

# Navy Water System Incident: Red Hill Mitigation and Remediation Efforts

Agenda Item D.2.

Hawai'i Department of Health  
for  
Department of Land and Natural Resources  
Commission on Water Resource Management  
April 19, 2022



# Agenda

1. Status of the Navy Drinking Water System
2. Status of the Red Hill Shaft Aquifer Mitigation and Remediation Efforts

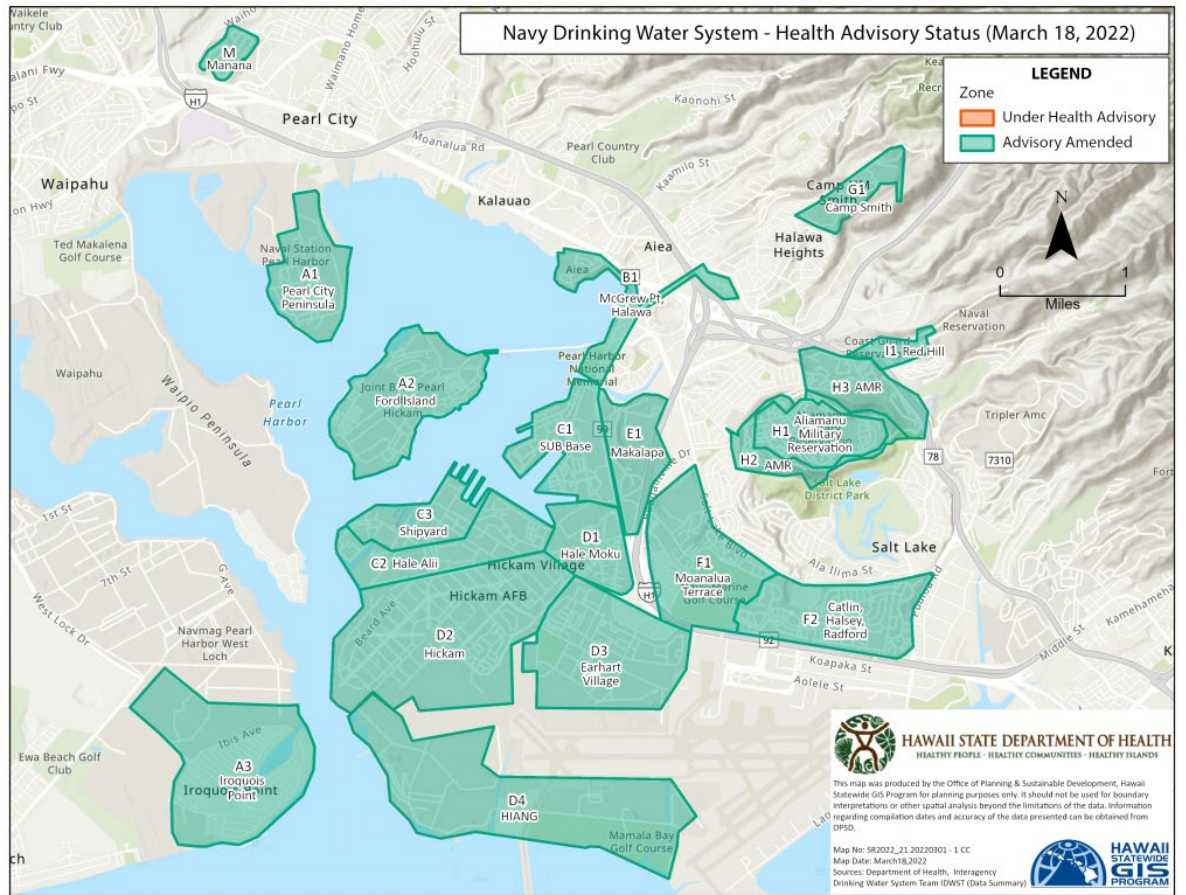




# Status of the Navy Drinking Water System



# Navy Drinking Water System - Health Advisory Status (as of 3/18/2022)



# Current Advisory

All Navy water system users in Zones A1, A2, A3, B1, C1, C2, C3, D1, D2, D3, D4, E1, F1, F2, G1, H1, H2, H3, and Manana Housing may now use water for all purposes, including drinking, cooking, and oral hygiene. This includes consumption by pets.

**The health advisory for all 19 zones and Manana Housing has been amended and water in these zones is safe to drink.**

DOH is waiting for an additional line of evidence from the Navy regarding non-residential areas of the distribution system and expects to lift the health advisory for the Joint Base Pearl Harbor-Hickam Public Water System No. HI0000360 and consecutive Aliamanu Military Reservation Public Water System No. HI0000337 when the Navy verifies this information and the final Drinking Water Long-Term Monitoring Plan is approved by DOH.

<https://health.hawaii.gov/news/newsroom/doh-declares-four-navy-drinking-water-distribution-system-zones-safe/>

<https://health.hawaii.gov/news/newsroom/hawaii-department-of-health-advises-navy-water-system-consumers-not-to-drink-consume-tap-water/>



# Navy Water System Long-Term Monitoring Results (as of 04/14/2022)

## Three of 219 Samples Detect Lead in Pearl Harbor Faucets, Indicate No System-wide Impacts – 14 April 2022

<https://www.cpf.navy.mil/News/Article/3000498/three-of-219-samples-detect-lead-in-pearl-harbor-faucets-indicate-no-system-wid/>

## Two of 122 Samples Detect Lead Exceedances in Pearl Harbor Buildings – 06 April 2022

<https://www.cpf.navy.mil/News/Article/2992081/two-of-122-samples-detect-lead-exceedances-in-pearl-harbor-buildings/>

## Mercury Detected From Indoor Sink at School Admin Building – 01 April 2022

<https://www.cpf.navy.mil/News/Article/2987103/mercury-detected-from-indoor-sink-at-school-admin-building/>

Navy has conducted their Course of Action after notifying DOH:

1. Notified and advised users not to consume the water from the affected fixture. In some cases, provided bottled water for consumption.
2. Fixture secured and not in use during additional sampling and testing. In some cases, the faucet was replaced before additional sampling was conducted.
3. Upon receipt of validated confirmation sample → develop and post Stage 5 Sampling Results Report



<https://www.cpf.navy.mil/JPBPHH-Water-Updates/> - See "The Latest"



# Contact the following with Drinking Water concerns

Department of Health Safe Drinking Water Branch  
808-586-4258 / [sdwb@doh.hawaii.gov](mailto:sdwb@doh.hawaii.gov)

## US Navy:

808-449-1979  
808-448-3262  
808-448-2557  
808-448-2570  
808-448-2583

## US Army:

808-620-7938  
808-620-7951





# Status of the Red Hill Shaft Aquifer Mitigation and Remediation Efforts



<https://health.hawaii.gov/ust/ust-home-test/ust-red-hill-project-main/>



# Red Hill Shaft Aquifer Mitigation

## DOH Issued Various Directives, Orders & Plans \*

Title	Dated	Link
Emergency Order to suspend operations and defuel (issued 12/06/2021)	01/03/2022 (finalized)	<a href="https://health.hawaii.gov/about/files/2022/01/Final-Decision-Docket-No.-21-UST-EA-02.pdf">https://health.hawaii.gov/about/files/2022/01/Final-Decision-Docket-No.-21-UST-EA-02.pdf</a>
Directive One for Flushing Requirements of the drinking water distribution system	12/8/2021	<a href="https://health.hawaii.gov/about/files/2021/12/DOH-Directive-Flushing.pdf">https://health.hawaii.gov/about/files/2021/12/DOH-Directive-Flushing.pdf</a>
Notice of Violation and Order for violations related to operation and maintenance	10/26/2021	<a href="https://health.hawaii.gov/shwb/files/2021/10/SHWB-NOVO.21-UST-EA-01-signed.pdf">https://health.hawaii.gov/shwb/files/2021/10/SHWB-NOVO.21-UST-EA-01-signed.pdf</a>
Administrative Order on Consent with Statement of Work to ... remediate existing contamination... prevent future releases	September 2015	<a href="https://health.hawaii.gov/ust/files/2015/09/Red-Hill-AOC_Final_29SEP151.pdf">https://health.hawaii.gov/ust/files/2015/09/Red-Hill-AOC_Final_29SEP151.pdf</a> & <a href="https://health.hawaii.gov/ust/files/2015/09/Red-Hill-SOW_11SEP15.pdf">https://health.hawaii.gov/ust/files/2015/09/Red-Hill-SOW_11SEP15.pdf</a>

<https://health.hawaii.gov/about/navy-water-system-quality-updates/>

\* Others are not listed.



# Red Hill Shaft Aquifer Mitigation

## Implementation of the Red Hill Shaft Recovery and Monitoring Plan, dated 1/26/2022, includes:

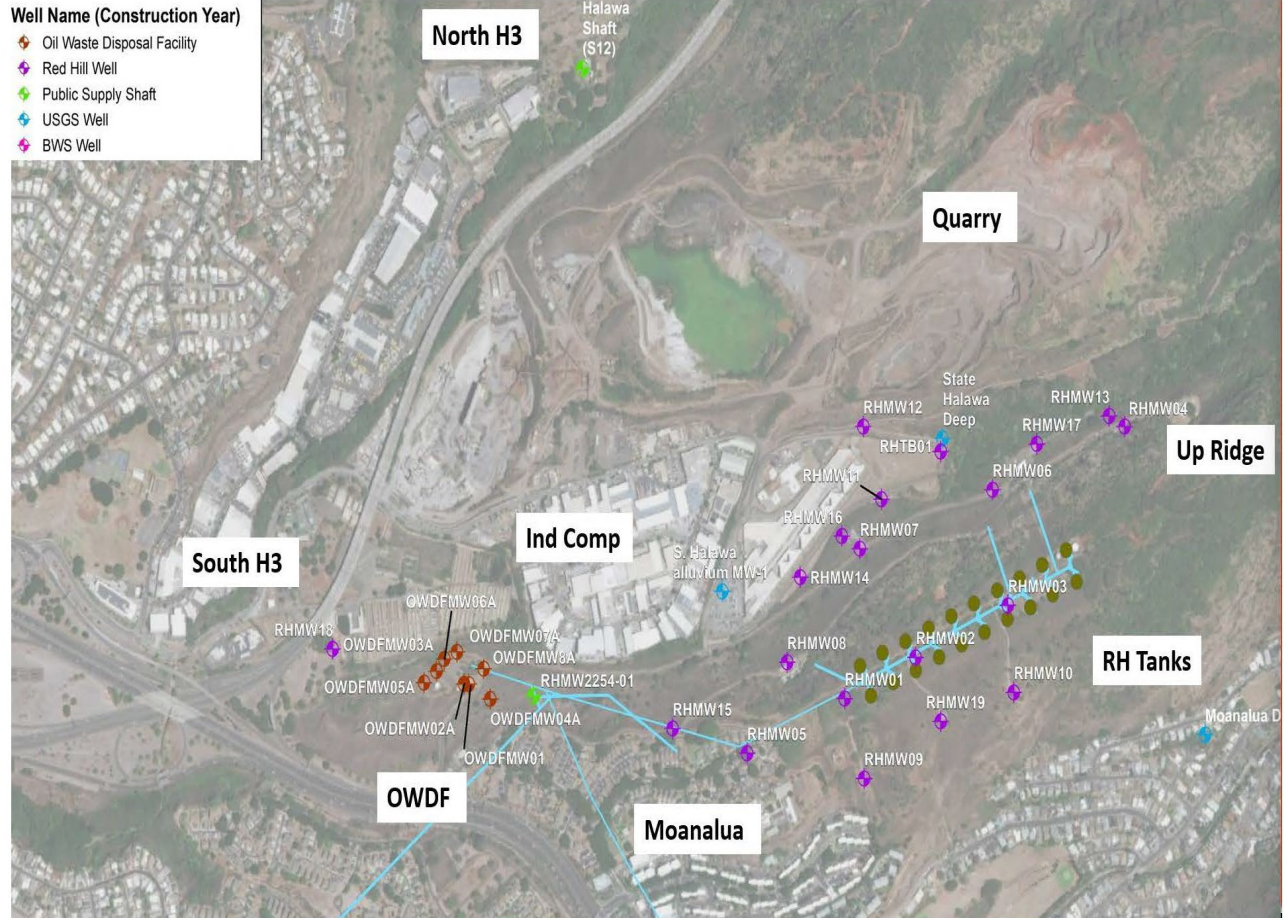
- Section 1.5 - Creation of the Capture Zone (to limit migration)
- Section 3.2 – Fuel Product Removal (from the shaft)
- Section 3.6 – Treatment System Installation (to treat and release)
- Section 5.1 – NPDES Compliance Monitoring Scheme and Sampling Plan
- Section 5.2 – Treatment System Performance Monitoring Scheme and Sampling Plan (for Halawa Stream Discharge)
- Section 5.3 – Groundwater Monitoring and Sampling Plan
- Section 5.4 – Halawa Stream Ecosystem Monitoring

<https://www.cpf.navy.mil/JBPHH-Water-Updates/Red-Hill-Shaft-and-Recovery-Plan/>



# Navy Monitoring Well Map (as of 02/24/2022)

Reference – *Existing and Recent Wells shown in Proposed Well Locations & Selection LOO 4.2 SME Small Group Meeting, Red Hill Emergency Response dated 02-24-2022*



<https://health.hawaii.gov/ust/files/2021/09/sample-locaton-map.pdf>



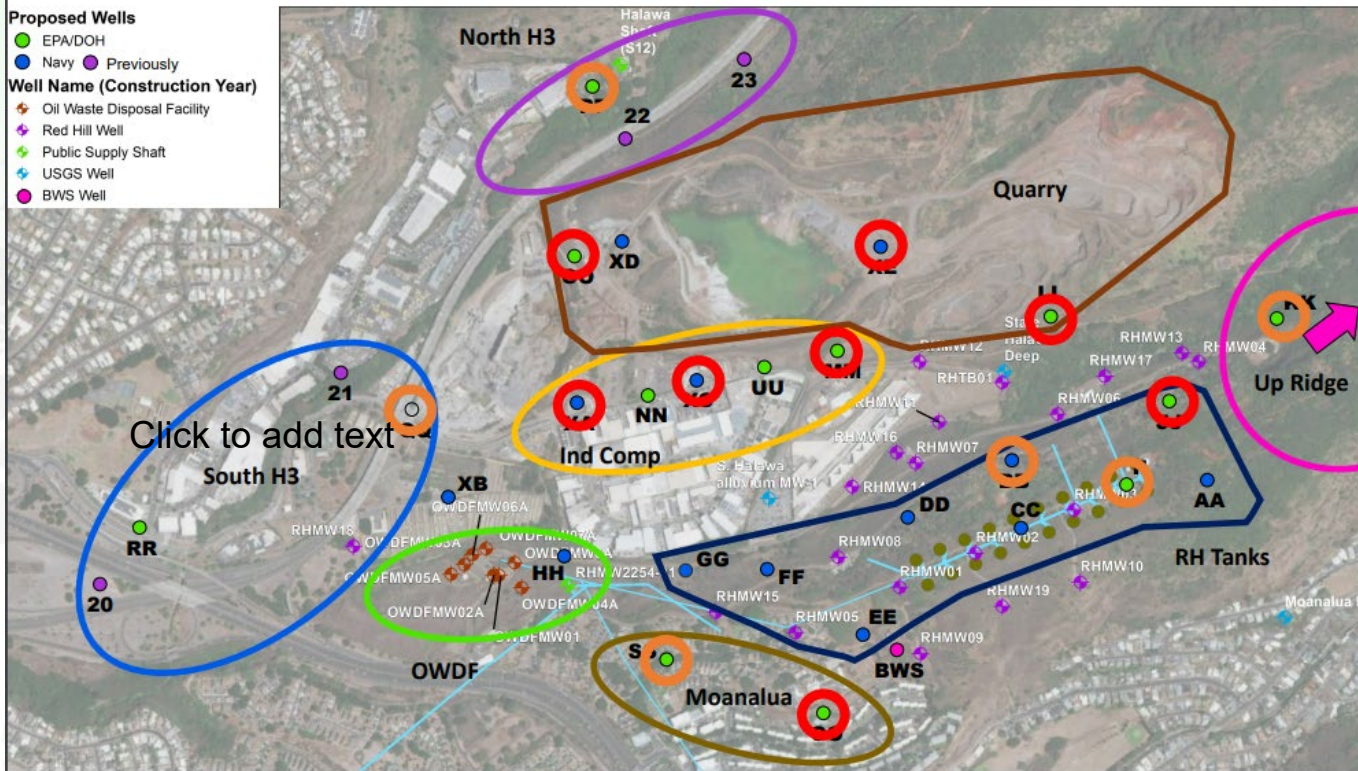


# Proposed Additional GW Monitoring Wells

(as of 02/22/2022)

Reference – EPA/DOH Letter, *Groundwater Monitoring Well Network - Installation of Additional Wells*, dated 02-22-2022

- Proposed Wells**
- EPA/DOH
  - Navy
  - Previously
- Well Name (Construction Year)**
- ◆ Oil Waste Disposal Facility
  - ◆ Red Hill Well
  - ◆ Public Supply Shaft
  - ◆ USGS Well
  - ◆ BWS Well



**Priority 1 wells**

**Priority 2 wells**

Final well locations off Navy property require access agreements from land/lease owners and must meet well siting requirements

<https://www.epa.gov/system/files/documents/2022-03/epa-hdoh-groundwater-monitoring-well-network-letter-2022-02-22-final.pdf>



# Navy Groundwater Monitoring Results

(as of 04/10/2022)

579 pages

Red Hill Bulk Fuel Storage Facility

Notice of Interest 20210507-0852 (6 May 2021 Event)

Notice of Interest 20211120-2330 (20 Nov 2021 Event)

**DISCLAIMER: Preliminary Data: Undergoing Validation - Subject to Change.**

Data includes:

- Groundwater Sampling: All Wells (PDF pages 2-155)
- Groundwater Sampling: RHMW01R (PDF pages 156-181)
- Groundwater Sampling: RHMW02 (PDF pages 182-209)
- Groundwater Sampling: RHMW03 (PDF pages 210-237)
- Groundwater Sampling: RHMW04 (PDF pages 238-251)
- Groundwater Sampling: RHMW05 (PDF pages 252-265)
- Groundwater Sampling: RHMW06 (PDF pages 266-279)
- Groundwater Sampling: RHMW08 (PDF pages 280-293)
- Groundwater Sampling: RHMW09 (PDF pages 294-307)
- ...
- 2.c. Monitoring Wells: RHMW01R, RHMW02, RHMW03 - Groundwater Sampling (PDF pages 560-562)



# Red Hill Shaft Remediation Efforts

## Section 6 – Water Resources Impact Offsets

“. . . the Navy shall take the following actions and implement the following project as immediate mitigation associated with the RHSRMP.

**Within 30 days of the approval of the RHSRMP**, the Navy shall commission a study for the beneficial use of water that is extracted and treated at the Red Hill Shaft.

**Within 60 days of the approval of the RHSRMP**, the Navy shall commission a “Pearl Harbor Water Resources Management Plan (PHWRMP).” The objective of the PHWRMP will be to rapidly identify policies and projects to decrease the Navy’s net potable water footprint across JBPHH, the communities served by Navy drinking water systems, and the broader communities of southern Oahu where Navy water resource management decisions have impacts to water security. . . .”

[page 50]



# Red Hill Shaft Remediation Efforts

## Section 6 – Water Resources Impact Offsets

“The PHWRMP will be developed respecting the intent of the Hawaii Water Plan and the State Water Code, Chapter 174C, Hawaii Revised Statutes, which recognizes the need for a program of comprehensive water resources planning to address the problems of supply and conservation of water. Hawaii’s water protection policies, which are reflected in the State’s Water Resource Protection Plan and Water Quality Plan, will be taken into account as the PHWRMP is developed.

**The overall goal of the PHWRMP will be to find at least 20 MGD in implementable water balance solutions in the areas of conservation, water reuse, enhanced recharge, source protection, and production capacity expansion.** The output of the stakeholder-inclusive process will be an integrated priority list of projects in each area, ranked by factors such as beneficial volumetric, environmental, and community impacts; feasibility; implementation timeline; and cost.”





# Red Hill Shaft Remediation Efforts

## Section 6 – Water Resources Impact Offsets

“Potential projects and policies to be considered as part of the PHWRMP may include [page 50]:

- **Conservation:** Distribution System Leak Detection Programs, Water Conservation/Shortage/Drought Plans, Artificial Turf, Low-flow Fixtures and Appliances, LEED Green-Building Initiatives and other Design Standards
- **Water Reuse:** Connection to City and County of Honolulu Non-potable Reclamation “Purple Pipe” to Increase Demands, Implementing Wastewater Reclamation Projects at Navy Wastewater Treatment Facilities and/or Collection System Lift Stations (see project #2 below), Facility Graywater Systems
- **Enhanced Recharge:** Low-Impact-Development (LID) Stormwater Management Initiatives, Watershed Protection Initiatives, Ecohydrology Initiatives (replacing “thirsty” invasive species with native species, hydrologic monitoring), Off-stream Recharge Basins in Upper Watersheds (Mauka recharge)”



# Red Hill Shaft Remediation Efforts

## Section 6 – Water Resources Impact Offsets (continued)

[Potential projects and policies to be considered as part of the PHWRMP may include continued – page 50]:

- **“Source Protection:** Wellhead Protection Programs, Deep Well Salinity Monitoring, Freshwater Lens Seawater Intrusion Modeling, Groundwater Remediation to Protect Potable Sources
- **Production Capacity Expansion:** Drinking Water Treatment Plants for Potentially Impacted Groundwater Sources, Seawater and/or Brackish Water Desalination for Potable or Non-potable Uses, Development of Additional/Alternate Potable and Non-potable Sources to Increase Water Security and Distribute Pumping Stress across the Aquifer System”



# Red Hill Shaft Remediation Efforts

## Section 6 – Water Resources Impact Offsets (continued)

“In addition to conducting the study above, the Navy or other Department of Defense entity shall support and complete the following efforts to begin meeting the **study goal of producing 20 MGD** in implementable water balance solutions.

[emphasis added]

1. Restoration and increase of future drinking water from the Red Hill Shaft through funding and implementation of “Drinking Water Creation” projects. The Navy agrees to submit [Readiness and Environmental Protection Integration] REPI program projects specific to addressing water security for the aquifers used to provide water to JBPHH and other installations as deemed appropriate. REPI program project submissions will be on annual basis and documentation of submissions will be provided as described in the last paragraph of this section. . . .” [page 51]



# Red Hill Shaft Remediation Efforts

## Section 6 – Water Resources Impact Offsets (continued)

“ . . .

2. Drinking Water Conservation and Efficiency efforts to reduce the stress on the Waiawa drinking water source and improve drinking water sustainability for JBPHH.
  - a. . . . upgrade of the NAVFAC Wastewater Treatment Plant and distribution system to produce R-1 water and replace all irrigation and non-potable water uses with treated wastewater...
  - b. . . . expand its water meter program to ensure conservation methods are effective. . . .
  - c. Conduct . . . annual water audit . . . no later than March 31<sup>st</sup> of the following year. . . . [s]ubmit all delinquent water audit reports for previous years since 2016. . . .” [page 51-52]



# Contact the following with Groundwater Quality concerns

## Gabriela Carvalho

Red Hill Coordinator

EPA Region 9

(808) 541-2723

[Carvalho.Gabriela@epa.gov](mailto:Carvalho.Gabriela@epa.gov)

[www.epa.gov/red-hill](http://www.epa.gov/red-hill)

## Fenix Grange

Groundwater Technical Lead

Hawai`i Department of Health

(808) 586-4226

[gabrielle.grange@doh.hawaii.gov](mailto:gabrielle.grange@doh.hawaii.gov)

<https://health.hawaii.gov/ust/ust-home-test/ust-red-hill-project-main/>





**DOH's mission is to protect public health  
and the environment.**

