)	78-87-5	5	5	0.5	0.5	524.2	524.2	1	2	4
1,4-Dichlorobenzene	106-46-7	75	75	0.5	0.5	524.2	524.2	1	2	4
Carbon tetrachloride (CTC)	56-23-5	5	5	0.5	0.5	524.2	524.2	1	2	4
Chlorobenzene	108-90-7	100	100	0.5	0.5	524.2	524.2	1	2	4
cis-1,2-Dichloroethylene	156-59-2	70	70	0.5	0.5	524.2	524.2	1	2	4
Dichloromethane (aka methylene chloride)	75-09-2	5	5	0.5	0.5	524.2	524.2	1	2	4
Styrene	100-42-5	100	100	0.5	0.5	524.2	524.2	1	2	4

Contaminant	Chemical Abstracts Service (CAS) Number	DOH MCL ¹ (µg/L)	DOH Project Screening Level (µg/L)	Method Detection Limits (µg/L)	Method Reporting Limits (µg/L)	Sampling Method	Re-Sampling Method(s)	Distribution COA	Building COA	Detection COA
Tetrachloroethylene	127-18-4	5	5	0.5	0.5	524.2	524.2	1	2	4
trans-1,2-Dichloroethylene	156-60-5	100	100	0.5	0.5	524.2	524.2	1	2	4
Trichloroethylene (TCE)	79-01-6	5	5	0.5	0.5	524.2	524.2	1	2	4
Vinyl Chloride	75-01-4	2	2	0.5	0.5	524.2	524.2	1	2	4
Total trihalomethanes (TTHM) (sum of chloroform, bromoform, bromodichloromethane, and dibromochloromethane)		80	80		0.5	524.2	524.2	1	2	4
Total Haloacetic acids (five) (HAA5) (sum of mono-, di-, trichloroacetic acids and mono- and dibromoacetic acids)		60	60	1	1	552.2 / 552.3	552.2 / 552.3	1	2	4
Benzo[a]pyrene	50-32-8	0.2	0.2	0.0095	0.019	525.2 / 525.3	525.2 / 525.3	1	2	4
Di(2-ethylhexyl)phthalate (DEHP aka BEHP)	117-81-7	6	6	0.38	0.57	525.2 / 525.3	525.2 / 525.3	1	2	4
Antimony	7440-36-0	6	6	0.1	0.4	200.8	200.8	1	2	-
Arsenic	7440-38-2	10	10	0.5	2	200.8	200.8	1	2	-
Barium	7440-39-3	2000	2000	0.5	2	200.8	200.8	1	2	-
Beryllium	7440-41-7	4	4	0.15	0.3	200.8	200.8	1	2	-
Cadmium	7440-43-9	5	5	0.05	0.15	200.8	200.8	1	2	-
Chromium	7440-47-3	100	100	0.5	2	200.8	200.8	1	2	-
Copper ^{3,5}	7440-50-8	1300	1300	0.5	2	200.8	200.8 ⁴	1	2	-
Lead ^{3,5}	7439-92-1	15	15	0.13	0.5	200.8	200.8 ⁴	1	2	-
Mercury	7487-94-7	2	2	0.025	0.1	245.1	245.1	1	2	-
Selenium	7782-49-2	50	50	0.3	0.7	200.8	200.8	1	2	-
Thallium	7440-28-0	2	2	0.05	0.2	200.8	200.8	1	2	-

Contaminant	Chemical Abstracts Service (CAS) Number	DOH MCL ¹ (µg/L)	DOH Project Screening Level (µg/L)	Method Detection Limits (µg/L)	Method Reporting Limits (µg/L)	Sampling Method	Re-Sampling Method(s)	Distribution COA	Building COA	Detection COA
From Table 3 of the Guidance										
1-methylnaphthalene	90-12-0	None	10	0.24	0.48	525.2 / 525.3	525.2 / 525.3	1	2	-
2-methylnaphthalene	91-57-6	None	10	0.24	0.48	525.2 / 525.3	525.2 / 525.3	1	2	-
Naphthalene	91-20-3	None	17	0.24	0.48	525.2 / 525.3	525.2 / 525.3	1	2	-
Total Organic Carbon (TOC) [Incident Specific Parameter]	TOC	None	4000	0.2	0.5	EPA approved method	EPA approved method	1	2	-
Chlorine, Free (Field Test)	CHLORINE	4000	4000	-	-	8021	8021	1	2	-

Notes:

¹ CONTAMINANTS REGULATED BY THE SAFE DRINKING WATER BRANCH (updated 7/10/14) at <https://health.hawaii.gov/sdwb/files/2014/07/MCL-Fct-2014-07-10.pdf>

² HODOH, 2017, Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater – Hawaii Edition (Fall 2017): Hawai'i Department of Health, Office of Hazard Evaluation and Emergency Response. <https://health.hawaii.gov/heer/guidance/ehe-and-eals/>. HODOH, 2022, Recommended Risk-Based Drinking Water Action Levels for Total Petroleum Hydrocarbons (TPH) Associated with Releases

³ Action Levels.

⁴ Analyze for the lead and/or copper, pH, alkalinity, calcium, conductivity, and temperature.

⁵ As a result of data collected during the first phase of LTM (Months 0-3), Lead and Copper samples will only be collected from residences, other buildings and the entry points to the distribution system during LTM Months 4-24.

9. PROTECTION OF DRINKING WATER SOURCE(S)

DOH acknowledges that the execution of the items proposed in this section may extend beyond the time frame of the Plan's 24 months and the Navy's desire to maintain scope integrity relative to the response. However, this section is included in the DW LTM as a guide for requirements needed before returning closed sources to service. Additionally, certain items may be addressed under DOH SDWA jurisdiction pending further evaluation of both public water systems and the pending Sanitary Survey to be conducted by DOH in 2022.

The Navy shall ensure that its current drinking water source(s) are protected from future contamination and implement a Water Quality Surveillance and Response System (SRS). The SRS is a framework designed to support monitoring and management of distribution system water quality. This Plan outlines implementation of two components that enhance a drinking water utility's capability to quickly detect and respond to water quality issues. Early warning and effective response to a deterioration in water quality can prevent it from becoming a more serious problem.

Online (also known as inline) monitoring involves continuous monitoring of water quality parameters at storage tank inlets and other strategic locations in the distribution system. Data from these monitoring stations will be sent to a central information management system and analyzed to detect unusual water quality conditions. Performance objectives for the three (3) drinking water sources (i.e., Waiawa Shaft, Aiea Halawa Shaft, and Red Hill Shaft), as well as future sources, must be designed to report detections in the distribution system in the timeframes listed below and discussed to establish framework to detect contaminants of concern. The Navy shall base the system on EPA guidance Online Water Quality Monitoring in Distribution Systems:

https://www.epa.gov/sites/default/files/2018-05/documents/owqm-ds_guidance_042018.pdf.

Data from the System will be transferred to EDMS as a secure location for data sharing. SDWB will maintain access to EDMS and any data provided by the System. SDWB must be notified within 24 hours of the Navy's response to a detection above the action level. Alert notification procedure includes sending an email immediately to sdwb@doh.hawaii.gov for all exceedances or pattern deviations. In the case of a TPH exceedance, a phone call should be made to the HEER Office State On-Scene Coordinators at 808-586-4249 during office hours (Monday–Friday, 7:45 am–4:30 pm, excluding State holidays) and at 808-236-8200 after hours.

9.1 WAIAWA SHAFT

The Navy shall develop a proposal to establish and implement an online program for the Waiawa Shaft EPD. As the Waiawa Shaft has been proven to currently be adequately protected and meeting MCLs, the Navy is granted more time to develop continuous monitoring at this source. However, for efficiency, the Navy may choose to include the Waiawa Shaft in its engineering planning for the currently unapproved Aiea Halawa Shaft and Red Hill Shaft sources. (see below)

9.2 AIEA HALAWA SHAFT & RED HILL SHAFT

An online program must be approved by SDWB, and fully functioning, prior to introducing water from these sources into the distribution system. Additional SDWB requirements may be required at the time of the request to re-activate the source.

10. REPORTING AND MEETING SCHEDULE

10.1 REPORTING TO THE NAVY AND DOH

A monthly DW LTM summary report which details the status of each zone will be provided to SDWB. Data included in the monthly report will be exported from EDMS and will, at a minimum, include the following:

- Houses and buildings sampled
- Number of samples collected
- Sampling phase (i.e., 0-3 Month, 6-Month, 3-Month and which 6-Month or 3-Month period, as appropriate)
- Sample sites that had exceedances and required resampling
- GIS map of sample sites with location IDs
- QC summary report
- Challenges incurred and recommendations for improvement
- Forward looking plan for DW LTM for the following month

The monthly DW LTM summary report will be submitted to SDWB by the 15th day of the month following the month that monitoring took place.

10.2 REPORTING TO RESIDENT, BUILDING MANAGER, AND PUBLIC

10.2.1 Laboratory Results

With the receipt of the monthly Step 5 LTM laboratory reports, the Navy shall:

- Provide access to an electronic⁸ copy of test results to the resident or building manager where sampling occurred. The electronic test results should be easily accessible using a code, address, or other means.
- Ask building managers or their representatives to post a notification in a common area of the sampled facility for a period of 30 calendar days that the results are available electronically. The electronic test results should be easily accessible using a code, address, or other means.
- Post the laboratory reports on the <https://jbphh-safewaters.org/> website.

<https://Jbphh-safewaters.org/> may be converted to a static data and public information repository once the need for EDMS is complete for this response. EDMS is an environmental data management system, and its functions and features are necessary while data and lab reports are being uploaded and managed through the end of LTM. However, once all data have been validated and the full dataset is complete, the management of data will no longer be necessary, and a much more cost-effective data warehouse can replace the management functionality.

10.2.2 Press and Public Inquiries

The System shall be responsible for addressing inquiries/concerns from the public or press. The System must add SDWB and DOH Communications Office to media release distribution lists via email to sdwb@doh.hawaii.gov and doh.pio@doh.hawaii.gov, respectively.

Customer complaint surveillance monitors customer calls to identify unusual trends in water quality complaints. Calls associated with an unusual trend are further investigated to determine if they are

⁸ Hardcopies shall be provided upon request of the resident or building manager where sampling occurred.

similar in nature and spatially clustered. Customers may often be the first to report loss of pressure, degraded water quality, waterline leaks, and much more.

The System will track complaints and develop a tool to specially evaluate clusters. These trends shall be identified by the System.

10.2.3 Public Notices as Required by DOH

Should the System be required to issue a public notice as required by HAR §11-20-18, they shall disseminate the notice upon consultation with DOH. It is the System's responsibility to ensure all affected consumers are notified. For each System, the appropriate method for issuing the public notice must be approved or suggested by SDWB. A copy of the draft public notice must be sent to SDWB for approval.

The area affected by the public notice is determined by the System and SDWB based on the location of the sampling points and the results of the routine and repeat sampling.

10.3 KEY STAKEHOLDERS MEETING SCHEDULE

SDWB will coordinate all DW LTM phase meetings with the stakeholders:

- Meetings with stakeholders to discuss DW LTM will, at DOH's discretion, be held monthly for first three (3) months of the DW LTM plan (e.g., April, May and June 2022).
- Meetings with key stakeholders to discuss DW LTM may be reduced to quarterly in January, April, July, and October of each calendar year 2023 and 2024.

The purpose of these meetings are to:

- Review schedules, data, deliverables and
- Discuss issues and possible modifications to DW LTM documents.

Attendees are DOH, and Navy and Army representatives. EPA may also be invited. The location of the meetings will be at the Uluakupu Bldg. 4, 2385 Waimano Home Road, Pearl City, Hawaii, 96782, (or other designated location determined by the DOH) and may include remote attendance as necessary or appropriate.

11. REFERENCES

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- Interagency Drinking Water System Team (IDWST). 2022. *Final Drinking Water Sampling Plan for JBPHH*. O'ahu, Hawai'i. Version 9, Addendum 2, January. https://www.cpf.navy.mil/Portals/52/Downloads/JBPHH-Water-Updates/Drinking%20Water%20Sampling%20Plan%20Addendum_V6_010422_Final2.pdf?ver=IHgyhCw68Io4cd8FtQAUeA%3d%3d (January 4, 2022 Addendum 1), (January 30, 2022 Addendum 2), (February 25, 2022 Addendum 3)
- Interagency Drinking Water System Team (IDWST). 2022. *Final Non-Residential Facility Flushing Plan Checklist and Standard Operating Procedures*. JBPHH, O'ahu, Hawai'i. January. <https://www.cpf.navy.mil/Portals/52/Downloads/JBPHH-Water-Updates/20220104%20FINAL%20NON-RESIDENTIAL%20FLUSHING%20SOP.pdf?ver=S6-CBkQuZq1Z6LZ6BewCZQ%3d%3d>.
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Interagency Drinking Water System Team (IDWST). 2021. *Single Family Home Flushing Plan Checklist and Standard Operating Procedures*. JBPHH, O'ahu, Hawai'i. December.
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**Appendix A:
SOPs**

SOP 1A: Drinking Water Sample Collection for Headspace, Sheen Observation and Free Chlorine, Part A

Scope – The purpose of this SOP is to ensure the sample collection and observation process is performed in a consistent manner so the results can be comparable to other observations taken on base.

Procedure - Prior to the collection of drinking water samples, a headspace, sheen observation and free chlorine test must be performed.

- Pre-sampling preparation –
 - Clear sampling area of any potential volatile sources (hand soaps, dishwashing soap, hand soap, etc.) within the immediate vicinity of the tap/spigot and sample bottle staging area. Redon a new pair of gloves if it becomes contaminated.
 - Place several sheets of paper towels on a suitable flat surface such as a counter- top or the floor.
 - Place sample containers on the paper towels and conduct Part B – Pre-sampling preparation.
 - Remove aerator or backflow prevention device at sampling point, if present.
- Photoionization Detector –
 - Calibrate photoionization detector (PID). Take a PID reading in the vicinity of the drinking water sampling point (within 2 feet) and record the results on the Drinking Water Field Observation Form under “Ambient Room”. Record any presence of odor and note any potential sources of the odor. If “Ambient Room” PID reading is greater than 2.0 ppm, contact the Drinking Water field team supervisor(s).
- Sheen Observation –
 - Half-fill a clear, unpreserved 40-milliliter (ml) VOA vial with water from the drinking water sampling point. Avoid agitating the water inside the vial and close the vial tightly.
 - Lay the vial on a paper towel, on its side. Record initial sheen observation on the Drinking Water Field Observation Form under “Initial Sheen Observation.” Set a timer for 5 minutes.
 - After 5 minutes has elapsed, observe the surface of the water in the vial for sheen or rainbow coloration. Record your observations on field form under “*Final Sheen Observation*”.
 - Once the analysis is concluded, the water can be discarded into the sanitary sewer (i.e. down the drain, if present). If no sheen is observed, the empty VOA vial can be reused at the next location. If a sheen is observed, dispose of the VOA vial with the discarded PPE.
- Quality control for Headspace and Sheen – In order to have consistency in the headspace and sheen analysis, it is critically important shake the 1L amber bottle for exactly 30 seconds and let the VOA vial rest for exactly 5 minutes. This way the results will be comparably with other teams collecting the same information. The vigorous shaking of the 1L amber will out-gas volatile chemicals into the headspace of the bottle, if present. Similarly, letting the

VOA vial rest for 5 minutes, allows time for chemicals dissolved in the water to migrate out and float to the surface. Like oil and vinegar dressing separate in the refrigerator, the oil floats to the top.

- Free Chlorine Analysis –
 - Review the Safety Data Sheet for the DPD Free Chlorine Reagent Powder Pillows and ensure the proper PPE is in use (e.g. nitrile gloves and safety glasses).
 - Power on the Hach DR300 coulometer and Start program 80 Chlorine F&T PP.
 - Set the instrument to low range by pressing the up arrow (triangle) button so the triangle is under **LR** (Low Range) on the instrument screen.
 - Rinse the Free Chlorine sample cell it with at least 3 volumes of the water from the sampling point. Similarly, rinse the sample cell cap.
 - Fill the sample cell to the 10 mL line and cap the sample cell. Clean the outside of the sample cell with a lint free cloth.
 - Insert the sample into the cell holder ensuring the diamond mark on the cell is lined up with the triangle mark on the meter (facing the meter).
 - Place the instrument cap over the cell holder.
 - Push **ZERO** (Blue button on the left of the meter). The display should show 0.00.
 - Remove the cell from the meter. Carefully open the DPD Free Chlorine Reagent Powder Pillow and add the contents to the sample. Close the sample cell with the cap.
 - Invert the sample cell several times for 20 seconds to mix. A pink color will develop if chlorine is present.
 - Set a timer for 3 minutes.
 - While timing the mixture, clean the cell with a lint free cloth. Place the cell in the meter making sure the diamond on the cell is lined up with the triangle on the meter.
 - Press the green button with the check mark on the right side of the meter and record the results on the field form in mg/L.
 - If the screen on the meter is blinking, this indicates the Free Chlorine concentration is greater than 2.0 mg/L and a dilution of the sample is required.
 - Dispose the contents of the cell into the sanitary sewer (i.e. down the drain, if present). Rinse the cell and cap 3x with sample water.
 - Prepare a 1:1 dilution of the sample by decanting 50 mL of sample into a 100 mL beaker and add 50 mL of distilled water, swirl the mixture and decant into the 10 mL cell to the 10 mL mark and repeat the analysis.
 - Take the reading from the meter and multiply the result by 2 and record on the field form.
 - If the analysis is still over range, prepare a 1:4 dilution by adding 25 mL of sample to the beaker and 75 mL of distilled water. Multiply the results by 4 and record on the field form.

- Free Chlorine Analysis – Quality Control
 - Prior to analysis at the beginning of each working day, a calibration spec check reference sample should be analyzed.
 - Power up the meter.
 - Run a distilled water blank sample as described above.
 - Next insert the Spec Check reference cell in the meter and place the instrument cover over the cell.
 - Press the green button with the check mark to read the results and compare to the concentration value printed on the Spec Check cell.

If the concentration is outside the acceptable range, consult the operator's manual to modify the instrument calibration. Repeat the Spec Check analysis.

SOP 1B: Drinking Water Sample Collection, Part B

Scope – The purpose of this SOP is to ensure the sample collection process is performed in a manner consistent with requests made by both EPA and Hawaii State Department of Health. The option to collect a sample from the first flush of water from a tap is a deviation of typical State and Federal requirements for the collection of drinking water samples for the generation of definitive-level analytical data.

Procedure - Once the headspace/sheen observations and free chlorine tests have been recorded according to Part A, samples can be collected for shipment to the designated analytical laboratory.

- Pre-sampling preparation - Place the cooler containing the sample containers to be filled next to the towel used in Part A. Check to ensure all required sample bottle/ware and preservatives are present in the sample kit. See Bottle Container Checklist (Part B). The 250 ml plastic bottle for metals contains the 1:1 nitric acid preservative, handle with caution. Do not rinse any of the bottles.
- First collect the samples for EPA Methods **524.2 VOCs** and **8015 TPH-g**.
 - Remove cap and tilt the vial so the flow falls on the interior surface of the vial, do not shake or agitate.
 - Fill almost to the top leaving a “U-shaped” concave meniscus at the top of the vial. Place cap on the vial, tighten and gently invert the vial several times to dissolve the solid ascorbic acid preservative.
 - For **524.2 VOCs**, remove the cap and add 3 drops of HCl using a dropper supplied by the lab. If the meniscus is not convex, add more sample until convex but do not overfill. Place cap on the vial, tighten and gently invert the vial several times to mix.
 - For **8015 TPH-g**, additional preservative is not required, remove the cap of the empty VOA vial and fill the vial until a convex meniscus is achieved. Place the cap on the vial and tighten. Once the vial has been sealed, turn the vial upside down and look for the presence of bubbles. If any bubbles are present greater than half the size of a pea, re-collect the sample. **DO NOT** add additional water. If there are no bubbles repeat the process until all the vials have been filled.
- Second collect the samples for EPA Method **5310 TOC**.
 - Remove cap and tilt the bottle so the flow falls on the interior wall of the bottle. Do not shake or agitate.
 - Fill the bottle 1 or 2 inches below the top (i.e. to the neck of the bottle).
 - Place the cap on the bottle and tighten. Gently tip the bottle to mix the preservative.
- Third collect the samples for EPA Method **525.2 SOCs** and **8015 TPH-d/o**.
 - Remove cap and tilt the bottle so the flow falls on the interior wall of the bottle. Do not shake or agitate.
 - For the **525.2 SOC** sample, fill the bottle 1 or 2 inches below the top (i.e. to the neck of the bottle). Add a vial of 1:1 HCl. Place the cap on the bottle, tighten and gently tip the bottle to mix the preservative.
 - For the **8015 TPH-d/o** sample, fill the bottle 1 or 2 inches below the top (i.e. to the neck of the bottle). Place the cap on the bottle and tighten. Gently tip the bottle to mix the preservative.
- Last collect the sample for EPA Method **200.8/245.1 Metals/Mercury**.
 - This bottle contains 1:1 HNO₃, a corrosive acid that can cause serious injury, therefore when filling the bottle point the opening away from you prior to and during sampling.

- Fill the bottle 1 or 2 inches below the top (i.e. to the neck of the bottle). Place the cap on the bottle and tighten. Gently tip the bottle to mix the preservative.

Take note of any color or odor associated with the sample and document. Complete the Chains of Custody (COC). Recode the date as Day/Month/Year (e.g. 15/02/2022) and time universal (military) time (e.g. 24:00). Affix the sample label to the bottles/vials, place the bottles/vial in bubble wrap or equivalent and then place in a zip lock bag. Transfer samples to a cooler containing ice.

SOP 2: Scheduling and Sample Site Selection

1. Purpose

This standard operating procedure establishes standard guidelines for the scheduling of the long-term monitoring (LTM) program for the Red Hill Drinking Water Sampling.

2. Scope

This procedure applies to the Red Hill Drinking Water Sampling performed in the NAVFAC Pacific Area of Responsibility.

This procedure shall serve as the reference for procedures on how to schedule the sampling events under the program.

3. Definitions

3.1 DRINKING WATER

Drinking water consists of Navy-supplied water within the Navy's potable water system.

3.2 GEOGRAPHICAL INFORMATION SYSTEM (GIS)

GIS provides a database of coordinates and data associated with those coordinates. The data can be viewed in different formats and manipulated on maps and figures.

3.3 ENVIRONMENTAL DATABASE MANAGEMENT SYSTEM (EDMS)

EDMS provides an interface to track samples from the sampling through laboratory analysis and validation. EDMS allows for laboratories to upload the electronic data deliverable directly to the system.

4. Responsibilities

The Project Manager is responsible for ensuring that this SOP is distributed to and understood by all sampling team members. The Project Manager is responsible for ensuring that all personnel involved in scheduling shall have the appropriate education, experience, and training to perform their assigned tasks, and be familiar with the requirements of the organizations requiring coordination.

The prime contractor QA Manager or Technical Director is responsible for ensuring overall compliance with this procedure.

5. Determination of Sampling Schedule, Quantity of Locations, and Event Generation

This section provides guidance on how the quantity and locations of samples will be determined.

5.1 PROCEDURE

1. Determine if event is 0-3 month (5%) or 6-month (10%)
2. Determine number of hydrant, housing, buildings, CDCs, and schools to sample per zone.
 - All schools in each zone shall be sampled
 - All CDCs in each zone shall be sample

- For 0-3-month samples, 5% of the selected 5% of locations shall be non-residential
 - For 6-month samples, 10% of the selected 10% of locations shall be non-residential
 - In the event the zone is primarily non-residential, the overall percentage requirement shall be met using non-residential facilities.
3. Request most current list of vacant homes from the Navy. Avoid selecting vacant homes for sampling.
 4. Request GIS figure for each zone showing which houses were sampled previously.
 5. Following the same general spatial distribution of previous samples, pick new locations to add up to the required quantity. Try to sample previously unsampled homes that have filed a complaint.
 6. Submit locations to GIS to generate a list of addresses.
 7. Turn list of addresses over to EDMS contact who will:
 8. QC the addresses and ensure addresses are standardized (e.g., Street vs. St.)
 9. Match the addresses to the LOCID
 10. Match the LOCID to the Sample ID for the Event
 11. Generate Sampling Tracking Sheet for the zone
 12. Generate Event in EDMS

6. Notification and Field Sampling Locations

This section provides guidance on how to notify the locations to be sampled and choosing a sampling point at the location. The Field Sampling SOP provides guidance on the field sampling procedures.

6.1 PROCEDURE

6.1.1 General Guidance

13. Sampling notification will involve coordination with primary, secondary, and individual levels of contact. The primary level of contact is the DoD branch (i.e., Navy, Air Force, Army, Marines). The secondary level is the housing management and Department of Education, and the individual level are school principals and facility managers.
14. Contact lists are included at the end of this SOP. Due to a high turnover rate of facility managers, this list shall be updated every time an entry is found to be out of date.
15. Sampling notification procedures within the Controlled Industrial Area (CIA) is covered in the Sample Site Notification SOP.

6.1.2 Notification Procedures

16. Primary Notification – notify the DoD branch POC that their residential and non-residential properties are scheduled to be sampled. Coordinate any necessary access and notifications through the Primary.
17. Secondary Notification – notify the housing management company for the area(s) that sampling is scheduled, and work with the management company to determine availability. Provide a list of houses to be sampled so that the company can prepare to assist. For schools

under Hawaii DOE jurisdiction, notify the DOE that sampling will be taking place prior to contacting the individual schools.

18. Individual notification – individual residents are not to be notified that their residence has been identified for sampling. Principals and heads of schools shall be contacted to coordinate a site walk to determine sampling locations and to agree on a time for sampling. Facility managers shall also be contacted to coordinate a site walk to determine sampling locations and to agree on a time for sampling.

6.1.3 Alternate Locations

Alternate locations may be required for instances such as, but not limited to:

- Elevated ambient PID reading
- No water
- Loose pets
- No key available
- Unaccompanied minor in residence
- Other unsafe conditions

To select an alternate location:

1. From initial sample location, pick a nearby home (to the immediate left or right is preferred).
2. Based on the new address, look up associated Location ID on the Coordinates and Elevation table for the zone in EDMS.
3. Using the Location ID, match to the new Sample ID located on the Event Status Report table in EDMS.
4. Use the new Sample ID on labels and COCs.
5. Send e-mail notification of all changed sample IDs to EDMS, GIS, laboratory tracking personnel, and any additional appropriate parties.
6. EDMS and GIS shall confirm sample IDs have been changed within their respective system within 48 hours.

**Appendix B:
Example COC Relinquishing/Receiving**

