



OFFICE OF INSPECTOR GENERAL U.S. ENVIRONMENTAL PROTECTION AGENCY

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Ensuring clean and safe water

EPA Region 9 Must Continue Oversight Throughout the Decontamination and Closure of the Red Hill Facility

Report No. 23-E-0015

April 25, 2023



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Abbreviations:

AOC	Administrative Order on Consent
DLA	Defense Logistics Agency
EPA	U.S. Environmental Protection Agency
Hawaii DOH	Hawaii Department of Health
Honolulu BWS	Honolulu Board of Water Supply
JBPHH	Joint Base Pearl Harbor-Hickam
OIG	Office of Inspector General
TPH	Total Petroleum Hydrocarbons

Cover Image: Red Hill lower access tunnel where the incident occurred. (U.S. Navy photo)

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Office of Inspector General U.S. Environmental Protection Agency **At a Glance**

23-E-0015
April 25, 2023

EPA Region 9 Must Continue Oversight Throughout the Decontamination and Closure of the Red Hill Facility

Why We Did This Evaluation

The U.S. Environmental Protection Agency Office of Inspector General conducted this evaluation to determine, by analyzing the sequence of events that led to drinking water contamination at the Red Hill site on Joint Base Pearl Harbor-Hickam, whether the EPA's oversight of relevant authorized state programs has effectively addressed the potential for contamination at the site. The facility, which the U.S. military uses, contains 20 underground tanks that can store up to 250 million gallons of fuel.

In November 2021, a petroleum release at the facility contaminated drinking water and sickened people. EPA Region 9 authorized the Hawaii Department of Health to implement various environmental programs, and the Department of Health used its authorities under those programs to respond to the incident. The EPA works with the Department of Health to ensure the programs perform consistent with federal laws and regulations.

This evaluation supports EPA mission-related efforts:

- *Ensuring clean and safe water.*
- *Cleaning up and revitalizing land.*

This evaluation addresses a top EPA [management challenge](#):

- *Enforcing environmental laws and regulations.*

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[List of OIG reports.](#)

What We Found

The EPA's regulatory oversight of authorized state programs for underground tanks or drinking water quality would not reasonably have identified the sequence of events that led to the drinking water contamination incident. According to the Navy, an improperly executed fuel transfer resulted in pipe joint ruptures and a subsequent fuel spill. Since the EPA does not regulate operations like this, its oversight of the underground tanks or drinking water quality would not reasonably have identified the events that led to the drinking water contamination. EPA Region 9 provided oversight of authorized Hawaii state programs prior to the incident. Additionally, Region 9 has worked with the Hawaii Department of Health, known as the Hawaii DOH, and the Navy to respond to the incident. However, the planned defueling—or fuel removal—process and decontamination efforts will require significant coordination between Region 9, the Hawaii DOH, and the Navy to minimize potential contamination and clearly communicate health and environmental risks to the public.

As part of Region 9's continued oversight, the region will need to address staffing, clearly communicate data, and maximize stakeholder involvement. First, Region 9 will need a sufficient number of staff to oversee the defueling process and address long-term remediation efforts. Second, Region 9 will need to collaborate with the Hawaii DOH and the Navy to clearly communicate risk and remediation information. Third, Region 9 will need to work with the Hawaii DOH and the Navy to maximize stakeholder involvement in Red Hill working groups to ensure that it hears all perspectives and instills public confidence in the defueling process, remediation efforts, and related outcomes.

After the defueling and closure processes are complete, consistent oversight of the remediation efforts will be necessary. Specifically, Region 9 will need to oversee the groundwater monitoring and contaminant migration information, as well as the communication of related information to the public.

Decontamination and closure of the Red Hill facility requires transparency and accountability to protect the Oahu aquifer—the primary drinking water source on the island.

Recommendations and Planned Agency Corrective Actions

We recommend that the regional administrator for Region 9 develop a plan to define and provide appropriate levels of resources and oversight during defueling and closure, collaborate with the Hawaii DOH and the Navy to clearly communicate information to the public, and work with the Hawaii DOH and the Navy to develop a plan to increase stakeholder participation. Region 9 agreed with all three recommendations and provided ten corrective actions with completion dates. The region completed two of the actions. We consider all of the recommendations resolved with corrective actions pending.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

THE INSPECTOR GENERAL

April 25, 2023

MEMORANDUM

SUBJECT: EPA Region 9 Must Continue Oversight Throughout the Decontamination and Closure of the Red Hill Facility
Report No. 23-E-0015

FROM: Sean W. O'Donnell

A handwritten signature in blue ink that reads "Sean W O'Donnell".

TO: Martha Guzman, Regional Administrator
Region 9

This is our report on the subject evaluation conducted by the U.S. Environmental Protection Agency Office of Inspector General. The project number for this evaluation was [OSRE-FY22-0075](#). This report contains findings that describe the problems the OIG has identified and corrective actions the OIG recommends. Final determinations on matters in this report will be made by EPA managers in accordance with established audit resolution procedures.

Region 9 is primarily responsible for the issues discussed in this report.

In accordance with EPA Manual 2750, your office completed two of four corrective actions for Recommendation 1. Your office also provided acceptable planned corrective actions and estimated milestone dates for the remaining two corrective actions for Recommendation 1, the four corrective actions for Recommendation 2, and the two corrective actions for Recommendation 3. All recommendations are resolved with corrective actions pending, and no final response to this report is required. If you submit a response, however, it will be posted on the OIG's website, along with our memorandum commenting on your response. Your response should be provided as an Adobe PDF file that complies with the accessibility requirements of section 508 of the Rehabilitation Act of 1973, as amended. The final response should not contain data that you do not want to be released to the public; if your response contains such data, you should identify the data for redaction or removal along with corresponding justification.

We will post this report to our website at www.epa.gov/oig.

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Purpose

The U.S. Environmental Protection Agency Office of Inspector General [initiated](#) this evaluation to determine, by analyzing the sequence of events that led to drinking water contamination at the Red Hill site on Joint Base Pearl Harbor-Hickam, whether the EPA’s oversight of relevant authorized state programs has effectively addressed the potential for contamination at the site.

Top Management Challenge Addressed

This evaluation addresses the following top management challenge for the Agency, as identified in the OIG’s *U.S. Environmental Protection Agency Fiscal Year 2023 Top Management Challenges [report](#)*, issued October 28, 2022:

- Enforcing environmental laws and regulations.

Background

The Red Hill Drinking Water Contamination Incident

The Red Hill Bulk Fuel Storage Facility is a fuel repository that the U.S. military uses at Joint Base Pearl Harbor-Hickam, or JBPHH, in Oahu, Hawaii. According to the EPA *About Red Hill Fuel Releases [webpage](#)*:

On May 6, 2021, a pressure surge event occurred during routine fuel movement operations at the Red Hill Bulk Fuel Storage Facility. The pressure surge event caused a pipeline joint failure that released over 19,000 gallons of JP-5 jet fuel onto the tunnel floor located between the underground storage tanks. The fuel ran down the tunnel floor into containment trenches and into a fire suppression system fluid sump. The sump pushed fuel down the tunnel in a fire suppression system fluid drain pipeline, where the fuel remained until the drain pipeline ruptured on November 20, 2021. This ruptured pipeline resulted in fuel spilling into the tunnel system near the Red Hill drinking water system shaft.

According to the Navy, the November spill occurred when “a watch stander inadvertently struck a low point drain with the passenger cart of a train, cracking the pipe and spilling the fuel.” This [video](#), obtained by a Hawaii news outlet purportedly from a military source, illustrates the event. Figure 1 shows the timeline of events as reported by the Hawaii Department of Health, or Hawaii DOH. In late November 2021, residents of JBPHH reported petroleum odors from their tap water, then reported health symptoms from drinking the contaminated drinking water. On November 29, the Hawaii DOH issued a drinking water advisory, and on December 2, the Navy identified petroleum in the Red Hill well. The Navy determined the fuel leak to be the result of the May 6, 2021 event.

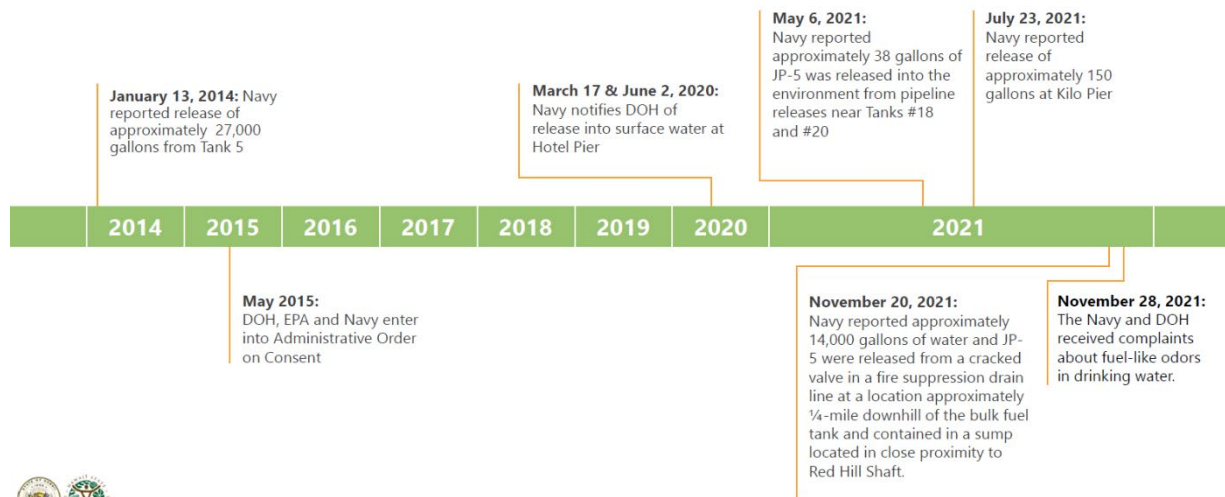


Cracked Low Point Drain

Train Passenger Cart

(U.S. Navy photos)

Figure 1: Red Hill events from the 2014 release to the 2021 drinking water contamination incident¹



Source: Hawaii DOH. (Hawaii DOH image)

The Red Hill Bulk Fuel Storage Facility

The Red Hill Bulk Fuel Storage Facility was constructed during World War II and is located under a volcanic mountain ridge known as Red Hill, or *Kapūkakā* in Hawaiian. It contains 20 underground storage tanks that hold up to 250 million gallons of fuel and connect to three pipelines that run 2.5 miles through a tunnel to Pearl Harbor fueling facilities. These tanks are located above Oahu’s sole-source aquifer, a “lens-shaped body of fresh water that exists within Oahu’s porous volcanic rock.”² The aquifer helps provide water to almost 25 percent of Oahu residents.

The U.S. Department of the Navy manages the Red Hill facility. The Hawaii DOH is responsible for managing EPA-authorized environmental programs, such as the underground storage tank and drinking water programs. EPA Region 9 oversees programs in the Pacific Southwest, including Hawaii, and is responsible for oversight of the authorized state programs that pertain to the Red Hill facility and the JBPHH drinking water system. Region 9 provides funding to the Hawaii DOH for the underground storage tank and drinking water programs and meets annually with the program staff to determine program commitments for the upcoming year.

The Navy developed a groundwater protection plan in 2008, at the request of the Hawaii DOH, to address risks associated with inadvertent releases of fuel from the Red Hill facility. No releases were reported until 2014, when approximately 27,000 gallons of jet fuel were released from one of the tanks. The Navy subsequently drained the tank and collected samples from existing monitoring wells that it installed as specified in the 2008 groundwater protection plan. Results from samples taken in and around the tank indicated increased hydrocarbons in soil vapor and groundwater. After this release, Region 9, the Hawaii DOH, the Navy, and the Defense Logistics Agency or DLA, developed an enforceable agreement, known as an administrative order on consent or AOC, that was issued in 2015.

¹ The Hawaii DOH estimate in Figure 1 references 14,000 gallons. According to the Navy, about 19,000 gallons were released on May 6, 2021, and about 14,000 gallons were recovered on November 20, 2021.

² Board of Water Supply, [Hawaii’s Water Cycle](#) (last visited Oct. 31, 2022).

The Administrative Order on Consent

According to Region 9, the AOC required the Navy and the DLA to take actions, which would be subject to EPA and Hawaii DOH approval, to address fuel releases and implement infrastructure improvements to protect human health and the environment. The AOC also required the Navy and the DLA to evaluate and improve procedures and practices to maintain the integrity of the tanks, evaluate structural upgrades, and use the best technology to detect leaks. In addition, the AOC required the Navy and the DLA to further develop models to better understand groundwater flow in the area around the facility, to evaluate the fate and transport of contaminants in the subsurface around the facility, and to address the investigation and remediation of the January 2014 release and any future releases at the Red Hill Bulk Fuel Storage Facility. Region 9 and the Hawaii DOH conducted oversight of deliverables specified under the AOC. For example, the Navy and the DLA:

- Implemented numerous infrastructure improvements, including more frequent leak detection testing, increased operator accountability, enhanced inspection and maintenance procedures, and additional quality assurance and control practices. Region 9 and the Hawaii DOH received and reviewed many infrastructure reports, which are available on the EPA [website](#).
- Prepared groundwater flow model reports in 2018 and 2020 for review by Region 9 and the Hawaii DOH. The regulatory agencies disapproved the 2020 groundwater flow model report in March 2022 and provided the Navy and the DLA the opportunity to respond to their concerns. As of July 1, 2022, the Navy and the DLA were working on a new groundwater flow model to address Region 9 and Hawaii DOH comments.
- Installed 12 groundwater monitoring wells, three directly under the tanks and nine in areas around the facility. The purpose of the wells is to provide regular data on contaminant concentrations in the groundwater under and around the facility.
- Prepared a decision document in September 2019 on tank upgrade and release detection alternatives for review by Region 9 and the Hawaii DOH. The regulatory agencies disapproved the document and issued a notice of deficiency in October 2020 to provide the Navy and the DLA the opportunity to respond to their concerns. The Navy and the DLA tried to address the concerns in a supplemental decision document sent to the regulatory agencies in August 2021. Since the Navy decided to defuel the tanks, the actions described in the tank upgrade alternatives are no longer relevant.

The EPA's Role and Response to the 2021 Incident

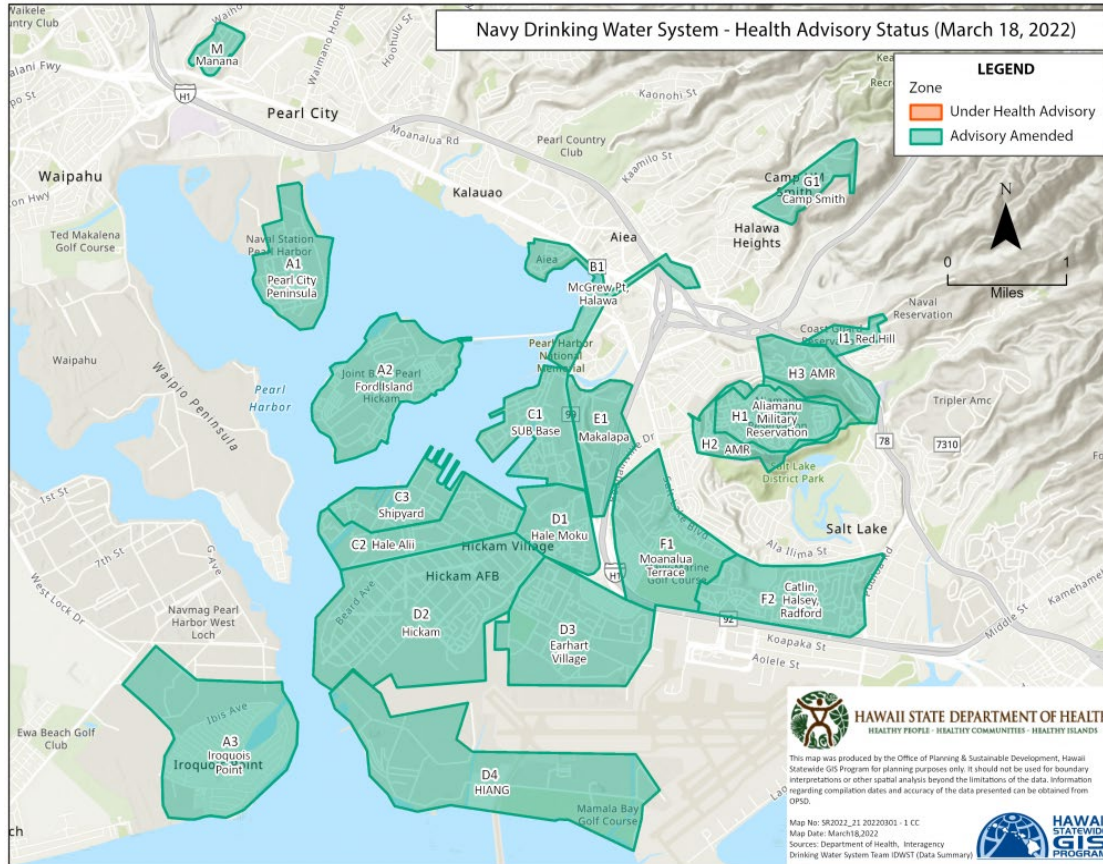
The underground storage tank and drinking water programs are the major environmental programs involved in the incident and incident response. The EPA authorized the State of Hawaii to implement these programs in lieu of the EPA. Region 9 works with the Hawaii DOH to ensure that the programs perform consistently with federal laws and regulations.

Given its oversight responsibility for the authorized Hawaii state drinking water program, Region 9 responded to the 2021 drinking water contamination incident. First, it mobilized on-scene coordinators, who arrived on December 5, 2022, to help coordinate efforts and provide technical support. Region 9 also temporarily assigned staff from its Superfund and Water Divisions to assist with the incident response. Additionally, Region 9 worked with the Hawaii DOH and Navy staff to establish the Interagency Drinking Water System Team to restore safe drinking water to the affected residents and

workers. The team began work in December 2021 and completed work to restore the drinking water system in March 2022.

Drinking water contamination was a major concern after the fuel release incident. The Navy provided drinking water health advisory statuses, like the one shown in Figure 2, to keep the public informed. To test drinking water, Region 9 mobilized a portable EPA laboratory to Seal Beach, California. The lab tested the water for total petroleum hydrocarbons, or TPH. This was necessary because no drinking water labs in Hawaii were certified for TPH analysis.

Figure 2: Example of a Navy drinking water system health advisory status



Source: Hawaii DOH. (Hawaii DOH image)

In April 2022, Region 9 performed a public water system inspection of the JBPHH water system to determine compliance with Safe Drinking Water Act requirements. The inspection report documented the Navy’s failure to adequately operate and maintain its system. According to Region 9, the Navy has submitted documentation for many of the corrective actions taken as a result of Region 9’s April 2022 public water system inspection. The proposed consent order discussed below will, if finalized, require the Navy to address additional items. According to Region 9, “Over the next two years, the Navy is required to

The Safe Drinking Water Act

According to the EPA, “Congress passed the Safe Drinking Water Act in 1974 to protect public health by regulating the nation’s public drinking water supply.” The law authorizes the EPA to set national health-based standards to protect against both naturally occurring and man-made contaminants that may be found in drinking water.

continue testing the affected drinking water area and continue work to clean up the Red Hill drinking water well and impacted soil and groundwater.”³

As of March 6, 2023, the EPA is not pursuing an enforcement action for failure to comply with past spill and drinking water contamination reporting requirements. However, the EPA entered into a proposed consent order that, if finalized, will require the Navy and DLA to take actions to safely defuel and close the Red Hill Bulk Storage Facility and will require the Navy to perform activities related to the delivery of a safe and resilient supply of drinking water to the JBPHH drinking water system. The EPA is evaluating the public comments on the proposed consent order. The EPA reports that it continues to work with the Hawaii DOH, the Navy, and the DLA to ensure the safe and timely defueling of the facility during the public comment process on the proposed consent order.

The Defueling and Closure of the Red Hill Facility

On December 6, 2021, the Hawaii DOH issued an emergency order directing the Red Hill facility to immediately suspend operations; install water treatment systems; and develop work plans to defuel, or remove fuel from, the facility and assess operations and system integrity. The Navy appealed the emergency order in federal and state courts in February 2022. On March 7, 2022, U.S. Secretary of Defense Lloyd Austin directed the Navy to defuel and permanently close the facility.

In April 2022, the Navy withdrew its appeal of the emergency order, and in May 2022, the Hawaii DOH issued a new emergency order that required continued suspension of operations, groundwater treatment system maintenance, and the submission of defueling and facility closure plans for Hawaii DOH review and approval. The Department of Defense published a defueling plan on June 30, 2022, but the Hawaii DOH rejected it on July 22, 2022. The Hawaii DOH stated that the plan “lacks the requisite details and specificity necessary for the [Hawaii] DOH to fully evaluate how the Navy will execute safe and expeditious defueling.”⁴ The Navy submitted responses to the Hawaii DOH in September 2022 to address EPA and Hawaii DOH comments and provide additional information. The Navy submitted a facility closure plan to the EPA and the Hawaii DOH on November 1, 2022.

“The contamination of drinking water from the Red Hill Shaft was the result of the Navy’s ineffective immediate responses to the 6 May and 20 November 2021 fuel releases at the Red Hill Bulk Fuel Storage Facility (Red Hill), and failure to resolve with urgency deficiencies in system design and construction, system knowledge, and incident response training.”

Rear Admiral Christopher J. Cavanaugh
June 13, 2022

Almost three miles of pipelines linking the facility to Pearl Harbor needed to be drained or unpacked before the Navy could implement repairs needed to safely defuel the tanks. The Navy began the unpacking process on October 25, 2022, and successfully removed more than one million gallons of fuel from the pipelines on November 3, 2022.

³ EPA, [Drinking Water Incident Response at Joint Base Pearl Harbor-Hickam, Honolulu, Hawai’i \(November 2021-March 2022\)](#) (last visited Oct. 31, 2022).

⁴ Press Release, Hawaii DOH, [DOH Disapproves DoD’s Red Hill Defueling Plan \(Jul. 26, 2022\)](#).

The Impact on the Community

On December 8, 2021, the Honolulu Board of Water Supply, or BWS, learned of the contamination and immediately shut down two nearby wells. Figure 3 shows the location of the Halawa shaft and the Red Hill facility.

About 93,000 Navy water system users were impacted by the contaminated drinking water and many were relocated to temporary housing during the crisis. Hundreds of families, according to the EPA, reported petroleum odors from their tap water, and residents also reported symptoms arising from the contaminated water. According to the Hawaii DOH, health effects of exposure to petroleum hydrocarbons in water include itching, rash, nausea, vomiting, diarrhea, headaches, and dizziness. The Hawaii DOH further stated that people exposed to contaminated water from the incident are not expected to experience long-term health effects.

On November 29, 2021, the Hawaii DOH advised all Navy water system users to avoid using the water for drinking, cooking, or oral hygiene. In addition, the Hawaii DOH advised that if residents detected a fuel odor, they should avoid using the water for bathing, dishwashing, and laundry. The incident subsequently resulted in public protests and demands to close the facility.

The Hawaiians say, “Water is life.” According to the State of Hawaii Division of Aquatic Resources [website](#), fresh water is so valuable and precious to them that they call it wai to indicate wealth. To signify abundance and prosperity, Hawaiians say waiwai.



Crisis at Kapūkakī, Ka Wai Ola, January 1, 2022. (Photograph credited to Jason Lees)

Figure 3: Location of the Honolulu BWS’s Halawa Shaft and the Navy’s Red Hill facility on Oahu



Source: Honolulu BWS. (Honolulu BWS image)

Responsible Offices

The Region 9 office implements and enforces federal environmental laws in Arizona, California, Hawaii, Nevada, the Pacific Islands, and 148 tribal nations. Within Region 9, multiple divisions are involved with the Red Hill facility:

- The Enforcement and Compliance Assurance Division administers compliance inspections, case development, state oversight, and compliance data management and analysis. The division also processes tips and complaints.
- The Land, Chemicals, and Redevelopment Division administers programs related to the Resource Conservation and Recovery Act and underground storage tanks.
- The Superfund and Emergency Management Division administers programs related to site cleanup, emergency response and planning, and oil pollution.
- The Water Division administers programs under the Clean Water Act and the Safe Drinking Water Act.

Scope and Methodology

We conducted this evaluation from March to November 2022 in accordance with the *Quality Standards for Inspection and Evaluation* published December 2020 by the Council of the Inspectors General on Integrity and Efficiency. Those standards require that we perform the evaluation to obtain sufficient and appropriate evidence to support our findings. We initiated this project following an [OIG inquiry](#) to review the drinking water contamination incident.

This evaluation focused on Region 9's oversight of authorized Hawaii state programs for underground storage tanks and drinking water quality and the response to the Red Hill incident. We coordinated our project efforts with the Department of Defense OIG. The Department of Defense OIG is focusing on the Navy's operation, maintenance, safety, and oversight of the facility. During the evaluation, we met with Department of Defense OIG staff every two months to discuss progress and avoid duplication of efforts.

We reviewed the sequence of events that led to the incident, as described by the Navy,⁵ to determine whether these should have been addressed through implementation of EPA-authorized Hawaii state programs. We also achieved this through document reviews, interviews with relevant stakeholders, and participation in public forums, as described below.

As part of the evaluation, we reviewed the 2021 *Consumer Confidence Report* for the JBPHH water system—which includes the Waiawa, Halawa, and Red Hill water sources—to determine the presence of contaminants such as TPH. *Consumer Confidence Reports* are required annually under the Safe Drinking Water Act.⁶ According to Region 9, the Act does not require water systems to include TPH test results in these reports, but since at least 2017, the Navy has included TPH test results from voluntary monitoring

⁵ [COMMAND INVESTIGATION INTO THE 6 MAY 2021 AND 20 NOVEMBER 2021 INCIDENTS AT RED HILL BULK FUEL STORAGE FACILITY](#), June 13, 2022.

⁶ Pursuant to section 1414(c)(4) of the Safe Drinking Water Act, 42 U.S.C. § 300g-3(c)(4), community water systems are required to deliver a *Consumer Confidence Report*, also known as an annual drinking water quality report, to their customers. These reports provide Americans information about their local drinking water quality.

of the Red Hill Shaft due to a January 2014 fuel release at the Red Hill Bulk Fuel Storage Facility. As the Navy water provider in the state, the Naval Facilities Engineering Command Hawaii primarily supplies water to military housing and installations. We also reviewed the mechanisms Region 9 has in place to oversee the integrity of Red Hill operations and underground storage tanks.

Additionally, we interviewed staff and managers from Region 9 and the EPA Office of Water; the EPA Office of Enforcement and Compliance Assurance, including its Federal Facilities Enforcement Office; the Hawaii DOH; the Honolulu BWS; and the Hawaii Commission on Water Resource Management. During our interviews with Region 9 and Hawaii DOH staff, we sought to determine compliance with drinking water monitoring and reporting regulations. We also met with selected stakeholders, including a nongovernmental organization, to learn about the native Hawaiian perspective on the Red Hill incident. Further, we visited Red Hill in April 2022 and attended the May 2022 virtual public forum on the Navy's defueling plan.

Results

Region 9 provided adequate oversight of authorized Hawaii state programs prior to the Red Hill drinking water contamination incident. The EPA's regulatory oversight of authorized state programs for underground tanks or drinking water quality would not reasonably have identified the sequence of events that led to the drinking water contamination incident. Additionally, Region 9 has continued to work with the Hawaii DOH and the Navy to respond to the November 2021 incident. However, the pending defueling and decontamination efforts at Red Hill will require continued significant coordination between Region 9, the Hawaii DOH, and the Navy to minimize potential contamination of the Oahu drinking water aquifer, ensure accountability, and provide clear and transparent communication to the public on health and environmental risks.

Region 9's Oversight of Authorized State Programs Related to Red Hill

According to the Navy, improper execution of a fuel transfer procedure caused the May 2021 pressure surge event, which resulted in two pipe joint ruptures and a subsequent fuel spill. Since the EPA does not oversee regular operations like this, its statutory and regulatory oversight of the underground tanks or drinking water quality would not reasonably have identified the events that led to the drinking water contamination incident. As detailed in the next section, EPA and Hawaii DOH oversight activities focus on tanks and potential tank leaks, not operations such as fuel transfers. Region 9 has provided oversight of authorized Hawaii state programs.

Underground Storage Tank Program

For the underground storage tank program, the EPA and Hawaii DOH meet throughout the year to plan the activities they will perform. Examples of the activities include:

- In May 2016, Region 9 requested that a team of subject matter experts conduct a baseline inspection of the underground storage tank systems and peripheral equipment at the Red Hill facility. According to the inspection report, published in June 2017, "The evaluation team

generally found that systems and management practices in place at the Red Hill Facility meet or exceed best practices for petroleum terminals and bulk fuel storage facilities.”⁷

- From September 28 to October 9, 2020, the Hawaii DOH performed an underground storage tank inspection. As a result of this inspection, the Hawaii DOH issued a Notice of Violation in October 2021. The notice detailed five violations and assessed an administrative penalty of about \$325,000. The violations were for failures to:
 - “[O]perate and maintain ongoing corrosion protection to metal components of the portion of the Navy’s tank and piping that contain regulated substances and are in contact with the ground.”⁸
 - “[P]erform line tightness testing of repaired piping before return to service.”⁹
 - “[P]erform an annual liquid tightness test on spill prevention equipment to prevent releases to the environment.”¹⁰
 - “[P]erform an adequate visual walkthrough inspection of hydrant pits.”¹¹
 - “[M]aintain adequate release detection for two double-walled underground product recovery storage tanks.”¹²
- According to Region 9, it has frequent calls with the Hawaii DOH and the DLA, including monthly principals calls to elevate AOC issues; weekly project coordination calls on AOC deliverables and regulatory review; and weekly environmental coordination calls on environmental investigation, remediation, monitoring, and modeling efforts.

Drinking Water Program

Similar to the underground storage tank program, the EPA and the Hawaii DOH jointly determine the drinking water program activities they will perform during the year. According to Region 9:

- Region 9 and Hawaii DOH program managers and assistant directors hold monthly calls.
- Region 9 and Hawaii DOH program staff and managers have quarterly calls.
- Region 9 and Hawaii DOH program staff, managers, and assistant directors hold midyear and end-of-year program performance reviews and issue an annual program evaluation report. The Region 9 Water division director attends the end-of-year performance review meeting.
- Since the Red Hill incident, calls between Region 9 and the Hawaii DOH have increased and are now held every week or two.
- The Hawaii DOH performs sanitary surveys every three years. A sanitary survey is a review of a public water system to assess its capability to supply safe drinking water. The Hawaii DOH

⁷ [Underground Storage Tank System Evaluation Final Report, Red Hill Bulk Fuel Storage Facility Joint Base Pearl Harbor-Hickam](#), June 13, 2017.

⁸ Press Release, Hawaii DOH, [Red Hill NOVO](#) [Notice of Violation and Order] (Oct. 27, 2021).

⁹ *Id.*

¹⁰ *Id.*

¹¹ *Id.*

¹² *Id.*

performed surveys of the JBPHH in 2014 and 2017. The 2020 survey was delayed due to the coronavirus pandemic. According to EPA, the Hawaii DOH completed its sanitary survey of the JBPHH water system November 14–15, 2022.

Inspections and Analyses

Since the November 2021 incident, the EPA and the Hawaii DOH have conducted additional inspections. Region 9 performed an underground tank inspection from February 28 through March 4, 2022. The inspection team included Region 9 inspectors, a subject matter expert from the EPA Office of Underground Storage Tanks, the EPA Red Hill project coordinator, and Hawaii DOH inspectors. The purpose of the inspection was to determine the JBPHH operational compliance with the Hawaii DOH's underground storage tank regulations. The inspection identified six areas of noncompliance.

Additionally, in April 2022, the EPA National Environment Investigations Center performed a Safe Drinking Water Act inspection of the JBPHH Public Water System. According to Region 9, National Environment Investigations Center staff performed the inspection because they are technical experts with experience inspecting complex public water systems. The inspection found that the Navy failed to adequately operate and maintain its water system. In response, the Navy has taken steps to address the concerns identified in the report and has submitted plans to address the concerns.

Finally, the 2021 *Consumer Confidence Report*, an analysis of local drinking water quality that was prepared by the Navy in accordance with federal Safe Drinking Water Act and Hawaii state regulations, showed no TPH contamination in the water.

Groundwater Monitoring Wells

Per the 2015 AOC, Region 9, in collaboration with the Hawaii DOH, has participated in oversight of the Red Hill Bulk Fuel Storage Facility to address fuel releases and implement infrastructure improvements to protect human health and the environment. Development of an adequate groundwater monitoring well network near Red Hill is a key requirement of the AOC. Since the November 2021 incident, the Navy installed additional monitoring wells and plans to install more. According to the Hawaii DOH, the additional wells are intended to improve confidence in the preliminary interpretation of perimeter detections, detect for potential migration beyond the historical region of impact, and provide monitoring to protect public drinking water supplies. According to Region 9, there were more than 30 monitoring wells in the area as of March 6, 2023.

Region 9 and the Hawaii DOH shared the results of monitoring at these wells with the public and stakeholders. For example, the Hawaii DOH shared the illustration of the TPH contamination shown in Figure 4 with the Fuel Tank Advisory Committee, a committee comprised of representatives from Region 9, the Hawaii DOH, Navy, the Honolulu BWS, Hawaii Commission on Water Resource Management, members of the Hawaii State Legislature, and Hawaii's congressional delegation. According to the Hawaii DOH, the TPH contamination is diminishing in mass. The Hawaii DOH also stated that sentinel wells and robust sampling are key to monitoring the contaminants.¹³ The Hawaii DOH shares committee meeting minutes and presentations on its [website](#).

¹³ According to the Navy, sentinel wells are monitoring wells installed between Red Hill and neighboring drinking water sources in order to provide a warning if any contamination in the aquifer were to migrate.

Figure 4: TPH contamination at the Red Hill site as of April 2022



Source: Hawaii DOH presentation to the Fuel Tank Advisory Committee on May 13, 2022. (Hawaii DOH image)

Defueling Process

Defueling the facility will be a multiyear process. The longer the fuel remains in the system, the greater the possibility of groundwater contamination from leaks. Region 9 will need sufficient staffing resources to provide necessary oversight. Since May 2022, Region 9 has temporarily assigned three additional staff to work with the region's Red Hill AOC project coordinator and existing staff; contractors; and management in the Land, Chemicals, and Redevelopment Division. The project coordinator is stationed full-time in Oahu; the other staff are in San Francisco and travel to Oahu as needed. The temporary assignments were based on workload expectations from the November 2021 incident and defueling, the latter of which is not expected to be complete before 2024. Residual TPH contamination will still require oversight after the defueling process is complete. Region 9 has started the process to hire a team of three permanent staff. The team will partner with the Hawaii DOH "to focus on reducing risk from recent drinking water/aquifer contamination and future defueling operations."

Data Are Not Clearly Communicated to the Public

EPA Administrator Michael S. Regan's message to EPA employees, *Transparency and Earning Public Trust in EPA Operations*, issued April 12, 2021, states that public trust requires transparency.¹⁴ The EPA *Risk Communication website* describes "[e]ffectively communicating science and potential health risk [as] one of the most important jobs [it has]" and states:

EPA's mission is to protect human health and the environment. This important mission cannot be accomplished without communicating about risk with communities, individuals, businesses, the media, and state, local, and tribal partners. Risk communication is fundamental to the work we do. When we communicate risk,

¹⁴ EPA, [Administrator Michael Regan Message to EPA Employees - Transparency and Earning Public Trust in EPA Operations, April 12, 2021](#).

it is our goal to provide **meaningful, understandable, and actionable** information to our many audiences. [emphasis in the original]

As part of its state program oversight, Region 9 should ensure that information the state communicates to the public is easy to understand. While the Hawaii DOH website includes Red Hill monitoring data, the state communicates this information through large spreadsheets with groundwater and soil vapor monitoring data, chemical names, and detection values. An example of this is shown in Figure 5. The website does not have concise or easy to understand information on risks to the public. Additionally, the extent of known TPH soil contamination, potential impact of the contamination on drinking water, and remediation information are not clearly communicated. The lack of clearly communicated data may cause the public to be unaware of or confused about existing and potential groundwater contamination at the Red Hill facility. Clear communication about potential health effects and drinking water contamination is essential.

Figure 5: Soil vapor sample results from July 2022 (partial view)

Date	A3+300	A3+250	A3+200	A3+150	A3+100	A3+050	A3a+000	A3b+000
12/17/2021	67	101	55	43	39	40	24	33
12/20/2021	235	178	88	96	67	85	65	79
12/21/2021	NT	NT	NT	NT	NT	NT	NT	NT
12/22/2021	55	106	51	62	62	37	45	60
12/23/2021	106	350	192	233	205	138	215	203
12/24/2021	120	281	282	131	462	101	448	471
12/27/2021	NT	240	79	160	141	99	180	181
12/29/2021	Wet	Wet	76	117	103	45	101	110
12/30/2021	Wet	Wet	74	109	85	45	87	87
12/31/2021	Wet	Wet	175	341	278	65	342	387
1/6/2022	Wet	614	238	426	415	95	497	544
1/12/2022	628	550	184	386	350	64	398	410
1/19/2022	654	531	148	313	343	65	316	344
1/26/2022	Wet	667	157	335	320	64	334	386
2/2/2022	Wet	598	159	391	389	41	400	414
2/9/2022	664	498	135	298	341	50	293	325
2/18/2022	369	295	77	187	181	30	186	180
2/23/2022	442	383	104	220	236	41	253	255
3/2/2022	508	424	125	290	298	37	307	330

Source: Section of the Hawaii DOH's soil vapor monitoring data from July 22, 2022.

Robust Stakeholder Participation Is Needed

The AOC states that the intent of the Navy, the DLA, the Hawaii DOH, and Region 9 is to include subject matter experts “for scoping and review of key deliverables” required by the order. However, some stakeholders told us that they declined to participate because the Navy required a nondisclosure agreement. The reason for the nondisclosure requirement is in the introductory paragraph of the agreement:

I have been invited to participate as a technical advisor or consultant on matters related to the Red Hill Administrative Order on Consent (AOC). These matters are expected to result in contracts for work involving a significant expenditure of public funds. Information and discussions related to these matters may also include details regarding infrastructure that is critical to national defense, which, if disclosed, could adversely affect national interests.

One stakeholder stated that it was not in the public interest for them to sign away their right to be transparent about the Red Hill facility and risks to the public. The Honolulu BWS, Hawaii Commission on Water Resources Management, and U.S. Geological Survey said that they did not participate due to the nondisclosure agreement requirement. Without direct involvement from relevant stakeholders, valuable perspectives on the defueling and decontamination process may not be considered in decision-making. Further, limits on information sharing could result in the public not being informed of all monitoring and remediation efforts.

We attempted to obtain the Navy’s perspective on the AOC nondisclosure agreement requirement, but the Navy declined to engage with us and referred us to the EPA. Some stakeholders expressed concerns about difficulties in working with the Navy, including delays in communication, which could result in delays to informing the public. Stakeholders attributed some of the difficulties to turnover in senior Navy officials and the associated loss of institutional knowledge.

The *Red Hill Remediation and Restoration Action Plan*—which the Hawaii DOH presented to the Fuel Tank Advisory Committee on May 13, 2022—lists tentative membership of the action plan committee to include Region 9 and the Hawaii DOH, the Navy, the Honolulu BWS, the Hawaii Commission on Water Resources Management, and U.S. Geological Survey. According to Region 9, the region and the Hawaii DOH convened the committee, later called the roundtable, to gather stakeholder agency expertise and input to help inform regulatory agency decision-making and make remediation efforts more efficient and effective. Figure 6 shows the *Red Hill Remediation and Restoration Action Plan Roundtable* objectives.

Figure 6: Red Hill Remediation and Restoration Action Plan Committee objectives

Prevent	Investigate and Assess	Protect	Remediate	Communicate
<ul style="list-style-type: none"> Prevent further releases of fuel or other contaminants from the Red Hill facility 	<ul style="list-style-type: none"> Investigate and assess the env. condition of the site and impacts of prior releases 	<ul style="list-style-type: none"> Protect drinking water and surface water resources 	<ul style="list-style-type: none"> Remediate the contamination 	<ul style="list-style-type: none"> Communicate progress and results to public

Source: Joint Region 9 and Hawaii DOH presentation to the Fuel Tank Advisory Committee on May 13, 2022.

The reduction of potential barriers to participation, like nondisclosure agreements, and inclusion of relevant stakeholders are critical to the action plan’s success. However, the Navy declined to attend the September 2022 roundtable. In Region 9’s technical comments in response to our draft report, the region noted that the Navy participated in the February 2023 roundtable and a groundwater subject matter expert meeting in January 2023, and that the EPA continues to work with the Navy to provide additional venues for stakeholder input.

Additional Observation

According to the EPA, Guam, a U.S. territory, has field-constructed fuel tanks at two military facilities. The tanks can hold over 60 million gallons of fuel and have the potential for leaks like most tanks. The EPA authorized the Guam Environmental Protection Agency to implement the underground tank program. In Region 9’s technical comments in response to our draft report, the region indicated that, in

2018, the Guam program expressed concerns to Region 9 about the field-constructed fuel tanks being above a sole-source aquifer, similar to Red Hill. Region 9 noted that the Guam program requested training on field-constructed tank inspections. In November 2019, the EPA, the Guam Environmental Protection Agency, and contractors conducted site visits and regulatory evaluations at the two military facilities. Region 9 is planning additional inspections for 2023 to fully assess the facilities' level of compliance with federal and Guam regulations.

Recommendations

We recommend that the regional administrator for Region 9:

1. Develop a plan to define and provide appropriate levels of resources and oversight, including maintaining adequate EPA staffing levels in Oahu, during the defueling and closure of the Red Hill facility.
2. Collaborate with the Hawaii Department of Health and the Navy, as appropriate, to clearly communicate risk and remediation information to the public.
3. Work with the Hawaii Department of Health and the Navy to develop a plan to increase regulatory agency and nongovernmental organization participation in Red Hill working groups.

Agency Response and OIG Assessment

Appendix A includes Region 9's March 6, 2023, response to our draft report. Region 9 also provided technical comments, which we considered as we finalized this report. Region 9 concurred with our recommendations and proposed corrective actions with planned completion dates.

On Recommendation 1, Region 9 proposed four corrective actions to address Red Hill staffing, including developing a staffing plan, increasing Red Hill staff in Hawaii, adding one staff person to work directly with the Hawaii DOH to support the state's capacity to oversee the drinking water program, and hiring to backfill vacant positions and permanently fill positions previously filled by temporary details. Additionally, Region 9 committed to identifying funding needs for defueling, closure, and remediation of the Red Hill facility, and working to address those needs through the annual budget process, including considerations in Region 9's 2024 President's Budget request. Region 9 further stated that it will continue to engage with the Navy on the appropriate allocation of oversight costs. When completed, these corrective actions should address the intent of Recommendation 1.

On Recommendation 2, Region 9 proposed four corrective actions to enhance communication of Red Hill risk and remediation information with the public, including requiring the Navy and the DLA to host quarterly public updates on defueling and closure, developing a web-based application to make groundwater monitoring data more easily available to the public, developing a community involvement plan with input from the Hawaii DOH to improve public communication, and collaborating with the Hawaii DOH to host webinars to share information with the public on what the agencies are doing to address impacts to human health and the environment. When completed, these corrective actions should address the intent of Recommendation 2.

On Recommendation 3, Region 9 proposed two corrective actions to increase participation in Red Hill working groups, including establishing a schedule of remediation roundtable and groundwater subject

matter expert meetings convened by Region 9 and the Hawaii DOH with participation by the Navy, the Honolulu BWS, the Hawaii Commission on Water Resource Management, and the U.S. Geological Survey; as well as developing a community involvement plan with input from the Hawaii DOH. When completed, these corrective actions should address the intent of Recommendation 3.

We verified that Region 9 completed two of its proposed corrective actions to develop a cross-divisional staffing plan and Fiscal Year 2023 resource request for oversight of the Red Hill facility, and to increase the number of Oahu-based staff. The eight remaining corrective actions are pending. We consider all three recommendations resolved with corrective actions pending.

Status of Recommendations

RECOMMENDATIONS

Rec. No.	Page No.	Subject	Status ¹	Action Official	Planned Completion Date
1	14	<p>Develop a plan to define and provide appropriate levels of resources and oversight, including maintaining adequate EPA staffing levels in Oahu, during the defueling and closure of the Red Hill facility.</p> <p><u>Corrective Action 1.1</u> – Develop cross-divisional EPA staffing plan and Fiscal Year 2023 Region 9 resource request for oversight of the Red Hill facility, including environmental investigation and remediation pursuant to the 2015 Administrative Order on Consent (AOC) and defuel, closure, completion of the implementation of the Drinking Water Long Term Monitoring Plan pursuant to proposed 2023 Consent Order.</p> <p><u>Corrective Action 1.2</u> – Increase the number of Oahu-based EPA staff, including hiring a dedicated Red Hill EJ Community Engagement Coordinator on temporary detail to work directly with the community and relocating three people to oversee spill prevention and response, environmental investigation and remediation, and provide drinking water support to the Hawaii Department of Health.</p> <p><u>Corrective Action 1.3</u> – Embed an EPA staff person at the Hawaii Department of Health through the Intergovernmental Personnel Act Mobility Program (IPA) to further support the state’s capacity to oversee the remaining drinking water long-term monitoring efforts underway.</p> <p><u>Corrective Action 1.4</u> – Complete additional hiring needed to backfill 2015 AOC Project Coordinator (vacant March 3, 2023) and Underground Storage Tanks Supervisor (vacant December 1, 2023) and permanently fill remaining positions previously filled by temporary details. One of the details was permanently filled on February 27, 2023.</p>	R	Regional Administrator for Region 9	10/1/23
			C		9/1/22
			C		3/1/23
			R		8/1/23
			R		10/1/23
2	14	<p>Collaborate with the Hawaii Department of Health and the Navy, as appropriate, to clearly communicate risk and remediation information to the public.</p> <p><u>Corrective Action 2.1</u> – Require Navy/DLA to host quarterly public updates on defueling, closure, completion of the implementation of the Drinking Water Long Term Monitoring Plan, and environmental investigation and remediation work with participation from EPA and Hawaii Department of Health pursuant to proposed 2023 Consent Order.</p> <p><u>Corrective Action 2.2</u> – Develop a web-based application to make Red Hill groundwater monitoring well data more easily available to the public</p> <p><u>Corrective Action 2.3</u> – With input from Hawaii Department of Health, develop a Community Involvement Plan, which will include a section on improving public communication through website updates and FAQs.</p> <p><u>Corrective Action 2.4</u> – Collaborate with Hawaii Department of Health to host a three-part webinar series to share information with the public on what agencies are doing to address impacts to human health and the environment from Red Hill releases. The first webinar was completed January 12, 2023, and is posted on EPA’s Red Hill website.</p>	R	Regional Administrator for Region 9	12/1/23
			R		6/1/23
			R		8/1/23
			R		12/1/23
			R		12/1/23
3	14	<p>Work with the Hawaii Department of Health and the Navy to develop a plan to increase regulatory agency and</p>	R	Regional Administrator for Region 9	8/1/23

RECOMMENDATIONS

Rec. No.	Page No.	Subject	Status ¹	Action Official	Planned Completion Date
		nongovernmental organization participation in Red Hill working groups.			
		<u>Corrective Action 3.1</u> – Establish a schedule of Red Hill Remediation Roundtable and Groundwater Subject Matter Expert Meetings to be convened by EPA/Hawaii Department of Health, with participation by Navy, Board of Water Supply, Commission on Water Resource Management, and USGS. Since the report, a Groundwater Subject Matter Expert meeting was held on January 2023 and Red Hill Remediation Roundtable meeting February 2023 with full participation.	R		5/1/23
		<u>Corrective Action 3.2</u> – With input from Hawaii Department of Health, develop a Community Involvement Plan (also mentioned in 2.3), which will include a section on community involvement activities.	R		8/1/23

¹ C = Corrective action completed.
R = Recommendation resolved with corrective action pending.
U = Recommendation unresolved with resolution efforts in progress.

Agency Response to Draft Report



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

OFFICE OF THE
REGIONAL ADMINISTRATOR

March 3, 2023

MEMORANDUM

SUBJECT: Response to Office of Inspector General Draft Report “Region 9 Must Continue Oversight Throughout the Decontamination and Closure of the Red Hill Facility,” Project No. OSRE-FY22-0075, dated February 6, 2023

FROM: Martha Guzman
Regional Administrator
Region 9

**MARTHA
ACEVES** Digitally signed by
MARTHA ACEVES
Date: 2023.03.05
17:11:05 -08'00'

TO: Laretta Joseph, Director
Programs, Offices, and Centers Oversight Directorate
Office of Special Review and Evaluation
Office of Inspector General

Thank you for the opportunity to respond to the issues and recommendations in the subject audit report. The U.S. Environmental Protection Agency, Region 9 (EPA) agrees with the recommendations identified in the report and had already started acting in accord with some of the recommendations. (See, for example, the discussion on p.11 about the Region hiring a team of three senior permanent project managers and staff to work on Red Hill-related issues.) Below is a summary of the proposed corrective actions and estimated completion dates and attached are EPA’s Technical Comments on the Report to supplement this response.

Agency resources are provided through annual appropriations and allocated across the Agency to Headquarters and Regional Offices by National Program Managers following Congressional direction and decisions made by Agency Senior Leadership to support the EPA’s mission. Funding needs for priority activities such as the oversight of defueling, closure, and remediation of the Red Hill facility are identified and needs are met to the maximum extent possible through that annual process. The Red Hill facility work is important to EPA and the Agency will maintain adequate resources for that work, including consideration in our FY 2024 President’s Budget request. In addition, the Agency will continue to engage with the Navy on the appropriate allocation of oversight costs, including specific obligations for federal contractors where appropriate.

AGENCY’S RESPONSE TO REPORT RECOMMENDATIONS

Agreements

No.	Recommendation	High-Level Intended Corrective Action(s)	Estimated Completion Date
1	Develop a plan to define and provide appropriate levels of resources and oversight, including maintaining adequate EPA staffing levels in Oahu, during the defueling and closure of the Red Hill facility.	1.1 Develop cross-divisional EPA staffing plan and Fiscal Year 2023 Region 9 resource request for oversight of the Red Hill facility, including environmental investigation and remediation pursuant to the 2015 Administrative Order on Consent (AOC) and defuel, closure, completion of the implementation of the Drinking Water Long Term Monitoring Plan pursuant to proposed 2023 Consent Order. Organizational chart below.	Completed September 1, 2022
		1.2 Increase the number of Oahu-based EPA staff, including hiring a dedicated Red Hill EJ Community Engagement Coordinator on temporary detail to work directly with the community and relocating three people to oversee spill prevention and response, environmental investigation and remediation, and provide drinking water support to the Hawaii Department of Health.	Completed March 1, 2023
		1.3 Embed an EPA staff person at the Hawaii Department of Health through the Intergovernmental Personnel Act Mobility Program (IPA) to further support the state's capacity to oversee the remaining drinking water long-term monitoring efforts underway.	In process to be completed by August 1, 2023
		1.4 Complete additional hiring needed to backfill 2015 AOC Project Coordinator (vacant March 3, 2023) and	In process to be completed by October 1, 2023

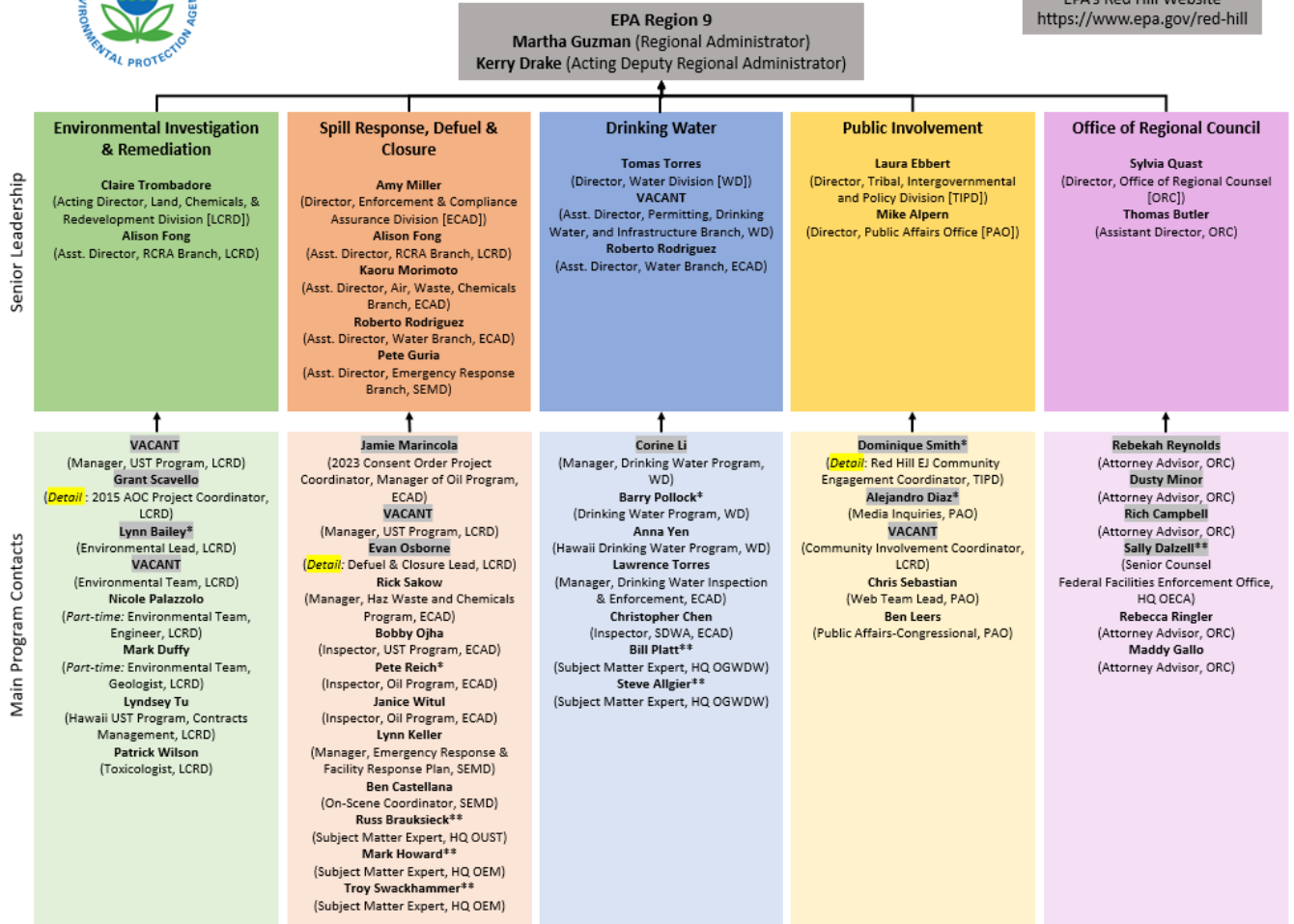
		Underground Storage Tanks Supervisor (vacant December 1, 2023) and permanently fill remaining positions previously filled by temporary details. One of the details was permanently filled on February 27, 2023.	
2	Collaborate with the Hawaii Department of Health and the Navy, as appropriate, to clearly communicate risk and remediation information to the public.	2.1 Require Navy/DLA to host quarterly public updates on defueling, closure, completion of the implementation of the Drinking Water Long Term Monitoring Plan, and environmental investigation and remediation work with participation from EPA and Hawaii Department of Health pursuant to proposed 2023 Consent Order.	June 1, 2023
		2.2 Develop a web-based application to make Red Hill groundwater monitoring well data more easily available to the public	June 1, 2023
		2.3 With input from Hawaii Department of Health, develop a Community Involvement Plan, which will include a section on improving public communication through website updates and FAQs.	August 1, 2023
		2.4 Collaborate with Hawaii Department of Health to host a three-part webinar series to share information with the public on what agencies are doing to address impacts to human health and the environment from Red Hill releases. The first webinar was completed January 12, 2023 and is posted on EPA's Red Hill website.	In process to be completed by December 1, 2023
3	Work with the Hawaii Department of Health and the Navy to develop a plan to increase	3.1 Establish a schedule of Red Hill Remediation Roundtable and Groundwater Subject Matter Expert Meetings to be convened	May 1, 2023

	regulatory agency and nongovernmental organization participation in Red Hill working groups.	by EPA/Hawaii Department of Health, with participation by Navy, Board of Water Supply, Commission on Water Resource Management, and USGS. Since the report, a Groundwater Subject Matter Expert meeting was held on January 2023 and Red Hill Remediation Roundtable meeting February 2023 with full participation.	
		3.2 With input from Hawaii Department of Health, develop a Community Involvement Plan (also mentioned in 2.3), which will include a section on community involvement activities.	August 1, 2023



EPA Regulatory Program Oversight of Red Hill

Updates & Contact Us
 EPA's Red Hill Website
<https://www.epa.gov/red-hill>



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