Report No. DODIG-2025-012

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INSPECTOR GENERAL

U.S. Department of Defense

NOVEMBER 8, 2024

(U) Evaluation of DoD Actions Related to the Red Hill Bulk Fuel Storage Facility's Contamination of the Joint Base Pearl Harbor-Hickam Community Water System

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INDEPENDENCE ★ INTEGRITY ★ EXCELLENCE ★ TRANSPARENCY

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INSPECTOR GENERAL
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(U) Results in Brief

Evaluation of DoD Actions Related to the Red Hill Bulk Fuel Storage Facility's Contamination of the Joint Base Pearl Harbor-Hickam Community Water System

(U) November 8, 2024

(U) Objective

(U) The objective of the evaluation was to determine the extent to which DoD officials protected drinking water systems, in compliance with Federal and state regulations and DoD policy. We address the extent to which DoD officials managed the operation, maintenance, safety, and oversight of Defense Fuel Support Point (DFSP) Joint Base Pearl Harbor–Hickam (JBPHH), including the Red Hill Bulk Fuel Storage Facility (BFSF), and protected the environment in Report No. DODIG-2025-011.

(U) Background

(U) During the construction of the Red Hill BFSF, portions of the JBPHH Community Water System, specifically the Red Hill well pump station and Red Hill well, were built inside the Red Hill BFSF.

(U) During a fuel incident on May 6, 2021, at the Red Hill BFSF, approximately 19,000 gallons of fuel was pumped into an overhead pipeline, where it remained until November 2021. On November 20, 2021, the fuel was released from the overhead pipeline and some of the fuel contaminated the JBPHH Community Water System.

(U) Findings

(U) We determined that there was an inherent and well-documented risk of contamination due to the co-location of the Red Hill well and the Red Hill BFSF. Additionally, Navy officials missed opportunities in May 2021 and

(U) Findings (cont'd)

(U) November 2021 to prevent or lessen the impact of the drinking water contamination incident. Finally, Navy officials did not issue the required public notice to effectively communicate the drinking water contamination incident response in a timely manner to the affected community.

(U) This occurred because Navy officials lacked sufficient understanding of the Red Hill BFSF and the Red Hill well. Specifically, they:

- (U) were not sufficiently aware of the roles, responsibilities, and requirements for owners and operators of community water systems;
- (U) were not trained on Emergency Response Plan roles and responsibilities; and
- (U) did not exercise the Emergency Response Plan.

(U) Due to the resulting drinking water contamination:

- (U) the drinking water supply for more than 90,000 people was contaminated with fuel;
- (U) approximately 4,000 families were displaced from their homes for approximately 4 months;
- (U) residents remaining on JBPHH had to collect alternate drinking water for consumption and domestic uses;
- (U) there were 6,138 medical encounters documented by DoD medical providers, with affected community members reporting symptoms including gastrointestinal, neurological, and skin symptoms or a combination of symptoms; and
- (U) affected community members reported mental health symptoms, including anxiety, insomnia, agitation, depression, and paranoia.

(U) Lastly, the drinking water contamination incident cost a significant amount of money. For example, Navy and Army officials told us that they spent more than $220 million combined in response to the drinking water contamination incident. Additionally, the FY 2022 and the FY 2023 National Defense Authorization Acts included more than $2.1 billion in funding related to the drinking water contamination incident and the planned closure of the Red Hill BFSF.

(U) Results in Brief

Evaluation of DoD Actions Related to the Red Hill Bulk Fuel Storage Facility's Contamination of the Joint Base Pearl Harbor-Hickam Community Water System

(U) Recommendations

(U) We recommend that the Secretary of the Navy:

- (U) designate an entity to be responsible for ensuring that all laws, policies, and agreements made in response to the 2021 drinking water contamination incident at the JBPHH Community Water System are implemented, and that appropriate action is taken with regard to recommendations made in prior oversight reports and command investigation reports;
- (U) direct the revision of Operations Navy Manual 5090.1 to clarify requirements related to drinking water management and drinking water contamination incident response at Navy installations;
- (U) direct the revision of Commander, Navy Installation Command Instruction (CNICINST) 5090.7 to clarify requirements related to drinking water management and drinking water contamination incident response at Navy installations worldwide;
- (U) direct the issuance of a retroactive Tier 1 public notice for the October 2022 water main break; and
- (U) direct a study to assess the location of Navy-owned drinking water systems, identify all co-located infrastructure that poses a threat to the safety of the drinking water, and develop and promulgate plans to mitigate the threats to the drinking water systems.

(U) Management Comments and Our Response

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment) (ASN[EI&E]), responding on behalf of the Secretary of the Navy, agreed to designate an entity to be responsible for ensuring implementation of all laws, policies, and agreements made in response to the 2021 drinking water contamination incident at the JBPHH Community Water System. Specifically, the ASN(EI&E) named two points of contact for DFSP JBPHH. Although the ASN(EI&E) agreed to designate an entity, they only partially addressed the recommendation, because the ASN(EI&E) did not state how the points of contact for the fuel systems would be responsible for addressing recommendations related to the drinking water contamination incident and the JBPHH Community Water System. Therefore, the recommendation is unresolved.

(U) The ASN(EI&E) agreed to and addressed the recommendation to direct the revision of Operations Navy Manual 5090.1. Therefore, the recommendation is resolved, and we will close the recommendation once we receive and review the updated policy and verify that the updates meet the intent of our recommendation.

(U) The ASN(EI&E) agreed to and addressed the recommendation to direct the revision of CNICINST 5090.7. Therefore, the recommendation is resolved, and we will close the recommendation once we receive and review the updated policy and verify that the updates meet the intent of our recommendation. Additionally, the ASN(EI&E) stated that Navy requirements related to drinking water management at Navy installations outside of the United States and its Territories are in CNICINST 5090.1B, which we verified. Therefore, that recommendation is resolved and closed.

(U) Results in Brief

Evaluation of DoD Actions Related to the Red Hill Bulk Fuel Storage Facility's Contamination of the Joint Base Pearl Harbor-Hickam Community Water System

(U) Comments (cont'd)

(U) The ASN(EI&E) did not agree to direct the issuance of a retroactive Tier 1 public notice for the October 2022 water main break. However, the ASN(EI&E) addressed the recommendation by proposing an alternative action that satisfied the intent of the recommendation. Therefore, the recommendation is resolved and open. We will close the recommendation once we receive the updated CNICINST 5090.7 and verify that the updates meet the intent of our recommendation.

(U) Furthermore, the ASN(EI&E) agreed to and addressed the recommendation to assess Navy-owned drinking water systems. According to the ASN(EI&E), Navy officials completed self-assessments of all Navy DFSPs and Navy-owned drinking water systems in 2022. Therefore, the recommendation is resolved and open. We will close the recommendation once we receive and review the 2022 DFSP and Navy drinking water system self-assessments and verify that the self-assessments meet the intent of our recommendation.

(U) We request that the Secretary of the Navy provide additional comments within 30 days of the final report clarifying their plans to address the unresolved recommendations. Please see the Recommendations Table on the next page for the status of recommendations.

(U) Recommendations Table

(U) Management	Recommendations Unresolved	Recommendations Resolved	Recommendations Closed
Secretary of the Navy	1.a, 1.b, 1.c, 1.d, 1.e, 1.f, 1.g	2.a, 2.b, 3.a, 3.b, 3.c, 3.d, 3.e, 3.f, 4, 5	3.g (U)

(U) Please provide Management Comments by December 8, 2024.

(U) Note: The following categories are used to describe agency management's comments to individual recommendations.

- **(U) Unresolved** – Management has not agreed to implement the recommendation or has not proposed actions that will address the recommendation.
- **(U) Resolved** – Management agreed to implement the recommendation or has proposed actions that will address the underlying finding that generated the recommendation.
- **(U) Closed** – The DoD OIG verified that the agreed upon corrective actions were implemented.

OFFICE OF INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
4800 MARK CENTER DRIVE
ALEXANDRIA, VIRGINIA 22350-1500

November 8, 2024

MEMORANDUM FOR SECRETARY OF THE NAVY

SUBJECT: (U) Evaluation of DoD Actions Related to the Red Hill Bulk Fuel Storage Facility's Contamination of the Joint Base Pearl Harbor-Hickam Community Water System (Report No. DODIG-2025-012)

(U) This final report provides the results of the DoD Office of Inspector General's evaluation. We previously provided copies of the draft report and requested written comments on the recommendations. We considered management's comments on the draft report when preparing the final report. These comments are included in the report.

(U) This report contains a recommendation that is considered unresolved because the Assistant Secretary of the Navy (Energy, Installations, and Environment) did not fully address Recommendations 1. Therefore, the recommendations remain open. We will track these recommendations until management has agreed to take actions that we determine to be sufficient to meet the intent of the recommendations and management officials submit adequate documentation showing that all agreed-upon actions are completed.

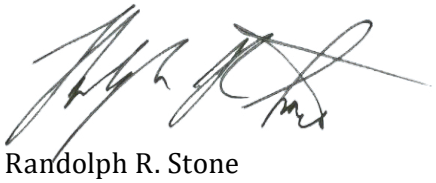
(U) DoD Instruction 7650.03 requires that recommendations be resolved promptly. Therefore, within 30 days please provide us your response concerning specific actions in process or alternative corrective actions proposed on the unresolved recommendations. Send your response to either [redacted] if unclassified or [redacted] if classified SECRET.

(U) Additionally, the Assistant Secretary of the Navy (Energy, Installations, and Environment), responding for the Secretary of the Navy, agreed to address Recommendations 2.a, 2.b, 3.a, 3.b, 3.c, 3.d, 3.e, 3.f, and 5; therefore, we consider the recommendations resolved and open. The Assistant Secretary did not agree to address Recommendation 4, but provided an alternative plan that met the intent of the recommendation. Therefore, we consider the recommendations resolved and open. We requested additional information to clarify Recommendations 2, 3, and 5. We will close the recommendations when you provide us documentation showing that all agreed-upon actions to implement the recommendations are completed. Therefore, within 90 days please provide us your response concerning specific actions in process or completed on the recommendations. Send your response to either [redacted] if unclassified or [redacted] if classified SECRET.

(U) Furthermore, the Assistant Secretary of the Navy (Energy, Installations, and Environment) agreed to address Recommendation 3.g, and provided evidence sufficient to resolve the recommendation; therefore, we consider the recommendation closed.

(U) If you have any questions, please contact [redacted]. We appreciate the cooperation and assistance received during the evaluation.

FOR THE INSPECTOR GENERAL:



Randolph R. Stone
Assistant Inspector General for Evaluations
Space, Intelligence, Engineering, and Oversight

CC:

SECRETARY OF DEFENSE
UNDER SECRETARY OF DEFENSE FOR ACQUISITION AND SUSTAINMENT
UNDER SECRETARY OF DEFENSE FOR PERSONNEL AND READINESS
COMMANDANT OF THE MARINE CORPS
CHIEF OF NAVAL OPERATIONS
COMMANDER, U.S. INDO-PACIFIC COMMAND
DIRECTOR, JOINT STAFF
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COMMANDER, NAVAL SUPPLY SYSTEMS COMMAND
AUDITOR GENERAL, DEPARTMENT OF THE ARMY
AUDITOR GENERAL, DEPARTMENT OF THE NAVY
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(U) Contents

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INSPECTOR GENERAL
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I. (U) Introduction

(U) On May 6, 2021, a fuel incident occurred at Defense Fuel Support Point (DFSP) Joint Base Pearl Harbor–Hickam (JBPHH), specifically at the Red Hill Bulk Fuel Storage Facility (BFSF).[1] During the May 2021 fuel incident, approximately 19,000 gallons of fuel was pumped into an overhead pipeline where it remained until November 2021. On November 20, 2021, the fuel was released from the overhead pipeline and some of the fuel contaminated the JBPHH Community Water System. On December 6, 2021, the DoD Office of Inspector General (OIG) received a letter from members of the Hawaii congressional delegation requesting that the DoD OIG conduct a comprehensive evaluation to assess the overall safety of the Red Hill BFSF.[2]

(U) We announced an evaluation on December 20, 2021.[3] The objective of the evaluation was to determine the extent to which DoD officials:

- (U) managed the operation, maintenance, safety, and oversight of DFSP JBPHH, including the Red Hill BFSF; and
- (U) protected the environment and drinking water systems, in compliance with Federal and state regulations and DoD policy.

(U) We address this objective in two separate reports. Specifically, in this report, we address the extent to which DoD officials protected the JBPHH Community Water System, in compliance with Federal and state regulations and DoD policy.[4]

(U) To conduct this evaluation, we assembled a multidisciplinary team of 20 DoD OIG personnel, including engineers, auditors, a program analyst, and an attorney. Additionally, before conducting site visits, eight team members attended formal training on environmental compliance, fuel storage tank compliance, or both.

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[1] (U) The term "fuel incident" refers to any occurrence or series of occurrences having the same origin involving one or more vessels, facilities, or any combination thereof, resulting in the release or substantial threat of release of oil or hazardous substances. We discuss the circumstances that led to the May and November 2021 fuel incidents and what occurred during the resulting drinking water contamination incident in DODIG-2025-011 and in Parts III and V of this report.

[2] (U) The DoD OIG also received a letter on November 3, 2021, from members of Hawaii's U.S. congressional delegation before the November 20, 2021 fuel incident. The letter requested that the DoD OIG determine whether Navy officials responded appropriately to earlier fuel incidents at DFSP JBPHH.

(U) This report contains information that has been redacted because it was identified by the Department of Defense as Controlled Unclassified Information (CUI) that is not releasable to the public. CUI is Government-created or owned unclassified information that allows for, or requires, safeguarding and dissemination controls in accordance with laws, regulations, or Government-wide policies.

[3] (U) DoD OIG Project No. D2022-DEV0SR-0051.000, "Evaluation of the Operation, Maintenance, Safety, and Oversight of the Navy's Red Hill Bulk Fuel Storage Facility," December 20, 2021.

[4] (U) We address the extent to which DoD officials managed the operation, maintenance, safety, and oversight of DFSP JBPHH, including the Red Hill BFSF; and protected the environment, in compliance with Federal and state regulations and DoD policy in Report No. DODIG-2025-011.

(U) Due to the breadth of our evaluation, we spent approximately 1 year performing fieldwork and 1 year performing our analysis, documenting our conclusions, and preparing two reports and a management advisory.[5] We formally requested information from DoD officials in 35 extensive requests for information (RFI). We reviewed over 100 written responses to our RFIs, engineering drawings, historical reports, and public affairs materials. Additionally, we reviewed over 240 Federal and State of Hawaii laws, regulations, and guidance; and DoD, Navy, and DLA directives, instructions, manuals, and policies, management plans, operating procedures, reports, contracts, memorandums of agreement, and administrative orders.

(U) During our evaluation, we conducted 95 interviews and meetings with DoD officials. We performed site visits at JBPHH in April 2022 and July 2022.[6] During our site visits, we evaluated DFSP JBPHH and the JBPHH Community Water System, including co-located fuel and drinking water infrastructure at the Red Hill BFSF. Additionally, we met with officials from the U.S. Environmental Protection (EPA), the Hawaii Department of Health (DOH), and the University of Hawaii. Furthermore, we met with affected JBPHH community members and administered an informal survey to understand their experiences related to the drinking water contamination incident.[7]

(U) We divided this report into seven Parts, followed by six Appendixes.

(U) This section, Part I, contains the introduction.

(U) Part II provides background information describing JBPHH, JBPHH Community Water System, DFSP JBPHH infrastructure, and where they interface.[8]

(U) Part III contains a summary of incidents at JBPHH relevant to the JBPHH Community Water System.

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[5] (U) We discuss incident response concerns related to aqueous film-forming foam incidents at JBPHH in Management Advisory No. DODIG-2025-013.

[6] (U) We also visited DFSP Craney Island in September 2022 to compare and contrast with DFSP JBPHH. During the site visits, we visually assessed relevant infrastructure and areas of JBPHH affected by fuel incidents and the drinking water contamination incident. Additionally, we verified the statements made by officials throughout the evaluation by reviewing records, including maps and engineering drawings of JBPHH infrastructure. Furthermore, we collected documentation to support our findings and conclusions, including laws, regulations, and DoD policies; operations and maintenance records; environmental assessments and plans; and records of historical incidents. For a detailed description of our evaluation scope and methodology, see Appendix A.

[7] (U) Throughout this report, we use the term "affected communities" to refer to the communities that live in, work in, and frequent the areas and facilities affected by the drinking water contamination incident. The term "drinking water contamination incident" refers to the events of the entire period from November 20, 2021, to March 18, 2022, resulting from the November 2021 fuel incident that caused the drinking water contamination in the JBPHH Community Water System. We discuss the circumstances that led to the fuel incident and what occurred during the resulting drinking water contamination incident throughout this report.

[8] (U) Infrastructure also refers to shore facilities and their components, such as the tanks, pipes, and other supporting structures and equipment that make up the DFSP JBPHH shore facility. A shore facility is any refinery, terminal, storage, or port facility taking deliveries of a commodity from or making deliveries of a commodity to a vessel. A shore facility does not have to be on land.

(U) Part IV contains a summary of the Federal and state laws, regulations, and DoD policies relevant to this report.[9] Additionally, Part IV contains a summary of the Navy's incident response plans. Finally, Part IV contains an introduction to the organizations relevant to this report.

(U) Part V describes our analysis of the extent to which DoD officials protected the JBPHH Community Water System and its users in compliance with Federal and state laws, regulations, and DoD policy; and our analysis of the management and oversight of the JBPHH Community Water System.

(U) Part VI contains our overall conclusions.

(U) Part VII contains recommendations for the Secretary of the Navy based on the findings of this evaluation, a summary of management comments received, and our response to those comments.

(U) Appendix A describes the evaluation scope and methodology.

(U) Appendix B includes details about the JBPHH Community Water System.

(U) Appendix C includes a description of the contaminants and potential health effects related to the drinking water contamination incident; a flow chart describing public notification procedures for drinking water incidents; an example public notice for community water systems; and a summary of the 2023 Administrative Consent Order.

(U) Appendix D includes copies of the memorandums containing DoD management comments to our report.

(U) Appendix E lists acronyms and abbreviations.

(U) Appendix F provides a glossary of terms used in this report.

[9] (U) For a detailed list of the Federal and state laws, regulations, requirements, and documents we reviewed during this evaluation, see Appendix A.

II. (U) Background

(U) This section provides background information on JBPHH; the JBPHH Community Water System; and DFSP JBPHH, including the Red Hill BFSF. Additionally, we describe the interfaces between JBPHH Community Water System infrastructure and DFSP JBPHH infrastructure where they meet due to the co-location of the water and fuel systems.

A. (U) Description of JBPHH

~~(CUI)~~ JBPHH is a joint Navy-led military installation on the Hawaiian island of Oahu. JBPHH combines two historic bases, Naval Station Pearl Harbor and Hickam Air Force Base (AFB), under the JBPHH installation command.[10] The JBPHH installation command provides base operating support functions and is responsible for safety, security, and environmental stewardship of personnel and property on JBPHH.[11] [redacted]. Specifically, JBPHH supports a population of over 90,000, consisting of people who both live and work on the installation, people who only work on the installation, and people who visit the installation.[12] JBPHH supports its population with:

- (U) infrastructure, including DFSP JBPHH and the JBPHH Community Water System;
- (U) services, such as police and firefighting;
- (U) housing in neighborhoods and dormitories; and
- (U) shopping centers, grocery stores, restaurants, gyms and recreation facilities, medical facilities, schools, and child care centers.

[10] (U) Although JBPHH combines the two historic bases, the physical areas are still referred to as Naval Station Pearl Harbor and Hickam AFB.

[11] (U) Joint Base Pearl Harbor-Hickam Instruction 5400.2, "Joint Base Pearl Harbor Hickam Standard Organization and Regulations Manual," August 19, 2019.
(U) Throughout this report, we use the term "JBPHH" to refer to the joint installation, and we use the term "JBPHH installation command" to refer to the Navy command of the same name.

[12] ~~(CUI)~~ [redacted]

(U) The Commander, Navy Installations Command (CNIC) is the real property owner on JBPHH and is responsible for the physical infrastructure on JBPHH.[13] The Commander, Navy Region Hawaii (CNRH) is the regional CNIC command responsible for Navy installations in Hawaii, including JBPHH, on behalf of the CNIC.[14]

(U) The JBPHH Public Works Department (PWD) manages and operates JBPHH infrastructure to support the JBPHH population. For example, the JBPHH PWD manages and operates the JBPHH Community Water System. The JBPHH PWD is subordinate to both the JBPHH installation command and the Naval Facilities Engineering Systems Command (NAVFAC) Hawaii.[15]

(U) The JBPHH Community Water System is the largest community water system owned and operated by the Navy, and provides water throughout JBPHH via pipes and other infrastructure.[16] In the United States, community water system owners and operators are required to treat the water supplied throughout homes and buildings to meet Federal and state standards for human consumption, which we refer to as drinking water.[17] Therefore, the water provided by the JBPHH Community Water System and supplied throughout homes and buildings is drinking water. CNIC is the DoD Executive Agent for drinking water quality matters for all Navy installations worldwide.[18]

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13 (U) CNIC is a Navy command responsible for Navy installations worldwide. Throughout this report, we use the term "CNIC" when we refer to the Navy command, and we use the term "CNIC Commanding Officer" to refer to the Commander of CNIC.

(U) DoD Directive (DoDD) 4165.06, "Real Property," July 19, 2022.

(U) According to DoDD 4165.06, DoD real property is "land and improvements to land (e.g., buildings, structures, and linear structures)."

14 (U) Throughout this report, we use the term "CNRH" when we refer to the regional command, and we use the term "CNRH Commanding Officer" to refer to the commander of the regional command.

15 (U) NAVFAC is the Navy's shore facility, base operating support, and expeditionary engineering systems command responsible for technical and acquisition services for the Navy and Marine Corps. In Part IV, we explain that the Navy has two chains of command: operational and administrative. The JBPHH PWD reports to NAVFAC Hawaii under administrative control and to the JBPHH installation command under operational control.

16 (U) When owners and operators of a water system provide drinking water to a non-transient population of at least 25 people, such as year-round residents or students in a school, the EPA classifies it as a community water system.

17 (U) Chapter 6A, subchapter XII, title 42, United States Code, "Safe Drinking Water Act.''

(U) In the United States, community water system owners and operators are required to comply with the Safe Drinking Water Act, which we discuss later in this report.

18 (U) According to DoDD 5101.01, a DoD Executive Agent is the head of a DoD Component assigned specific responsibilities, functions, and authorities by the Secretary of Defense or Deputy Secretary of Defense to provide operational, administrative, or other designated activities involving two or more DoD Components. DoD Components refers to the Office of the Secretary of Defense, the Military Departments, the Joint Chiefs of Staff and Joint Staff, the combatant commands, the Office of Inspector General of the DoD, the Defense agencies, DoD field activities, and all other organizational entities within the DoD.

(U) DoDD 5101.01, "DoD Executive Agent," February 7, 2022.

(U) DFSPs are bulk fuel storage facilities that receive, store, and distribute Defense Logistics Agency (DLA) fuel.[19] The Naval Supply Systems Command Fleet Logistics Center Pearl Harbor (NAVSUP FLC PH) is a tenant command on JBPHH that receives, stores, manages, and distributes bulk fuel in support of the United States across the Pacific region.[20] NAVSUP FLC PH conducts its regional bulk fuel operation at DFSP JBPHH, which consists of the interconnected fuel systems that receive, store, manage, and distribute fuel at Naval Station Pearl Harbor, Hickam AFB, and the Red Hill BFSF.[21] Unlike the other locations in DFSP JBPHH, the Red Hill BFSF is almost entirely underground, and is one of the largest underground bulk fuel storage facilities in the world.

B. (U) Description of the JBPHH Community Water System

(U) The JBPHH Community Water System is owned and operated by the Navy and provides drinking water to the JBPHH population.[22] According to a Navy risk assessment, the JBPHH Community Water System provides drinking water on and off the JBPHH installation, as shown in Figure 1, including to:

- (U) Navy facilities at Naval Station Pearl Harbor, Hickam AFB, and outlying areas, including Camp Smith, Halawa Housing, the Eastern Housing area, McGrew Point Housing, Manana Housing, Pearl City Peninsula, Waipio, and West Loch;

[19] (U) The DLA was the DoD Executive Agent for bulk fuel and they own the fuel at DFSP JBPHH until it is distributed to a customer, such as the Navy or Air Force. The DLA is a combat logistics support agency responsible for global support services to the DoD. The DLA manages the fuel supply chain and provides fuel quality and technical support to the Services, 11 combatant commands, and other Federal, state, and local agency partners and allied nations.

(U) On May 10, 2023, the Deputy Secretary of Defense issued a memorandum implementing the U. S. Transportation Command as the "Single Manager for Global Bulk Fuel Management and Delivery" supporting Combatant Commander requirements for bulk fuel posture, planning, execution, resource and capability advocacy, and process improvements. This policy also cancelled DLA's DoD Executive Agent designation.

(U) Deputy Secretary of Defense, "Implementation of U.S. Transportation Command as the Single Manager for Global Bulk Fuel Management and Delivery," May 10, 2023.

[20] (U) NAVSUP is a Navy command responsible for products and services that support readiness and sustainment of naval forces worldwide. The term "bulk fuel" refers to fuel delivered in volumes greater than 55 U.S. gallons by delivery modes, such as tank trucks, pipelines, hydrant systems, and ships.

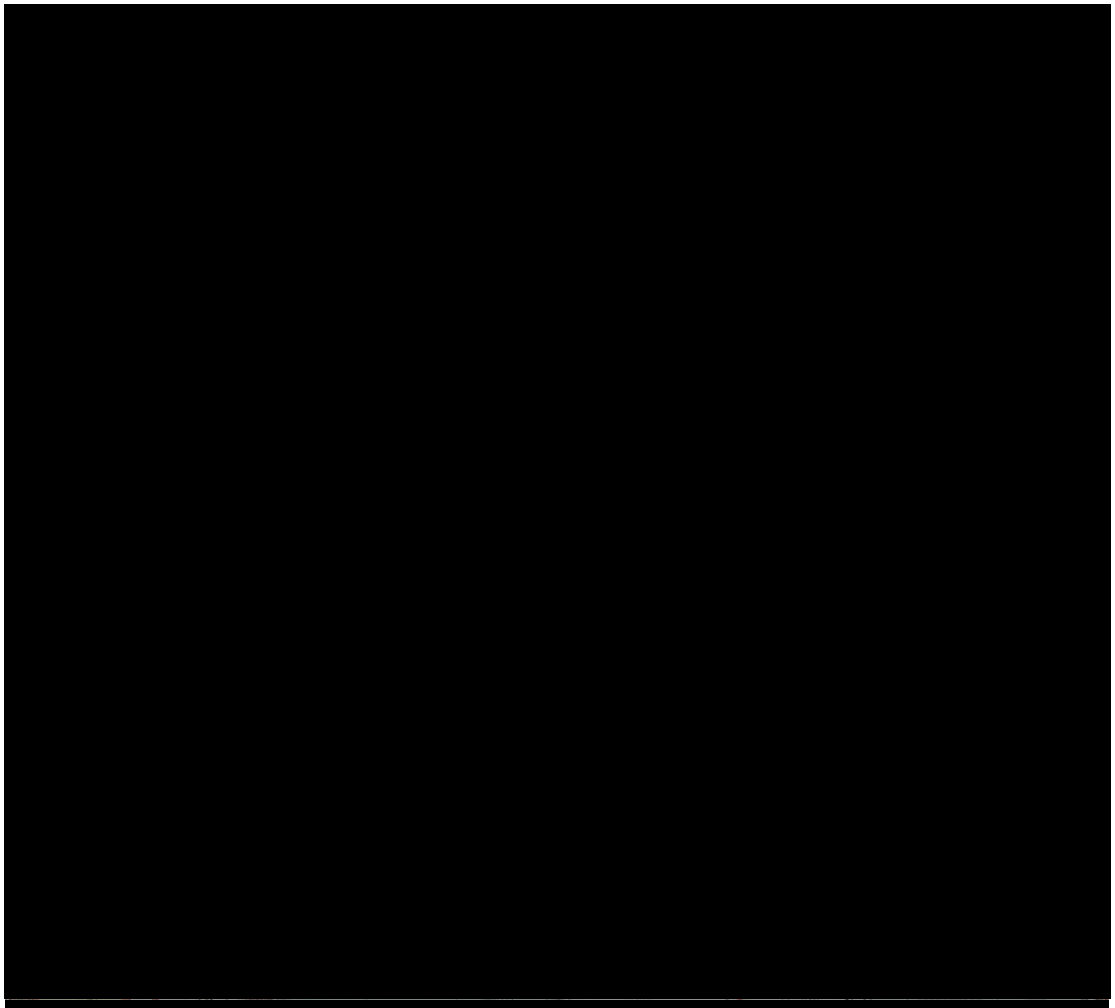
(U) NAVSUP FLC PH provides fuel to the Military Departments, the Department of Homeland Security and other Federal agencies, the Hawaii National Guard, and the U.S. Coast Guard. The Military Departments, created by the National Security Act of 1947, are the Departments of the Army, Navy, and Air Force. According to NAVSUP officials, NAVSUP FLC PH can also support civilian authorities in the event of an emergency.

[21] (U) DODIG-2025-011 provides a detailed description of DFSP JBPHH. We also discuss the Red Hill BFSF in more detail in the next section.

(U) DFSP JBPHH has three types of fuel: jet propellant 5 (JP-5), marine diesel fuel number 76 (F-76), and jet fuel number 24 (F-24).

[22] (U) According to EPA and Navy documentation we reviewed, the JBPHH Community Water System provides water to approximately 65,000 customers. However, the Agency for Toxic Substances and Disease Registry estimated that approximately 93,000 people were affected by the drinking water contamination incident, which aligns with the base population of more than 90,000 people we discussed earlier in this report.

- (U) non-Navy facilities, including the Moanalua Shopping Center, Iroquois Point Housing, Puuloa Rifle Range, and various commercial restaurants on JBPHH; and
- (U) consecutive water systems owned and operated by the U.S. Army Garrison Hawaii serving the Red Hill Coast Guard Housing and the Army's Aliamanu Military Reservation (AMR), which we refer to as the Red Hill and AMR neighborhoods, respectively.[23]



(U) Figure 1. Joint Base Pearl Harbor–Hickam Community Water System
(U) Source: The NAVFAC Engineering and Expeditionary Warfare Center.

[23] (U) NAVFAC Engineering and Expeditionary Warfare Center (EXWC), "Community Water System (PWS-360) Risk and Resilience Assessment for Joint Base Pearl Harbor-Hickam (JBPHH), Pearl Harbor, Hawaii," December 2020.
(U) A consecutive water system is a water system that has no water production or source facility of its own, but obtains all of its water from another water system. For example, the U.S. Army Garrison Hawaii owns and operates a community water system that provides drinking water for human consumption to the AMR, but the U.S. Army Garrison Hawaii does not own any source water wells or produce the water that enters its water system. Instead, the JBPHH Community Water System supplies the drinking water, thereby making the AMR Community Water System a consecutive water system.

(U) In the following sections, we describe how drinking water is produced by JBPHH Community Water System infrastructure and distributed to JBPHH Community Water System users. Additionally, we discuss the Red Hill well and its supporting infrastructure, which is inside the Red Hill BFSF. See DODIG-2025-011 for details on the DFSP JBPHH fuel system infrastructure, including the Red Hill BFSF.

1. (U) Drinking Water Production and Distribution

~~(CUI)~~ The JBPHH Community Water System dates back to 1922, but most of the system was constructed in 1943. Many of the original water distribution pipes are still in use.[24] [redacted] The JBPHH Community Water System draws its water from three groundwater wells: the Red Hill well, the Waiawa well, and the Halawa well.[25] To make drinking water, the JBPHH Community Water System disinfects and treats the groundwater drawn from the groundwater wells to meet Federal and state drinking water quality standards. The drinking water is pumped through pipes to [redacted] drinking water ground storage tanks in various locations on JBPHH. A network of water distribution pipes carries the drinking water from the drinking water ground storage tanks to users in the areas on and off JBPHH served by the JBPHH Community Water System.[26] The water supplied by the JBPHH Community Water System is drinking water regardless of whether a JBPHH Community Water System user drinks the water or uses it for another use, such as bathing. Table 4 in Appendix B details the JBPHH Community Water System infrastructure.

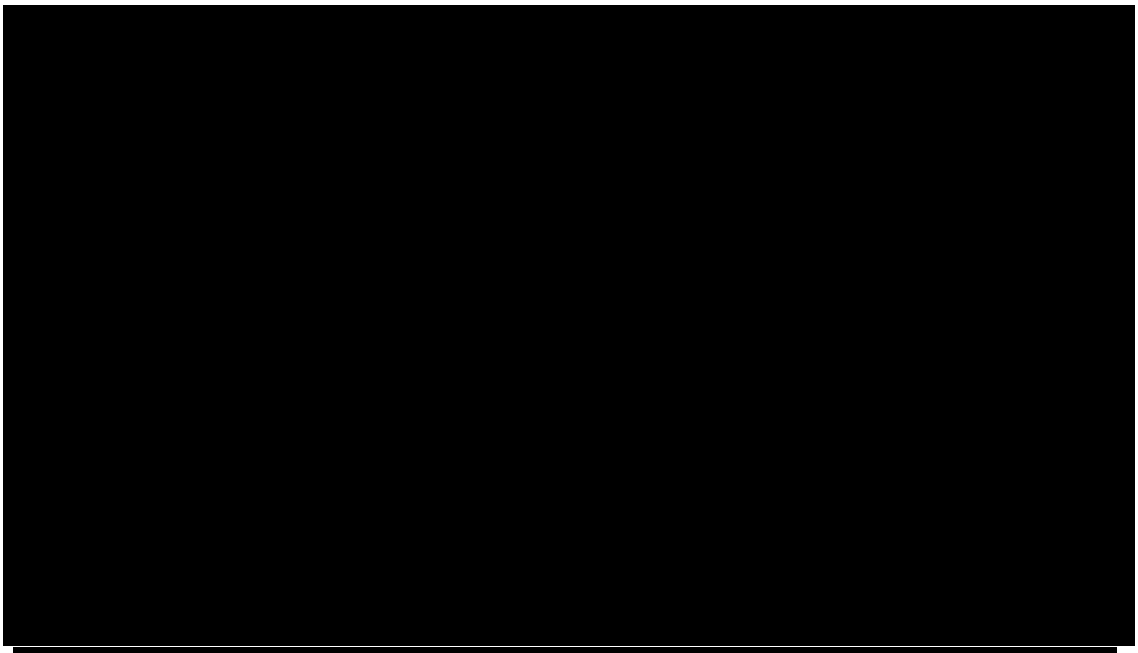
[24] (U) Due to the age of the system, most of the water distribution pipes are cast iron. Recently installed water distribution pipes are ductile iron, polyvinyl chloride (PVC), or high-density polyethylene.

[25] (U) The Halawa well is also referred to as Aiea-Halawa or the Navy's Halawa well in order to distinguish it from the Honolulu Board of Water Supply's separate well of the same name.

[26] (U) The JBPHH PWD maintains the JBPHH Community Water System network of water distribution pipes. However, the JBPHH PWD does not necessarily maintain the plumbing throughout homes and buildings, which we refer to as premise plumbing, even though the water in the pipes is the same drinking water. For example, the JBPHH PWD does not own or maintain the homes in the military family housing neighborhoods on JBPHH. Instead, the housing managers who manage the military family housing on JBPHH own and maintain the premise plumbing in the homes.

2. (U) The Red Hill Well Pump Station, the Red Hill Well, and the Water Development Tunnel

~~(CUI)~~ The Navy placed the Red Hill well in service on April 6, 1943. During the construction of the Red Hill BFSF, the Red Hill well pump station and the Red Hill well were built inside the Red Hill BFSF. [redacted][27] See Figure 2 for a depiction of the Red Hill well pump station inside the Red Hill BFSF.



(U) Figure 2. The Red Hill Well Pump Station in the Red Hill BFSF
(U) Source: The DoD OIG, based on a figure provided by NAVFAC Pacific.

(U) Note: The Red Hill BFSF includes 20 underground storage tanks (USTs) to store fuel.

~~(CUI)~~ The Red Hill well pump station is a room with [redacted] pumps used to draw water from the groundwater well and a circular entrance to the well shaft protected by an oil-tight hatch. Additionally, the Red Hill well pump station includes electrical equipment for the pumps and systems to disinfect and treat the groundwater to meet drinking water quality standards.

[27] (U) Navy officials decided to install the Red Hill well during construction of the Red Hill BFSF because they already had excavating equipment on site. Additionally, Navy officials decided that locating the Red Hill well inside the Red Hill BFSF provided an opportunity to replace the aging Halawa well located in another part of the JBPHH Community Water System.

~~(CUI)~~ The Red Hill BFSF and the Red Hill well pump station are accessed by entrances called adits.[28] To access the Red Hill well pump station, Navy officials enter the lower access tunnel (LAT) of the Red Hill BFSF through Adit 3. [redacted]

(U) Figure 3. The Adit 3 Wye in the Red Hill BFSF
(U) Source: Commander, U.S. Pacific Fleet (COMPACFLT), "Command Investigation into the 6 May 2021 and 20 November 2021 Incidents at Red Hill Bulk Fuel Storage Facility," June 13, 2022, modified and labeled by the DoD OIG.

~~(CUI)~~ Note: The LAT splits at the Adit 3 Wye. The large black fuel pipelines shown on the left side of the image turn down the harbor tunnel [redacted]. On the right side of the picture, the LAT continues [redacted] to Adit 3. [redacted]

[28] (U) An adit is a horizontal passage leading into an underground facility or tunnel for the purpose of access or drainage. The approximately 7 miles of tunnels in the Red Hill BFSF also include the upper access tunnel and its branches, which provide physical access to the inside of the underground storage tanks (USTs) at the tops of the upper domes. A bridge connects the upper access tunnel to the internal support tower in each UST. Gauge galleries provide access to the tops of the upper domes of the USTs.

(U) Inside the Red Hill well pump station is the Red Hill well, which is a skimming well.[29] A skimming well includes a shaft that extends vertically into the water table with one or more horizontal water collection tunnels, also known as water development tunnels, towards the bottom of the well shaft. A water development tunnel was excavated at the bottom of the shaft when the Red Hill well was built.

(U) Water development tunnels are designed to collect groundwater. Once groundwater collects in the water development tunnel, the skimming well skims water from the top layer of water inside the water development tunnel. The top layer of water is pumped up through the well shaft via suction piping.

~~(CUI)~~ As shown in Figure 4, the Red Hill well pumps draw water from a [redacted] deep well shaft via suction piping. Near the bottom of the Red Hill well shaft is the water development tunnel. Groundwater flows continuously into the water development tunnel, which [redacted] follows the water path.[30]

[redacted]

(U) Figure 4. The Red Hill Well and the Water Development Tunnel
(U) Source: The U.S. Environmental Protection Agency, modified and labeled by the DoD OIG.

[29] (U) Skimming wells, also known as a Maui-type wells, are necessary in low-lying locations near sea level, including on islands such as Oahu. Since these low-lying areas are at or near sea level, well pumps might unintentionally pump salty sea water that naturally infiltrates the ground. The water development tunnels allow lighter, fresh groundwater and heavier salt water to naturally separate so the pumps can skim only the fresh water from the top layer.

[30] (CUI) The Red Hill well water development tunnel is connected [redacted] down the vertical well shaft. [redacted]. The tunnel heads east from the well toward the USTs. [redacted]

C. (U) Description of the Red Hill BFSF

(U) The Red Hill BFSF includes 20 underground storage tanks (USTs) to store fuel. Each UST is assigned a number from 1 to 20. The USTs were field constructed, meaning that they were constructed on site and were not pre-fabricated tanks. Each UST can store approximately 12.5 million gallons of fuel.[31]

(U) As previously discussed, the Red Hill BFSF is accessed by adits and includes approximately 7 miles of tunnels, including the LAT. The LAT is centered between the two rows of USTs. The LAT and its branches, including the harbor tunnel, are located at the bottom of the USTs. The LAT and its branches contain, among other things: (1) fuel pipelines, (2) a narrow train track and a battery-powered locomotive and cart, (3) a fire protection system, and (4) several types of sump pits.[32]

(U) The bottoms of the USTs are located approximately 100 feet above the Southern Oahu Basal Aquifer, as shown in Figure 5. The Southern Oahu Basal Aquifer is a sole-source groundwater aquifer that is the principal source of drinking water for Oahu. Water from this aquifer collects in the Red Hill well water development tunnel. Therefore, the Red Hill well draws its water from this aquifer. The Southern Oahu Basal Aquifer is also a source of drinking water for the Honolulu Board of Water Supply.[33]

[redacted]

(U) Figure 5. Red Hill Bulk Fuel Storage Facility Underground Storage Tanks in Relation to the Southern Oahu Basal Aquifer
(U) Source: NAVSUP FLC PH.

[31] ~~(CUI)~~ The Red Hill BFSF occupies [redacted] the Red Hill ridge, from where it gets its name. [redacted] Each UST is a 100-foot-diameter vertical cylinder with a dome-shaped top (upper dome) and bottom (lower dome) and a total height of 250 feet. The USTs are spaced 200 feet apart (center to center) in two rows parallel to the Red Hill ridge in which they were constructed. The UST walls are 2 ½-foot to 4-foot thick reinforced concrete. The interiors of the UST walls are lined with ¼-inch steel plates, except for the lower domes, which are lined with ½-inch steel plates. Each UST contains an internal support tower at its center.

[32] (U) We describe the purpose and function of the sump pits in the next section.

[33] (U) The Honolulu Board of Water Supply manages Oahu's municipal water resources and drinking water distribution system.

D. (U) Co-Located Infrastructure

(U) As shown in Figure 2, the Red Hill BFSF and the Red Hill well are co-located and therefore can interface in a fuel incident. In this section, we discuss locations where fuel can cross an interface at the:

- (U) groundwater sump pit,
- (U) Red Hill well water development tunnel, and
- (U) Red Hill BFSF fire protection system.

1. (U) The Groundwater Sump Pit

~~(CUI)~~ A sump pit is a pit or low space that collects liquids, such as water or fuel.[34] The Red Hill BFSF LAT contains several types of sump pits, each of which is intended to collect specific liquids, including fuel, groundwater, or aqueous film forming foam (AFFF).[35] There is a groundwater sump pit located in a low point of the LAT, [redacted] designed to collect naturally occurring groundwater.[36]

(U) Because the Red Hill BFSF tunnels are underground, naturally occurring groundwater, such as rainwater that seeps through the hill terrain after a rainstorm, can collect in the tunnels. To prevent a build-up of groundwater in the LAT in low-lying areas, there is a network of subsurface drains, referred to as French drains, that collect the groundwater and direct it to the groundwater sump pit.

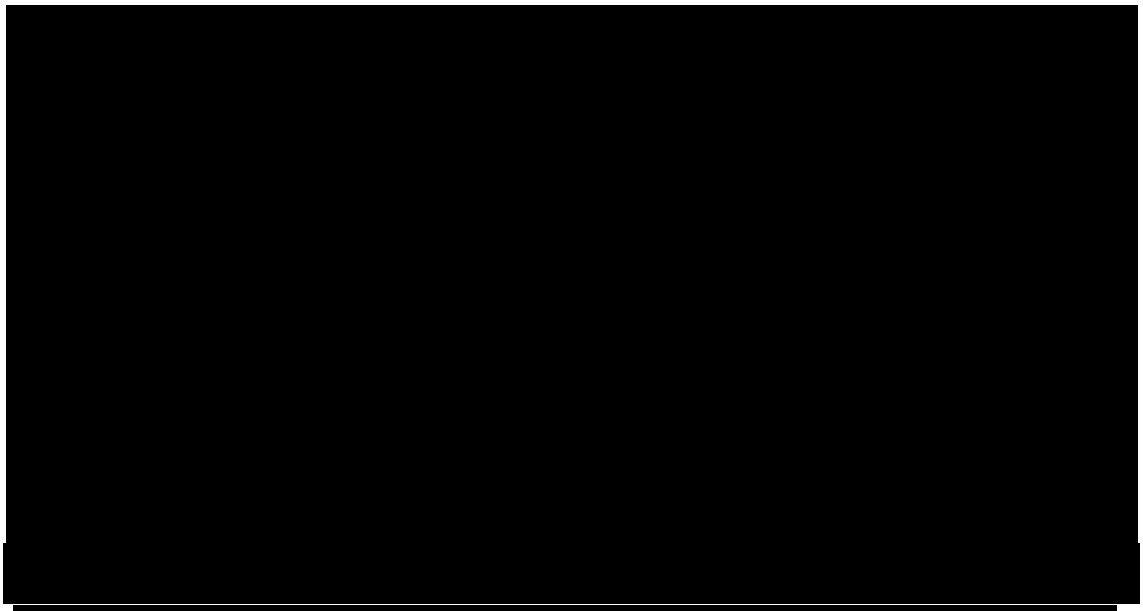
[34] (U) Any area that is lower than the surrounding area can be considered a sump pit; however, the construction and maintenance of each type of sump pit depend on its purpose. For example, a sump pit intended to collect and contain fuel to protect the environment must be constructed and maintained to ensure it is liquid-tight. Liquids collect in sump pits by various means. Any liquid flowing over ground nearby can flow into a sump pit from openings, such as grates, in the top of the sump pit. Additionally, liquids can be directed to sump pits through drainage systems, such as floor trenches that collect liquid flowing over ground and channel it to the sump pit. Furthermore, liquids can collect in subsurface drains and subsequently be directed to sump pits via those drains. In such cases, the subsurface drain pipes penetrate the side wall of the sump pit, creating an opening in the side of the sump pit that allows liquids from the pipes to flow into the sump pit. Each sump pit in the LAT is equipped with sump pumps that are intended to pump liquids out of the sump pits via pipes to removal and disposal points that are appropriate for the type of liquid. For example, some sump pits and sump pumps are intended to collect and remove uncontaminated groundwater, while others are intended to collect and remove unintentional fuel releases.

[35] (U) AFFF is a fire suppressant foam used by firefighters at military installations, civilian airports, and local fire departments to fight petroleum-based fires. When AFFF is applied to petroleum-based fires, it forms a film that restricts oxygen to the fire and extinguishes the flames.

[36] (U) Throughout this report, when we refer to the groundwater sump pit, we are referring to this specific sump pit.

~~(CUI)~~ The French drains are 6-inch-diameter horizontal pipes underneath the LAT floor. Each French drain has openings on the top that allow groundwater to flow into the pipe. The solid bottom of the French drain pipe allows the groundwater to collect and flow toward the groundwater sump pit, and then two pumps in the groundwater sump pit send the collected groundwater via a pipe to a leach field system outside [redacted].[37]

(U) Because the French drains and the groundwater sump pit have openings for groundwater to flow in and out, they are designed to interface directly with the environment to manage the groundwater. Because fuel pipelines are nearby in the LAT, there is a potential for fuel to cross the interface to the environment via the groundwater sump pit and the French drains if a fuel release occurs from the nearby pipeline. See Figure 6 for a depiction of the groundwater sump pit in relation to Adit 3 and the Red Hill well pump station.



(U) Figure 6. The Red Hill Well Pump Station, the Water Development Tunnel, and the Groundwater Sump Pit in Relation to Adit 3 and the LAT in the Red Hill BFSF
(U) Source: The DoD OIG, based on figures provided by NAVFAC Hawaii and NAVSUP FLC PH.

[37] (U) A French drain is a sloped trench filled with a perforated pipe buried beneath layers of gravel. Liquids, such as naturally occurring groundwater, collect above the French drain. Gravity pulls the liquids through the gravel and into the perforated pipe, which acts as a pathway to take the liquids to a different location, such as a sump pit. We discuss the leach field system in DODIG-2025-011.

(U) Additionally, Navy officials told us that water used to cool the Red Hill well pumps drains into the groundwater sump pit via pipes from the Red Hill well pump station. Pumps are critical components in every pump station, including the Red Hill well pump station. Overheating of pump motors can lead to pump failure, so cooling systems are necessary to transfer excess heat away from the pump motor. Using water in an external cooling system is one way to cool a pump motor.

2. (U) The Red Hill Well Water Development Tunnel

(U) As previously discussed, a water development tunnel was excavated at the bottom of the shaft when the Red Hill well was built. The water development tunnel is designed to collect groundwater so that the Red Hill well pumps can draw the water into the JBPHH Community Water System.

~~(CUI)~~ Figure 6 depicts the water development tunnel in relation to the Red Hill well pump station, the Adit 3 Wye, the LAT, and the USTs. [redacted] Groundwater flows continuously into ~~t~~the water development tunnel. Because the water development tunnel has openings for groundwater to flow in, it is designed to interface directly with the environment to collect groundwater that is a source of drinking water for JBPHH. Because fuel pipelines are [redacted] above the water development tunnel in the LAT, there is a potential for fuel to cross the interface to the water development tunnel if a release occurs in the LAT.

3. (U) The Red Hill BFSF Fire Protection System

(U) NAVFAC Pacific officials commissioned a project, completed in 2019, to design and construct a fire protection system in the Red Hill BFSF.[38] Among other things, the project included an AFFF fire suppression system, including an AFFF fire suppression system in the LAT; and a system of five compartments in the LAT enclosing the access points to four USTs each with fire walls.[39]

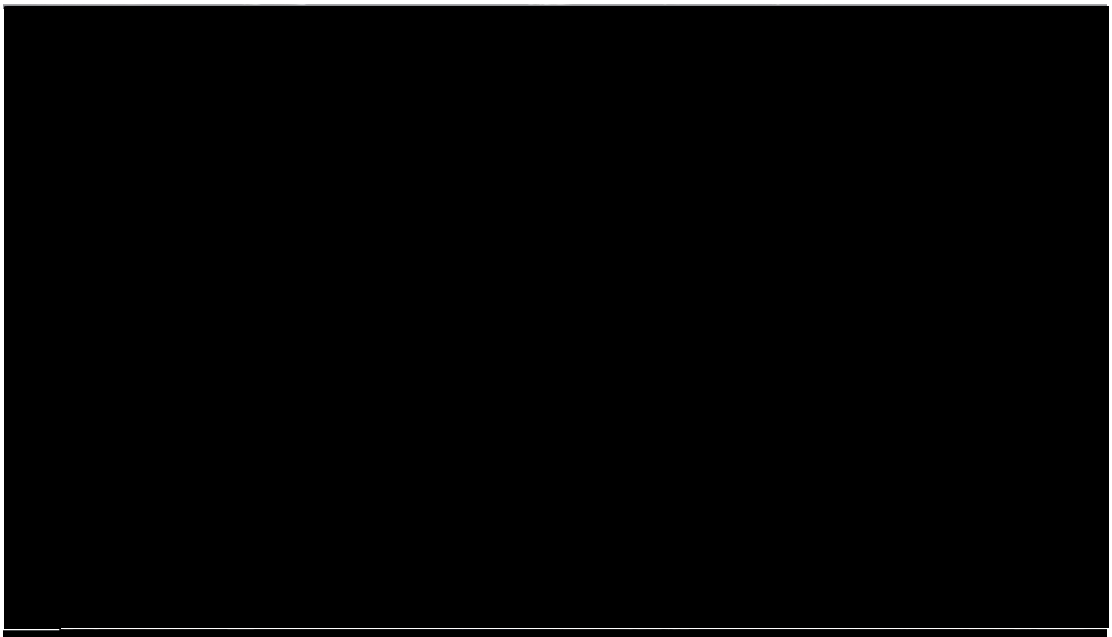
(U) The design of the Red Hill BFSF fire protection system included a system for collecting, transferring, and storing mixtures of fuel, water, and AFFF that could be released during a fire emergency. All five compartments of the LAT were designed with an AFFF sump pit.[40] The design of each of the five AFFF sump pits included AFFF sump pumps to transfer any liquids that collected in the AFFF sump pits. The AFFF sump pumps were designed to pump the fuel, water, and AFFF mixtures into an overhead AFFF drainage pipeline where the mixtures would flow to a

[38] ~~(CUI)~~ [redacted] A fixed fire protection system is a permanently installed system designed for use on the specific fire hazards it is expected to control or extinguish, such as a fire involving flammable liquids like fuel.
(U) We discuss this project in more detail in DODIG-2025-011.

[39] (U) The five compartments were designed to control the movement of smoke, heat, fuel, and fuel vapors during a fire and allow occupants to escape to a safer location.

[40] (U) As previously discussed, the Red Hill BFSF includes 20 vertical USTs. The project compartmentalized access to the USTs via the LAT in groups of four tanks in each compartment, for a total of five compartments. Each of the five compartments included one AFFF sump pit, for a total of five AFFF sump pits. Each of the five AFFF sump pits was equipped with four AFFF sump pumps. Figure 9 in the next section of this report shows the five AFFF sump pits.

(U) retention tank outside of Adit 3.[41] Figure 7 shows the overhead AFFF drainage pipeline in the LAT designed to carry fuel, water, and AFFF mixtures to the AFFF retention tank outside of Adit 3.



(U) Figure 7. Overhead AFFF Drainage Pipeline in the Red Hill BFSF LAT
(U) Source: The DoD OIG.

(U) Because some parts of the Red Hill BFSF fire protection system, such as the AFFF sump pits, are co-located in the LAT with the Red Hill BFSF fuel system equipment, there are interfaces between the fire protection and fuel systems. For example, the AFFF sump pits are intended to collect large-volume releases of AFFF fire suppressant during a fire incident. However, because sump pits can collect any liquid flowing nearby, unintentional releases of fuel that do not cause a fire can also collect in the AFFF sump pits.

(U) In Part III, we describe the fuel incident that occurred in May 2021 during which fuel was pumped into the overhead AFFF drainage pipeline from an AFFF sump pit. Additionally, we will explain how the fuel remained unnoticed in the overhead AFFF drainage pipeline until it was released during the November 2021 fuel incident.

[41] (U) The overhead AFFF drainage pipeline is also referred to as an AFFF retention pipeline. A retention structure, such as a retention pipeline or a retention tank, is designed to collect and prevent the release of a liquid to retain the liquid.

III. (U) Fuel Incidents at the Red Hill BFSF that Contaminated Drinking Water at JBPHH

(U) In this section, we describe the fuel incidents at the Red Hill BFSF that caused drinking water contamination incidents at JBPHH. These incidents are relevant to our analysis of the November 2021 drinking water contamination incident discussed in Parts V and VI.

A. (U) 1948 Fuel Incident and Drinking Water Contamination Incident

(U) Fuel contaminated the Red Hill well in 1948 and the Red Hill well was taken offline for 68 days while Navy officials cleaned up the contamination using a water flush.

~~(CUI)~~ In 1948, 500 gallons of fuel leaked in the Red Hill Bulk BFSF LAT [redacted] The incident contaminated the Red Hill well with fuel. Navy officials determined that fuel leaked into openings created when they drilled through the LAT in 1945, and that fuel flowed directly into the water development tunnel.[43] The Red Hill well was taken offline from February 19, 1948, to April 27, 1948, while Navy officials cleaned up the contamination using a water flush. In Part V, we discuss how this incident directly affected the Red Hill well infrastructure and likely contributed to the November 2021 drinking water contamination.

[42] (U) A 1949 Fourteenth Naval District report we reviewed described multiple incidents at the Red Hill BFSF. In 1979, the Fourteenth Naval District was disestablished, and the primary duties were assigned to Command Naval Base Pearl Harbor, Hawaii. We concluded that these duties passed to the JBPHH installation command and the JBPHH PWD after joint basing.

(U) Fourteenth Naval District Public Works Office, "Technical Study of Possibility of Contamination of Basal Water Sources from the Red Hill Underground Fuel Oil Storage," June 28, 1949.

[43] (U) We discuss this incident in more detail and explain why Navy officials drilled through the LAT in 1945 in Part V.

B. (U) May 2021 Fuel Incident

(U) On May 6, 2021, at approximately 6:10 p.m., a NAVSUP FLC PH employee heard a loud noise in the Red Hill BFSF LAT.[44] The employee investigated the area and identified a fuel release near Red Hill BFSF UST #20. NAVSUP FLC PH and NAVFAC Hawaii officials entered the LAT to investigate and observed that the AFFF sump pit located closest to the release was filled with JP-5 fuel. As previously discussed, the AFFF sump pits were designed to collect and transfer mixtures of fuel, water, and AFFF that could be released during a fire emergency. However, because sump pits can collect any liquid flowing nearby, unintentional releases of fuel that do not cause a fire can also collect in the AFFF sump pits. NAVSUP FLC PH and NAVFAC Hawaii officials told us that they assumed that all of the released JP-5 fuel was contained in the AFFF sump pit and that their inspection of the AFFF sump pit system found no indication that the AFFF sump pumps turned on and removed any fuel from the AFFF sump pit. We discuss the AFFF sump pumps operation in more detail in DODIG-2025-011.

(U) That evening, NAVSUP FLC PH officials conducting the nightly fuel inventory noted that their monitoring system recorded a significant tank level drop in Red Hill BFSF UST #12 at the approximate time the NAVSUP FLC PH employee heard the loud noise.[45] Accordingly, NAVSUP FLC PH officials entered a daily loss of 20,139 gallons of JP-5 fuel in their inventory and accounting system. NAVSUP FLC PH officials told us that they assumed the missing 20,139 gallons of JP-5 fuel was somewhere in the JP-5 pipeline and did not conduct any further investigation.

[44] (U) The Navy later determined that the May 2021 fuel incident occurred because the control room operator misaligned valves by opening and closing valves out of order during an operation, and contributing factors included improper setpoints for the "out-of-balance" and low-pressure alarm in the AFHE and modifications in the JP-5 fuel pipeline that were not properly restrained. The valve misalignment caused a pressure surge in the system. A pressure surge is the increased pressure caused by a short-term or sudden increase in velocity of fluid in a pipeline. The combination of the pressure surge and the other contributing factors caused simultaneous events at Red Hill BFSF UST #18 and Red Hill BFSF UST #20 and the loud noise. Specifically, the JP-5 fuel pipeline near Red Hill BFSF UST #20 moved approximately 16 inches laterally, damaged an air duct, ruptured, and released JP-5 fuel. Additionally, a JP-5 fuel pipeline joint near Red Hill BFSF UST #18 failed and released JP-5 fuel. We based our description of the May 2021 fuel incident on the timeline described in a Vice Chief of Naval Operations (VCNO) command investigation report, which we describe later in this section of the report. We verified the timeline during our site visit interviews.

(U) VCNO, "Command Investigation into the 6 May 2021 and 20 November 2021 Incidents at Red Hill Bulk Fuel Storage Facility," June 13, 2022.

[45] (U) NAVSUP FLC PH officials monitor the DFSP JBPHH fuel systems and control fuel movement throughout the DFSP with automated fuel handling equipment (AFHE). The AFHE is monitored from a control room that is staffed 24 hours per day, 7 days per week in the underground pump house. The DFSP JBPHH AFHE is a supervisory control and data acquisition system consisting of computers, networked components, data communications, and graphical user interfaces. The DFSP JBPHH AFHE provides automated inventory management for fuel.

(U) Approximately 19,000 gallons of fuel missing from the May 2021 fuel incident was pumped into an overhead pipeline, where it remained undiscovered until November 2021.

(U) However, the AFFF sump pumps did turn on and pumped approximately 19,000 gallons of JP-5 fuel from the AFFF sump pit into the overhead AFFF drainage pipeline. The JP-5 fuel that was pumped into the overhead pipeline collected in a low point in the pipe. Because Navy officials did not realize that the sump pumps in the AFFF sump pit activated, the JP-5 fuel remained in the overhead pipeline.[46] In the next section, we discuss how this incident caused the November 2021 fuel incident and contributed to the drinking water contamination incident, with a figure depicting both the May 2021 and November 2021 fuel incidents.[47]

C. (U) November 2021 Fuel Incident and Drinking Water Contamination Incident

~~(CUI)~~ On November 20, 2021, at 4:50 p.m., the battery-powered locomotive and cart in the Red Hill BFSF LAT, driven by a NAVSUP FLC PH employee, struck a valve on a low-point drain in the overhead AFFF drainage pipeline.[48] The overhead AFFF drainage pipeline cracked, and a strong flow of fuel began to be released.[49] The fuel poured onto the LAT, [redacted], and began collecting in the groundwater sump pit [redacted]

(U) NAVSUP FLC PH officials evacuated the Red Hill BFSF, and officials from the CNRH Federal Fire Department (FFD) responded to the incident scene. CNRH FFD officials determined that the area was safe from fuel vapors approximately 5 hours after the incident began. NAVSUP FLC PH officials were unable to immediately isolate the pipeline and stop the release. Fuel continued to flow from the overhead AFFF drainage pipeline for approximately 34 hours and released an estimated 19,000 gallons of fuel into the LAT.[50]

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46 (U) The JP-5 fuel remained in the overhead AFFF drainage pipeline until November 20, 2021.

47 (U) "November 2021 fuel incident" refers to the fuel incident in the Red Hill BFSF and the efforts to stop the fuel release, perform the immediate clean-up of the fuel release, and report the fuel release.

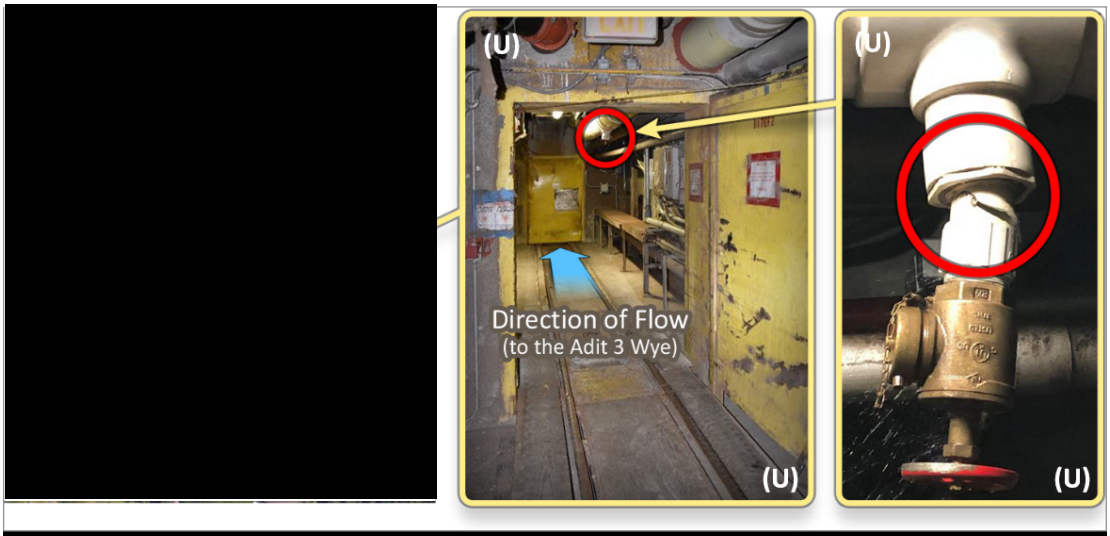
48 (U) A low-point drain is a drain, equipped with a valve, installed at a low point in a pipeline. The valve can be opened to drain any fluid that naturally collects and stagnates in low-lying portions of a pipeline.

49 (U) Navy officials told us that, at first, they did not know that the fluid released was fuel but later realized it was fuel. We discuss this in more detail in DODIG-2025-011.

50 (U) We based our conclusion that fuel flowed for approximately 34 hours on the timeline described in a VCNO command investigation report, which we describe later in this section of the report. We verified the timeline during our site visit interviews. Additionally, once Navy officials realized that the May 2021 and November 2021 fuel incidents were related, they recalculated the fuel volumes relevant to the fuel incidents. The VCNO command investigation report included the updated calculations. Specifically, Navy officials determined that the total JP-5 fuel spilled on May 6, 2021, was 20,957 gallons, the total JP-5 fuel recovered immediately after the May 2021 fuel incident was 1,580 gallons, and the maximum amount of JP-5 fuel that was pumped into the overhead AFFF drainage pipeline and remained there until it was released during the November 2021 fuel incident was 19,377 gallons. According to the VCNO command investigation report, 15,415 gallons of the 20,957 gallons had been recovered and a "total of 5,542 gallons of fuel remain[ed] unaccounted for, and some or all of that fuel contaminated the Red Hill well … ."

(U) The missing fuel from the May 2021 fuel incident was released over a period of approximately 34 hours and some of the fuel contaminated the Navy's drinking water system.

(U) Although Navy officials began pumping fuel out of the groundwater sump pit and into tanker trucks for disposal, fuel continued to fill the groundwater sump pit. Up to 5,542 gallons of fuel backed up into the French drain, seeped through the ground and into the Red Hill well water development tunnel located below the LAT, and contaminated the Red Hill well.[51] Figure 8 shows the overhead AFFF drainage pipeline and the crack in the pipeline from where the fuel flowed.

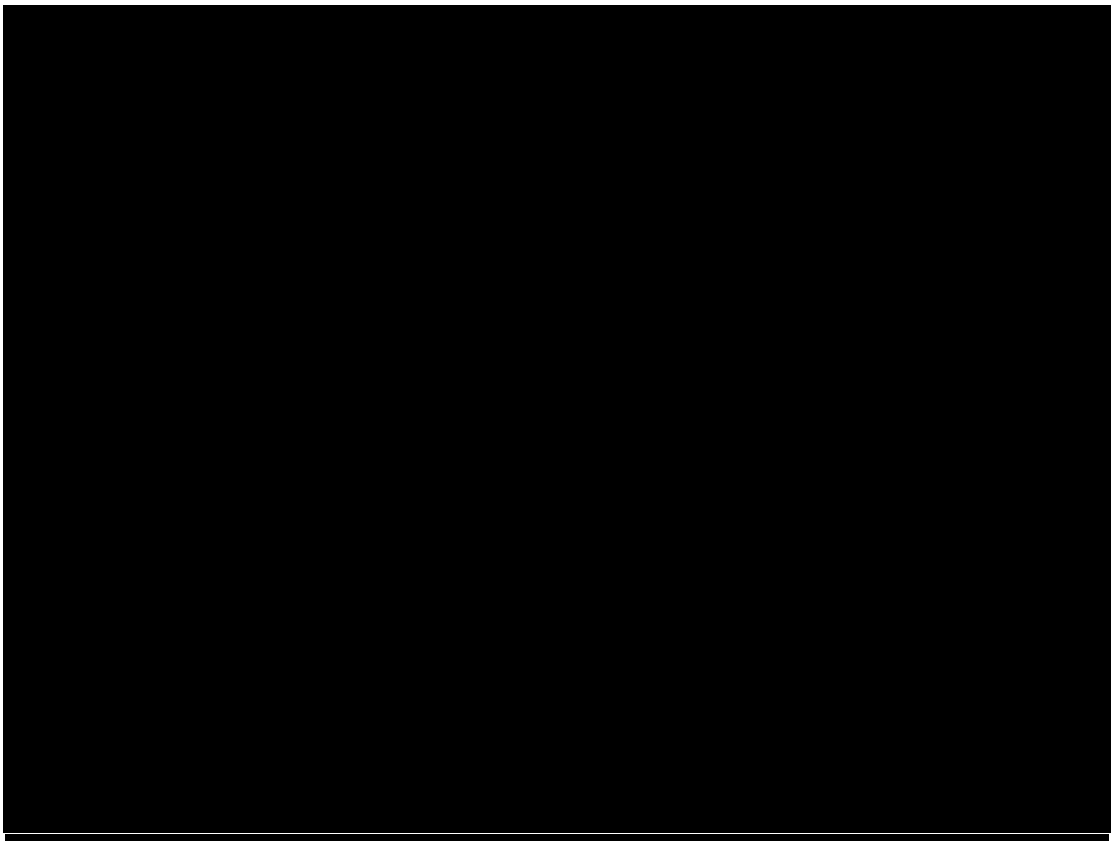


(U) Figure 8. November 20, 2021 Cracked Overhead AFFF Drainage Pipeline
(U) Source: The DoD OIG, based on figures provided by NAVFAC Hawaii and NAVSUP FLC PH and images from the Vice Chief of Naval Operations command investigation report, labeled by the DoD OIG.

(U) Note: At the time of the incident, the second fire door in the image in the center was open. Although the NAVSUP FLC PH employee driving the battery-powered locomotive and cart closed the door, fuel continued to flow under the door. Through this fire door is the Adit 3 Wye, as shown in Figure 3.

[51] (U) Later in this report, we explain that Navy officials told us that they did not know about the French drain at the time It was not until December 2021 that Navy officials began to suspect that the Red Hill well was contaminated when fuel in the groundwater sump pit backed up into the French drain, seeped through the ground and into the Red Hill well water development tunnel. Based on our evaluation, which included site visits to assess the infrastructure, reviews of historical Navy documentation, and reviews of engineering drawings of the Red Hill BFSF and the Red Hill well, we came to the same conclusion.

(U) By the morning of November 21, 2021, NAVSUP FLC PH officials realized that the JP-5 fuel missing from the fuel inventory after the May 2021 incident had been in the overhead AFFF drainage pipeline.[52] See Figure 9 for a depiction of the May 6, 2021 and November 20, 2021 fuel incidents in relation to each other.



(U) Figure 9. May 6, 2021 and November 20, 2021 Fuel Incidents in the Red Hill BFSF
(U) Source: NAVSUP FLC PH, modified by the DoD OIG.

(U) Note: Although the oil-tight door is shown in this image, it did not play a role in the May 6, 2021 and November 20, 2021 fuel incidents.

(U) On November 24, 2021, the Hawaii Department of Health (DOH) issued a letter of instruction to the CNRH requiring Navy officials to take specific "response measures concerning the release."

[52] (U) According to the VCNO command investigation report, the morning of November 21, 2021, was the first time the CNRH CO heard of the missing fuel, which was later reported to the Commander, U.S. Pacific Fleet (COMPACFLT) CO. On November 23, 2021, the COMPACFLT CO directed the COMPACFLT Director of Maritime Headquarters to conduct a command investigation to inquire into the May 6, 2021 and November 20, 2021 fuel incidents at the Red Hill BFSF.

(U) On November 27, 2021, a resident of Moanalua Terrace called the Command Duty Officer and complained of "a chemical smell in their water."[53] The Hawaii DOH and Navy officials became aware of the drinking water contamination on November 28, 2021, when an increasing number of residents began reporting complaints throughout the day.[54] Navy officials told us that, based on the content of the complaints and their knowledge of the recent fuel incident, they suspected that the November 20, 2021 fuel release might have contaminated the Red Hill well with JP-5 fuel.

(U) Navy officials ordered the Red Hill well to be isolated on the evening of November 28, 2021. On November 29, 2021, the Hawaii DOH issued a Drinking Water Health Advisory that advised "Navy water system consumers not to drink, consume tap water." By November 30, 2021, Navy officials had received more than 200 phone calls from 6 of the 26 family housing neighborhoods located on JBPHH.[55]

(U) On November 30, 2021, the Commander, U.S. Pacific Fleet (COMPACFLT) CO convened a COMPACFLT Water Crisis Action Team.[56] Between November 29, 2021, and December 13, 2021, Navy officials took drinking water samples at various locations for EPA-approved laboratory analysis.[57] On December 2, 2021, Navy officials took a sample of water from the Red Hill well, observed fuel in the water sample, and confirmed that the November 20, 2021 fuel incident at the Red Hill BFSF contaminated the Red Hill well.[58] On December 5, 2021, Navy divers entered the water development tunnel and saw fuel leaking from the ceiling.

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53 (U) Moanalua Terrace is an on-base Ohana Military Communities–Navy neighborhood. Ohana Military Communities is a privatized military housing community.

(U) The Command Duty Officer is responsible for receiving all administrative and emergency matters that occur after hours, informing leaders, and ensuring that any necessary responses occur.

54 (U) Although the first recorded complaint was in the evening of November 27, 2021, Hawaii DOH and Navy officials were not aware of the indicators of drinking water contamination until November 28, 2021, when an increasing number of residents began reporting complaints throughout the day. This timeline is based on the VCNO command investigation report and our site visit interviews.

55 (U) The six neighborhoods were Radford Terrace, Halsey Terrace, Catlin Park, Doris Miller, Moanalua Terrace, and Ohana Nui.

56 (U) COMPACFLT established three "lines of operation" for the Water Crisis Action Team to address: resident care and assistance, technical resolution of the contamination, and effective communications. Accordingly, COMPACFLT established five working groups to address the lines of operation: engineering, logistics, medical, joint information center, and policy and administration.

57 (U) The locations included community centers, child care centers, schools, and individual family housing units.

58 (U) On December 3, 2021, "after residents in the JBPHH area began reporting water contamination," the COMPACFLT CO modified the scope of the COMPACFLT command investigation to include a determination of whether the May 2021 and November 2021 fuel incidents contributed to or caused the drinking water contamination. The COMPACFLT command investigation was completed on January 20, 2022.

(U) COMPACFLT, "Command Investigation into the 6 May 2021 and 20 November 2021 Incidents at Red Hill Bulk Fuel Storage Facility," January 20, 2022.

(U) On December 6, 2021, the Hawaii DOH issued an Emergency Order to the Navy that required Navy officials to suspend all operations at the Red Hill BFSF, install a drinking water treatment system at the Red Hill well, perform an independent third-party assessment of the Red Hill BFSF, and defuel the Red Hill BFSF USTs.[59] On December 7, 2021, the Secretary of the Navy directed Navy officials to halt all operations at the Red Hill BFSF and continue isolating the Red Hill well.

(U) On December 8, 2021, DoD medical officials established an incident roster in the Defense Occupational and Environmental Health Readiness System (DOEHRS) to document the members of the affected community.[60]

(U) On December 17, 2021, EPA, Hawaii DOH, and DoD officials, including Navy and Army officials, jointly established an Interagency Drinking Water System Team (IDWST). The IDWST prepared the following plans in December 2021 and January 2022 to restore safe drinking water in 19 zones established across the JBPHH Community Water System service areas.

- (U) The Drinking Water Sampling Plan described the laboratory sampling required to determine whether the drinking water in the JBPHH Community Water System complied with Federal and state drinking water quality standards.[61] The Drinking Water Sampling Plan also included the criteria for the Hawaii DOH to clear the 19 zones. Once the Hawaii DOH cleared a zone, limitations on the use of drinking water in that zone ended.
- (U) The Drinking Water Distribution System Recovery Plan described the method and procedures for flushing the JBPHH Community Water System with clean drinking water by zone.[62]
- (U) The Single Family Home Flushing Plan and the Non-Residential Flushing Plan described the procedures for flushing the plumbing and appliances in buildings, including homes, on JBPHH.[63]

[59] (U) The Hawaii DOH's December 6, 2021 Emergency Order became a final order on January 3, 2022.

[60] (U) According to the Defense Health Agency (DHA), DOEHRS is a software system that allows the DoD to manage occupational and environmental health risk data. DOEHRS may be used to identify global and local health hazards, provide individual exposure information to occupational health professionals, and provide information for epidemiological studies. The Navy and Marine Corps Public Health Center (NMCPHC), an office within the Navy Bureau of Medicine and Surgery, is the Executive Agent for the DOEHRS. DoD medical officials established the Oahu Military Water Contamination Incident Report Registry in DOEHRS, which we refer to as the incident roster. DoD officials, including NMCPHC and COMPACFLT Water Crisis Action Team medical officials, told us that the incident roster in DOEHRS was intended to be an enduring record to archive the list, or roster, of people who may have been exposed to fuel-contaminated drinking water for future studies or data mining. The incident roster did not include specific health effects or exposure data.

[61] (U) IDWST, "Drinking Water Sampling Plan, JBPHH, Oahu, Hawaii," December 2021.

[62] (U) IDWST, "Drinking Water Distribution System Recovery Plan, JBPHH, Oahu, Hawaii," December 2021.

[63] (U) IDWST, "Single Family Home Flushing Plan Checklist and Standard Operating Procedures, JBPHH, Oahu, Hawaii," December 2021.

(U) IDWST, "Non-Residential Flushing Plan Checklist and Standard Operating Procedures, JBPHH, Oahu, Hawaii," January 2022.

- (U) The Red Hill Shaft Recovery and Monitoring Plan described the work to remove fuel contamination at the Red Hill well, to prevent migration of the contamination, and to remediate environmental impacts.[64]

(U) DoD officials told us that they executed the recovery and flushing plans between December 2021 and March 2022.[65] The Hawaii DOH began clearing zones beginning on February 14, 2022, and cleared the last zone on March 18, 2022. Additionally, according to documentation we reviewed, DoD medical officials provided direct medical care to members of the affected community during 6,138 medical encounters between November 28, 2021, and April 8, 2022.[66] During the drinking water contamination incident at JBPHH, laboratory testing of drinking water samples identified contaminants including petroleum hydrocarbons; chemicals in the benzene, toluene, ethylbenzene, and xylenes (BTEX) group of chemicals; and lead.[67] See Appendix C, for a description of these contaminants and their potential health effects.

(U) On January 4, 2022, in response to the drinking water contamination incident, NAVFAC Headquarters initiated a command investigation.[68] Additionally, on March 4, 2022, the Vice Chief of Naval Operations (VCNO) appointed the Director of the Military Personnel Plans and Policy Division to "gather additional facts concerning the Navy's response to both spills," which we refer to as the VCNO command investigation.[69]

(U) The Agency for Toxic Substances and Disease Registry (ATSDR) conducted an initial assessment of chemical exposures, including a health impact survey that was available from January 7 to February 10, 2022.[70]

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64 (U) IDWST, "Red Hill Shaft Recovery and Monitoring Plan (RHSRMP), JBPHH, Oahu, Hawaii," January 2022.

65 (U) We visited JBPHH in April 2022 and in July 2022. During our site visits, we saw that the work described in the Red Hill Shaft Recovery and Monitoring Plan was ongoing.

66 (U) As previously discussed, COMPACFLT established the Water Crisis Action Team and working groups, one of which was a medical working group referred to as the Joint Health Services Working Group. According to documentation we reviewed from the Joint Health Services Working Group, the data were sourced from the Tripler Army Medical Center, Naval Health Clinic Hawaii, Schofield Clinic, Task Force Ohana, Emergency Family Assistance Center, and Defense Health Agency Market. Medical encounters for members of the affected community who sought medical care from non-DoD health care facilities were not included in the count of DoD medical encounters.

67 (U) Fuels, such as JP-5, are petroleum products made from crude oil and hydrocarbons.

68 (U) NAVFAC, "Command Investigation of Drinking Water Systems on Oahu," February 10, 2022. We refer to this report as the NAVFAC command investigation report.

69 (U) Vice Chief of Naval Operations memorandum, "Supplement to Command Investigation into the 6 May 2021 and 20 November 2021 Incidents at Red Hill Bulk Fuel Storage Facility," March 4, 2022.

(U) Vice Chief of Naval Operations, "Command Investigation into the 6 May 2021 and 20 November 2021 Incidents at Red Hill Bulk Fuel Storage Facility," June 13, 2022.

(U) The VCNO command investigation report was completed on June 13, 2022. The investigation incorporated, updated, and modified information and conclusions from the COMPACFLT command investigation.

70 (U) The ATSDR is a Federal public health agency that aims to protect communities from harmful health effects related to exposure to natural and artificially made hazardous substances. The ATSDR investigates emerging environmental health threats; conducts scientific research; and prepares information for Federal and state agencies, the health care and environmental community, and the public.

(U) On March 7, 2022, the Secretary of Defense ordered the permanent closure of the Red Hill BFSF.

(U) During April 4–8, 2022, officials at the EPA Office of Enforcement and Compliance Assurance, National Enforcement Investigations Center (NEIC), performed a Safe Drinking Water Act (SDWA) civil investigation of the JBPHH Community Water System.[71]

(U) On May 6, 2022, the Hawaii DOH issued another Emergency Order to the Navy that required Navy officials to maintain the suspension of all operations at the Red Hill BFSF, maintain the drinking water treatment system at the Red Hill well, take steps to recover the Red Hill well as a source of drinking water, submit an independent third-party assessment of the Red Hill BFSF, and submit a phased plan for defueling and closing the Red Hill BFSF.[72]

(U) On July 19, 2022, the IDWST approved the Drinking Water Long-Term Monitoring Plan to describe the laboratory sampling that will determine whether the drinking water in the JBPHH Community Water System remains in compliance with Federal and state drinking water quality standards for the long-term.[73]

(U) In July 2022, the ATSDR began a public health assessment to evaluate existing environmental and health data on releases from the Red Hill facility since 2005.[74] On November 16, 2022, the Defense Health Agency (DHA) requested ATSDR assistance to conduct a detailed review of the medical records of the members of the affected community with "persistent, worsening, or new symptoms or conditions attributed to" the drinking water contamination incident.

(U) On January 3, 2023, the DHA opened the Red Hill Clinic at JBPHH for patients "experiencing chronic symptoms that may be related to the Red Hill fuel spill."

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71 (U) Congress passed the SDWA in 1974 to protect public health by regulating the nation's public drinking water supply. The law, amended in 1986 and 1996, requires many actions to protect drinking water. The SDWA gives the EPA authority to issue and enforce regulations to implement the SDWA.

72 (U) The May 6, 2022 Hawaii DOH Emergency Order superseded the December 6, 2021 Hawaii DOH Emergency Order.

73 (U) IDWST, "Drinking Water Long-Term Monitoring Plan," June 2022.
(U) The Drinking Water Long-Term Monitoring Plan superseded the long-term monitoring procedures described in the December 2021 Drinking Water Sampling Plan.

74 (U) According to the ATSDR, a public health assessment evaluates levels of hazardous substances, how and whether people might be exposed to contamination, and what levels of a toxic substance might harm people. According to the ATSDR, the public health assessment is expected to take several years. As of May 2024, the ATSDR's website for the public health assessment indicated that the assessment was ongoing.

(U) On June 2, 2023, the EPA Region 9, DLA, and CNRH, on behalf of the Navy, entered into an Administrative Consent Order (ACO), which we refer to as the 2023 ACO.[75] The 2023 ACO required DLA and Navy officials to take specific actions to defuel and close the Red Hill BFSF infrastructure and to properly operate and maintain the JBPHH Community Water System to protect the environment and human health.[76]

(U) On December 22, 2023, section 1092 of the FY 2024 National Defense Authorization Act (NDAA) required the Secretary of Defense to review the programs and services available to members of the affected community and to review current research on fuel exposure to identify additional research needs.[77] Additionally, section 1092 of the FY 2024 NDAA required the Secretary of Defense to submit to Congress seven annual reports regarding "Red Hill health impacts" that include:

- (U) "strategies for communicating and engaging with stakeholders";
- (U) the number of affected community members;
- (U) "measures and frequency of follow-up to collect data and specimens related to exposure, health, and developmental milestones as appropriate"; and
- (U) "a summary of data and analyses on exposure, health, and developmental milestones for impacted individuals."

(U) Furthermore, the FY 2024 NDAA required the Secretary of Defense to submit results of a "feasibility assessment to determine the necessity of an epidemiological health outcomes study."

(U) On January 9, 2024, DHA officials announced that they were in the early stages of setting up an independent registry, operated by a third party, for the affected community. Everyone who was potentially exposed to contaminated drinking water will be eligible to join the registry, regardless of their affiliation with the DoD. According to the DHA website, the purpose of the registry is to "track [individual] health over time, investigate any health effects, and provide information and support to those potentially exposed during the Red Hill fuel release."

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[75] (U) EPA Region 9, "Red Hill Bulk Fuel Storage Facility Defueling, Closure, and Joint Base Pearl Harbor-Hickam Drinking Water System 2023 Consent Order," June 2, 2023.

(U) The EPA Region 9, Hawaii DOH, DLA, and CNRH entered into an earlier Administrative Order on Consent (AOC) on May 27, 2015, in response to a January 2014 fuel incident associated with one of the Red Hill BFSF USTs, which we refer to as the 2015 AOC. This order required DLA and Navy officials to take specific actions to prevent future releases and improve Red Hill BFSF infrastructure to protect the environment and human health. We discuss the 2015 AOC in DODIG-2025-011.

[76] (U) The 2023 ACO did not replace the 2015 AOC. As of October 2023, EPA Region 9, Hawaii DOH, DLA, and CNRH officials were working together to clarify the 2015 AOC scope of work. Specifically, officials were working together to eliminate work that will no longer be relevant or required due to the planned closure of the Red Hill BFSF and to consolidate ongoing work to investigate and remediate fuel releases under the 2015 AOC scope of work.

[77] (U) Public Law 118-31, the H.R.2670-National Defense Authorization Act for Fiscal Year 2024 (FY 2024 NDAA), was enacted on December 22, 2023.

(U) The FY 2024 NDAA required the Secretary of Defense to perform these reviews in coordination with the Director of the Centers for Disease Control and Prevention, the Secretary of Veterans Affairs, and appropriate state and local authorities.

D. (U) Chronology of Events

(U) Table 1 provides a chronology of events for the drinking water contamination incident at JBPHH.

(U) Table 1. Chronology of Events

(U)	Date	Description
1	May 6, 2021	A fuel incident occurred at the Red Hill BFSF. JP-5 fuel filled the AFFF sump pit near the incident. The AFFF sump pumps activated and pumped much of the fuel into the overhead AFFF drainage pipeline.
2	Approximately 4:50 p.m. November 20, 2021	A battery powered locomotive and cart in the Red Hill BFSF LAT struck and cracked a valve on a low point drain in the overhead AFFF drainage pipeline, which released fuel that had been in the overhead AFFF drainage pipeline since May 6, 2021.
3	Between approximately 4:50 p.m. November 20, 2021, and approximately 3:00 a.m. November 22, 2021	Fuel flowed from the overhead AFFF drainage pipeline into the groundwater sump pit. This was the first opportunity to activate the JBPHH Community Water System Emergency Response Plan (ERP).
4	Approximately 3:00 a.m. November 22, 2021	NAVSUP FLC PH officials stopped the flow of fuel from the overhead AFFF drainage pipeline.
5	November 23, 2021	The COMPACFLT CO directed a command investigation of the May 6, 2021 and November 20, 2021 fuel incidents.
6	November 24, 2021	Fuel reappeared in the groundwater sump pit. This was the second opportunity to activate the JBPHH Community Water System ERP. Navy officials did not test for floating fuel during scheduled groundwater testing at the Red Hill well. This was the third opportunity to activate the JBPHH Community Water System ERP.
7	November 27, 2021	A resident of JBPHH complained of "a chemical smell in their water," but no action was taken.
8	November 28, 2021	The JBPHH PWD help desk began receiving repeated calls about chemical or fuel smells in the drinking water. That evening, Navy officials ordered JBPHH PWD officials to turn off the Red Hill well pumps and isolate the Red Hill well from the JBPHH Community Water System. This was the fourth opportunity to activate the JBPHH Community Water System ERP.
9	November 29, 2021	The Hawaii DOH issued a Drinking Water Health Advisory that advised "Navy water system consumers not to drink, consume tap water."
10	November 30, 2021	The COMPACFLT CO convened the Water Crisis Action Team.
11	December 2, 2021	Navy officials confirmed that the Red Hill well was contaminated with JP-5 fuel. **(U)**

(U) Table 1. Chronology of Events (cont'd)

(U)	Date	Description
12	December 5, 2021	Navy divers entered the water development tunnel and saw fuel leaking from the ceiling.
13	December 6, 2021	The Hawaii DOH issued an Emergency Order to the Navy that required Navy officials to suspend all operations at the Red Hill BFSF, install a drinking water treatment system at the Red Hill well, perform an independent third-party assessment of the Red Hill BFSF, and defuel the Red Hill BFSF USTs. The Hawaii congressional delegation requested that the DoD OIG conduct a "comprehensive, holistic evaluation to assess the overall safety of the Red Hill Bulk Fuel Storage Facility."
14	December 7, 2021	The Secretary of the Navy directed Navy officials to halt all operations at the Red Hill BFSF and continue isolating the Red Hill well.
15	December 8, 2021	DoD medical officials established an incident roster in the Defense Occupational and Environmental Health Readiness System (DOEHRS) to document the members of the affected community.
16	December 17, 2021	The IDWST was created with Navy, Army, EPA, and Hawaii DOH representatives.
17	December 20, 2021	The Navy began implementing the IDWST plans to restore safe drinking water by flushing the water distribution system according to the IDWST's Drinking Water Distribution System Recovery Plan. The DoD OIG announced this evaluation.
18	January 4, 2022	NAVFAC Headquarters initiated a command investigation.
19	January 20, 2022	The COMPACFLT command investigation was completed.
20	February 10, 2022	The NAVFAC Headquarters command investigation was completed.
21	February 14, 2022	The Hawaii DOH removed drinking water restrictions for the first of 19 zones established across the JBPHH Community Water System service areas.
22	March 4, 2022	The VCNO directed Navy officials to gather additional facts to supplement the COMPACFLT command investigations.
23	March 7, 2022	The Secretary of Defense ordered the permanent closure of the Red Hill BFSF and requested a plan of actions and milestones from the Secretary of the Navy and Director of the DLA.
24	March 18, 2022	The Hawaii DOH removed drinking water restrictions from the last of 19 zones established across the JBPHH Community Water System service areas. **(U)**

(U) Table 1. Chronology of Events (cont'd)

(U)	Date	Description
25	April 4–8, 2022	EPA Office of Enforcement and Compliance Assurance, National Enforcement Investigations Center (NEIC) officials performed a Safe Drinking Water Act (SDWA) civil investigation of the JBPHH Community Water System.
26	May 6, 2022	The Hawaii DOH issued another Emergency Order to the Navy that required Navy officials to maintain the suspension of all operations at the Red Hill BFSF, maintain the drinking water treatment system at the Red Hill well, take steps to recover the Red Hill well as a source of drinking water, submit an independent third-party assessment of the Red Hill BFSF, and submit a phased plan for the defueling and closure of the Red Hill BFSF.
27	June 13, 2022	Navy officials completed the VCNO command investigation report into the 2021 incidents.
28	July 19, 2022	The IDWST approved the Drinking Water Long-Term Monitoring Plan.
29	July 2022	The Agency for Toxic Substances and Disease Registry (ATSDR) began a public health assessment to evaluate existing environmental and health data on releases from the Red Hill facility since 2005.
30	November 16, 2022	The Defense Health Agency (DHA) requested ATSDR assistance to conduct a detailed review of the medical records of the members of the affected community with "persistent, worsening, or new symptoms or conditions attributed to" the drinking water contamination incident.
31	January 3, 2023	The DHA opened the Red Hill Clinic at JBPHH for patients "experiencing chronic symptoms that may be related to the Red Hill fuel spill."
32	June 2, 2023	In response to the November 2021 fuel and drinking water incident, EPA Region 9, the DLA, and the Navy, acting by and through the CNRH, entered into the 2023 ACO.
33	December 22, 2023	The FY 2024 National Defense Authorization Act required the Secretary of Defense to meet specific public health requirements related to the drinking water contamination incident.
34	January 9, 2024	DHA officials announced that they were in the early stages of setting up an independent registry, operated by a third party, to track individual health over time, investigate any health effects, and provide information and support to those potentially exposed to drinking water contamination. **(U)**

(U) Source: The DoD OIG.

IV. (U) Requirements, Roles, and Responsibilities

(U) In this section, we discuss Federal and state laws, regulations, and DoD policies relevant to the findings and recommendations in this report. Additionally, we provide a summary of the Navy's incident response plans required by Federal and state laws and Navy policy. Furthermore, we discuss the organizations, roles, and responsibilities relevant to the findings and recommendations in this report.

A. (U) Federal and State Laws and Regulations, DoD Policies, and Incident Response Plans

(U) Federal and state entities enacted laws and issued regulations relevant to drinking water quality and bulk fuel management. Additionally, the DoD and the Navy issued policies and guidance relevant to the objective of our evaluation. The findings in this report are based, in part, on the following laws, regulations, and policies. Additionally, Appendix A provides a list of laws, regulations, and policies we reviewed during this evaluation.

- (U) The Safe Drinking Water Act (SDWA) was passed to protect public health by regulating the nation's public drinking water supply.[78] The EPA issues regulations to implement the SDWA, including title 40 Code of Federal Regulations (CFR) part 141, which establishes the National Primary Drinking Water Regulations (NPDWR). Additionally, the EPA grants states and local governments the authority to implement and oversee compliance with the SDWA and its regulations when those states incorporate Federal requirements into state regulations, meet certain EPA requirements, and are at least as stringent as the EPA. Under the authority of the SDWA, the EPA granted the State of Hawaii the authority to regulate drinking water by delegating primary enforcement responsibility, also called primacy, to the State. Accordingly, Hawaii Administrative Rules (HAR) chapters 11-19, 11-20, 11-21, and 11-25 include requirements applicable to the JBPHH Community Water System.[79] Additionally, the America's Water Infrastructure Act was passed to protect drinking water systems and requires community water system owners and operators to develop or update risk and resilience assessments and emergency response plans.[80]

[78] (U) Chapter 6A, subchapter XII, title 42, United States Code, "Safe Drinking Water Act.''
(U) Congress originally passed the SDWA in 1974. The law, amended in 1986 and 1996, requires many actions to protect drinking water. The SDWA gives the EPA authority to issue and enforce regulations to implement the SDWA.

[79] (U) HAR, chapter 11-19, "Emergency Plan for Safe Drinking Water."
(U) HAR, chapter 11-20, "Rules Relating to Public Water Systems."
(U) HAR, chapter 11-21, "Cross-Connection and Backflow Control."
(U) HAR, chapter 11-25, "Rules Relating to Certification of Public Water System Operators."

[80] (U) Public Law 115-270, "America's Water Infrastructure Act."
(U) On October 23, 2018, the America's Water Infrastructure Act was signed into law.

- (U) United Facilities Criteria (UFC) provide planning, design, construction, sustainment, restoration, and modernization criteria applicable to the Military Departments. UFC 3-230-02 is "a comprehensive operations and maintenance manual" for community water systems, including how often inspections and preventive maintenance should occur for community water system infrastructure components, such as drinking water ground storage tanks and water development tunnels.[81]
- (U) Chief of Naval Operations Instruction (OPNAVINST) 5090.1E states that all Navy commands must "ensure the Navy conducts its mission in an environmentally responsible manner … ," implement the policy guidance in Naval Operations Manual 5090.1 (OPNAV M-5090.1) into their operations, and comply with applicable Federal and state environmental laws and regulations and DoD policies.[82] Each chapter of OPNAV M-5090.1 covers a specific environmental readiness program area. The OPNAV M-5090.1 chapters relevant to the findings in this report include requirements for drinking water quality, oil pollution prevention, and incident response.
- (U) Navy Bureau of Medicine and Surgery Instruction (BUMEDINST) 6240.10C provides policy and guidance, and assigns roles and responsibilities, for drinking water quality to Navy medical officials.[83] Manual of Naval Preventive Medicine (NAVMED) P-5010-5 provides public health and preventive medicine guidance for Navy community water systems, including guidance for responding to drinking water contamination.[84]
- (U) DoD Instruction (DoDI) 6055.20 "establishes policy, assigns responsibilities, and establishes procedures for assessing significant long-term health risks from past environmental exposures to military personnel and civilian individuals from living or working on military installations."[85]

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81 (U) UFC 3-230-02, "Operation and Maintenance: Water Supply Systems (2021)," December 10, 2019 (Incorporating Change 1, April 1, 2021).

(U) The DoD's Unified Facilities Criteria Program unifies all technical criteria and guide specifications pertaining to planning, design, construction, and operation and maintenance of real property facilities, including the JBPHH Community Water System. According to the DoD's Unified Facilities Criteria Program website, the program streamlines the military criteria system by eliminating duplication of information, increasing reliance on private-sector standards, and creating a more efficient criteria development and publishing process. The DoD's Unified Facilities Criteria Program includes UFCs.

82 (U) According to DoD Instruction (DoDI) 4715.06, it is DoD policy that "[e]nvironmental programs in the DoD achieve, maintain, and monitor compliance with all applicable environmental requirements." DoDI 4715.06 defines compliance as "[a]dherence to and attainment of all applicable federal, State, tribal, and local regulatory environmental requirements or standards." Accordingly, OPNAVINST 5090.1E includes requirements, delineates responsibilities, and issues implementing policy guidance.

(U) DoDI 4715.06, "Environmental Compliance in the United States," May 4, 2015 (Incorporating Change 2, August 31, 2018).

(U) OPNAV Instruction 5090.1E, "Environmental Readiness Program," September 3, 2019.

(U) OPNAV Manual 5090.1, "Environmental Readiness Program Manual," June 25, 2021.

83 (U) BUMEDINST 6240.10C, "Department of the Navy Medical Drinking Water Program" September 18, 2018.

84 (U) NAVMED P-5010-5, "Manual of Naval Preventive Medicine; Chapter 5: Water Quality for Shore Installations," July 2019.

85 (U) DoDI 6055.20, "Assessment of Significant Long-Term Health Risks from Past Environmental Exposures on Military Installations," June 6, 2017 (Incorporating Change 2, June 10, 2019).

- (U) OPNAV M-5090.1 requires Navy officials to implement the Environmental Management System (EMS), which is "a formal management framework that integrates environmental considerations into day-to-day activities and long-term planning processes across all levels and functions of the Navy enterprise."[86] Specifically, the EMS requires Navy officials to perform recurring self-assessments of their implementation of the EMS and compliance with environmental requirements. "Navy installations and activities worldwide must verify the continuing EMS conformance and environmental regulatory compliance status, at a minimum of a 1-year internal and 3-year external cycle." OPNAV M-5090.1 states:

  > (U) When a compliance deficiency or EMS nonconformity occurs, the Navy-EMS-appropriate facility must follow a structured problem-solving process that takes immediate action to control, correct, and mitigate adverse environmental impacts. The process should also evaluate the need for preventive action to eliminate the causes, in order that it does not recur or occur elsewhere…

- (U) The Clean Water Act was passed to regulate discharges of pollutants into waters of the United States.[87] The EPA issues regulations to implement the Clean Water Act, including title 40 CFR part 112. Title 40 CFR part 112 is an oil pollution prevention regulation that requires the preparation of spill prevention, control, and countermeasure (SPCC) plans and facility response plans (FRPs) for bulk fuel storage facilities such as the Red Hill BFSF that could "reasonably be expected to cause substantial harm to the environment."[88]

(U) Additionally, Federal and state laws and Navy policy require Navy officials to:

- (U) assess the risks to and resilience of the JBPHH Community Water System and DFSP JBPHH, including the Red Hill BFSF;
- (U) prepare incident response plans; and
- (U) implement the plans.

(U) Navy officials prepared incident response plans referred to in Part V of this report, including the:

- (U) CNRH Integrated Contingency Plan (ICP);
- (U) CNRH Spill Prevention, Control, and Countermeasure (SPCC) Plan;

[86] (U) DoDI 4715.17 requires the DoD to integrate an EMS "into missions, activities, functions, contracts, and installation support agreements as a business practice for improving overall [environmental] performance."
(U) DoDI 4715.17, "Environmental Management Systems," April 15, 2009 (Incorporating Change 2, August 31, 2018).

[87] (U) Chapter 26, title 33, United States Code, "Clean Water Act.''
(U) Congress originally passed the Clean Water Act in 1948. The law, reorganized and expanded in 1972, requires many actions to protect surface waters. The Clean Water Act gives the EPA authority to issue and enforce regulations to implement the Act.

[88] (U) Title 40 CFR part 112, "Oil Pollution Prevention."
(U) Title 40 CFR section 112.20, "Facility response plans."

- (U) JBPHH Community Water System Emergency Response Plan (ERP); and
- (U) Red Hill BFSF Facility Response Plan (FRP).[89]

B. (U) Organizations, Roles, and Responsibilities

(U) As previously discussed, JBPHH is a Navy-led installation, and the Navy owns and operates the real property, facilities, vessels, and equipment at the JBPHH Community Water System and the Red Hill BFSF.[90] Specifically, at JBPHH, the following organizations manage JBPHH Community Water System and Red Hill BFSF infrastructure.

- (U) The CNRH acts on behalf of CNIC and owns the physical JBPHH Community Water System and Red Hill BFSF infrastructure. Additionally, the CNRH acts on behalf of CNIC as the DoD Executive Agent for drinking water quality matters and is responsible for environmental compliance at JBPHH.
- (U) The JBPHH PWD operates and maintains the JBPHH Community Water System.[91]
- (U) The JBPHH installation command is responsible for installation operations, including utilities, such as water, on JBPHH.[92]
- (U) The DLA owns the fuel in the Red Hill BFSF.
- (U) NAVSUP FLC PH operates the Red Hill BFSF.
- (U) Naval Preventive Medicine officials support the JBPHH installation command and the JBPHH PWD with health aspects of drinking water.

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89 (U) CNRH, "Integrated Contingency Plan (ICP)," August 2018.
(U) CNRH, "Spill Prevention, Control, and Countermeasure (SPCC) Plan for Commander Navy Region Hawaii (CNRH): Naval Supply Systems (NAVSUP) Command Fleet Logistics Center Pearl Harbor (FLCPH)/Defense Fuel Supply Center Pearl Harbor (DFSP PH) Bulk Terminal, Oahu, Hawaii," December 2019.
(U) CNRH, "Red Hill Fuel Storage Facility (RHFSF) Response Plan," August 2020.
(U) NAVFAC Engineering and Expeditionary Warfare Center (EXWC), "Community Water System (PWS-360) Emergency Response Plan [ERP] for Joint Base Pearl Harbor-Hickam (JBPHH), Pearl Harbor, Hawaii," June 2021.

90 (U) Unlike the other Military Services, the Navy has two chains of command: operational and administrative. Operational chains of command carry out specific missions, such as naval operations and exercises. Administrative chains of command manage personnel, education, training, infrastructure, and supply chains necessary for readiness. The operational and administrative chains of command can overlap or diverge, such that a Sailor can be part of both and, therefore, report to two chains of command. For example, the CNRH reports to CNIC under administrative control and reports to the Commander, U.S. Pacific Fleet under operational control.
(U) Throughout this report, we refer to DoD officials or Navy and DLA officials when we are referring to the actions of more than one of these organizations. Otherwise, we specify the actions of one organization. Additionally, some DoD officials are dual-hatted, meaning that they are responsible for more than one job. In many cases, we were unable to determine which role DoD officials were performing during the incidents. Therefore, in those cases, we refer to the dual-hatted official by both job titles.

91 (U) The JBPHH PWD reports to NAVFAC Hawaii under administrative control and the JBPHH installation command under operational control.

92 (U) The JBPHH installation command reports to the CNRH under administrative and operational control.

- (U) DoD medical officials, such as Surgeons General, provide health-related support to commands, including providing direct medical care to service members and their families.

(U) Although JBPHH is a Navy-led installation, it hosts various DoD commands, including Army, Navy, Marine Corps, Air Force, and joint commands that were affected by the drinking water contamination incident.

V. (U) Analysis of the DoD's Response to the Drinking Water Contamination Incident and the Management and Oversight of the JBPHH Community Water System

(U) In this section, we analyze the DoD's response to the contamination of the Joint Base Pearl Harbor–Hickam (JBPHH) Community Water System. First, we explain that there were risks associated with the co-location of the Red Hill Bulk Fuel Storage Facility (BFSF) and the Red Hill well. These risks were documented; however, Navy officials missed opportunities to prevent or mitigate the drinking water contamination. Next, we explain that Navy officials did not effectively manage the response to the drinking water contamination incident. Finally, we explain the reasons why this occurred. Specifically, this occurred because Navy officials lacked understanding of the infrastructure systems at DFSP JBPHH, and were not adequately prepared to respond to the drinking water contamination incident or implement risk communication.

(U) Additionally, we analyze the operations, maintenance, and management of the JBPHH Community Water System. First, we explain that poor infrastructure conditions existed throughout the JBPHH Community Water System. Then, we explain the reasons why this occurred and how these factors contributed to the drinking water contamination incident. Specifically, this occurred because Navy officials lacked the operation and maintenance programs needed to protect the JBPHH Community water System in compliance with Federal and state regulations and DoD policy.

(U) Lastly, we describe the impact to the affected community and the costs to the DoD as a result of the drinking water contamination.

A. (U) Risks Associated with the Co-Location of the Red Hill BFSF and the Red Hill Well Were Documented; However, Navy Officials Missed Opportunities to Mitigate the Drinking Water Contamination

(U) The Red Hill well is co-located with a bulk fuel storage facility, the Red Hill BFSF. Therefore, there was an inherent risk to the aquifer and the JBPHH Community Water System. Additionally, based on historical incidents,

(U) we concluded that the lower access tunnel (LAT) floors, soil, and rock below are permeable to liquids, such as fuel. In the following sections, we discuss that Navy officials:

- (U) had documentation of these risks,
- (U) assessed the risks to and resilience of the JBPHH Community Water System as recently as 2020,[93] and
- (U) prepared the JBPHH Community Water System Emergency Response Plan (ERP) in 2021.

(U) However, Navy officials missed the opportunity to prevent the November 2021 fuel incident and drinking water contamination incident. Subsequently, Navy officials missed four opportunities to activate the JBPHH Community Water System ERP and mitigate the drinking water contamination.

1. (U) The Red Hill Well Is Co-Located with a Bulk Fuel Facility

~~(CUI)~~ The Navy built the Red Hill well pump station, the Red Hill well, and the water development tunnel inside the Red Hill BFSF in 1943. [redacted] However, placement of the Red Hill BFSF above an aquifer was an inherent risk to the aquifer and the JBPHH Community Water System.

(U) During our evaluation, we visited the NAVSUP FLC PH technical library to look at maps and engineering drawings of the Red Hill BFSF and the Red Hill well. During our visit, we found a historical Navy report describing related incidents in 1945 and 1948.[94] According to the Navy report, the Navy drew large amounts of water from the Red Hill well during World War II. In August 1945, the significant water draw lowered the water level in the water development tunnel, and as a result, the Red Hill well pumps were not fully submerged. This led to operating issues with the pumps, which were designed to be fully submerged.[95]

(U) The report stated that to address the situation, Navy officials attempted to increase the water level in the water development tunnel. At the request of Navy officials, Army officials drilled a 10-inch hole from the LAT surface down

[93] (U) NAVFAC Engineering and Expeditionary Warfare Center, "Community Water System (PWS-360) Risk and Resilience Assessment for Joint Base Pearl Harbor-Hickam (JBPHH), Pearl Harbor, Hawaii," December 2020.
(U) NAVFAC Engineering and Expeditionary Warfare Center, "Community Water System (PWS-360) Emergency Response Plan for Joint Base Pearl Harbor-Hickam (JBPHH), Pearl Harbor, Hawaii," June 2021.

[94] (U) Fourteenth Naval District Public Works Office, "Technical Study of Possibility of Contamination of Basal Water Sources from the Red Hill Underground Fuel Oil Storage," June 28, 1949.

[95] (U) Because the pumps were not fully submerged in water, the pumps were drawing a mix of water and air that was detrimental to the pumps.

(U) to the water development tunnel. Next, the Army officials continued to drill further down into the floor of the water development tunnel. Then, they detonated more than 50 sticks of dynamite in the hole in an attempt to draw additional groundwater into the water development tunnel. The attempt was unsuccessful.[96]

(U) According to the Navy report of the incident, a concrete plug was poured in the hole, but "[t]he plug probably seal[ed] only a few feet at the top of the hole."[97] The drilling and dynamiting increased the risk to the Red Hill well, because it damaged the structural integrity of the water development tunnel and created additional subsurface routes in the LAT floors, soil, and rock between the LAT and the water development tunnel. Therefore, releases of liquids in the LAT, such as fuel, could flow to the water development tunnel in the event of an incident, as evidenced in 1948.[98]

~~(CUI)~~ According to the Navy report, in 1948, 500 gallons of fuel leaked from a deteriorated pipeline connected to a "war-time emergency power plant" in the LAT [redacted], and the release contaminated the Red Hill well with fuel.[99] Navy officials determined that fuel leaked into the openings created when they drilled through the LAT in 1945, and flowed directly into the water development tunnel.[100] Navy officials dug a pit in the LAT where the fuel leaked. Navy officials confirmed that the fuel leak was the source of contamination by pouring chlorine into the pit and checking to see if the chlorine made its way to the water development tunnel. Navy officials found chlorine in the water development tunnel 17 minutes later. Navy officials entered the water development tunnel on two occasions during their response to the contamination in 1948 and saw "unmistakable oil accumulations" and "evidence of the blast" where Army officials blasted an opening into the water development tunnel.[101]

[96] (U) Additionally, the Navy's plan was not approved by local geologists or water resource authorities.

[97] (U) Fourteenth Naval District Public Works Office, "Technical Study of Possibility of Contamination of Basal Water Sources from the Red Hill Underground Fuel Oil Storage," June 28, 1949.

[98] (U) Drilling and boring through concrete negatively affects the structural integrity of the concrete. The use of dynamite would have also negatively affected the structural integrity of the concrete.

[99] (U) According to the Navy report of the incident, the leak did not originate from a Red Hill BFSF UST or the pipelines connected to the USTs. The report states that the Red Hill well was the Navy's primary source of drinking water at the time.

[100] (U) The Navy report of the incident does not clearly describe where the 10-inch hole was drilled.

[101] ~~(CUI)~~ In 1948, Navy officials saw evidence of the 10-inch hole [redacted] into the water development tunnel.

(U) As a result, the Navy report stated that the Red Hill well was taken offline from February 19, 1948, to April 27, 1948, while Navy officials cleaned up the contamination.[102] According to the Navy report of the incident, to clean up the contamination, Navy officials repeatedly poured a heavy stream of water into the pit in the LAT, "which flushed residual [fuel] out of the rock" and down into the water development tunnel.[103] Then Navy officials skimmed the fuel from the surface of the water development tunnel. Based on the actions taken by the Navy in 1945 and the fuel incident and drinking water contamination incident in 1948, we concluded that the LAT floors, soil, and rock below are permeable to liquids, such as fuel.

(U) The Red Hill Bulk Fuel Storage Facility tunnel floors, soil, and rock below them are permeable to fuel.

(U) Based on our analysis of the Navy's report describing the 1945 drilling and dynamiting and the 1948 fuel incident and drinking water contamination incident, we concluded that the 1948 fuel incident and the way it contaminated the drinking water at that time bore significant similarities to the drinking water contamination incident resulting from the November 2021 fuel incident. Specifically, we concluded that both incidents occurred when fuel seeped through subsurface openings below the LAT and flowed into the water development tunnel.[104] We did not find any evidence that current Navy officials knew about this historical incident. Additionally, our interviews with Navy officials determined that they lacked sufficient understanding of the Red Hill BFSF and Red Hill well infrastructure and the risks associated with the co-location of the facilities. However, Navy officials had engineering drawings, studies, environmental risk assessments, and plans that described the infrastructure systems, their interfaces, and the associated risks.

[102] (U) This drinking water contamination incident occurred in 1948, 11 years before Hawaii became a state in 1959, 22 years before the EPA was established in 1970, and 26 years before the Safe Drinking Water Act (SDWA) was passed in 1974. Additionally, the environmental cleanup law, the Comprehensive Environmental Response, Compensation, and Liability Act, was not established until 1980, 32 years later. The 1949 report does not discuss how Navy officials confirmed that the contamination was fully remediated during the 68 days the Red Hill well was inoperable. The 1949 report also does not discuss whether human health was impacted. According to the Red Hill BFSF FRP, the existence of the Red Hill BFSF was classified until 1995.

[103] (U) Fourteenth Naval District Public Works Office, "Technical Study of Possibility of Contamination of Basal Water Sources from the Red Hill Underground Fuel Oil Storage," June 28, 1949.

[104] (U) The VCNO command investigation report concluded that the drinking water contamination incident occurred when fuel from the November 20, 2021 fuel incident seeped through subsurface openings below the LAT and flowed into the water development tunnel, and we came to the same conclusion.

2. (U) Navy Officials Had Documentation of the Risks Associated with the Interfaces Between the Red Hill BFSF and the Red Hill Well

(U) Although current Navy officials might not have known about the incidents in the 1940s, our analysis determined that there were engineering drawings, studies, environmental risk assessments, and plans that clearly identified the risks to the Red Hill well in the event of a fuel incident. As previously discussed, Federal and state laws and Navy policy require Navy officials to prepare fuel incident response plans for DFSP JBPHH, including the Red Hill BFSF. Navy officials had incident response plans, including the Commander, Navy Region Hawaii (CNRH) Integrated Contingency Plan (ICP), CNRH Spill Prevention, Control, and Countermeasure (SPCC) Plan, the JBPHH Community Water System Emergency Response Plan (ERP), and the CNRH Groundwater Protection Plan (GWPP).

(U) The CNRH ICP states that the LAT is not impermeable to spills.[105] Specifically, the CNRH ICP states that the "[a]bility of the LAT to contain spills will depend on the size of the spill, cause, and the fuel tightness and integrity of the … tunnel floor and walls." Additionally, 40 CFR part 112 states that the entire secondary containment system, "including walls and floor, must be capable of containing oil and must be constructed so that any discharge from a primary containment system … will not escape containment before cleanup occurs." Title 40 CFR part 112 requires SPCC plans to address how the secondary containment is designed to effectively contain fuel until it is cleaned up. Accordingly, the CNRH SPCC states: "Secondary containment must be sufficiently impervious to contain spilled oil."[106] The CNRH SPCC lists and describes the infrastructure "designated" as containment, including for fuel, on JBPHH. The Red Hill BFSF LAT and the groundwater sump pit are not included on the list in the CNRH SPCC. Based on our review of the 40 CFR part 112 requirements, we determined that, if infrastructure is not

[105] (U) CNRH, "Integrated Contingency Plan (ICP)," August 2018.

[106] (U) CNRH, "Spill Prevention, Control, and Countermeasure (SPCC) Plan for Commander Navy Region Hawaii (CNRH): Naval Supply Systems (NAVSUP) Command Fleet Logistics Center Pearl Harbor (FLCPH)/Defense Fuel Supply Center Pearl Harbor (DFSP PH) Bulk Terminal, Oahu, Hawaii," December 2019.

(U) included on the SPCC list, it should not be considered containment. Therefore, the LAT and groundwater sump pit are not containment. Furthermore, according to a 2018 NAVFAC Pacific Phase I Quantitative Risk and Vulnerability Assessment:

> (U) The design and proximity of the RHBFSF Lower Access Tunnel and the Red Hill [well pump station] is important to risk. This is because potential fuel releases into the RHBFSF Lower Access Tunnel could potentially propagate to this area and flow (in a near-direct path) to the water table.[107]

(U) The 2018 America's Water Infrastructure Act (AWIA) required owners and operators of community water systems to:

- (U) assess the risks to and resilience of community water systems,
- (U) prepare an emergency response plan (ERP) that protects public health, and
- (U) implement the plan.[108]

(U) OPNAV M-5090.1 required Navy officials to implement the 2018 AWIA, including assessing the risks to and resilience of community water systems from emergencies caused by human error. Navy officials assessed the risks to and resilience of the JBPHH Community Water System in 2020 and prepared the JBPHH Community Water System ERP in 2021, as required by the AWIA and OPNAV M-5090.1.[109] The JBPHH Community Water System ERP provides guidance to "minimize damage and maintain control of the [drinking water system] at JBPHH following a natural disaster or [human-made] emergency," including the threat or introduction of contaminants, such as fuel. Additionally, the JBPHH Community Water System ERP states that Navy officials must initiate the ERP if certain conditions are met. Specifically, Navy officials must activate the ERP if there are indicators of a drinking water emergency, such as reports of drinking water with a strange odor, color, or appearance. The JBPHH Community Water System ERP also directs Navy officials to isolate the Red Hill well and issue "do not drink" notifications until the contaminant has been identified.

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[107] (U) NAVFAC Pacific, "Quantitative Risk and Vulnerability Assessment Phase 1 (Internal Events without Fire and Flooding)," October 9, 2018.

(U) NAVFAC Pacific officials commissioned this risk and vulnerability assessment to meet requirements of the 2015 AOC. We could not verify which Navy officials received this report. However, the report states that the assessment was designed to "assess the level of risk the Red Hill Bulk Fuel Storage Facility (RHBFSF) may pose to the surrounding groundwater to inform the Government in subsequent development of best available practicable technology decisions," and "serve as a tool to help facilitate decision making that will mitigate risk and improve safety for the RHBFSF throughout the remainder of its life cycle."

[108] (U) Public-Law 115-270, "America's Water Infrastructure Act of 2018," October 23, 2018.

[109] (U) NAVFAC Engineering and Expeditionary Warfare Center, "Community Water System (PWS-360) Risk and Resilience Assessment for Joint Base Pearl Harbor-Hickam (JBPHH), Pearl Harbor, Hawaii," December 2020.

(U) NAVFAC Engineering and Expeditionary Warfare Center, "Community Water System (PWS-360) Emergency Response Plan for Joint Base Pearl Harbor-Hickam (JBPHH), Pearl Harbor, Hawaii," June 2021.

(U) The AWIA required community water systems serving a population between 50,000 and 100,000, such as the JBPHH community water system, to certify the completion of its risk and resilience assessment by December 31, 2020, and to certify the completion of its emergency response plan no later than June 30, 2021, 6 months later.

(U) Furthermore, CNRH officials established the Groundwater Protection Plan (GWPP) in 2008 to mitigate the risk of fuel incidents to groundwater and the aquifer in the Red Hill BFSF through groundwater and soil-vapor monitoring.[110] According to the CNRH GWPP, "past inadvertent releases have contaminated" the rock, soil, and groundwater beneath the Red Hill BFSF with petroleum products. Additionally, the CNRH GWPP states that groundwater under the Red Hill BFSF generally flows toward the Red Hill well and its water development tunnel. The CNRH GWPP states that the Red Hill BFSF:

> ~~(CUI)~~ is approximately 100 feet above the basal groundwater table on the boundary of [...] aquifers [which] are sources of potable water for several public water systems. [...The aquifers are] listed as currently used, fresh ... drinking water sources that are irreplaceable and have a high vulnerability to contamination ... . [redacted]

(U) As discussed in Part II, there is a network of subsurface drains, referred to as French drains, that prevent a build-up of groundwater in the LAT. Because the components of this drainage system have openings for groundwater to flow in and out, there is a potential for fuel to enter the French drains via the groundwater sump pit if a fuel release occurs nearby. Engineering drawings of the subsurface drainage system and the groundwater sump pit show the French drain, how it connects directly to the groundwater sump pit, and its proximity to the Red Hill well.[111] Specifically, the CNRH ICP directs Navy officials to:

> (U) [p]revent spill[s] from ... entering manmade or natural drainage. [...] Due to the age of the active drainage systems and the existence of old drainage systems still in place throughout the base, it may be difficult to determine which path a spill that enters the drainage system will take in the drainage system. Subsequently, the spill may not discharge at the anticipated [location].[112]

(U) Furthermore, the fire protection system project completed in 2019 was designed to reduce the risk of fire in the Red Hill BFSF. However, the design included the addition of an overhead AFFF drainage pipeline in the LAT that passes directly by the entrance to the Red Hill well pump station. Because the function of the overhead AFFF drainage pipeline is to carry a mixture

[110] (U) NAVFAC Pacific, "Red Hill Bulk Fuel Storage Facility Final Groundwater Protection Plan," January 2008 (Interim Update August 2014).

[111] (U) Water used to cool the Red Hill well pumps also drains to the groundwater sump pit.

[112] (U) CNRH, "Integrated Contingency Plan (ICP)," August 2018.

(U) of fuel, water, and AFFF in a fire emergency, its addition increased the risk of contamination to the Red Hill well in the event of an incident involving the overhead AFFF drainage pipeline.[113]

~~(CUI)~~ As discussed in Part III, the battery-powered locomotive and cart in the Red Hill BFSF LAT, driven by a NAVSUP FLC PH employee, struck a valve on a low-point drain in the overhead AFFF drainage pipeline on November 20, 2021. The overhead AFFF drainage pipeline cracked and approximately 19,000 gallons of fuel poured onto the LAT floor, flowed downhill, and collected in the groundwater sump pit [redacted]. According to the VCNO command investigation report, Navy officials recovered fuel from various locations after the November 2021 fuel incident, including the fuel they pumped from the groundwater sump pit into tanker trucks for disposal. A total of 5,542 gallons of fuel remained unaccounted for, and some or all of that fuel:

- (U) backed up into the French drain;
- (U) seeped through the ground and into the Red Hill well water development tunnel located below the LAT; and
- (U) contaminated the Red Hill well.

3. (U) Navy Officials Missed the Opportunity to Prevent the November 2021 Fuel Incident and Drinking Water Contamination Incident

(U) Navy officials did not conduct further investigation to find the fuel missing from the fuel inventory and missed the opportunity to prevent the November 2021 incidents.

(U) As discussed in Part III, approximately 19,000 gallons of the JP-5 fuel that was released on May 6, 2021 was pumped from the AFFF sump pit into the overhead AFFF drainage pipeline where it collected in a low point in the pipe. Because Navy officials did not realize that the sump pumps in the AFFF sump pit activated, the JP-5 fuel remained in the overhead AFFF drainage pipeline. Although NAVSUP FLC PH officials entered a daily loss of 20,139 gallons of fuel in their inventory and accounting system, they assumed that the missing JP-5 fuel was somewhere in the JP-5 pipeline and did not conduct any further investigation. In DODIG-2025-011, we discuss the factors that led Navy officials to make these incorrect assumptions. If Navy officials had performed sufficient causative research to account for the JP-5 fuel missing from the inventory, they might have found the fuel that was sitting in the overhead AFFF drainage pipeline.

[113] (U) Although DoD policy requires the use of steel for AFFF drainage pipelines, Navy and DLA officials allowed the construction contractor to use polyvinyl chloride (PVC) pipe for the overhead AFFF drainage pipeline. The use of PVC pipe for the overhead AFFF drainage pipeline also increased the risks associated with the system. We discuss this construction project and explain how the use of PVC increased risk in DODIG-2025-011.
(U) UFC 3-600-01, "Fire Protection Engineering for Facilities," September 26, 2006 (Incorporating Change 3, March 1, 2013).

(U) In response to the May 6, 2021 fuel incident, the Hawaii DOH issued a letter of instruction to the CNRH requiring Navy officials to, among other things:

- (U) increase environmental monitoring in the Red Hill BFSF, including groundwater monitoring performed in accordance with the GWPP; and
- (U) submit a written statement of the details of the fuel release, "including specific details regarding source, volume, cause, remedy, and nature of the release."

(U) However, Navy officials did not inform the Hawaii DOH of the fuel inventory discrepancy. If Navy officials had found the missing JP-5 fuel, they might have drained it from the overhead AFFF drainage pipeline and prevented the November 2021 fuel incident from occurring. If Navy officials had prevented the November 2021 fuel incident from occurring, they would have prevented the drinking water contamination incident.

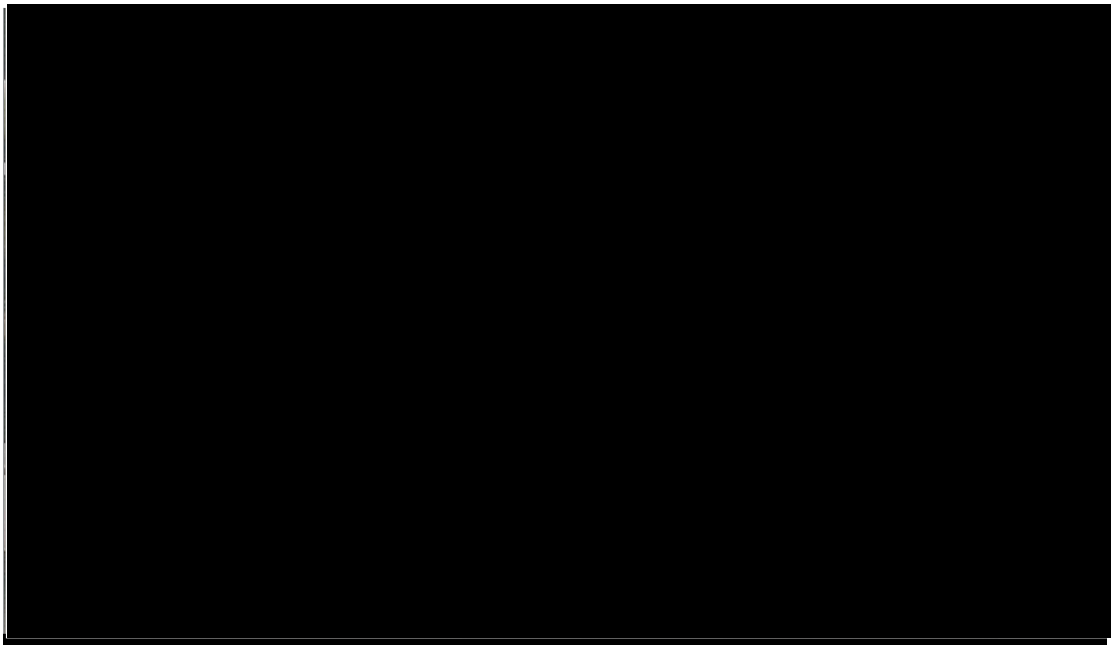
4. (U) Navy Officials Missed Opportunities to Activate the JBPHH Community Water System Emergency Response Plan

(U) Drinking water emergencies addressed by the JBPHH Community Water System ERP include contamination of the JBPHH Community Water System. According to the JBPHH Community Water System ERP, the JBPHH Commanding Officer (CO) and the NAVFAC Hawaii CO are the primary officials responsible for responding to a drinking water emergency, and they must be notified when an incident occurs or a threat is made against the JBPHH Community Water System. Then, the JBPHH Community Water System ERP is activated, the incident or threat is evaluated, and, if confirmed, the Incident Commander directs response assets applicable to the type of incident to report to the scene. According to the JBPHH Community Water System ERP, the Incident Commander may also activate an Emergency Operations Center.

a. (U) Navy Officials Missed the First Opportunity to Activate the JBPHH Community Water System Emergency Response Plan on November 20, 2021

~~(CUI)~~ We determined that Navy officials missed the first opportunity to activate the JBPHH Community Water System ERP on November 20, 2021. As discussed in Part III, a fuel incident began at 4:50 p.m. that threatened the JBPHH Community Water System. Specifically, JP-5 fuel was released from the overhead AFFF drainage pipeline [redacted] The fuel flowed [redacted] downhill on the floor of the LAT, past the entrance to the Red Hill well pump station, and toward the groundwater sump pit. However, Navy officials

~~(CUI)~~ did not activate the JBPHH Community Water System ERP.[114] Figure 10 shows, with a yellow arrow, where fuel was released from the overhead AFFF drainage pipeline and flowed downhill.[115]



(U) Figure 10. Downhill View of the Lower Access Tunnel with Overhead AFFF Drainage Pipeline and the Direction of the Fuel Flow
(U) Source: VCNO command investigation report, labeled by the DoD OIG.

(U) The JBPHH CO told us that the JBPHH Public Works Officer notified the JBPHH CO about the incident at the Red Hill BFSF.[116] However, the JBPHH CO did not respond to the scene, establish Incident Command, activate an Emergency Operations Center for the JBPHH Community Water System, or activate the JBPHH Community Water System ERP.

(U) According to the VCNO command investigation report, a JBPHH Public Works Department (PWD) official responded to the scene at 10:30 p.m. The JBPHH PWD official stepped over the fuel flowing between the train tracks to reach the Red Hill well pump station. The JBPHH PWD official opened the door to the Red Hill well pump station, verified that fuel was not flowing over ground into the Red Hill well pump station, and left the scene shortly thereafter.

[114] (U) We discuss the Navy's response to the fuel aspects of the incident in detail in DODIG-2025-011.

[115] (U) On November 20, 2021, the battery-powered locomotive and cart traveling on the train track in the LAT struck a valve on a low-point drain in the overhead AFFF drainage pipeline. The valve cracked, and the fuel that had remained in the overhead AFFF drainage pipeline since May 6, 2021, was released. This photo was taken after Navy officials stopped the release, removed the valve, and placed a cap over the release point.

[116] (U) The JBPHH CO did not tell us what time it was when they were notified. The JBPHH CO did not go to the Red Hill well pump station until December 5, 2021, which, as we discuss in the following sections, was 7 days after drinking water complaints began and 3 days after drinking water contamination was confirmed in the Red Hill well.

(U) At 10:30 p.m. on November 20, 2021, the NAVFAC Hawaii CO responded to the scene.[117] However, the NAVFAC Hawaii CO did not establish Incident Command, activate an Emergency Operations Center for the JBPHH Community Water System, or activate the JBPHH Community Water System ERP. According to the VCNO command investigation report, the NAVFAC Hawaii CO was concerned about the groundwater sump pit, specifically whether the pumps in the groundwater sump pit had pumped fuel to the leach field system, but was not concerned about fuel in the ground water sump pit threatening the Red Hill well. We discuss the reasons why these Navy officials did not respond to the incident or did not activate the JBPHH Community Water System ERP later in this report.

(U) As previously discussed, the CNRH ICP states that the LAT is not impermeable to spills and the CNRH SPCC Plan does not demonstrate that the concrete is sufficiently impervious to spills.[118] Furthermore, the Red Hill BFSF FRP, which directs spill responders to implement a variety of strategies to mitigate fuel releases in the Red Hill BFSF, does not describe any scenario under which the groundwater sump pit would be suitable for containing fuel during a fuel release incident. Lastly, the CNRH ICP directs spill responders to prevent fuel from entering drainage systems, such as the groundwater sump pit, because "it may be difficult to determine which path a spill … will take in the drainage system. Subsequently, the spill may not discharge at the anticipated [location]."

(U) However, Navy officials did not take action to prevent the fuel that was flowing downhill from entering the groundwater sump pit even though the CNRH ICP warns that it may be difficult to determine which path a spill may take in a drainage system. Unbeknownst to Navy officials at the time, some of the fuel that flowed into the groundwater sump pit backed up into the French drain, seeped through the ground and into the Red Hill well water development tunnel located below the LAT, and contaminated the Red Hill well. In sum, Navy officials missed

(U) Navy officials did not recognize the risk to the drinking water system and did not prevent fuel from entering drainage systems, which resulted in drinking water contamination.

[117] (U) The NAVFAC Hawaii CO told us that they were notified of the incident by the NAVSUP FLC PH CO. The VCNO command investigation report states that the NAVFAC Hawaii CO arrived at the Red Hill BFSF at 10:30 p.m. However, we were unable to independently verify the exact time that various Navy officials arrived at the Red Hill BFSF, because the CCTV system in the LAT was largely inoperable during the incident. We discuss the CCTV system in more detail in DODIG-2025-011.

(U) The NAVFAC Hawaii CO is also dual-hatted as the CNRH N4. The CNRH N4 is the administrative authority for facilities and environmental activities.

[118] (U) According to the CNRH SPCC Plan, 40 CFR part 112 does not specify the "permeability, hydraulic conductivity, or retention time performance criteria" for secondary containment, such as the concrete LAT floors. Additionally, according to EPA guidance we reviewed, "a complete description of how secondary containment is designed, implemented, and maintained to meet the standard of sufficiently impervious is necessary" in SPCC Plans. However, as previously discussed, Navy officials did not include the concrete floors of the LAT in the CNRH SPCC Plan.

(U) the first opportunity to activate the JBPHH Community Water System ERP on November 20, 2021 which would have required Navy officials to evaluate the threat to drinking water posed by the incident and direct response assets to the Red Hill well pump station.

b. (U) Navy Officials Missed a Second Opportunity to Activate the JBPHH Community Water System Emergency Response Plan on November 24, 2021

~~(CUI)~~ We determined that Navy officials missed a second opportunity to activate the JBPHH Community Water System ERP on November 24, 2021. As previously discussed, the November 2021 fuel incident began at 4:50 p.m. on November 20, 2021. NAVSUP FLC PH officials could not stop the flow of fuel from the damaged overhead AFFF drainage pipeline. The fuel flowed downhill into the groundwater sump pit [redacted]. That evening, Navy officials began pumping the fuel out of the groundwater sump pit to tanker trucks staged outside [redacted]. The fuel flowed into the groundwater sump pit for approximately 34 hours until around 3:00 a.m. on November 22, 2021, when NAVSUP FLC PH officials managed to stop the flow of fuel from the overhead AFFF drainage pipeline.

(U) According to the VCNO command investigation report, by November 23, 2021, Navy officials were no longer using the groundwater sump pit to collect the released fuel and had cleaned the area. The report indicated: "Due to cleaning … of the tunnel that occurred over the previous few days, there was no sign of a spill." Additionally, on November 24, 2021, in response to the November 2021 fuel incident, the Hawaii Department of Health (DOH) issued a letter of instruction to the CNRH requiring Navy officials to, among other things:

- (U) develop work plans and immediate implementation schedules to sample the Red Hill well, including sampling for floating fuel;
- (U) submit engineering drawings of the Red Hill well in relation to the groundwater sump pit; and
- (U) investigate whether the groundwater sump pit had any "potential cracks" that might allow the fuel that collected in the groundwater sump pit to escape.[119]

[119] (U) Hawaii DOH, "Notice of Interest in a Release or Threatened Release of Hazardous Substances," November 24, 2021.

(U) Although Navy officials had cleaned the area, fuel reappeared in the groundwater sump pit on November 24, 2021. CNRH environmental officials collected samples of the fuel that reappeared in the groundwater sump pit for laboratory analysis. However, Navy officials did not immediately investigate the integrity of the groundwater sump pit, including for potential cracks. If they had, they would have seen the subsurface drainage system, specifically the French drain, connected to the groundwater sump pit. We determined that the reappearance of fuel in the groundwater sump pit was an indicator that the recently released fuel was seeping back out from the subsurface drainage system, which should have triggered Navy officials to activate the JBPHH Community Water System ERP. Therefore, Navy officials missed a second opportunity to activate the JBPHH Community Water System ERP.

(U) Navy officials did not immediately investigate the integrity of the groundwater sump pit when fuel reappeared in it.

c. (U) Navy Officials Missed a Third Opportunity to Activate the JBPHH Community Water System Emergency Response Plan on November 24, 2021

(U) We determined that Navy officials missed a third opportunity to activate the JBPHH Community Water System ERP, also on November 24, 2021. In response to the May 2021 fuel incident discussed in Part III, the Hawaii DOH required the Navy to perform additional groundwater monitoring at the Red Hill BFSF, including the Red Hill well.[120] In accordance with this requirement, water samples were scheduled to be collected for analysis at the Red Hill well on November 24, 2021.

(U) The CNRH GWPP requires Navy officials to collect samples at the Red Hill well for groundwater monitoring according to a specific sampling procedure.[121] One of the steps in the sampling procedure for groundwater monitoring requires Navy

[120] (U) On May 10, 2021, in response to the May 2021 fuel incident, the Hawaii DOH issued a letter of instruction to the CNRH requiring Navy officials to, among other things, perform additional groundwater monitoring at the Red Hill BFSF. The November 24, 2021 sampling was scheduled to meet this earlier requirement, and was, therefore, not performed in response to the November 2021 fuel incident, since it was previously scheduled.

[121] (U) CNRH officials established the GWPP in 2008 to mitigate the risk of fuel incidents at the Red Hill BFSF to groundwater and the aquifer. According to the GWPP, the GWPP presents "a strategy for ensure that both the [Red Hill BSFS and the Red Hill well] can continue to operate at optimum efficiency into the future."
(U) NAVFAC Pacific, "Red Hill Bulk Fuel Storage Facility Final Groundwater Protection Plan," January 2008 (Interim Update August 2014).

(U) officials to test for floating fuel.[122] Since fuels are made up of hundreds of chemicals, some of the fuel will dissolve in the water. However, fuels such as JP-5 and water generally do not mix well because fuel is generally lighter than water, so most of the fuel will float on top. The fuel that floats on top of water is referred to as free product.[123] Tests for floating fuel, or free product, provide immediate results using tools such as an oil/water interface meter or a bailer.[124] For example, when an oil/water interface meter detects free product, it emits an audible tone.

(U) Although Navy officials tested for free product in the other groundwater monitoring wells in the LAT, Navy officials did not test, and were not testing, the Red Hill well for free product during scheduled sampling for groundwater monitoring. Navy officials did not modify their practice and did not test for free product during the sampling at the Red Hill well on November 24, 2021, even though:

- (U) the Navy's sampling procedures, including for the sampling required by the Hawaii DOH in response to the May 2021 fuel incident, included a step for testing for free product;
- (U) the November 24, 2021 Hawaii DOH letter of instruction directed Navy officials to test for free product at the Red Hill well; and
- (U) a fuel release had just occurred in the LAT above the water development tunnel.

(U) If Navy officials had tested for free product in the Red Hill well, they might have found floating fuel and thus had an indicator to activate the JBPHH Community Water System ERP.

[122] (U) The 2014 version of the GWPP describes the requirement to test for floating fuel during the sampling procedure for groundwater monitoring and refers to a February 2007 NAVFAC Pacific Project Procedure Manual. We were unable to verify the contents of the February 2007 NAVFAC Pacific Project Procedure Manual to confirm whether it required testing for floating fuel. However, we reviewed the May 2015 NAVFAC Pacific Project Procedure Manual, which is the standard operating procedures (SOP) for the Navy environmental restoration program in the Pacific region. The May 2015 NAVFAC Pacific Project Procedure Manual requires Navy officials to test for floating fuel. Therefore, Navy officials were required to test for floating fuel when performing groundwater monitoring since at least 2014 and possibly for years before.

[123] (U) The floating fuel is referred to as "free," because it is not dissolved in the water. Free product is also referred to as non-aqueous-phase liquid (NAPL).

[124] (U) An oil/water interface meter is a portable meter that includes a probe that detects free product. A bailer is also portable and consists of a hollow tube used to "grab" a sample of water and anything floating on top of the water.

(U) We asked Navy officials why they were not testing for free product in the Red Hill well. According to a written response we received from NAVFAC officials, the groundwater monitoring procedure included a step for "free product gauging"; however, "[a] modification was made to the sampling procedure" for the Red Hill well.[125] According to Navy officials, the oil/water interface meter used to test for free product during groundwater monitoring is "typically rented equipment by the sampling contractor. In the past, the rented equipment would have noticeable and very strong hydrocarbon odors from past uses by other renters at different sites." According to Navy officials, they did not use the oil/water interface meter at the Red Hill well because they did not want to contaminate the Red Hill well, which is a source of drinking water, with a dirty oil/water interface meter. However, the sampling procedure Navy officials provided us included steps for cleaning and decontaminating equipment, such as the oil/water interface meter. Additionally, Navy officials did not explain why they did not use another tool to test for free product, such as a bailer. Ultimately, we determined that Navy officials did not have a good reason for not testing for free product in the Red Hill well.

(U) Contrary to their sampling procedure, Navy officials did not test the Red Hill well for floating fuel.

(U) Although Navy officials took water samples at the Red Hill well on November 24, 2021, they did not test for free product, as required by the sampling procedure for groundwater monitoring and the Hawaii DOH.[126] Therefore, Navy officials missed a third opportunity to activate the JBPHH Community Water System ERP.

d. (U) Navy Officials Missed a Fourth Opportunity to Activate the JBPHH Community Water System Emergency Response Plan on November 28, 2021

~~(CUI)~~ We determined that Navy officials missed a fourth opportunity to activate the JBPHH Community Water System ERP on November 28, 2021. Specifically, residents began calling the JBPHH PWD help desk at 7:49 a.m. to complain of a chemical

[125] (U) We were unable to verify when this modification was made or whether Navy officials had ever tested for free product during groundwater monitoring at the Red Hill well.

[126] (U) According to the VCNO command investigation report, the water samples taken on November 24, 2021 were drawn from a low-flow pump that takes water from two feet below the surface of the water in the water development tunnel. Navy officials received the water sample results on December 3, 2021. Although the results did not indicate total petroleum hydrocarbons (TPH) contamination, there were estimated detections of three naphthalene compounds, which are components of fuel. See Appendix C for an explanation of contaminants identified during the drinking water contamination incident. Later in this report, we explain that, by the time Navy officials received the results of the November 24, 2021 water samples, they had already confirmed that the Red Hill well was contaminated with fuel. We verified these sample results in laboratory documentation provided by Navy officials.

~~(CUI)~~ or fuel smell in their drinking water, and calls continued throughout the day.[127] JBPHH PWD officials were able to smell fuel in the drinking water at some homes and in one of the drinking water ground storage tanks by 11:30 a.m. on November 28, 2021. The JBPHH Public Works Officer informed the JBPHH CO and the NAVFAC Hawaii CO about the resident complaints at approximately 4:00 p.m. Subsequently, several Navy officials, including the JBPHH Public Works Officer and the NAVFAC Hawaii CO, visited three JBPHH residential homes, [redacted] drinking water ground storage tanks, and the Red Hill well to assess the complaints.[128]

(U) That evening, at approximately 6:15 p.m., the CRNH CO, NAVFAC Hawaii CO, JBPHH CO, and JBPHH Public Works Officer decided to isolate the Red Hill well from the JBPHH Community Water System, and ordered JBPHH PWD officials to turn off the Red Hill well pumps.[129] Although Navy officials confirmed the smell of fuel in the drinking water and decided to turn off the Red Hill well, they did not activate the JBPHH Community Water System ERP on or after November 28, 2021, thereby missing a fourth opportunity.

(U) In sum, Navy officials missed four opportunities to activate the JBPHH Community Water System ERP. Specifically, Navy officials missed opportunities to prevent or lessen the impact of the drinking water contamination incident on:

- (U) November 20, 2021, when a fuel incident began in the Red Hill BFSF LAT which threatened the Red Hill well;
- (U) November 24, 2021, by not immediately investigating when fuel reappeared in the groundwater sump pit;
- (U) November 24, 2021, by not testing for free product at the Red Hill well; and
- (U) November 28, 2021, when Navy officials confirmed the smell of fuel in the drinking water and decided to turn off the Red Hill well.

(U) We discuss the reasons why these Navy officials did not respond to the incident or did not activate the JBPHH Community Water System ERP later in this report.

[127] (U) November 25, 2021, was Thanksgiving, and many Navy officials also did not work on Friday, November 26, 2021. According to the VCNO command investigation report, a resident of the Moanalua Terrace neighborhood on JBPHH complained of a chemical smell in the drinking water on Saturday, November 27, 2021. The report stated that there was no indication that action was taken beyond logging the complaint. JBPHH PWD help desk officials received a total of 37 calls on November 28, 2021. Residents were also calling the housing managers who manage military family housing on JBPHH. According to the EPA National Enforcement Investigations Center (NEIC) investigation report, by 5:00 a.m. November 28, 2021, housing managers had received 42 customer complaints regarding water quality.

[128] (U) JBPHH PWD officials responsible for the day-to-day operations of the JBPHH Community Water System, a NAVFAC Hawaii official responsible for projects at the Red Hill BFSF, and the NAVSUP FLC PH CO accompanied the JBPHH Public Works Officer and the NAVFAC Hawaii CO to assess the complaints.

[129] (U) We discuss the specific timing of when Navy officials isolated the Red Hill well from the JBPHH Community Water System later in this section of the report.

B. (U) Navy Officials Did Not Effectively Manage the Response to the Drinking Water Contamination Incident

(U) Navy officials assessed the risks to and resilience of the JBPHH Community Water System and prepared the JBPHH Community Water System ERP, but they did not effectively implement the plan in response to indicators of drinking water contamination in November 2021. Specifically, as discussed in the following sections, Navy officials did not activate or follow their emergency response plan. Additionally, a primary purpose of protecting drinking water systems is to protect public health. However, Navy officials did not take all available precautionary measures to protect human health, immediately and effectively characterize the contamination, and immediately provide alternate drinking water. Furthermore, DoD officials did not effectively communicate with the affected community throughout the public health response.

1. (U) Navy Officials Actions Did Not Activate the JBPHH Community Water System ERP or Meet Its Requirements

(U) As previously discussed, Navy officials missed four opportunities to activate the JBPHH Community Water System ERP before resident complaints became widespread on November 28, 2021. The NAVFAC Hawaii CO and a JBPHH PWD official told us that they did not immediately refer to the JBPHH Community Water System ERP because they were already busy responding to the complaints. The JBPHH PWD Deputy Operations Officer told us that NAVFAC officials reviewed the JBPHH Community Water System ERP in "early December" and believed that they had performed the actions it described. However, we determined that Navy officials did not perform all of the actions described in the JBPHH Community Water System ERP and did not take all available precautionary measures to protect human health.

(U) According to the JBPHH Community Water System ERP, drinking water emergencies include contamination of the JBPHH Community Water System. The stated goals of the JBPHH Community Water System ERP are to:

- (U) rapidly restore drinking water after an incident;
- (U) minimize damage to the JBPHH Community Water System infrastructure;
- (U) minimize the impact to JBPHH Community Water System users;
- (U) minimize negative impacts on public health and employee safety;
- (U) minimize adverse effects on the environment;

- (U) provide emergency public information concerning drinking water;
- (U) inform first responders and regulatory agencies, such as the Hawaii DOH; and
- (U) facilitate effective communication during an emergency involving drinking water at JBPHH.

(U) The JBPHH Community Water System ERP directs Navy officials responding to a drinking water emergency indicator, such as an unusual odor, to:

> (U) [a]ssess the condition of the water system and determine if parts or the entire system needs to be shut down to mitigate any further damage, identify any water use advisories that need to be released, and locate and secure alternative sources of water to meet the most critical demands.

(U) Additionally, the EPA provides guidance for owners and operators of community water systems planning for and responding to drinking water contamination threats and incidents. Specifically, the EPA published a response protocol toolbox, including a public health response guide, and a drinking water contamination guide.[130] The EPA's drinking water contamination guide provides a roadmap, shown in Figure 11, for community water system owners and operators to:

- (U) investigate the credibility of a drinking water emergency indicator,
- (U) minimize public health consequences through operational responses and public notification, and
- (U) guide remediation and recovery efforts to ultimately return a community water system to normal operation.[131]

(U) The red box in Figure 11 reflects that the EPA places equal importance on: (1) site characterization, sampling, and analysis; (2) operational responses; and (3) risk communication and public notification. Under the EPA guidance, these response actions should occur simultaneously during the investigation and response phase.

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[130] (U) The EPA published the "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents" in six modules. For this evaluation, we referred to modules 2, 3, and 5.

(U) EPA, "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents, Module 2: Contamination Threat Management Guide," December 2003.

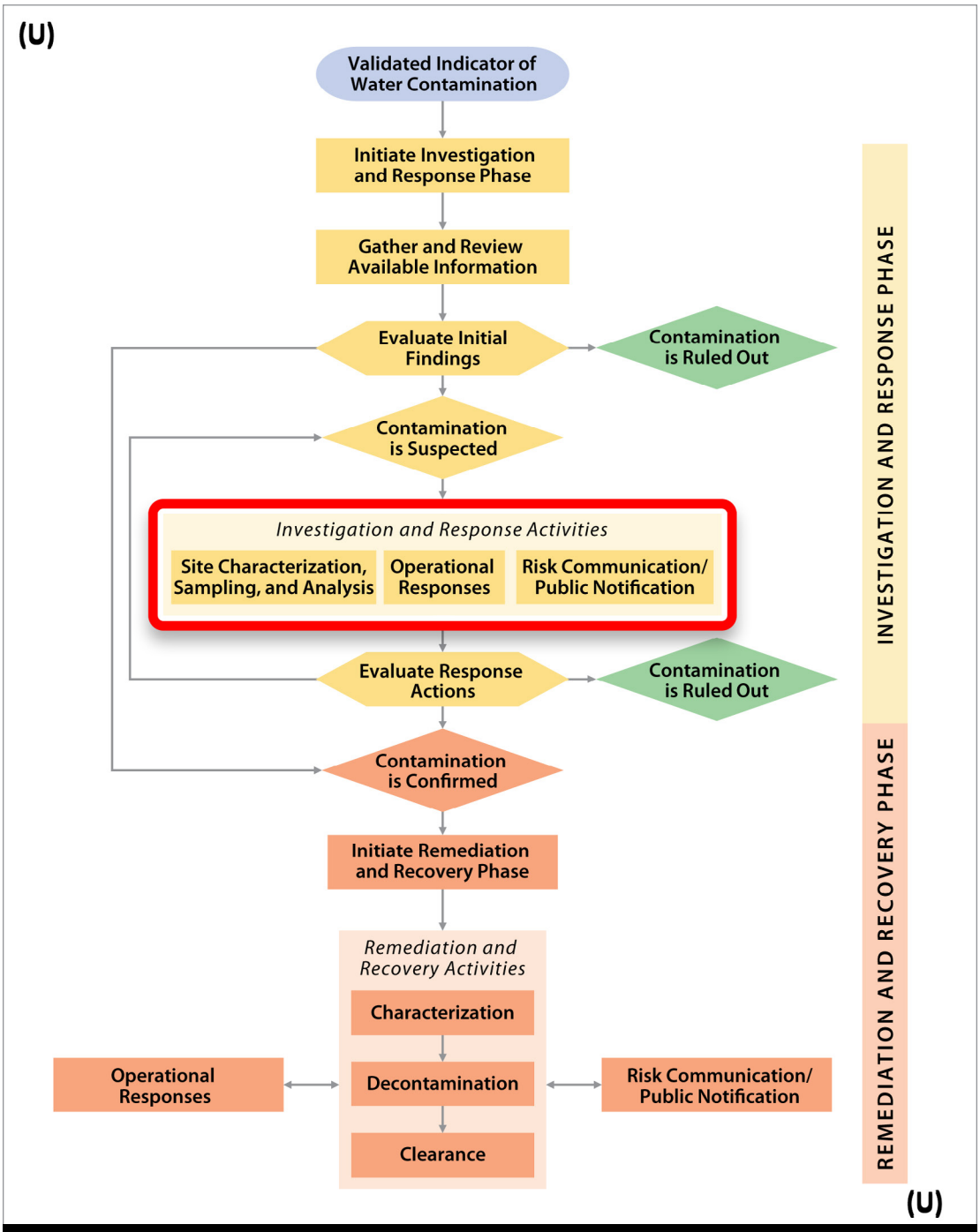
(U) EPA, "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents, Module 3: Site Characterization and Sampling Guide," December 2003.

(U) EPA, "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents, Module 5: Public Health Response Guide," April 2004.

(U) EPA, "Guidance for Responding to Drinking Water Contamination Incidents," October 2018.

(U) The EPA's drinking water contamination guide provides a framework for responding to drinking water contamination incidents and integrating incident-specific response procedures into the community water system emergency response plan.

[131] (U) Drinking water emergency indicators include, among other things, community water system user reports of problems with taste, odor, or appearance of water.



(U) Figure 11. Overview of the EPA's Recommended Response to a Drinking Water Contamination Incident
(U) Source: EPA, "Guidance for Responding to Drinking Water Contamination Incidents," October 2018, labeled by the DoD OIG.

a. (U) Navy Officials Did Not Respond Rapidly to the Indicators of Drinking Water Contamination

(U) According to the JBPHH Community Water System ERP, the JBPHH CO is responsible for:

- (U) notifying the NAVFAC Hawaii CO about indicators of a drinking water emergency,
- (U) responding to the indicators,
- (U) assembling a team, and
- (U) "rapidly assessing the situation."

(U) Additionally, according to the EPA's response protocol toolbox, the "target time period" for determining whether drinking water contamination indicators are "possible" is within 1 hour from the time community water system owners and operators learn of the indicator. The EPA's target time period for determining whether drinking water contamination indicators are "credible" is within 2 to 8 hours from the time community water system owners and operators determine that drinking water contamination is possible. Although the EPA is clear that these target time periods are goals, the EPA's response protocol toolbox stresses the importance of a rapid response because of the "potentially severe consequences of failing to respond to an actual contamination incident in a timely and appropriate manner."

(U) As previously discussed, Navy officials missed four opportunities to activate the JBPHH Community Water System ERP. Although all four opportunities, beginning on November 20, 2021, were indicators of a potential drinking water emergency, Navy officials did not respond to the indicators until November 28, 2021, after Navy officials received multiple complaints from residents of a chemical or fuel smell in their drinking water.

(U) Specifically, on November 27, 2021, a resident of the Moanalua Terrace neighborhood on JBPHH called the Command Duty Officer at 6:30 p.m. and complained of a chemical smell in the drinking water.[132] According to the VCNO command investigation report, the Command Duty Officer forwarded the complaint to the JBPHH PWD help desk. However, there is no indication that action was taken on the complaint. Additionally, we did not find evidence that anyone notified the JBPHH CO or the NAVFAC Hawaii CO of the indicator of drinking water contamination or explaining why the complaint was not forwarded.

[132] (U) The Command Duty Officer is responsible for receiving all administrative and emergency matters that occur after hours, informing leaders, and ensuring that any necessary responses occur.

(U) On November 28, 2021, calls to the JBPHH PWD help desk began at 7:49 a.m. and Navy officials smelled fuel odors in drinking water by 11:30 a.m.[133] However, according to the VCNO command investigation report, the JBPHH Public Works Officer did not inform the JBPHH CO and the NAVFAC Hawaii CO about the reports until approximately 4:00 p.m., and the decision to isolate the Red Hill well was not made until later that evening, at approximately 6:15 p.m.

(U) Navy officials had a drinking water emergency response plan but did not activate it and did not respond rapidly to indicators of drinking water contamination.

(U) The JBPHH Community Water System ERP requires Navy officials to respond rapidly. However, Navy officials did not respond to the indicator on November 27, 2021, and did not respond rapidly on November 28, 2021. Specifically, the JBPHH Public Works Officer did not contact the JBPHH CO and the NAVFAC Hawaii CO until 4½ hours after Navy officials confirmed fuel odors in the drinking water.

b. (U) Contrary to Navy Reports, the Red Hill Well Was Not Fully Isolated Until November 29, 2021

(U) One of the first priorities in the JBPHH Community Water System ERP is to mitigate additional damage. Specifically, turning off the Red Hill well pumps would mitigate additional damage by preventing them from continuing to pump contaminated water from the Red Hill well into the JBPHH Community Water System. Navy officials publicly reported that they shut down the Red Hill well on November 28, 2021. Additionally, during our evaluation, Navy officials repeatedly told us the same. However, contrary to Navy reports, officials at the EPA Office of Enforcement and Compliance Assurance, National Enforcement Investigations Center (NEIC) reported that the Red Hill well was not fully isolated from the JBPHH Community Water System until the afternoon of November 29, 2021.

(U) As discussed in Part III, EPA NEIC officials performed a Safe Drinking Water Act (SDWA) civil investigation of the JBPHH Community Water System in April 2022. According to the EPA NEIC investigation report, JBPHH PWD officials received the order to turn off the Red Hill well pumps at 6:15 p.m. on November 28, 2021, but turned one of the pumps back on two different

[133] (U) Residents were also calling the privatized military housing partners who manage military family housing on JBPHH, and those calls began sooner than 7:49 a.m. According to the VCNO command investigation report, all public works related calls to the JBPHH Command Duty Officer or Public-Private Venture help desk are routed to the JBPHH PWD trouble desk for action. The VCNO command investigation report states that the JBPHH Command Duty Officer contacted the Drinking Water Distribution System Operator at approximately 9:00 a.m. to investigate the reports of the smells in the water. However, the VCNO command investigation report does not state what happed between 9:00 a.m. and 4:00 p.m. when the JBPHH CO and the NAVFAC Hawaii CO were notified.

(U) times.[134] Navy officials did not fully isolate the Red Hill well until 3:00 p.m. November 29, 2021. Specifically, one of the pumps continued to pump additional contaminated water into the JBPHH Community Water System for a total of approximately 4½ more hours.[135]

~~(CUI)~~ The JBPHH Community Water System ERP requires Navy officials to mitigate additional damage. However, by allowing one of the Red Hill well pumps to run for an additional total of 4½ hours, Navy officials did not mitigate additional damage. [redacted].[136]

c. (U) Navy Officials Did Not Isolate the Drinking Water Ground Storage Tanks Near the Red Hill Well from the JBPHH Community Water System

(U) As discussed in the previous section, one of the first priorities in the JBPHH Community Water System ERP is to mitigate additional damage. According to the JBPHH Community Water System ERP:

> (U) [i]f the damage is limited to parts of the system, those parts should be isolated by closing/opening the closest valves on both the upstream and downstream side of the system that would divert water from the damaged area.

~~(CUI)~~ As discussed in Part II, there are [redacted] drinking water ground storage tanks in various locations throughout the JBPHH Community Water System. Drinking water flows from the three groundwater wells to the [redacted] drinking water ground storage tanks and eventually to JBPHH Community Water System users.[137] Drinking water is constantly flowing into and out of the tanks to maintain volume and pressure throughout the JBPHH Community Water System.

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134 ~~(CUI)~~ There are [redacted] pumps in the Red Hill well pump station, but only [redacted] pumps are normally in operation at any given time. The [redacted] pumps that are normally in operation pump based on the demand for drinking water in the JBPHH Community Water System.

135 (U) The EPA NEIC investigation report included a review of the control system data and the operator logs from the JBPHH Community Water System control room. According to the EPA NEIC investigation report, JBPHH PWD officials received the order to turn off the Red Hill well pumps on November 28, 2021, at 6:15 p.m. On November 28, 2021, at 7:55 p.m., JBPHH PWD officials turned one of the Red Hill well pumps back on to allow for collection of a water sample. JBPHH PWD officials turned off the Red Hill well pumps at 9:20 p.m. At noon on November 29, 2021, JBPHH PWD officials turned one of the Red Hill well pumps back on with no explanation in the operator logs. JBPHH PWD officials turned off the Red Hill well pumps at 3:00 p.m.

136 ~~(CUI)~~ [redacted]

137 ~~(CUI)~~ [redacted]

(U) The drinking water ground storage tanks near JBPHH neighborhoods maintain volume and pressure in those areas during times of the day when JBPHH Community Water System users tend to use more water for domestic purposes, such as cooking and showering. As previously discussed, the Red Hill well pumps did not stop pumping finally until 3:00 p.m. on November 29, 2021, 9 days after the November 2021 fuel incident contaminated the Red Hill well with fuel. During this time, with the exception of the periods the pumps were off on November 28 and 29, 2021, contaminated drinking water flowed from the Red Hill well pump station into the drinking water ground storage tanks.

(U) Although Navy officials isolated the Red Hill well from the JBPHH Community Water System on November 29, 2021, Navy officials did not mitigate additional damage because they did not isolate the drinking water ground storage tanks from JBPHH Community Water System users. Specifically, Navy officials did not prevent contaminated drinking water that was already in the drinking water ground storage tanks from flowing out of the tanks, into the water distribution pipes, and to JBPHH Community Water System users.

(U) We asked Navy officials why they did not isolate the drinking water ground storage tanks. Navy officials told us that they did not isolate the drinking water ground storage tanks because it would have left the areas they serve vulnerable to a fire, since isolating the drinking water ground storage tanks would reduce the available volume and pressure in the JBPHH Community Water System.[138] However, Navy officials did not issue public notices to JBPHH Community Water System users to prevent them from using or consuming the water. We discuss this in more detail later in this report.

(U) Navy officials did not prevent consumption of contaminated drinking water that was already in the drinking water system's water storage tanks.

~~(CUI)~~ Additionally, Navy officials did not immediately take water samples from the drinking water ground storage tanks, even though Navy officials smelled fuel in the water at residences earlier in the day on November 28, 2021. Although Navy officials visited the [redacted] drinking water ground storage tanks nearest the Red Hill well on November 28, 2021, and some officials smelled fuel in at least one of the tanks, they did not take water samples from those drinking water ground storage tanks until December 3, 2021.

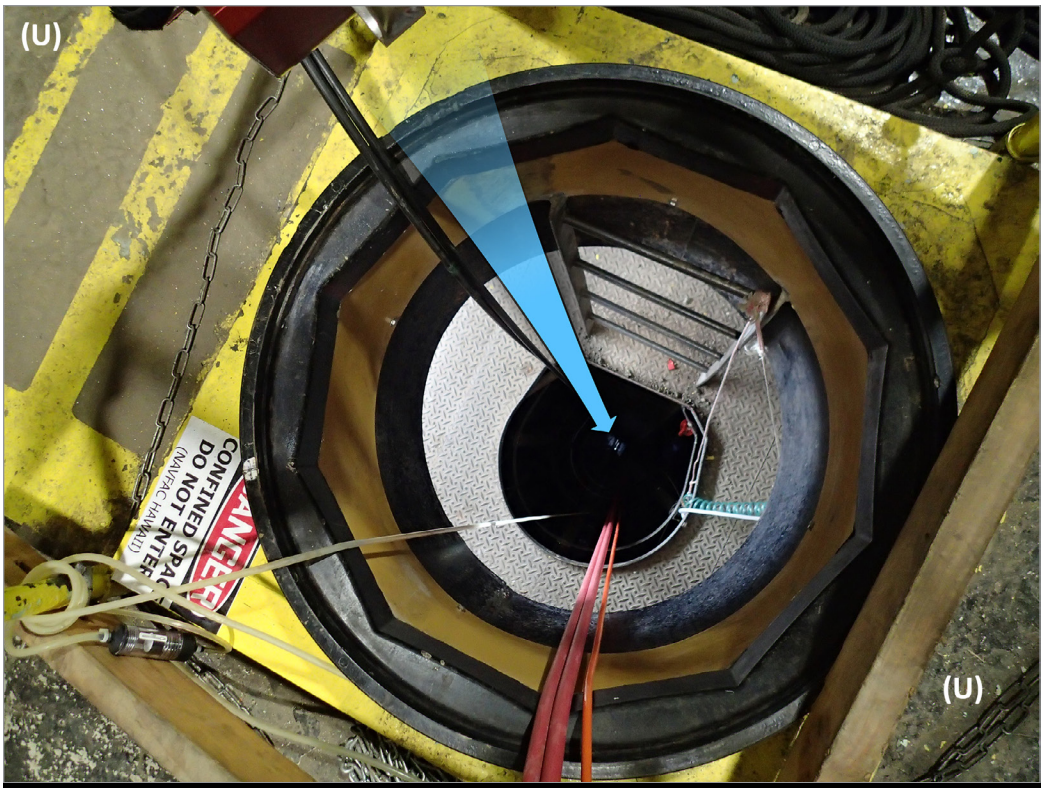
[138] (U) According to the EPA's response protocol toolbox, owners and operators of community water systems must consider the potential impacts of response actions, such as isolating parts of the community water system, on the public. Among those considerations is water necessary for firefighting.

d. (U) Navy Officials Did Not Immediately and Effectively Characterize the Contamination

(U) We determined that Navy officials did not immediately and effectively characterize the contamination, as required by the JBPHH Community Water System ERP and recommended by the EPA's drinking water contamination guide. Specifically, Navy officials did not:

- (U) immediately test for free product at the Red Hill well or the drinking water ground storage tanks; and
- ~~(CUI)~~ immediately take water samples from the [redacted] drinking water ground storage tanks located nearest to the Red Hill well.

~~(CUI)~~ Navy officials visited the Red Hill well on November 28, 2021. At the Red Hill well, they opened the hatch that covers the well and looked down to the surface of the groundwater in the water development tunnel. Navy officials did not observe a visible fuel sheen on the water surface. However, the Red Hill well is [redacted] deep.[139] We visited the Red Hill well during our site visits to JBPHH and found that the distance from the hatch to the water surface would have made a visual assessment of the water quality unreliable, as shown in Figure 12.

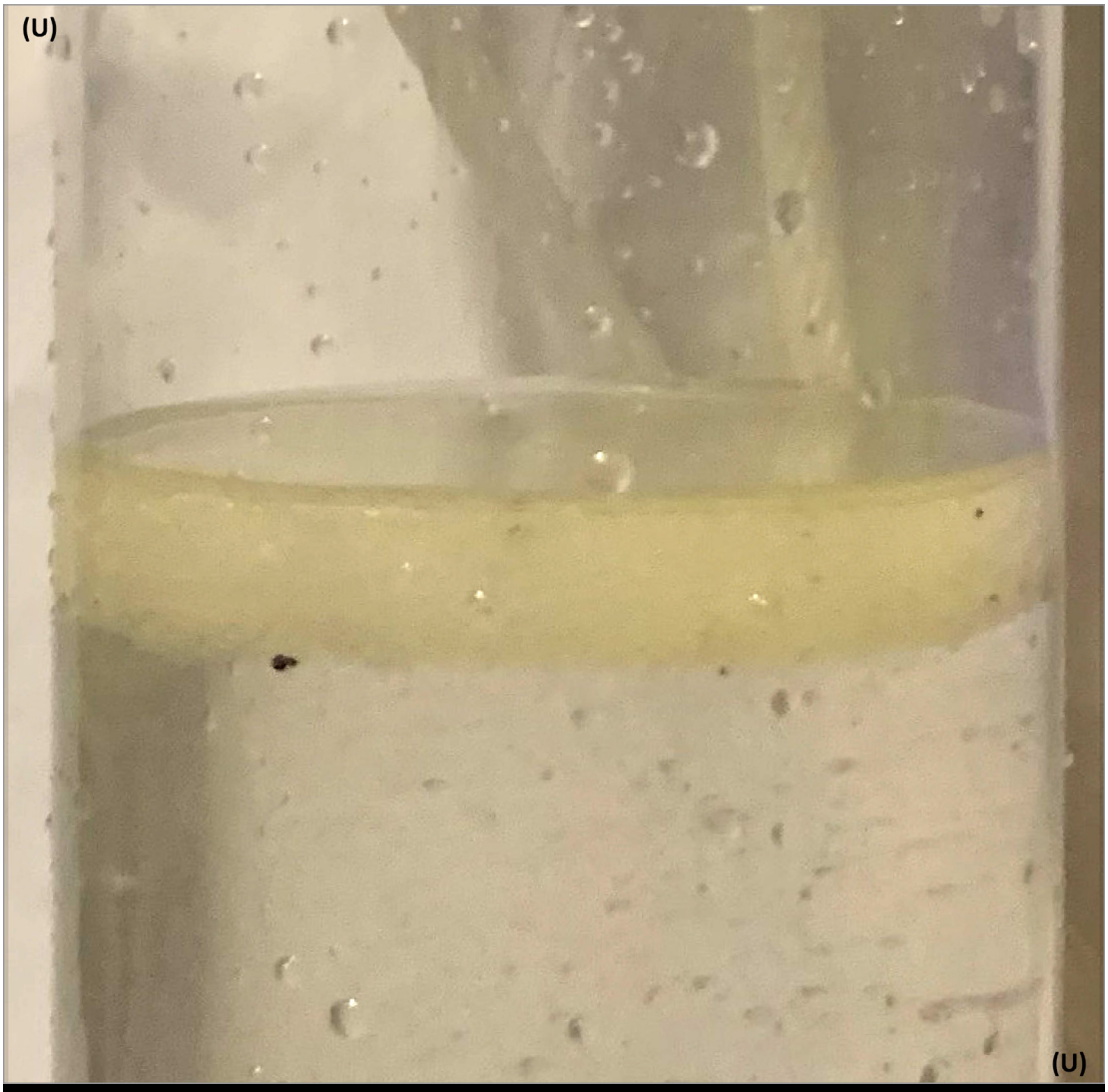


(U) Figure 12. View From the Hatch to the Water Surface in the Red Hill Well
(U) Source: The DoD OIG.

(U) Note: The blue arrow points to the water surface.

[139] (U) The exact distance from the hatch to the water surface varies, because the water level in the water development tunnel varies based on factors, such as the natural variation in the amount of groundwater flowing into the water development tunnel.

(U) In the Red Hill well pump station, Navy officials could not discern whether any fuel odors they smelled on November 28, 2021, came from the Red Hill well or lingered in the vicinity of the LAT from the November 2021 fuel incident.[140] Additionally, the Navy officials did not use a tool to test for free product. Navy officials told us that they did not test for free product at the Red Hill well until December 2, 2021.[141] As shown in Figure 13, that test, using a bailer, found free product, or floating fuel, in the water development tunnel at the Red Hill well. We discuss the reasons why these Navy officials did not immediately and effectively characterize the contamination later in this report.



(U) Figure 13. Free Product Visible in Groundwater Drawn from the Red Hill Well in a Bailer on December 2, 2021
(U) Source: CNRH.

[140] (U) On November 20, 2021, the fuel flowed directly past the entrance to the Red Hill well pump station.

[141] (U) As previously discussed, Navy officials had already missed an opportunity to test for free product on November 24, 2021.

~~(CUI)~~ As outlined above, according to the VCNO command investigation report, Navy officials visited [redacted] drinking water ground storage tanks on November 28, 2021. At the drinking water ground storage tanks, they opened the tank covers and looked down to the water surface. According to the VCNO command investigation report, Navy officials did not observe a visible fuel sheen on the water surface. Some Navy officials could detect an odor of fuel coming from the water. However, we did not find evidence that the Navy officials used a tool to test for free product.

~~(CUI)~~ Navy officials told us that, between November 29, 2021, and December 13, 2021, they took drinking water samples at various locations for EPA-approved laboratory analysis. Based on our review of the results, we determined that Navy officials took water samples at the [redacted] drinking water ground storage tanks near the AMR neighborhood on November 29, 2021. However, Navy officials did not take water samples at the [redacted] drinking water ground storage tanks nearest the Red Hill well until December 3, 2021.[142]

(U) In sum, we determined that Navy officials did not begin characterizing the contamination, as required by the JBPHH Community Water System ERP and recommended by the EPA's drinking water contamination guide, until December 2, 2021—4 days after Navy officials received the first resident complaints, and 12 days after the November 20, 2021 fuel incident. During this time, JBPHH Community Water System users continued to consume contaminated drinking water and use it for domestic purposes, such as cooking and showering.

e. (U) Navy Officials Did Not Immediately Provide Alternate Drinking Water to JBPHH Community Water System Users

(U) According to the JBPHH Community Water System ERP, providing alternate drinking water is a priority during the emergency response if Navy officials suspect contamination. Specifically, the JBPHH Community Water System ERP states, "If necessary, arrangements must be made to secure a supply of potable water to meet the minimum requirements to keep critical activities at JBPHH in operation." However, Navy officials did not immediately provide alternate drinking water to JBPHH Community Water System users.

[142] ~~(CUI)~~ Navy officials did not take water samples at the remaining [redacted] drinking water ground storage tanks until December 13, 2021. All the results from the tests at the drinking water ground storage tanks indicated detections of fuel. Navy officials told us that they were limited on the number of samples they could take and ship overnight to the mainland during this timeframe. However, we could not determine why Navy officials prioritized some areas over others.

(U) According to a Navy media release on November 29, 2021, Navy officials were "moving forward to provide sources of water to affected residents … ." Navy officials began providing alternate drinking water, including bottled water, to residents of 6 of the 26 JBPHH family housing neighborhoods on December 1, 2021, 3 days after resident complaints began on November 28, 2021. However, alternate drinking water was not immediately available to all JBPHH Community Water System users. We asked Navy officials whether they made alternate drinking water available to all JBPHH Community Water System users. A Navy official told us that "early on it was only certain areas," but that later they provided alternate drinking water to any JBPHH Community Water System user who wanted it. According to documentation we reviewed, as of December 2, 2021, a "short term goal" of the Joint Health Services Working Group was to expand the availability of alternate drinking water to all JBPHH Community Water System users. Although Navy media releases we reviewed promoted the availability of alternate drinking water, we could not determine when Navy officials began providing alternate drinking water to any JBPHH Community Water System user who wanted it.[143] We will describe why Navy officials initially limited the provision of alternate sources of drinking water later in this section of this report.[144]

2. (U) Navy Officials Did Not Effectively Communicate with the Affected Community

(U) The National Primary Drinking Water Regulations (NPDWR) and Hawaii Administrative Rules (HAR) 11-20 require owners and operators of community water systems to issue public notices to community water system users for all violations of drinking water regulations and for situations with potential adverse health effects for users. The NPDWR and HAR 11-20 require owners and operators of community water systems to issue public notices to community water system users:

- (U) within certain time frames, based on the specific violation or type of situation with potential adverse health effects for users;
- (U) including 10 required elements of information; and
- (U) delivered "in a manner designed to reach all persons served" by the community water system.

[143] (U) Later in this report, we explain that Navy officials also established the "JBPHH Water Updates" website and posted information there. This website promoted the availability of alternate drinking water, but it did not explicitly state that the alternate drinking water was available to any JBPHH Community Water System user who wanted it. According to the JBPHH Water Updates website, members of the affected community could collect alternate drinking water at eight locations established across the installation.

[144] (U) We discuss this later in this section under the heading, "Navy Officials Assumed That the Contamination Did Not Spread Throughout the JBPHH Community Water System."

(U) Additionally, NAVMED P-5010-5, the JBPHH Community Water System ERP, and the EPA's drinking water contamination guide describe the importance of risk communication during the investigation and response phase of a drinking water emergency, including public notification. According to guidance provided by the Agency for Toxic Substances and Disease Registry (ATSDR), risk communication is "how we talk to the public about substances … that can be harmful," and one of the most important aspects of risk communication is "how we get the message to our community about environmental risks."[145] According to the ATSDR guidance, risk communication must be clear, simple, consistent, and considerate of the affected community.

(U) As previously discussed, the Navy owns and operates the JBPHH Community Water System, and Navy officials are therefore responsible for complying with the NPDWR and HAR 11-20 requirements, including providing public notices to JBPHH Community Water System users. The NPDWR and HAR 11-20 specify how public notices must be written and delivered to community water system users to communicate to users how they should respond to a drinking water emergency.

(U) During the drinking water contamination incident, Navy officials did not issue a public notice that met regulatory requirements.

(U) Navy officials published media releases, issued statements, held town halls, and provided updates during the drinking water contamination incident. However, Navy officials did not effectively communicate with the affected community because they did not meet all the communication requirements of the NPDWR and HAR 11-20. In the following sections, we will explain that Navy officials did not:

- (U) immediately issue an adequate public notice, specifically a Tier 1 public notice, as required by the NPDWR and the HAR;
- (U) include the 10 required elements in communications with JBPHH Community Water System users; or
- (U) communicate "in a manner designed to reach all persons served" by the JBPHH Community Water System.

(U) Additionally, Navy officials did not assume that the contamination spread throughout the JBPHH Community Water System, as required by the JBPHH Community Water System ERP. As a result, Navy officials did not communicate risks to all the JBPHH Community Water System users. Because Navy officials did not effectively communicate with the affected community, JBPHH Community Water System users may have continued to consume contaminated drinking water and use it for domestic purposes, such as cooking and showering.

[145] (U) ATSDR, "Environmental Health Resources Self Learning Module: Risk Communication."

a. (U) Navy Officials Did Not Immediately Provide Adequate Information to the Public

(U) On November 21 and 22, 2021, CNRH public affairs officials issued media releases about the November 2021 fuel incident. Each of the media releases stated that "the drinking water remains safe." However, Navy officials did not take water samples or perform any type of laboratory analysis to confirm that the drinking water was safe. Instead, Navy officials reported that "the drinking water remains safe" based only on the lack of immediate indicators of drinking water contamination.

(U) As previously discussed, on the morning of November 28, 2021, JBPHH residents began complaining of a chemical or fuel smell in their drinking water, JBPHH PWD officials smelled fuel in the drinking water by 11:30 a.m., and the NAVFAC Hawaii CO ordered JBPHH PWD officials to turn off the Red Hill well pumps at 6:15 p.m.

(U) However, Navy officials did not issue a public notice to JBPHH Community Water System users to prevent them from using the contaminated drinking water that was already in the drinking water ground storage tanks and the network of water distribution pipes. Instead, on November 28, 2021, at 9:38 p.m., CNRH public affairs officials issued a media release stating:

> (U) The Navy is investigating reports of a chemical smell in drinking water at several homes in some of the military housing areas for Joint Base Pearl Harbor Hickam Sunday evening. There is no immediate indication that the water is not safe. The Navy continues to investigate reports and is testing the water.
>
> (U) Navy engineers visited several homes of families who reported the smell and also immediately went to Navy's drinking water wells to investigate. There was no smell or sign of fuel or chemicals in the water at the Navy's water wells and water tanks.

(U) Although some JBPHH PWD officials smelled fuel in the drinking water earlier in the day and the NAVFAC Hawaii CO ordered JBPHH PWD officials to turn off the Red Hill well pumps, the NAVFAC Hawaii CO was not able to smell fuel in the drinking water until approximately 10:00 p.m. on November 28, 2021. However, Navy officials did not correct the November 28, 2021 media release.

(U) Instead, on November 29, 2021, the day after Navy officials turned off the Red Hill well due to suspected contamination, the JBPHH CO released a statement, coordinated with CNRH and COMPACFLT officials, via email. The email, sent to residents of the JBPHH family housing neighborhoods, stated:

> (U) I can tell you at this point that there are no immediate indications that the water is not safe. My staff and I are drinking the water on base this morning, and many of my team live in housing and drink and use the water as well. […]

> (U) We have not recommended any schools to be closed, and we have not sent out any notifications telling people to not use the water.

(U) According to the JBPHH Community Water System ERP, "[i]f contamination is coming from Red Hill shaft, isolate Red Hill shaft, [and] issue 'Do Not Drink' notifications until the contaminant has been identified … ." Additionally, NAVMED P-5010-5 includes a flow chart describing public notification procedures for a drinking water "issue that has the potential to threaten public health," as shown in Appendix C. According to NAVMED P-5010-5:

> (U) Potential restrictions on water use that might be achieved through public notification include issuing a 'boil water' notice, 'do not drink' notice (no consumption), and 'do not use' [for any purpose] notice.

(U) In sum, NAVMED P-5010-5 allows three options for a public notification: (1) boil water, (2) do not drink, and (3) do not use for any purpose. For example, community water system owners and operators may issue a "do not drink" public notice when users should not drink or consume the water, but it is safe to use the water for other purposes, such as washing laundry. A "do not use" public notice is the most restrictive. According to the NAVMED P-5010-5 flow chart, when the contaminant is unknown, a "do not use" public notice should be issued. Additionally, when the contaminant is known and the contaminant is associated with a risk of dermal or inhalation exposure, a "do not use" public notice should be issued. ATSDR documents we reviewed indicate that fuel is associated with a risk of dermal or inhalation exposure to humans.[146]

(U) On November 28, 2021, Navy officials did not know with certainty what contaminant was in the JBPHH Community Water System. However, they suspected that the contaminant was fuel from the November 2021 fuel incident and shut down the Red Hill well.[147] Either way, Navy officials should have issued a "do not use" public notice to JBPHH Community Water System users. However, Navy officials did not issue such a notice.

[146] (U) ATSDR Division of Toxicology and Human Health Sciences, "JP-5, JP-8, and Jet A Fuels – ToxFAQs," March 2017.
(U) ATSDR Division of Toxicology and Human Health Sciences, "Public Health Statement JP-5, JP-8, and Jet A Fuels," March 2017.

[147] (U) Navy officials suspected that the contaminant was fuel from the November 2021 fuel incident but did not know how much fuel might have contaminated the JBPHH Community Water System via the Red Hill well. Our review of the NPDWR, HAR 11-20, and NAVMED P-5010-5 did not indicate that owners and operators of drinking water systems should delay public notifications until they determine the amount of contaminant in the system if they receive indicators of drinking water contamination. We concluded that the NPDWR, HAR 11-20, and NAVMED P-5010-5 prioritized early and proactive public notifications to mitigate risks to public health.

(U) On November 29, 2021, the Hawaii DOH issued a Drinking Water Health Advisory that advised "Navy water system consumers not to drink, consume tap water." Specifically, it stated that the Hawaii DOH recommended that:

> (U) **all Navy water system users** avoid using the water for drinking, cooking, or oral hygiene. Navy water system users **who detect a fuel odor** from their water should avoid using the water for drinking, cooking, bathing, dishwashing, laundry or oral hygiene (brushing teeth, etc.).

(U) On November 29, 2021, CNRH public affairs officials issued a media release stating:

> (U) The Navy's current guidance for Joint Base Pearl Harbor–Hickam military housing residents is to report any chemical or petroleum odors associated with their potable water. If chemical or petroleum odors are present, recommend avoiding ingestion as a cautionary measure.

(U) Navy officials told us that they aligned their message in December with the Hawaii DOH's November 29, 2021 Drinking Water Health Advisory. However, the Navy's media releases we reviewed did not contain any language that repeated the Hawaii DOH's recommendations.[148] Additionally, we did not find any Navy media releases that specifically stated either "do not use" or "do not drink" the JBPHH Community Water System drinking water. Furthermore, according to the VCNO command investigation report, Navy officials dissuaded Hawaii DOH officials from shutting down the entire JBPHH Community Water System, and told us that they were unaware of the Hawaii DOH's authority to direct the Navy to shut it down.[149] Later in this report, we will explain that Navy officials were not sufficiently aware of the roles, responsibilities, and requirements applicable to owners and operators of community water systems in Federal and state laws and regulations and DoD policies.

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[148] (U) The Navy's January 13, 2022 media release was the first media release that referred to the Hawaii DOH's November 29, 2021 Drinking Water Health Advisory. The Navy media release on January 24, 2022, contained a web link to the advisory on the Hawaii DOH website. This was the first communication by Navy officials that we found linking readers to the Hawaii DOH's November 29, 2021 Drinking Water Health Advisory. Subsequent Navy media releases included the web link; however, the media releases never repeated the Hawaii DOH language. Navy officials did not post the Hawaii DOH's November 29, 2021 Drinking Water Health Advisory on the "JBPHH Water Updates" web page that Navy officials established to provide information, resources, and updates about the drinking water contamination incident; or include the exact language from the Hawaii DOH's November 29, 2021 Drinking Water Health Advisory on any communications we reviewed.

(U) Navy officials established the "JBPHH Water Updates" website on December 1, 2021, and posted information there, including previously released information from November 2021.

[149] (U) The EPA granted the State of Hawaii the authority to regulate drinking water in the State in accordance with the SDWA. Therefore, the State of Hawaii has primary enforcement responsibility for the JBPHH Community Water System. According to OPNAV M-5090.1, Navy officials "cannot override a regulatory requirement to provide alternative water but can advise more protective measures." According to the VCNO command investigation report, on November 29, 2021, Hawaii DOH officials were considering whether to recommend that the Navy shut down the entire JBPHH Community Water System.

(U) As previously discussed, the U.S. Army Garrison Hawaii is the owner and operator of the consecutive water systems that serve the Aliamanu Military Reservation (AMR) and Red Hill neighborhoods that receive their water from the JBPHH Community Water System. Beginning on December 2, 2021, Army officials told residents of the AMR and Red Hill neighborhoods, "Do not use the water in your home." By December 9, 2021, Army officials had extended the same message to all Army families living in JBPHH family housing neighborhoods. Therefore, JBPHH Community Water System users received three conflicting messages about how to respond to the drinking water contamination. Specifically, the messages from the:

- (U) Hawaii DOH stated "do not drink" at all and "do not use" for any other reason if you smell fuel,
- (U) Navy stated "do not drink" if you smell fuel, and
- (U) Army stated "do not use" for any reason.

b. (U) Navy Officials Did Not Issue a Tier 1 Public Notice

(U) The NPDWR and HAR 11-20 require owners and operators of community water systems to issue public notices to community water system users within certain time frames, based on the specific violation or type of situation with potential adverse health effects for users. Specifically, community water system owners and operators must issue a Tier 1 public notice "as soon as practical, but no later than 24 hours after" the owners and operators "learn of the … situation" during:

- (U) situations "with significant potential to have serious adverse effects on human health as a result of short term exposure"; and
- (U) "incidents under investigation without confirmed contamination."

(U) However, Navy officials did not issue a Tier 1 public notice within 24 hours of:

- (U) learning of the situation on November 28, 2021, when residents complained of a chemical or fuel smell in their drinking water; and
- (U) confirming, on December 2, 2021, that the Red Hill well had been contaminated with fuel.[150]

(U) Because Navy officials did not issue a Tier 1 public notice, JBPHH Community Water System users may have continued to consume contaminated drinking water and use it for domestic purposes, such as cooking and showering. Navy officials issued a retroactive Tier 1 public notice to JBPHH Community Water System users on May 13, 2022, more than 5 months after Navy officials confirmed the contamination.[151]

[150] (U) As previously discussed and shown in Figure 13, Navy officials confirmed the contamination on December 2, 2021, when they found free product at the Red Hill well.

[151] (U) Throughout this report, we use the term "retroactive Tier 1 public notice" to refer to the public notice that Navy officials issued on May 13, 2022, to correct the lack of an earlier public notice. Navy officials amended the retroactive Tier 1 public notice again on June 30, 2022.

c. (U) Navy Officials Did Not Deliver Public Notices Including Ten Required Elements of Information

(U) The NPDWR and HAR 11-20 require owners and operators of community water systems to include specific "elements" of information in all public notices, regardless of whether the public notice is a Tier 1 public notice. Specifically, public notices must include the 10 elements shown in Table 2.

(U) Table 2. The 10 Elements of Public Notices

(U) Element	Description
1	A description of the violation or situation that occurred, including the contaminant(s) of concern, and the contaminant level(s).
2	When the situation occurred.
3	The potential health effects (including standard required language).
4	The population at risk, including subpopulations vulnerable if exposed to the contaminant in their drinking water.
5	Whether alternate water supplies need to be used.
6	What the community water system owners and operators are doing to correct the problem.
7	Actions community water system users can take.
8	When the community water system expects a resolution to the problem.
9	How to contact the community water system owners and operators for more information.
10	Language encouraging broader distribution of the public notice. **(U)**

(U) Source: DoD OIG summary of NPDWR and HAR 11-20 requirements.

(U) The EPA published an example public notice on its website that shows how community water system owners and operators should incorporate the 10 elements of information required in a public notice.[152] We reviewed the NPDWR and HAR 11-20 requirements, the EPA's example public notice, and all of the Navy's media releases during the drinking water contamination incident between November 20, 2021, and March 18, 2022. We found that Navy officials did not issue any media releases to JBPHH Community Water System users during the drinking water contamination incident that met the requirements of a public notice by including the 10 required elements of information.

[152] (U) See Appendix C for the EPA's example public notice.

(U) Specifically, although Navy officials included some of the required elements of information in certain media releases, we did not find any media releases that included all 10 required elements of information. For example, as previously discussed, the November 29, 2021 media release recommended that JBPHH family housing neighborhood residents report any drinking water odors and avoid drinking their drinking water if odors were present and described some actions Navy officials were taking to obtain drinking water samples and provide alternate drinking water. However, the media release did not include other required elements of information, including a description of the violation or situation that occurred, the potential health effects, and how to contact the community water system owners and operators for more information. Additionally, we were unable to find certain required elements of information in any Navy media releases. For example, Navy media releases we reviewed did not encourage broader distribution of the message.

(U) Additionally, the NPDWR and HAR 11-20 require owners and operators of community water systems to provide public notices "in a manner designed to reach all persons served" by the community water system, including transient users. Specifically, the NPDWR and HAR 11-20 require owners and operators of community water systems to directly deliver public notices by:

> (U) employing one or more of the following forms of delivery:
>
> (A) (U) Appropriate broadcast media (such as radio and television);
>
> (B) (U) Posting of the notice in conspicuous locations throughout the area served by the water system;
>
> (C) (U) Hand delivery of the notice to persons served by the water system; or
>
> (D) (U) Another delivery method approved or ordered in writing by the State.

(U) Although Navy officials did not issue a Tier 1 public notice within 24 hours and did not include the 10 required elements of information in their other communications, they did communicate with JBPHH Community Water System users during the drinking water contamination incident. Navy officials communicated with JBPHH Community Water System users through emails to military email accounts and emails to residents of JBPHH family housing

(U) neighborhoods. Navy officials also established the "JBPHH Water Updates" website and posted information there, including recordings of virtual events.[153] Based on our review of the website, we found that Navy officials hosted:

- (U) six in-person town hall events between November 30 and December 5, 2021; and
- (U) 85 virtual events between December 2, 2021, and May 26, 2022.

(U) We asked Navy officials if they directly delivered any public notices via the "forms of delivery" required by the NPDWR and HAR 11-20. Navy officials sent us many examples of their communications, including a few flyers that Navy officials prepared for JBPHH family housing residents. However, Navy officials did not provide us evidence that their communications were designed to reach all persons served by the JBPHH Community Water System. We observed that Navy officials were communicating; however, we found that the communications:

- (U) did not include the 10 elements of information required in a public notice; and
- (U) were not consistently delivered "in a manner designed to reach all persons served" by the JBPHH Community Water System, as required by the NPDWR and HAR 11-20.

(U) In sum, public notices that include the 10 elements of information and are directly delivered to community water system users reduce or eliminate the risk of human exposure to contaminated drinking water during a drinking water emergency and mitigate public health effects with consistent and repeatable information. Finally, on May 13, 2022, more than 5 months after Navy officials confirmed the contamination, Navy officials issued a retroactive Tier 1 public notice to JBPHH Community Water System users.[154] The Tier 1 public notice included the 10 required elements of information and stated:

> (U) This is information users should have received in NOVEMBER 2021 about your drinking water. [...] This notification is being provided to inform the Joint Base Pearl Harbor-Hickam (JBPHH) drinking water system users that the Navy did not provide a required public notification for the November 2021 fuel release in accordance with the prescribed format as required by the HAR [11-20]. [...] Water users of the JBPHH and AMR drinking water system were recommended to avoid using the water for drinking, cooking, oral hygiene, and consumption by pets and to use bottled water from November 29, 2021 until the public health advisory for each zone was amended by the [Hawaii] DOH.[155]

[153] (U) The JBPHH Water Updates website is at https://www.cpf.navy.mil/JBPHH-Water-Updates/.

[154] (U) Navy officials issued the retroactive Tier 1 public notice in response to the EPA NEIC SDWA investigation.
(U) EPA National Enforcement Investigations Center, "NEIC Civil Investigation Report: Joint Base Pearl Harbor-Hickam Public Water System, Pearl Harbor, Hawaii 96860" April 4-8, 2022.

[155] (U) Navy officials amended the public notification on June 30, 2022.

d. (U) Navy Officials Assumed That the Contamination Did Not Spread Throughout the JBPHH Community Water System

(U) We asked Navy officials why they did not issue a "do not use" public notice to all JBPHH Community Water System users. Navy officials told us that they mapped the complaints in December 2021. Additionally, Navy officials told us they believed that there were areas of the JBPHH Community Water System that could never receive drinking water from the Red Hill well due to hydraulic conditions within the JBPHH Community Water System. However, Navy officials did not have a calibrated hydraulic computer model of the hydraulic conditions within the JBPHH Community Water System to validate that assumption.[156]

(U) Additionally, as previously discussed, one goal of the JBPHH Community Water System ERP is to "minimize negative impacts on public health … ." The JBPHH Community Water System ERP states:

> (U) Water contamination events are more difficult to pinpoint and require sampling and analysis to detect and delineate. For that reason, it is best to assume that during the time required to respond to such an emergency, the contamination has been distributed [i.e. spread] throughout the system.

(U) However, Navy officials did not respond to the incident by assuming that the contamination spread throughout the JBPHH Community Water System. Instead, Navy officials assumed that only certain JBPHH family housing neighborhoods were affected, which they referred to as "impacted" JBPHH family housing neighborhoods. However, while Navy officials were flushing the JBPHH Community Water System with clean drinking water, they found fuel contamination in areas of the JBPHH Community Water System that Navy officials did not refer to as impacted.[157]

(U) The Navy's drinking water emergency response plan recommends assuming that contamination is spread throughout the drinking water system, but Navy officials assumed that only certain areas were affected.

[156] (U) According to Navy officials, a hydraulic computer model of the largest drinking water distribution pipelines in the JBPHH Community Water System was developed in 2014 and calibrated to the conditions at that time. However, because the model did not include all of the pipelines and was not calibrated to the conditions at the time of the drinking water contamination incident, it was considered to be of limited use. EPA NEIC officials also reported that Navy officials could not verify hydraulic conditions within the JBPHH Community Water System during their SDWA investigation.

[157] (U) For example, on January 26, 2021, laboratory testing of a drinking water sample taken from the Pearl City Peninsula JBPHH family housing neighborhood identified total petroleum hydrocarbons (TPH) contamination. Because there are many different chemicals in fuel, it is useful to measure the total amount of mixed petroleum hydrocarbons, referred to as TPH. See Appendix C for more detail about the contaminants identified during the drinking water contamination incident. As discussed in Part III, on December 17, 2021, EPA, Hawaii DOH, Army, and Navy officials established the IDWST and signed the Joint Water Distribution Recovery Plan for flushing the entire JBPHH Community Water System with clean drinking water to flush out the contamination.

(U) Additionally, Navy officials did not refer to the neighborhoods as impacted until residents complained about their drinking water. For example:

- (U) the CNRH media release on November 30, 2021, the day after the Hawaii DOH issued its advisory to all Navy water system users, listed only 6 of the 26 JBPHH family housing neighborhoods as impacted, implying an isolated issue;[158]
- (U) the CNRH media release on December 1, 2021, listed 7 of the 26 JBPHH family housing neighborhoods; and[159]
- (U) on December 7, 2021, CNRH "heat maps" we reviewed described 12 impacted JBPHH family housing neighborhoods, even though Navy officials had received 1,544 complaints from 21 of the 26 JBPHH family housing neighborhoods by December 6, 2021.[160]

(U) Furthermore, the CNRH heat maps did not track areas of JBPHH other than JBPHH family housing neighborhoods and did not acknowledge that child care centers, schools, and installation facilities were impacted.[161] Therefore, JBPHH Community Water System users who lived in, worked in, or frequented areas of JBPHH that were not referred to as impacted may have continued to consume contaminated drinking water and use it for domestic purposes, such as cooking and showering.

[158] (U) The CNRH media release referred to the issue as occurring at "several military housing areas." The CNRH media releases listed the Catlin Park, Halsey Terrace, Radford Terrace, Doris Miller, Moanalua Terrace, and Earhart Village (located on Ohana Nui Circle) JBPHH family housing neighborhoods.

[159] (U) In addition to the six JBPHH family housing neighborhoods described in the November 30, 2021 CNRH media release, the December 1, 2021 CNRH media release listed the AMR JBPHH family housing neighborhood.

[160] (U) We found that CNRH officials developed color-coded maps, which they referred to as heat maps, of JBPHH to track the areas they considered "impacted areas," which they color-coded red. Between December 7, 2021, and December 15, 2021, the CNRH heat maps listed these 12 JBPHH family housing neighborhoods: Catlin Park, Halsey Terrace, Radford Terrace, Doris Miller, Moanalua Terrace, Hale Moku, Earhart Village, Hale Na Koa, Officer Field, Onizuka Village, AMR, and Red Hill.

[161] (U) On December 10, 2021, Navy officials addressed Hawaii state legislators. The officials repeated the belief that the fuel contamination was limited to certain areas of the JBPHH Community Water System, but also acknowledged that child care centers, schools, and installation facilities were impacted. This was the first public acknowledgement we found that the "impacted areas" were not limited to JBPHH family housing neighborhoods. Additionally, as previously discussed, Navy officials repeatedly told us they believed that there were areas of the JBPHH Community Water System that could never receive drinking water from the Red Hill well due to hydraulic conditions within the JBPHH Community Water System.

C. (U) Navy Officials Lacked Understanding of the Infrastructure Systems at DFSP JBPHH, and Were Not Adequately Prepared to Respond to the Drinking Water Contamination Incident or Implement Risk Communication

(U) In this section, we discuss the reasons why the drinking water contamination incident occurred and why Navy officials did not effectively manage the response. Specifically, we determined that Navy officials lacked sufficient understanding of the risks associated with the co-location of the Red Hill well and the Red Hill BFSF. Additionally, DoD officials were not adequately prepared to respond to a drinking water contamination incident. Furthermore, DoD officials were not adequately prepared to implement risk communication in response to the resultant public health crisis.

1. (U) Navy Officials Lacked Understanding of the Co-Location of the Red Hill Well and the Red Hill BFSF, the Interfaces Between Them, and the Associated Risks

(U) We determined that Navy officials did not effectively implement the JBPHH Community Water System ERP because they lacked sufficient understanding of the Red Hill BFSF and the Red Hill well. Specifically, Navy officials did not activate the JBPHH Community Water System ERP on November 20, 2021, because they did not recognize the imminent risk to the Red Hill well. Because the Navy officials lacked sufficient understanding of the risks, they incorrectly believed that the fuel released during the November 2021 fuel incident did not have a pathway to contaminate the Red Hill well.

(U) The November 2021 incident was both a fuel incident and a drinking water contamination incident. However, Navy officials' immediate response was for a fuel incident.[162] Navy officials repeatedly told us that they did not expect drinking water contamination to occur for the following reasons.

- (U) Some Navy officials told us that they did not know about the existence of the Red Hill well and the water development tunnel or did not understand the proximity of the fuel release to the Red Hill well.
- ~~(CUI)~~ All Navy officials we met reported that they did not know about the subsurface drainage system [redacted], including the French drain, that connects to the groundwater sump pit.
- (U) Various Navy officials reported that they thought the tunnel floors and the groundwater sump pit would effectively contain the fuel.
- (U) Some Navy officials did not realize that the November 20, 2021 incident was a fuel release until after residents began complaining, since Navy officials initially and incorrectly reported a water release and did not effectively correct the error. We discuss this in more detail in DODIG-2025-011.

(U) For example, the CNRH Chief of Staff told us that CNRH officials, including the CNRH CO, did not know the Red Hill well was in the Red Hill BFSF. The NAVFAC Hawaii CO told us that many people did not understand the proximity of the fuel release to the Red Hill well.[163] According to the VCNO command investigation report, the JBPHH CO did not believe that there was a requirement for them to serve as the Incident Commander for a fuel incident at the Red Hill BFSF.[164] Additionally, the JBPHH CO reported that they did not understand the proximity of the fuel release to the Red Hill well until December 5, 2021 during a visit with the Secretary of the Navy to the Red Hill BFSF—6 days after their November 29, 2021 email to resident of JBPHH stating that "there are no immediate indications that the water is not safe."[165] In another example, the JBPHH PWD Utilities Director reported that they had never visited the Red Hill well before

[162] (U) As previously discussed, various Navy organizations are involved in the ownership, operations, and management of DFSP JBPHH, including the Red Hill BFSF, and the JBPHH Community Water System. Specifically, CNIC owns the physical Red Hill BFSF and JBPHH Community Water System infrastructure and is the Executive Agent for drinking water quality matters for all Navy installations worldwide, including drinking water compliance. CNRH is the regional CNIC command in Hawaii. NAVSUP FLC PH operates the Red Hill BFSF. NAVFAC Hawaii, specifically the JBPHH PWD, operates and maintains the JBPHH Community Water System. The JBPHH installation command provides base operating support functions and is responsible for safety, security, and environmental stewardship of personnel and property on JBPHH. The response to the November 2021 fuel incident involved a variety of Navy officials, including commanding officers, environmental officials, engineers, and fuel system operators. Additionally, the incident garnered the attention of the Hawaii DOH, congressional representatives, and other local DoD commands dependent on fuel operations who visited the site of the incident. For example, on November 23, 2021, the COMPACFLT command team visited the Red Hill BFSF to view the site of the incident.

[163] (U) The NAVFAC Hawaii CO is also dual-hatted as the CNRH N4.

[164] (U) We discuss the response to the May and November 2021 fuel incidents in DODIG-2025-011.

[165] (U) The Secretary of the Navy was at JBPHH to participate in the response to the drinking water contamination incident.

(U) the drinking water contamination incident. Furthermore, the JBPHH Public Works Officer did not know the release that began on November 20, 2021, was a fuel release until November 28, 2021, when residents began complaining.

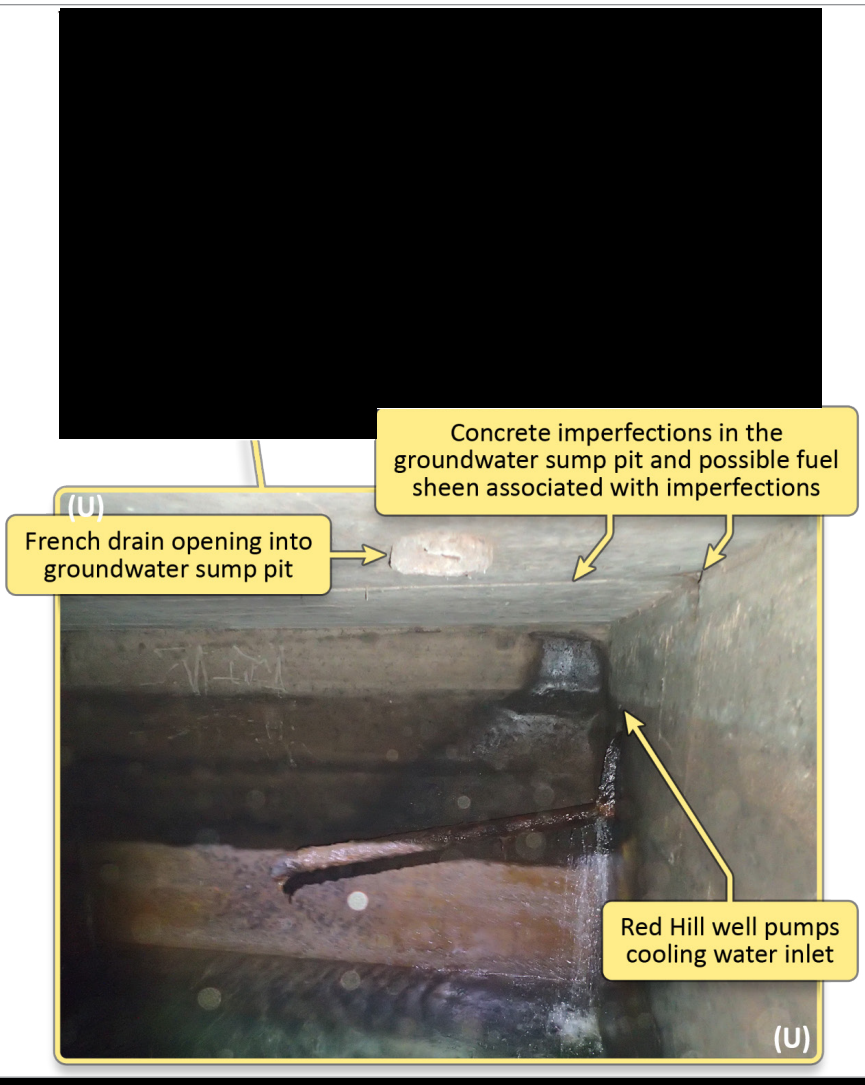
(U) As previously discussed, the CNRH SPCC does not list the tunnels as containment, and the CNRH ICP clearly states that the LAT is not impermeable to spills. However, the dual-hatted CNRH Environmental Program Manager and NAVFAC Hawaii Environmental Director told us that they and other Navy officials incorrectly assumed that the tunnel system would provide containment. The dual-hatted Navy environmental official told us that Navy officials did not place emphasis on potential impacts to the Red Hill well from sources other than a subsurface leak from one of the Red Hill BFSF USTs, because they believed fuel releases in the tunnel system would be contained by the tunnels.

(U) Additionally, Navy officials repeatedly stated to our evaluation team that the failure mode and contamination pathway that led to the drinking water contamination incident could not have been predicted. However, Navy officials might have been able to predict the failure mode and contamination pathway if they:

- (U) reviewed or were aware of the history of the Red Hill well, including the 1949 report we previously discussed, which described a similar failure mode and contamination pathway in 1948;
- (U) reviewed the relevant engineering drawings of the Red Hill well and the groundwater sump pit; and
- (U) investigated the integrity of the groundwater sump pit.

(U) However, Navy officials did not review the engineering drawings until after November 28, 2021, when resident complaints began. During our site visit, we inspected the groundwater sump pit and used handheld cameras to photograph the interior. We found that imperfections in the concrete, the French drain inlet, and the cooling water inlet were readily visible, as shown in Figure 14.

(U) Despite the documented risks of the co-located fuel and drinking water systems, Navy officials did not expect the drinking water contamination to occur and did not review engineering drawings of the systems until after residents complained.



(U) Figure 14. Interior Image of the Groundwater Sump Pit, Including Imperfections in the Concrete, View of the French Drain Opening and the Cooling Water Inlet
(U) Source: The DoD OIG, based on figures provided by NAVFAC Hawaii and NAVSUP FLC PH and DoD OIG photo taken during an April 2022 site visit.

2. (U) Navy Officials Were Not Adequately Prepared to Respond to the Drinking Water Contamination Incident

(U) Navy officials were not adequately prepared to respond to contamination of the JBPHH Community Water System because they:

- (U) were not sufficiently aware of the roles, responsibilities, and requirements applicable to owners and operators of community water systems in Federal and state laws and regulations and DoD policies;
- (U) were not trained on their JBPHH Community Water System ERP roles and responsibilities; and
- (U) did not exercise the JBPHH Community Water System ERP.

(U) Our interviews with responsible Navy officials revealed that they were not sufficiently aware of the roles, responsibilities, and requirements applicable to owners and operators of community water systems. Navy officials expressed confusion about who was responsible for issuing public notices, such as a Tier 1 public notice. Additionally, Navy officials defended their decision not to immediately issue a "do not drink" or "do not use" public notice, stating that they only had odor as an indicator at the time. Each of these statements contradicted requirements of the NPDWR, HAR 11-20, and Navy policies and manuals, including OPNAV M-5090.1 and NAVMED P-5010-5, that we previously discussed in this report.

(U) The JBPHH Community Water System ERP states that community water system owners and operators should be trained on their emergency response plan roles and responsibilities and that the plan should be regularly exercised. According to the EPA NEIC investigation report and the NAVFAC command investigation report, installation officials:

- (U) did not know their JBPHH Community Water System ERP roles and responsibilities;
- (U) did not refer to the JBPHH Community Water System ERP; and
- (U) did not conduct drills or training sessions designed around the JBPHH Community Water System ERP before or after the plan became effective in June 2021—about 6 months before the November 2021 fuel incident.

(U) During our site visit in July 2022, we asked Navy officials whether they knew about or referred to the JBPHH Community Water System ERP.

- (U) A JBPHH PWD official told us that it did not occur to them to go back to the office to review the plan because NAVFAC Hawaii and JBPHH PWD officials were already out assessing the possible causes of the resident complaints.
- (U) The NAVFAC Hawaii CO told us that they were aware of the JBPHH Community Water System ERP but did not reference the plan during the first several days of the drinking water contamination incident.

Navy officials did not refer to their drinking water emergency plan or practice how to respond to drinking water contamination incidents.

- (U) A CNRH Public Affairs official told us they had never heard of the JBPHH Community Water System ERP and did not know that the plan states that the Public Affairs Office has a primary role in responding to drinking water incidents.

3. (U) DoD Officials Were Not Adequately Prepared to Implement Risk Communication

(U) We determined that DoD officials were not adequately prepared to implement risk communication in response to the public health crisis. As previously discussed, the ATSDR states that risk communication must be clear, simple, consistent, and considerate of the affected community. For example, the 10 required elements of a public notice ensure a clear and consistent message.

(U) Additionally, the ATSDR recommends seeking risk communication assistance "if you are in the middle of a crisis situation, addressing an angry community, or have to work with the media … ." DoDI 6055.20 requires DoD officials to "[p]rovide targeted and effective health risk communication early and continuously as new and credible information becomes available."[166] According to the VCNO command investigation report, CNIC directed CNRH environmental and public health officials to seek risk communication assistance from the Navy's risk communication experts at the Navy and Marine Corps Public Health Center (NMCPHC).[167]

(U) NMCPHC officials told us that, when they traveled to JBPHH, they observed a lack of coordination and inconsistent messaging. The NMCPHC officials drafted a risk communication plan, recommended changes to the "JBPHH Water Updates" website, and prepared at least eight fact sheets to share with the public. However, the NMCPHC officials told us that officials at JBPHH did not implement the proposed risk communication plan and published only one of the proposed fact sheets. According to NMCPHC officials, the lack of a consistent and repeatable message from a risk communication plan and fact sheets meant that Navy officials were "re-creating the wheel as pressure from the public heats up." Additionally, during our second site visit in July 2022, DoD medical officials acknowledged that risk communication was a challenge. Furthermore, in December 2022, a Defense Health Agency (DHA) official told us that the lack of an organized response hindered risk communication.

[166] (U) DoDI 6055.20, "Assessment of Significant Long-Term Health Risks from Past Environmental Exposures on Military Installations," June 6, 2017 (Incorporating Change 2, June 10, 2019).

[167] (U) According to BUMEDINST 6240.10C, the NMCPHC provides risk communication support as requested or required.
(U) According to the VCNO command investigation report, CNIC directed CNRH environmental and public health officials to seek risk communication assistance on December 1, 2021.

D. (U) Ineffective Operation, Maintenance, and Management Led to Poor JBPHH Community Water System Infrastructure Conditions

(U) The Navy constructed the majority of the JBPHH Community Water System in 1943, but some parts of the system date back to 1922. According to CNRH documentation we reviewed, the JBPHH Community Water System infrastructure components are, on average, 12 years beyond their useful life and in poor condition. In addition to the conditions that led to the drinking water contamination incident, we determined that there were systemic issues with the JBPHH Community Water System operations, maintenance, and management.

1. (U) Poor Infrastructure Conditions Existed Throughout the JBPHH Community Water System

(U) EPA NEIC officials reported that they found degraded material conditions throughout the JBPHH Community Water System.[168] For example, EPA NEIC officials found significant rust and pitting of pumps, pipes, and valves at the Waiawa well and the Halawa well. In another example, EPA NEIC officials identified a deficiency at one of the drinking water ground storage tanks that allowed geckos to nest inside the tank. According to the EPA NEIC report, this deficiency was first brought to the attention of JBPHH officials in 2014, but it was not corrected at the time of the EPA NEIC investigation in April 2022, 8 years later.

~~(CUI)~~ In another example, EPA NEIC officials observed a significant amount of sediment at the bottom of one of the [redacted] drinking water ground storage tanks.[169] United Facilities Criteria (UFC) 3-230-02 requires JBPHH PWD officials to perform a complete inspection, drain, clean, repair, and disinfect drinking water ground storage tanks every 3 to 5 years.[170] However, JBPHH PWD officials told EPA NEIC officials that the tank was installed in the mid-1990s and had never been cleaned.

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168 (U) EPA National Enforcement Investigations Center, "NEIC Civil Investigation Report: Joint Base Pearl Harbor-Hickam Public Water System, Pearl Harbor, Hawaii 96860" April 4-8, 2022.

169 ~~(CUI)~~ EPA NEIC officials made this observation at one of the [redacted] ground storage tanks [redacted]. The ground storage tank provides drinking water to the nearby area, including the Red Hill neighborhood.

170 (U) UFC 3-230-02, "Operation and Maintenance: Water Supply Systems (2021)," December 10, 2019 (Incorporating Change 1, April 1, 2021).

(U) UFC 3-230-02 is "a comprehensive operations and maintenance manual" for Community Water Systems including how often inspections and preventive maintenance should occur for Community Water System infrastructure components, such as ground storage tanks and water development tunnels.

(U) Inspection and assessment reports described the poor condition of drinking water infrastructure at DFSP JBPHH.

~~(CUI)~~ EPA NEIC officials reported that they found degraded material conditions at the Red Hill well in April 2022. For example, EPA NEIC officials found an actively leaking and severely corroded valve on the pipe that carries drinking water from the Red Hill well pump station to the [redacted] drinking water ground storage tanks [redacted] the Red Hill neighborhood.

(U) UFC 3-230-02 requires JBPHH PWD officials to maintain the structural integrity of water development tunnels and to disinfect water development tunnels as a normal maintenance procedure. As previously discussed, on December 5, 2021, Navy divers entered the water development tunnel and saw fuel leaking from the ceiling. Additionally, in January 2022, Navy officials sent a remotely operated, submersible vehicle into the water development tunnel to record video of its condition. The video showed evidence of fuel. Specifically, the video findings report that we reviewed described an iridescent sheen on the walls and ceiling and floating on the groundwater in the water development tunnel.[171] The evidence of fuel was most prevalent in areas of the water development tunnel directly underneath the location of the November 2021 fuel incident. Additionally, in some areas, the video showed "blebs" of what appeared to be fuel in the groundwater and fluid dripping from the ceiling.[172]

(U) According to the video findings report, water and fuel were leaking through subsurface routes under the permeable LAT floors into the water development tunnel. Furthermore, Navy officials found fractures in the ceiling, wires hanging in the tunnel, timbers lying submerged on the tunnel floor, rusted pipes, and copious amounts of biomaterial growing on walls and ceilings and floating in the groundwater. Based on our analysis of this report, we determined that the structural integrity of the water development tunnel had not been maintained, as required by UFC 3-230-02.

[171] (U) NAVFAC HI, "Findings from ROV Video Review of Red Hill Water Development Tunnel," February 2022.

[172] (U) A bleb is a bubble or cluster of bubbles. Although the report indicates that the blebs appear to be fuel, it also indicates that there was some uncertainty because the report is an interpretation of the video footage. Additionally, the report does not define the type of fluid that was dripping from the ceiling of the water development tunnel.

2. (U) Navy Officials Lacked the Operation and Maintenance Programs Needed to Protect the JBPHH Community Water System in Compliance with Federal and State Regulations and DoD Policy

(U) The SDWA requires community water systems to demonstrate "adequate technical and managerial capacity." Additionally, HAR 11-20 states that community water systems with adequate technical and managerial capacity must have:

- (U) protection of water sources, such as wells;
- (U) adequate technical performance, shown by the community water system's actual or planned compliance with regulatory standards;
- (U) an operation plan that includes operator certifications, identification of roles and responsibilities, preventive and corrective maintenance programs, and water quality monitoring; and
- (U) emergency response plans that describe plausible drinking water emergencies.[173]

(U) Similarly, OPNAV M-5090.1 states that Navy owners and operators of community water systems must develop, document, and implement an operation and maintenance program including emergency and preventive maintenance, proper operation and maintenance of storage tanks and reservoirs, documentation of emergency response procedures, and determination of roles and responsibilities.[174] Additionally, OPNAV M-5090.1 requires all installations to develop and implement programs, including a cross-connection control and backflow prevention program to find and eliminate cross-connections and a wellhead protection program to minimize risks of well contamination.[175]

(U) EPA NEIC officials identified systemic issues with the operation, maintenance, and management of all aspects of the JBPHH Community Water System, including:

- (U) treatment and distribution of drinking water;
- (U) emergency and preventive maintenance;
- (U) operation and maintenance of drinking water ground storage tanks;
- (U) determination of roles and responsibilities;

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[173] (U) HAR, chapter 11-20, "Rules Relating to Public Water Sources."

[174] (U) OPNAV M-5090.1, "Environmental Readiness Program Manual," September 3, 2019 (Updated June 25, 2021).

[175] (U) A cross-connection is any physical link, either direct or indirect, through which contamination can enter a community water system. The flow of contaminated water into a drinking water system, such as a community water system, is called backflow when the flow of contamination occurs due to pressure differences. A cross-connection control and backflow prevention program is a program to find and eliminate existing cross-connections in a community water system and to install, inspect, test, maintain, and periodically certify backflow prevention devices when cross-connections cannot be eliminated.
(U) HAR 11-21, "Cross-Connection and Backflow Control," also includes requirements to promote the elimination or control of existing cross-connections.

- (U) training and certification of personnel;
- (U) documentation of emergency response procedures, including contingency plans for providing safe drinking water in an emergency; and
- (U) public notification.[176]

(CUI) Additionally, we found that CNRH officials did not have or maintain required environmental compliance plans and programs. For example, CNRH officials did not have a wellhead protection program, [redacted][177] In another example, CNRH officials did not perform the required 5-year update of the CNRH GWPP in 2019.

(U) Furthermore, the Hawaii DOH conducts sanitary surveys at community water systems in accordance with HAR 11-20.[178] Our review of the EPA NEIC report identified repeated examples of deficiencies and significant deficiencies identified in the three most recent Hawaii DOH sanitary surveys that Navy officials had not corrected, as required by HAR 11-20.[179] Similarly, OPNAV M-5090.1 requires Navy officials to implement the Environmental Management System (EMS), which is "a formal management framework that integrates environmental considerations into day-to-day activities and long-term planning processes across all levels and functions of the Navy enterprise." Additionally, OPNAV M-5090.1 requires Navy officials to perform recurring self-assessments of their implementation of the EMS and compliance with environmental requirements and take corrective actions in response to noncompliance findings. We asked Navy officials about their environmental compliance self-assessments and found that Navy officials had the required internal and external audits.[180]

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176 (U) EPA NEIC officials also performed a civil investigation of the U.S. Army Garrison Hawaii's consecutive water systems that serve the AMR and Red Hill neighborhoods in April 2022. EPA NEIC officials found degraded material conditions and systemic issues with the operation and maintenance of all aspects of the consecutive water systems.

177 (U) A wellhead protection program is a program to protect groundwater wells that are a source of drinking water. A wellhead protection program is intended to protect the surface and subsurface area surrounding a groundwater well through which contaminants are reasonably likely to move toward and reach such groundwater well.
(U) Hawaii DOH Safe Drinking Water Branch, "Hawaii Source Water Assessment Program Report," November 2006.
~~(CUI)~~ [redacted]

178 (U) According to HAR 11-20, a sanitary survey is "an on-site review of the water source, facilities, equipment, operation, and maintenance of a public water system for the purpose of evaluating the adequacy of such source, facilities, equipment, operation, and maintenance for producing and distributing safe drinking water."

179 (U) The three most recent Hawaii DOH sanitary surveys discussed in the EPA NEIC report were conducted in 2009, 2014, and 2017. According to HAR 11-20, significant deficiencies are "any defect in a system's design, operation and maintenance, as well as any failure or malfunction of any system component, that the [Hawaii DOH] determines to cause, or have the potential to cause, an immediate sanitary risk to health." HAR 11-20 requires owners and operators of community water systems to take the necessary steps to correct significant deficiencies.

180 (U) As discussed in Part IV, the EMS requires Navy officials to perform annual internal audits and external audits every 3 years. We reviewed the reports from the internal and external EMS audits that occurred most recently before the drinking water contamination incident. The most recent external EMS audit was in 2018 and the most recent internal EMS audit was in 2020.

(U) However, we determined that Navy officials did not take corrective actions in response to noncompliance findings identified in the internal and external audits. For example, a 2018 EMS external audit report we reviewed stated that the "lack of taking corrective and preventative actions has been noted as a repeat nonconformance finding of the [EMS] on the last two … external audits."

(U) Despite repeated findings in both internal and external assessments, systemic deficiencies in operation, maintenance, and management of all aspects of the Navy's drinking water system persisted.

(U) Additionally, the 2020 CNRH EMS internal audit report cited the lack of a cross-connection control and backflow prevention program for the JBPHH Community Water System as a "long-standing" issue. In an example specific to the drinking water contamination incident, the groundwater sump pit and the French drain in the Red Hill BFSF that contaminated the Red Hill well with fuel is a cross-connection. This cross-connection might have been identified if the JBPHH PWD had corrected the noncompliance findings in the EMS internal audit. However, the February 2022 NAVFAC command investigation report verified that the JBPHH PWD still did not have a cross-connection control and backflow prevention program when the drinking water contamination incident occurred.

(U) Furthermore, OPNAV M-5090.1, BUMEDINST 6240.10C, and NAVMED P-5010-5 require Navy owners and operators of community water systems to coordinate the management of the system among stakeholders, such as Navy Preventive Medicine officials.[181] According to BUMEDINST 6240.10C, Navy Preventive Medicine officials are required to support the JBPHH CO and the JBPHH PWD with health aspects of drinking water. However, the February 2022 NAVFAC command investigation report stated that JBPHH PWD officials did not regularly coordinate the management of the JBPHH Community Water System among responsible officials and stakeholders. For example, JBPHH PWD officials were not conducting regular meetings with Navy Preventive Medicine officials or the JBPHH installation command.

(U) On October 14, 2022, one of the JBPHH Community Water System's main water distribution pipelines, referred to as a "water main," broke. The water main break impacted JBPHH facilities, including base housing, and surrounding

[181] (U) Navy Bureau of Medicine and Surgery, Bureau of Medicine Instruction 6240.10C, "Department of the Navy Medical Drinking Water Program," September 18, 2018.
(U) Manual of Naval Preventive Medicine, NAVMED P-5010-5, "Chapter 5, Water Quality for Shore Installations," July 1, 2019.

(U) housing areas. Although this incident was not within the scope of our evaluation, we observed the response of Navy officials.[182] While Navy officials improved their communication with the public compared to the drinking water contamination incident, Navy officials did not issue the required Tier 1 public notice for the water main break, and the public notices that were issued did not include the 10 required elements of information required by the NPDWR and HAR 11-20.[183]

(U) According to the 2023 Administrative Consent Order (ACO), Navy officials took steps to address many of the deficiencies reported by EPA NEIC officials. Additionally, the 2023 ACO included various requirements to address the ineffective operation, maintenance, and management of the JBPHH Community Water System, as shown in Appendix C. Furthermore, on February 2, 2024, CNIC issued policy to "establish criteria and requirements that Navy [officials must] implement to meet drinking water quality standards and perform proper operations and maintenance at" Navy owned and operated drinking water systems. Our review of Commander, Navy Installation Command Instruction (CNICINST) 5090.7 found that it addresses many of the drinking water operation, maintenance, and management deficiencies discussed in this report.[184] Among other things, CNICINST 5090.7 reiterates the requirements of OPNAV M-5090.1 stating that CNIC is the DoD Executive Agent for drinking water quality matters for all Navy installations worldwide. CNICINST 5090.7 requires Navy officials to establish drinking water committees at each Navy installation, referred to as the Installation Drinking Water Committee (IDWC), and at each region, referred to as the Region Drinking Water Committee (RDWC).

(U) Navy officials have taken steps to improve operation, maintenance, and management of the Navy's drinking water system, but more improvement is needed.

(U) CNICINST 5090.7 defines the required IDWC and RDWC membership, meeting periodicity, and drinking water quality compliance requirements. For example, IDWC members are required to conduct site walk-throughs of the installation

[182] (U) An October 14, 2022 press release advised "[t]hose in affected areas are advised to conserve water until further notice. A boil water advisory is in effect for impacted areas until further notice." On October 16, 2022, the JBPHH CO published a letter that added some clarity by stating, "A boil water advisory remains in effect. Water can continue to be used for personal hygiene, but all water used for consumption, cooking, brushing teeth, etc. should be boiled for at least one minute." Navy officials continued to provide updates until October 21, 2022 when the boil water advisory was lifted.

[183] (U) The NPDWR and HAR 11-20 require a Tier 1 notice within 24 hours for an occurrence of an emergency such as a "failure of significant interruption in key water treatment processes [or] a natural disaster that disrupts the water supply or distribution system…."

[184] (U) CNICINST 5090.7, "Navy Drinking Water Program Management Ashore," February 2, 2024.

(U) drinking water infrastructure; coordinate the management of the system among stakeholders, including Navy Preventive Medicine officials; annually exercise the installation ERP; take corrective actions in response to noncompliance findings identified in EMS audits and in sanitary surveys; and issue public notices in the event of a drinking water emergency.

(U) Our review of CNICINST 5090.7 found that implementing its requirements should improve the day-to-day oversight of community water systems. However, we determined that CNICINST 5090.7 is not fully aligned with OPNAV M-5090.1. For example, CNICINST 5090.7 assigns the installation "[Public Works Officer] PWO as the lead for the IDWC and overall responsible authority for the installation's drinking water program/systems." However, OPNAV M-5090.1 assigns this responsibility to the installation CO and does not refer to any roles and responsibilities for the PWO. In another example, CNICINST 5090.7 requires the IDWC to issue public notices in the event of a drinking water emergency. However, OPNAV M-5090.1 requires CNIC to issue public notices.

(U) CNICINST 5090.7 also requires an "Operator in Responsible Charge for Treatment and Distribution" to participate on the IDWC. HAR 11-25 defines the role and responsibilities of the operator in "responsible charge" for community water systems in Hawaii; however, neither CNICINST 5090.7 nor OPNAV M-5090.1 defines the role of Operator in Responsible Charge for Treatment and Distribution or describes its responsibilities.[185] Therefore, including this role in CNICINST 5090.7 without defining it or directing installation officials to where its requirements are defined, such as in state regulations, may lead to confusion regarding roles and responsibilities.

(U) If Navy officials do not align and implement these requirements, confusion over roles and responsibilities for accountability may persist at Navy owned and operated drinking water systems, including the JBPHH Community Water System. Additionally, a lack of accountability may jeopardize operations, maintenance, and management of drinking water infrastructure. Furthermore, Navy personnel could continue mishandling incidents and place increasing risk of negative impacts on human health and the environment.

[185] (U) According to HAR 11-25, in Hawaii, the "operator(s) in responsible charge is the person(s) designated by the purveyor to be the certified operator(s) who makes decisions regarding the daily operational activities of a public water system, water treatment facility, or distribution system, that will directly impact the quality or quantity of drinking water."

E. (U) Effects of the Drinking Water Contamination on the Affected Community and the Costs to the DoD

(U) As a result of the drinking water contamination, approximately 4,000 families were displaced from their homes for approximately 4 months.[186] Residents who chose to remain on the installation or who were not given a choice to relocate, including unaccompanied military members living in the dormitories, had to collect alternate drinking water for consumption and domestic uses, such as cooking and showering, provided by the Navy.[187]

(U) Furthermore, JBPHH Community Water System users may have been exposed to contaminated drinking water. Specifically, the drinking water supply for more than 90,000 people was contaminated with JP-5, and it was nearly 4 months before the Hawaii DOH cleared all of the zones on JBPHH. During the drinking water contamination incident, laboratory testing identified fuel contaminants in the drinking water, including total petroleum hydrocarbons (TPH) and chemicals in the group of hazardous chemicals referred to as BTEX: benzene, toluene, ethylbenzene, and xylenes.[188]

(U) DoD medical providers documented 6,138 medical encounters with affected community members. According to the Commander, U.S. Pacific Fleet (COMPACFLT), the symptoms reported to DoD medical providers included gastrointestinal, neurological, skin, and respiratory symptoms or a combination of multiple symptoms. Approximately:

- (U) 30 percent of patients reported gastrointestinal symptoms (1,841 of the 6,138 medical encounters);

[186] (U) DoD officials provided alternate housing accommodations to certain members of the affected community. DoD officials gave approximately 8,000 families on the installation the choice to stay in their homes or relocate to alternate housing accommodations. Approximately half of the family housing neighborhood residents moved to alternate housing accommodations, using financial allowances from the DoD toward the cost. The remaining families chose to stay in their homes during the drinking water contamination incident even though their water was not usable. Each family's choice to relocate or stay in their home was influenced by factors such as the logistics of traveling back and forth in a congested metropolitan area, pets that were not allowed in alternate housing accommodations, and COVID-19. However, DoD officials did not provide alternate housing accommodations to everyone in the affected community. For example, unaccompanied military members living in the dormitories were not given the option to move to alternate housing.

[187] (U) Residents were authorized alternate accommodations beginning on December 3, 2021. Navy officials began providing alternate drinking water for residents to collect from collection points at JBPHH on December 1, 2021. The Hawaii DOH began clearing zones beginning on February 14, 2022, and cleared the last zone on March 18, 2022. Therefore, residents were displaced from their homes or had to collect alternate drinking water for nearly 4 months.

[188] (U) Because there are many different chemicals in fuel, it is useful to measure the total amount of mixed petroleum hydrocarbons, referred to as total petroleum hydrocarbons (TPH). See Appendix C for a description of the contaminants identified during the drinking water contamination incident. Additionally, during the drinking water contamination incident, laboratory testing of drinking water samples identified elevated levels of lead associated with plumbing fixtures that were subsequently replaced. As of May 13, 2022, there were seven detections of elevated lead levels in the long-term monitoring program that started in March 2022. According to a CNRH media release, these seven samples were out of 1,666 total samples taken as of May 13, 2022. The media release stated that Navy officials secured the faucets from use, replaced them when necessary, and performed additional drinking water sampling.

- (U) 27 percent of patients reported neurological symptoms (1,657 of 6,138);
- (U) 17 percent of patients reported skin related symptoms (1,043 of 6,138);
- (U) 6 percent of patients reported respiratory symptoms (368 of 6,138); and
- (U) 30 percent of patients reported multiple symptoms (1,841 of 6,138).

(U) According to the ATSDR, there were also mental health symptoms reported as a result of the contamination incident, including anxiety, insomnia, agitation, tense and nervous feelings, feeling depressed, and paranoia.[189]

(U) Additionally, the EPA reported that there was a "potential for a lingering presence of petroleum hydrocarbons [TPH] somewhere within the distribution system or premise plumbing."[190] Specifically, three of four laboratory tests conducted by EPA officials at homes on JBPHH in October 2023 detected TPH.

(U) As discussed in Part III, on January 9, 2024, DHA officials announced that they were in the early stages of setting up an independent registry, operated by a third party, for the affected community that will track health over time, investigate any health effects, and provide information and support to those potentially exposed to contaminated drinking water. According to the DHA, everyone who was potentially exposed to contaminated drinking water will be eligible to join the registry, regardless of their affiliation with the DoD.

(U) Lastly, the drinking water contamination incident cost a significant amount of money. For example, during our site visit, Navy officials told us that they had spent more than $101 million in response to the drinking water contamination incident, including more than $32 million on a temporary water filtration system and supporting equipment and more than $54 million for laboratory sampling and environmental response services.[191] Army officials told us that they spent more than $120 million to provide alternate accommodations to Army families in the affected community during the drinking water contamination incident. The FY 2022 and the FY 2023 National Defense Authorization Acts (NDAAs) included more than $2.1 billion in funding related to the drinking water contamination incident and the planned closure of the Red Hill BFSF.

[189] (U) As discussed in Part III, the ATSDR conducted an initial assessment of chemical exposures, including a health impact survey that was available from January 7 to February 10, 2022.

[190] (U) EPA Region 9 memorandum, "EPA Investigation Report on October 2023 Drinking Water Complaints," December 20, 2023.

[191] (U) Although the costs we cite are out of date, they indicate the costs that might have been avoided.

VI. (U) Overall Conclusions

(U) In this section, we discuss our overall conclusions based on the analysis provided in Part V. We determined that there was an inherent risk to the Red Hill well and the JBPHH Community Water System from the co-location of the Red Hill well within the Red Hill Bulk BFSF. We found that these risks were well-documented by the time the May 2021 and November 2021 fuel incidents occurred in the Red Hill BFSF. Navy officials missed the opportunity to prevent the November 2021 fuel incident and drinking water contamination incident by not performing sufficient causative research to account for fuel missing from the inventory after the May 2021 fuel incident. Additionally, Navy officials missed four opportunities to activate the JBPHH Community Water System Emergency Response Plan (ERP) and prevent or lessen the impact of the drinking water contamination incident, on:

- (U) November 20, 2021, when a fuel incident occurred in the Red Hill BFSF near the Red Hill well pump station which threatened the Red Hill well and the JBPHH Community Water System;
- (U) November 24, 2021, by not immediately investigating when fuel reappeared in the groundwater sump pit;
- (U) November 24, 2021, by not testing for free product, or floating fuel, during scheduled water sampling at the Red Hill well; and
- (U) November 28, 2021, when Navy officials received multiple complaints from residents of a chemical or fuel smell in their drinking water, confirmed the smell of fuel in the drinking water, and decided to turn off the Red Hill well.

(U) Navy officials responded to the drinking water contamination incident beginning on November 28, 2021. However, they did not activate the JBPHH Community Water System ERP or meet its requirements to "minimize damage and maintain control of the [drinking water system] at JBPHH following a natural disaster or man-made emergency," including the threat or introduction of contaminants such as fuel.[192] Furthermore, Navy officials assumed that the contamination did not spread throughout the JBPHH Community Water System. Additionally, Navy officials did not issue the required Tier 1 public notice, which should have included 10 required elements of information necessary to effectively communicate with the affected community. Therefore, JBPHH Community Water System users may have continued to consume contaminated drinking water and use it for domestic purposes, such as cooking and showering.

[192] (U) JBPHH Community Water System ERP.

(U) This occurred because Navy officials lacked sufficient understanding of the Red Hill BFSF and the Red Hill well. Specifically, Navy officials did not recognize the imminent risk to the Red Hill well from the November 2021 fuel incident. Additionally, Navy officials:

- (U) were not sufficiently aware of the roles, responsibilities, and requirements applicable to owners and operators of community water systems in Federal and state laws and regulations and DoD policies;
- (U) were not trained on their JBPHH Community Water System ERP roles and responsibilities; and
- (U) did not exercise the JBPHH Community Water System ERP.

(U) As a result, JBPHH Community Water System users may have been exposed to contaminated drinking water; members of the affected community reported multiple systems of exposure; residents were displaced from their homes or had to collect alternate drinking water for an extended period of time; and the drinking water contamination incident cost a significant amount of money. In DODIG-2025-011, we discuss the extent to which DoD officials managed the operation, maintenance, safety, and oversight of DFSP JBPHH, including the Red Hill BFSF, and protected the environment. Specifically, we discuss the Navy's response to fuel incidents, including the November 20, 2021 fuel incident that contaminated the JBPHH Community Water System.

VII. (U) Recommendations, Management Comments, and Our Response

(U) In this section, we provide five recommendations to the Secretary of the Navy based on the findings in this report. We did not duplicate recommendations that were already made by the U.S. Environmental Protection Agency (EPA) and the Agency for Toxic Substances and Disease Registry (ATSDR). Additionally, we did not duplicate recommendations that were already made in the Vice Chief of Naval Operations (VCNO) command investigation report and the Naval Facilities Engineering Systems Command (NAVFAC) command investigation report. Furthermore, we did not include recommendations that were already addressed by the 2023 Administrative Consent Order (ACO), required by law in National Defense Authorization Acts, or included in Commander, Navy Installation Command Instruction (CNICINST) 5090.7.

(U) As a result of management comments, we revised Recommendation 1 to clarify the actions needed to ensure that all laws, policies, and agreements related to the JBPHH Community Water System are implemented and that appropriate action is taken with regard to recommendations made in prior oversight reports and command investigations.

(U) Recommendation 1

(U) We recommend that the Secretary of the Navy designate an entity to be responsible for ensuring that all laws, policies, and agreements made in response to the 2021 drinking water contamination incident at the Joint Base Pearl Harbor–Hickam Community Water System are implemented, and that appropriate action is taken with regard to recommendations made in prior oversight reports and command investigation reports. Specifically:

a. **(U) Implement the requirements of the 2015 Administrative Order on Consent and the 2023 Administrative Consent Order related to the Joint Base Pearl Harbor–Hickam Community Water System.**

b. **(U) Implement the requirements put forth in the FY 2024 National Defense Authorization Act.**

c. **(U) Implement the recommendations of the U.S. Environmental Protection Agency Safe Drinking Water Act Investigation.**

d. **(U) Implement the recommendations of the Agency for Toxic Substances and Disease Registry.**

e. (U) Implement the recommendations of the Vice Chief of Naval Operations command investigation related to the Joint Base Pearl Harbor–Hickam Community Water System.

f. (U) Implement the recommendations of the Naval Facilities Engineering Systems Command command investigation.

g. (U) Implement the requirements of Commander, Navy Installation Command Instruction 5090.7.

(U) Assistant Secretary of the Navy (Energy, Installations, and Environment) Comments

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment) (ASN[EI&E]), responding on behalf of the Secretary of the Navy (SecNav), agreed with the recommendation. Additionally, the ASN(EI&E) stated that the Commander, Navy Closure Task Force–Red Hill (NCTF-RH) is the single point of contact for closure and remediation, and the Joint Base Pearl Harbor–Hickam (JBPHH) Commanding Officer is the single point of contact for the JBPHH Defense Fuel Supply Point (DFSP).

(U) For Recommendation 1.a., the ASN(EI&E) stated that Navy officials are implementing requirements of the 2015 Administrative Order on Consent (AOC) and the 2023 ACO. The ASN(EI&E) also stated that Navy officials are working with EPA and Hawaii Department of Health (DOH) officials, as appropriate, to modify the 2015 AOC and 2023 ACO as needed during the implementation. Furthermore, according to the ASN(EI&E), the requirements governing fuel storage and operation of the underground storage tanks are no longer applicable because of the defueling and pending closure of the Red Hill BFSF.

(U) For Recommendation 1.b., the ASN(EI&E) agreed with the recommendation.

(U) For Recommendation 1.c., the ASN(EI&E) stated that Navy officials are implementing the applicable recommendations from the EPA Safe Drinking Water Act Investigation.

(U) For Recommendation 1.d., the ASN(EI&E) stated that Navy officials are implementing recommendations related to rebuilding community confidence in the drinking water system from two ATSDR Assessment of Chemical Exposures (ACE) reports. According to the ASN(EI&E), certain ATSDR ACE report recommendations were outside of the Navy's purview.

(U) For Recommendation 1.e., the ASN(EI&E) stated that corrective actions for 56 of the 104 recommendations from the VCNO command investigation report are complete. Additionally, the ASN(EI&E) stated that 32 of 104 recommendations are no longer applicable because of the closure of the Red Hill BFSF. The ASN(EI&E) stated that a corrective action plan was under development for the remaining 16 of 104 recommendations that remain open due to their complex nature. The ASN(EI&E) stated that 11 of 16 open recommendations from the VCNO command investigation report are related to streamlining command and control for DFSP JBPHH.

(U) For Recommendation 1.f., the ASN(EI&E) agreed with the recommendation.

(U) For Recommendation 1.g., the ASN(EI&E) stated that Navy officials are implementing the requirements in Commander, Navy Installation Command Instruction (CNICINST) 5090.7.

(U) Our Response

(U) The ASN(EI&E) stated that the NCTF-RH was responsible for closure and remediation of the Red Hill Bulk Fuel Storage Facility (BFSF) and the JBPHH Commanding Officer (CO) is responsible for the remainder of DFSP JBPHH. However, the ASN(EI&E) did not state how either entity would be responsible for addressing aspects of the recommendation specifically related to the drinking water contamination incident and the JBPHH Community Water System.

(U) For Recommendation 1.a., comments from the ASN(EI&E) partially addressed the recommendation by agreeing to implement the requirements of the 2015 AOC and 2023 ACO. However, the ASN(EI&E) did not designate an entity responsible for the 2015 AOC and the 2023 ACO requirements. Therefore, the recommendation is unresolved. We request that the SecNav provide additional comments in response to the final report within 30 days specifying the designated entity for ensuring that the 2015 AOC and the 2023 ACO requirements are met and the timeline for completion.

(U) For Recommendation 1.b., comments from the ASN(EI&E) partially addressed the recommendation by agreeing to implement FY 24 National Defense Authorization Act (NDAA) requirements. However, the ASN(EI&E) did not designate an entity responsible for the FY 2024 NDAA requirements. Therefore, the recommendation is unresolved. We request that the SecNav provide additional comments in response to the final report within 30 days specifying the designated entity responsible for the FY 2024 NDAA requirements, and the timeline for completion.

(U) For Recommendation 1.c., comments from the ASN(EI&E) partially addressed the recommendation by agreeing to implement recommendations from the EPA Safe Drinking Water Act investigation. However, the ASN(EI&E) did not designate an entity responsible for the EPA recommendations or identify which recommendations were not applicable and why. Therefore, the recommendation is unresolved. We request that the SecNav provide additional comments in response to the final report within 30 days specifying the entity responsible for the EPA recommendations, which recommendations they are implementing, and the timeline for completion.

(U) For Recommendation 1.d., comments from the ASN(EI&E) partially addressed the recommendation by agreeing to implement ATSDR recommendations. However, the ASN(EI&E) did not designate an entity responsible for the ATSDR recommendations or identify which recommendations were not outside of the purview of the Navy and why. Therefore, the recommendation is unresolved. We request that the ASN(EI&E) provide additional comments in response to the final report within 30 days specifying the entity responsible for the ATSDR recommendations, which recommendations they are implementing, and the timeline for completion.

(U) For Recommendation 1.e., comments from the ASN(EI&E) partially addressed the recommendation by agreeing to implement the VCNO command investigation recommendations. However, the comments from the ASN(EI&E) did not designate an entity to be responsible for implementing the VCNO command investigation recommendations or identify which recommendations fell into the specific categories mentioned in the ASN(EI&E) memorandum. Therefore, the recommendation is unresolved. We request that the ASN(EI&E) provide additional comments in response to the final report within 30 days specifying which entity will be responsible for the VCNO command investigation recommendations, which recommendations are no longer applicable, open, or closed, and the timeline for closure.

(U) For Recommendation 1.f., comments from the ASN(EI&E) partially addressed the recommendation by agreeing to implement the NAVFAC command investigation recommendations. However, the ASN(EI&E) did not designate an entity responsible for implementing the NAVFAC command investigation recommendations. Therefore, the recommendation is unresolved. We request that the ASN(EI&E) provide additional comments in response to the final report within 30 days specifying the designated entity responsible for the NAVFAC command investigation recommendations and the timeline for completion.

(U) For Recommendation 1.g., comments from the ASN(EI&E) partially addressed the recommendation by agreeing to implement the CNICINST 5090.7 requirements. However, the ASN(EI&E) did not designate an entity responsible for ensuring the implementation of CNICINST 5090.7 requirements. Therefore, the recommendation is unresolved. We request that the ASN(EI&E) provide additional comments in response to the final report within 30 days specifying the designated entity responsible for CNICINST 5090.7 requirements and the timeline for completion.

(U) Recommendation 2

(U) We recommend that the Secretary of the Navy revise Operations Navy Manual 5090.1. Specifically:

a. **(U) Include the roles, responsibilities, and training requirements for the Operator in Responsible Charge for Treatment and Distribution.**

b. **(U) Align requirements of Operations Navy Manual 5090.1 with Commander, Navy Installation Command Instruction 5090.7. Specifically, clarify conflicting requirements for roles and responsibilities, including for the preparation and publication of public notices and contingency plans for alternate drinking water supplies during a drinking water emergency.**

(U) Assistant Secretary of the Navy (Energy, Installations, and Environment) Comments

(U) The ASN(EI&E), responding on behalf of the SecNav, agreed with the recommendations. Specifically, the ASN(EI&E) stated that Navy officials will review and align Operations Navy Manual 5090.1 with CNICINST 5090.7. Additionally, the ASN(EI&E) stated that Navy policies refer to external regulatory requirements to ensure that the Navy is following the latest regulatory requirements. Furthermore, the ASN(EI&E) stated that policy revisions will include the Chief of Naval Operations' changes to command and control for stronger accountability at all DFSPs.

(U) Our Response

(U) Comments from the ASN(EI&E) addressed the recommendations by agreeing to review and align Operations Navy Manual 5090.1 with CNICINST 5090.7. Therefore, the recommendations are resolved but will remain open. We request that the SecNav provide additional comments specifying the timeline for updating the policies. We will close the recommendations once we receive and review the updated Operations Navy Manual 5090.1 and CNICINST 5090.7 and verify that the updates meet the intent of our recommendations.

(U) Recommendation 3

(U) We recommend that the Secretary of the Navy direct the Commander, Navy Installations Command to revise Commander, Navy Installation Command Instruction 5090.7. Specifically:

a. **(U) Define the roles and responsibilities of the Installation Community Officer.**

b. **(U) Include the roles, responsibilities, and training requirements for the Operator in Responsible Charge for Treatment and Distribution.**

c. **(U) Require the standing membership of the Installation Drinking Water Committee to include owners and operators of consecutive water systems.**

d. **(U) Periodically require the Installation Drinking Water Committee to assess committee membership, no less than annually, to determine whether additional stakeholders with the potential to affect drinking water quality should participate on the committee, such as users of aqueous film-forming foam, owners and operators of oil or hazardous substance facilities, or managers of solid waste facilities.**

e. **(U) Require that the annual table-top exercise of the installation's drinking water Emergency Response Plan include triggers and timelines for updating and editing the Emergency Response Plan when the table-top exercise identifies a need.**

f. **(U) Include roles and responsibilities for the risk communication requirements of DoD Instruction 6055.20, including recurring training.**

g. **(U) Define the requirements for Navy drinking water program management ashore at Navy installations outside of the United States and its Territories.**

(U) Assistant Secretary of the Navy (Energy, Installations, and Environment) Comments

(U) The ASN(EI&E), responding on behalf of the SecNav, agreed with the recommendations. Specifically, the ASN(EI&E) stated that Navy officials addressed improvements to drinking water system oversight, assessment, and coordination in the February 2024 version of CNICINST 5090.7. The ASN(EI&E) also stated that Navy officials would update CNICINST 5090.7 to address roles and responsibilities. Additionally, the ASN(EI&E) stated that Navy policies refer to external regulatory requirements to ensure that the Navy is following the latest regulatory requirements. Furthermore, the ASN(EI&E) stated that CNICINST 5090.1B includes requirements for Navy drinking water program management ashore at Navy installations outside of the United States and its Territories.

(U) Our Response

(U) Comments from the ASN(EI&E) addressed Recommendations 3.a., 3.b., 3.c., 3.d., 3.e., and 3.f by agreeing to revise the CNICINST 5090.7. Therefore, the recommendations are resolved but will remain open. We request that the SecNav provide additional comments specifying the timeline for updating the policy. We will close the recommendations once we receive and review the updated CNICINST 5090.7 and verify that the updates meet the intent of our recommendations.

(U) Comments from the ASN(EI&E) also addressed the specifics of Recommendation 3.g. Specifically, the ASN(EI&E) stated that Navy requirements related to drinking water management at Navy installations outside of the United States and its Territories are in CNICINST 5090.1B. We reviewed CNICINST 5090.1B and verified that it includes requirements for Navy drinking water program management ashore at Navy installations outside of the United States and its Territories. Therefore, the recommendation is resolved and closed.

(U) Recommendation 4

(U) We recommend that the Secretary of the Navy direct the appropriate Joint Base Pearl Harbor–Hickam official to issue a retroactive Tier 1 public notice including the 10 required elements of information for the October 2022 water main break.

(U) Assistant Secretary of the Navy (Energy, Installations, and Environment) Comments

(U) The ASN(EI&E), responding on behalf of the SecNav, disagreed with the recommendation. Specifically, the ASN(EI&E) stated that regulatory agencies do not provide for retroactive notifications and have not required a retroactive Tier 1 notification for the October 2022 water main break at JBPHH. The ASN(EI&E), citing the National Primary Drinking Water Regulations (NPDWR), stated that, when a Tier 1 public notice is justified, it must be issued as soon as practical, but no later than 24 hours after the public water system learns of the violation or situation "in a form and manner ... to fit the specific situation." Additionally, the ASN(EI&E) stated that a boil water notice was issued and the ASN(EI&E) summarized the JBPHH installation command's communication with JBPHH Community Water System users in relation to the event. The ASN(EI&E) stated that the recommended retroactive Tier 1 public notice is inconsistent with state and Federal regulatory agencies' requirements for public notice. Furthermore, the ASN(EI&E) stated that there is potential for confusion and distress among JBPHH Community Water System users who receive a Tier 1 public notice about a situation that no longer poses a hazard, particularly if receiving the notice implies that an emergency is currently taking place.

(U) As an alternative, the ASN(EI&E) proposed expressly incorporating the responsibilities for issuing Tier 1 public notices into the recommended revisions to CNICINST 5090.7.

(U) Our Response

(U) We disagree with the ASN(EI&E)'s position that regulatory agencies do not provide for retroactive notifications and that the recommended retroactive Tier 1 public notice is inconsistent with state and Federal regulatory agencies' requirements for public notice. Specifically, as noted in this report, Navy officials communicated during the drinking water contamination incident, but did not communicate effectively because they did not meet all of the communication requirements of the NPDWR and Hawaii Administrative Rules (HAR) 11-20. For that incident, Navy officials issued a retroactive Tier 1 public notice to JBPHH Community Water System users on May 13, 2022. The public notice stated that it was a correction of the lack of a required administrative notification and clarified that there was no new incident and that there was no action required for JBPHH Community Water System users. Therefore, there is precedent for issuing a retroactive Tier 1 public notice at JBPHH.

(U) Additionally, although we recognize the potential for confusion and distress among JBPHH Community Water System users who receive a Tier 1 public notice about a situation that no longer poses a hazard, both the NPDWR and HAR 11-20 include standard language for public notices issued to meet regulatory requirements for violations that are not otherwise ongoing.

(U) Although the ASN(EI&E) disagreed with the recommendation, the proposed revisions to CNICINST 5090.7 satisfied the intent of the recommendation to strengthen accountability for public notices. Therefore, the recommendation is resolved but will remain open. We request that the SecNav provide additional comments specifying the timeline for the revisions to CNICINST 5090.7. We will close the recommendation once we receive the updated CNICINST 5090.7 and verify that the updates meet the intent of our recommendation.

(U) Recommendation 5

(U) We recommend that the Secretary of the Navy direct a study to assess the location of Navy-owned drinking water systems, identify all co-located infrastructure that poses a threat to the safety of the drinking water, and make plans to mitigate the threats to the drinking water systems.

(U) Assistant Secretary of the Navy (Energy, Installations, and Environment) Comments

(U) The ASN(EI&E), responding on behalf of the SecNav, agreed with the recommendation. Specifically, the ASN(EI&E) stated that Navy officials completed self-assessments of material, operational, and incident response readiness at all Navy DFSPs in 2022. Additionally, the ASN(EI&E) stated that Navy officials completed self-assessments of risks and mitigation requirements to ensure compliance for Navy-owned drinking water systems in the United States and its Territories in 2022. According to the ASN(EI&E), detailed sanitary surveys were underway at Navy drinking water systems with elevated risks. Furthermore, the ASN(EI&E) stated that Navy officials assess drinking water systems at Navy installations outside of the United States and its Territories in accordance with the manual associated with CNICINST 5090.1B. The ASN(EI&E) stated that CNICINST 5090.7 was developed and issued in February 2024 to ensure similar oversight and continuous monitoring.

(U) Our Response

(U) Comments from the ASN(EI&E) addressed the recommendation by agreeing to direct a study to assess the location of Navy-owned drinking water systems co-located with infrastructure that poses a threat to the safety of the drinking water. Therefore, the recommendation is resolved but will remain open. We will close the recommendation once we receive and review the 2022 DFSP and Navy drinking water system self-assessments and verify that the self-assessments meet the intent of our recommendation.

(U) Appendix A

(U) Scope and Methodology

(U) We conducted this evaluation from December 2021 through May 2024 in accordance with the "Quality Standards for Inspection and Evaluation," published in January 2012 by the Council of the Inspectors General on Integrity and Efficiency. Those standards require that we adequately plan the evaluation to ensure that objectives are met and that we perform the evaluation to obtain sufficient, competent, and relevant evidence to support the findings, conclusions, and recommendations. We believe that the evidence obtained was sufficient, competent, and relevant to lead a reasonable person to sustain the findings, conclusions, and recommendations.

(U) This report was reviewed by the DoD Component(s) associated with this oversight project to identify whether any of their reported information, including legacy FOUO information, should be safeguarded and marked in accordance with the DoD CUI Program. In preparing and marking this report, we considered any comments submitted by the DoD Component(s) about the CUI treatment of their information. If the DoD Component(s) failed to provide any or sufficient comments about the CUI treatment of their information, we marked the report based on our assessment of the available information.

(U) To conduct this evaluation, we assembled a multidisciplinary team of 20 DoD OIG personnel, including engineers, auditors, a program analyst, and an attorney. Before conducting site visits, eight team members attended formal training on environmental compliance, fuel storage tank compliance, or both. Due to the breadth of our evaluation, we spent approximately 1 year performing fieldwork and 1 year performing our analysis, documenting our conclusions, and preparing two reports and a management advisory.

(U) To determine the extent that DoD officials managed the operation, maintenance, safety, and oversight of Defense Fuel Support Point (DFSP) Joint Base Pearl Harbor–Hickam (JBPHH), including the Red Hill Bulk Fuel Storage Facility (BFSF), and protected the environment and drinking water systems in compliance with Federal and state regulations and DoD policy, we collected and reviewed applicable criteria and documentation, conducted interviews, and performed site visits. Although we conducted one evaluation, we developed

(U) two reports and a management advisory with our findings and conclusions. For brevity, the following sections in this Appendix describe our scope and methodology focus on the portion of our objective addressed in this report.[193]

(U) Criteria and Documentation

(U) We formally requested information from DoD officials in 35 extensive requests for information (RFI). We received the requested documentation from DoD officials from January 2022 through May 2023, and concluded our field work in April 2023. To support our findings and conclusions, we received, collected, and reviewed over 100 written responses to our RFIs, engineering drawings, historical reports, public affairs materials, operations and maintenance records, internal communications and regulatory notifications, incident investigation reports, and technical reports. Additionally, we reviewed over 240 Federal and State of Hawaii laws, regulations, and guidance; and DoD, Navy, and DLA directives, instructions, manuals, and policies, management plans, operating procedures, reports, contracts, memorandums of agreement, and administrative orders. Table 3 includes the criteria related to fuel management, environmental protection, and drinking water quality that we reviewed for aspects of our objective addressed in this report.

[193] (U) In this report, we address the extent to which DoD officials protected the JBPHH Community Water System, in compliance with Federal and state regulations and DoD policy. We address the extent to which DoD officials managed the operation, maintenance, safety, and oversight of DFSP JBPHH, including the Red Hill BFSF; and protected the environment, in compliance with Federal and state regulations and DoD policy, in DODIG-2025-011. Appendix A in that report overlaps significantly with this section since we conducted this evaluation as a single evaluation with two reports.

(U) Table 3. DoD OIG Evaluation Criteria

(U) Type	Title
Public Laws	• Public Law 115-270 "America's Water Infrastructure Act of 2018" • United States Code (U.S.C.), title 33, chapter 26, "Clean Water Act'' • U.S.C., title 33, sections 2701-2761, "The Oil Pollution Act of 1990" • U.S.C., title 42, chapter 6A, subchapter XII, "Safe Drinking Water Act'' • U.S.C., title 42, chapter 82, subchapter IX, "Regulation of Underground Storage Tanks"
Federal Rules and Regulations	• Title 40 Code of Federal Regulations (CFR) part 112, "Oil Pollution Prevention" • Title 40 CFR part 141, "National Primary Drinking Water Standards" • Title 40 CFR part 280, "Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)"
Environmental Protection Agency (EPA) Guidelines	• EPA, "The Required Elements of Public Notice for Public Water Systems," January 20, 2022 • EPA, "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents, Module 2: Contamination Threat Management Guide," December 2003. • EPA, "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents, Module 3: Site Characterization and Sampling Guide," December 2003. • EPA, "Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents, Module 5: Public Health Response Guide," April 2004. • EPA, Office of Water, EPA 817-B-18-005, "Guidance for Responding to Drinking Water Contamination Incidents," October 2018
State of Hawaii Laws, Regulations, and Agreements	• Hawaii Revised Statutes (HRS), title 10, chapter 128D, "Environmental Response Law" • Hawaii Administrative Rules (HAR), title 11, chapter 19 "Emergency Plan for Safe Drinking Water" • HAR, title 11, chapter 20, "Rules Relating to Public Water Systems" • HAR, title 11, chapter21, "Cross-Connection and Backflow Control" • HAR, title 11, chapter 25, "Rules Relating to Certification of Public Water System Operators" • HAR, title 11, chapter 11-280.1, "Underground Storage Tanks" • HAR, title 11, chapter 11-451, "The State Contingency Plan (SCP)" • Hawaii DOH Users Guide, "Evaluation of Environmental Hazards at Sites with Contaminated Soil and Groundwater," Fall 2017

(U)

(U) Table 3. DoD OIG Evaluation Criteria (cont'd)

(U) Type	Title
Consent Orders	• U.S. EPA Region 9 and the Hawaii DOH in the matter of the Department of the Navy and DLA respondents Red Hill BFSF, Oahu, Hawaii, "Administrative Order On Consent," May 27, 2015 • U.S. EPA Region 9 in the matter of the Department of the Navy and DLA respondents Red Hill BFSF, Oahu, Hawaii, Joint Base Pearl Harbor-Hickam Water System PWS, "Red Hill Bulk Fuel Storage Facility Defueling, Closure, and Joint Base Pearl Harbor-Hickam Drinking Water System 2023 Consent Order," June 2, 2023
DoD Directives (DoDDs)	• DoDD 5101.08E, "DoD Executive Agent (DoD EA) for Bulk Petroleum," September 19, 2017, (Incorporating Change 2, May 2, 2019) • DoDD 5101.01, "DoD Executive Agent," February 7, 2022
DoD Instructions (DoDIs)	• DoDI 4715.06, "Environmental Compliance in the United States," May 4, 2015 (Incorporating Change 2, August 31, 2018) • DoDI 4715.17, "Environmental Management Systems," April 15, 2009 (Incorporating Change 2, August 31, 2018) • DoDI 6055.20, "Assessment of Significant Long-Term Health Risks from Past Environmental Exposures on Military Installations," June 6, 2017 (Incorporating Change 2, June 10, 2019)
Unified Facilities Criteria (UFC)	• UFC 3-230-02, "Operation and Maintenance: Water Supply Systems," December 10, 2019 (Incorporating Change 1, April 1, 2021)
Chief of Naval Operations (CNO) Policy	• OPNAVINST 5090.1E, "Environmental Readiness Program," September 3, 2019 • OPNAVINST 5450.348A, "Mission, Functions and Tasks of Commander, Naval Facilities Engineering Systems Command," June 23, 2021 • OPNAVINST 5450.349A, "Mission, Functions and Tasks of Commander, Naval Supply Systems Command," December 16, 2019 • OPNAV M-5090.1, "Environmental Readiness Program Manual," September 3, 2019 (Updated June 25, 2021)
Commander, Navy Installations Command (CNIC) Policy	• CNIC Instruction 5090.7, "Navy Drinking Water Program Management Ashore," February 2, 2024
Commander, Navy Region Hawaii (CNRH) Policy	• CNRH Instruction 3120.2D, "Commander, Navy Region Hawaii Standard Organization and Regulations Manual," March 9, 2018 **(U)**

(U) Table 3. DoD OIG Evaluation Criteria (cont'd)

(U) Type	Title
JBPHH Policy	• JBPHH Instruction 3440.17D, "Joint Base Pearl Harbor-Hickam Installation Emergency Management Program," February 27, 2018 • JBPHH Instruction 5400.2, "Joint Base Pearl Harbor-Hickam Standard Organization and Regulations Manual," August 19, 2019
Naval Supply Systems Command (NAVSUP) Policy	• NAVSUP Fleet Logistics Center Pearl Harbor Instruction 5450.3T, "Missions, Functions, and Organization of the NAVSUP Fleet Logistics Center Pearl Harbor," May 12, 2021
Navy Bureau of Medicine and Surgery (BUMED) Policy	• BUMED Navy Medicine P-5010-5, "Manual of Naval Preventive Medicine," Chapter 5, "Water Quality for Shore Installations," July 1, 2019 • BUMED Instruction 6240.10C, "Department of the Navy Medical Drinking Water Program," September 18, 2018 **(U)**

(U) Source: The DoD OIG.

(U) Interviews with Officials

(U) Throughout our evaluation, we met and interviewed officials responsible for operation, maintenance, safety, and oversight of drinking water systems and DFSPs. Specifically, we conducted 95 meetings and interviews with DoD officials. We began conducting meetings and interviews in March 2022, including interviews of the DoD and Navy officials responsible for responding to incidents at DFSP JBPHH, including the Red Hill BFSF and the JBPHH Community Water System. We also met with officials from the U.S. Environmental Protection Agency (EPA) and the Hawaii Department of Health (DOH) to discuss Federal and state law and regulations applicable to DFSPs and drinking water systems, including the DFSP JBPHH and the JBPHH Community Water System. Specifically, we met with the following commands and organizations.

- (U) U.S. Environmental Protection Agency, including the EPA Region 9
- (U) Occupational Safety and Health Administration
- (U) Office of the Assistant Secretary of Defense (Readiness)
- (U) Office of the Assistant Secretary of Defense (Energy, Installations, and Environment)
- (U) Defense Health Agency
- (U) Office of the Assistant Secretary of the Navy (Energy, Installations, and Environment)
- (U) Defense Logistics Agency, including DLA Energy
- (U) Navy Bureau of Medicine and the Navy and Marine Corps Public Health Center
- (U) Commander, U.S. Pacific Fleet
- (U) Commander, U.S. Indo-Pacific Command
- (U) Commander, Navy Installations Command and Commander, Navy Region Hawaii
- (U) Joint Base Pearl Harbor–Hickam
- (U) Naval Supply Systems Command (NAVSUP), including NAVSUP Fleet Logistic Center Pearl Harbor, and NAVSUP Naval Petroleum Office
- (U) Naval Facilities Engineering Systems Command (NAVFAC), including NAVFAC Pacific, NAVFAC Hawaii, Naval Facilities Engineering and Expeditionary Warfare Center
- (U) Naval Information Warfare Center

- (U) U.S. Army Pacific
- (U) U.S. Army Corps of Engineers
- (U) State of Hawaii, Department of Health
- (U) University of Hawaii

(U) Furthermore, we met with officials responsible for operation, maintenance, safety, and oversight of DFSP Craney Island, DFSP Manchester, and DFSP Point Loma.

(U) Site Visits

(U) We visited JBPHH in April 2022 and in July 2022. During the site visits, we conducted additional interviews, visually assessed relevant infrastructure, and visited areas of JBPHH affected by each of the incidents described in Part III. We interviewed Navy officials, including officials responsible for management, operations and maintenance, environmental, engineering, safety, health, and public affairs.

(U) During our first site visit to JBPHH, from April 1 to April 14, 2022, we held 30 meetings, one of which included a visit to the Hawaii DOH offices. Additionally, we performed eight walk-throughs of JBPHH infrastructure and visually assessed the Red Hill BFSF, Naval Station Pearl Harbor, Hickam Air Force Base, and JBPHH Community Water System. Furthermore, we visited family housing neighborhoods and met with affected community members. We collected non-statistical informal feedback from affected community members to understand their experiences from the drinking water contamination incident via a questionnaire.[194] Specifically, our questionnaire included the following six questions.

- (U) When did you first learn about the Red Hill water contamination?
- (U) How did you learn about the Red Hill water contamination?
- (U) Did the Red Hill water contamination impact you at home, work, both, or neither?
- (U) What steps were you required to take in your home, work site, or both?
- (U) When were you given the all-clear at home, work, or both?
- (U) Do you have any ongoing concerns regarding the Red Hill water contamination?

[194] (U) The term "drinking water contamination incident" refers to the November 20, 2021 incident that caused the drinking water contamination and to the events of the entire period from November 20, 2021, to March 18, 2022. Additionally, the term "affected communities" refers to the communities that live, work, and frequent the areas and facilities affected by the drinking water contamination incident.

(U) We received a total of 32 responses from the affected community, including men and women, military officers and enlisted personnel representing multiple Services, DoD civilians, family members, members of the general public, and people affected both at work and at home. We also held a meeting with U.S. Army officials to understand how the drinking water contamination incident impacted its consecutive water system.

(U) During our second site visit to JBPHH, from July 12 to July 22, 2022, we held 32 meetings, including a second visit to the Hawaii DOH offices and a visit to a University of Hawaii laboratory to learn about drinking water testing methods. Additionally, we performed five walk-throughs of JBPHH infrastructure and visually assessed the Red Hill BFSF and the Red Hill well.[195]

(U) Use of Computer-Processed Data

(U) We did not use computer-processed data to perform this evaluation.

(U) Prior Coverage

(U) During the last 7 years, the Government Accountability Office (GAO) issued one report discussing regulatory compliance in DoD owned and operated drinking water systems, and the EPA Office of Inspector General (OIG) issued one report discussing the drinking water contamination incident at Joint Base Pearl Harbor–Hickam. Unrestricted GAO reports can be accessed at http://www.gao.gov. Unrestricted EPA OIG reports can be accessed at http://www.epaoig.gov.

(U) Additionally, during the last 23 years, the DoD OIG and the Naval Audit Service issued six reports related to operations, maintenance, safety, environmental, and construction aspects of bulk fuel management. We discuss this prior coverage in DODIG-2025-011. Unrestricted DoD OIG reports can be accessed at http://www.dodig.mil/reports.html. Naval Audit Service reports are not available on the Internet.

[195] (U) We discuss additional site visits relevant to the topics in DODIG-2025-011 in Appendix A of that report.

(U) GAO

(U) Report No. GAO-18-78, "Drinking Water: DoD Has Acted on Some Emerging Contaminants but Should Improve Internal Reporting on Regulatory Compliance," October 2017[196]

(U) The GAO determined that, from 2013 to 2015, the DoD's public water systems complied with EPA and state health-based drinking water regulations at a level comparable with other systems in the United States. However, the DoD had not internally reported on all data on compliance with health-based drinking water regulations or used available data to assess compliance. The GAO determined that this indicated that the internal reporting systems of the DoD were either not clear in DoD regulations or were not clearly understood by those implementing them. Additionally, the GAO determined the two types of systems—DoD-treated water and non-DoD-treated water—had different compliance rates. Specifically, DoD data indicated that about 99 percent of the people who received non-DoD-treated drinking water were served by systems with no violations, while about 89 percent of the people who received DoD-treated drinking water were served by systems with no violations. According to the GAO, the DoD had not used its data to determine why its systems where owners and operators produced their own water had a higher incidence of drinking water regulation violations. The GAO concluded that, absent further analysis of its data, the DoD may not be able to improve overall drinking water quality compliance.

(U) EPA OIG

(U) Report No. 23-E-0015, "EPA Region 9 Must Continue Oversight Throughout the Decontamination and Closure of the Red Hill Facility," April 25, 2023

(U) The EPA OIG determined that EPA Region 9 provided adequate oversight of authorized Hawaii state programs before the Red Hill drinking water contamination incident. The EPA's adequate oversight would not reasonably have identified the sequence of events that led to the drinking water contamination incident at Red Hill. However, the EPA OIG determined that defueling and decontamination efforts will require significant coordination between EPA Region 9, the Hawaii DOH, and the Navy to reduce potential contamination of the Oahu drinking water aquifer, ensure accountability, and provide clear and transparent communication to the public on health and environmental risks.

[196] (U) This report did not specifically audit the JBPHH Community Water System.

(U) Appendix B

(U) Description of the Joint Base Pearl Harbor–Hickam Community Water System

(U) The JBPHH Community Water System is owned and operated by the Navy and provides drinking water to the JBPHH population. Table 4 details the JBPHH Community Water System infrastructure.

(U) Table 4. Joint Base Pearl Harbor–Hickam Community Water System Infrastructure

~~(CUI)~~ Location		Infrastructure
1	Groundwater wells*	[redacted]
2	Drinking water ground storage tanks	[redacted]
3	Control systems	[redacted]
4	Disinfection and treatment	[redacted]
5	Booster pump stations	[redacted]
6	Water distribution pipes	[redacted]
7	Emergency water supplies	[redacted] ~~(CUI)~~

(U) *This table details the groundwater wells under normal operating conditions. Navy officials isolated the Red Hill well and the Halawa well from the JBPHH Community Water System during the drinking water contamination incident.

(U) Source: The DoD OIG.

(U) Appendix C

(U) Contaminants Identified During the Drinking Water Contamination Incident

(U) Fuels are petroleum products made from crude oil and hydrocarbons.[197] Each type of fuel is a mix of hundreds of different chemicals, including a group of chemicals referred to as petroleum hydrocarbons. During the drinking water contamination incident at JBPHH, laboratory testing of drinking water samples identified contaminants including:

- (U) petroleum hydrocarbons;
- (U) chemicals in the benzene, toluene, ethylbenzene, and xylenes (BTEX) group of chemicals; and
- (U) lead.[198]

(U) Because there are many different chemicals in fuel, it is useful to measure the total amount of mixed petroleum hydrocarbons, referred to as total petroleum hydrocarbons (TPH).[199] BTEX are a hazardous subset of TPH chemicals commonly found in fuel, such as jet propellant 5 (JP-5), which was released during the November 2021 fuel incident at the Red Hill BFSF.[200]

[197] (U) A hydrocarbon is any chemical that is composed of only carbon and hydrogen atoms bonded together. Crude oil and other hydrocarbons exist in liquid or gaseous form in underground pools or reservoirs, in tiny spaces within sedimentary rocks, and near the earth's surface. After crude oil is removed from the ground, it is sent to a refinery where different parts of the crude oil are separated into usable petroleum products.

[198] (U) Congress passed the Safe Drinking Water Act (SDWA) in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water. The EPA issues regulations to implement the SDWA. For example, the EPA establishes National Primary Drinking Water Regulations that set enforceable water quality standards called maximum contaminant levels (MCLs). According to the EPA, MCLs are established to protect the public against consumption of drinking water contaminants that present a risk to human health. An MCL is the maximum allowable amount of a contaminant in drinking water. According to the EPA, there are no MCLs for the total amount of mixed petroleum hydrocarbons, TPH, in drinking water; however, BTEX chemicals have MCLs. Additionally, lead has an MCL.

(U) Title 42, United States Code, Section 300i–2, "Safe Drinking Water Act."

[199] (U) Scientists divide TPH into groups called fractions, each of which has an EPA-designed laboratory testing method. Scientists divide TPH into fractions that act alike in soil or water, which generally corresponds to the size range of the chemicals, referred to in terms of the length of the carbon and hydrogen bonded chain. The three TPH fractions are TPHs in the: (1) gasoline range (TPH-g), which easily evaporate and are flammable; (2) diesel range (TPH-d), which do not evaporate as well as TPH-g, but do produce a large amount of energy when burned; and (3) oil range (TPH-o), which are commonly used to make lubricants and greases that do not evaporate and do not burn well.

[200] (U) Within one of the TPH fractions is a subset of four types of TPH chemicals typically measured individually in laboratory testing: BTEX. BTEX are volatile organic compounds, meaning that they are highly flammable and evaporate quickly.

(U) According to the ATSDR, little is known about the long-term risks or health effects associated with human exposure to fuels, such as JP-5. However, results from studies suggest that fuel exposure can affect the central nervous system, affect neurological functions such as reaction time, and harm the respiratory system and gastrointestinal tracts. An ATSDR fact sheet states, "The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present."[201]

(U) According to the Hawaii DOH and Navy medical officials, people may be exposed to the chemicals in fuel, including TPHs and BTEX, "by swallowing them (ingestion), inhaling them (inhalation), or touching them (dermal contact)." The following list describes the potential symptoms from human exposure to fuel.

- (U) Central nervous system: headaches, dizziness, and lightheadedness.
- (U) Gastrointestinal tract: upset stomach, nausea, vomiting, diarrhea, and abdominal cramping.
- (U) Skin: irritation and rashes.
- (U) Mucous membranes: irritation and nose bleeds.
- (U) Respiratory system: cough, shortness of breath, and chemical pneumonia.

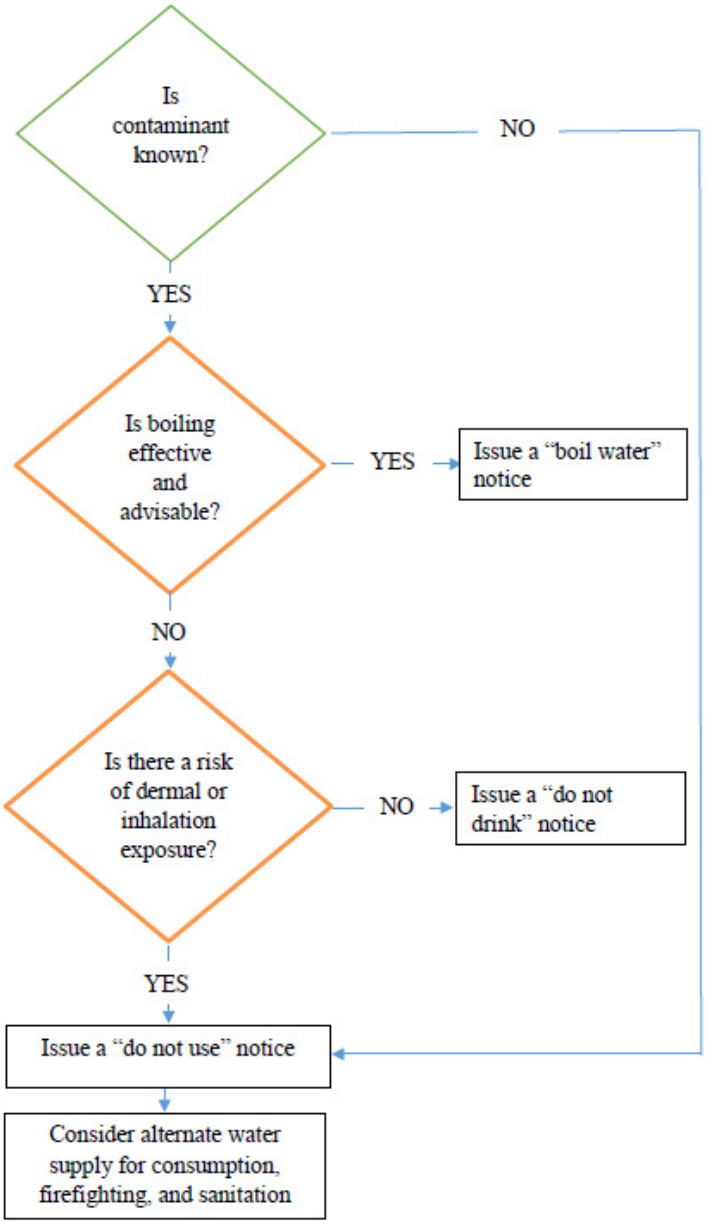
(U) Lead is a naturally occurring element. According to Navy officials, lead was not an ingredient of the fuel released during the November 2021 incident. However, lead was a historical ingredient of a variety of fuels and is still found in plumbing materials used in community water systems. Lead can enter drinking water when plumbing materials that contain lead corrode. Although Federal law reduced the maximum allowable lead content in plumbing, lead pipes may be found in older cities and in homes built before 1986. Lead can be poisonous if inhaled or ingested. Lead is particularly dangerous to children because their growing bodies absorb more lead than adults and their brains and nervous systems are more sensitive to the damaging effects of lead. Lead poisoning can cause problems with learning, growth, and behavior that last a lifetime.

[201] (U) ATSDR Division of Toxicology and Human Health Sciences, "JP-5, JP-8, and Jet A Fuels – ToxFAQs," March 2017.

(U) NAVMED P-5010-5 Public Notification Flow Chart

(U) The Manual of Naval Preventive Medicine includes a flow chart describing public notification procedures for a drinking water "issue that has the potential to threaten public health." As shown in Figure 15, when the contaminant is unknown, a "do not use" public notice should be issued. Additionally, when the contaminant is known and the contaminant is associated with a risk of dermal or inhalation exposure, a "do not use" public notice should be issued.

(U)

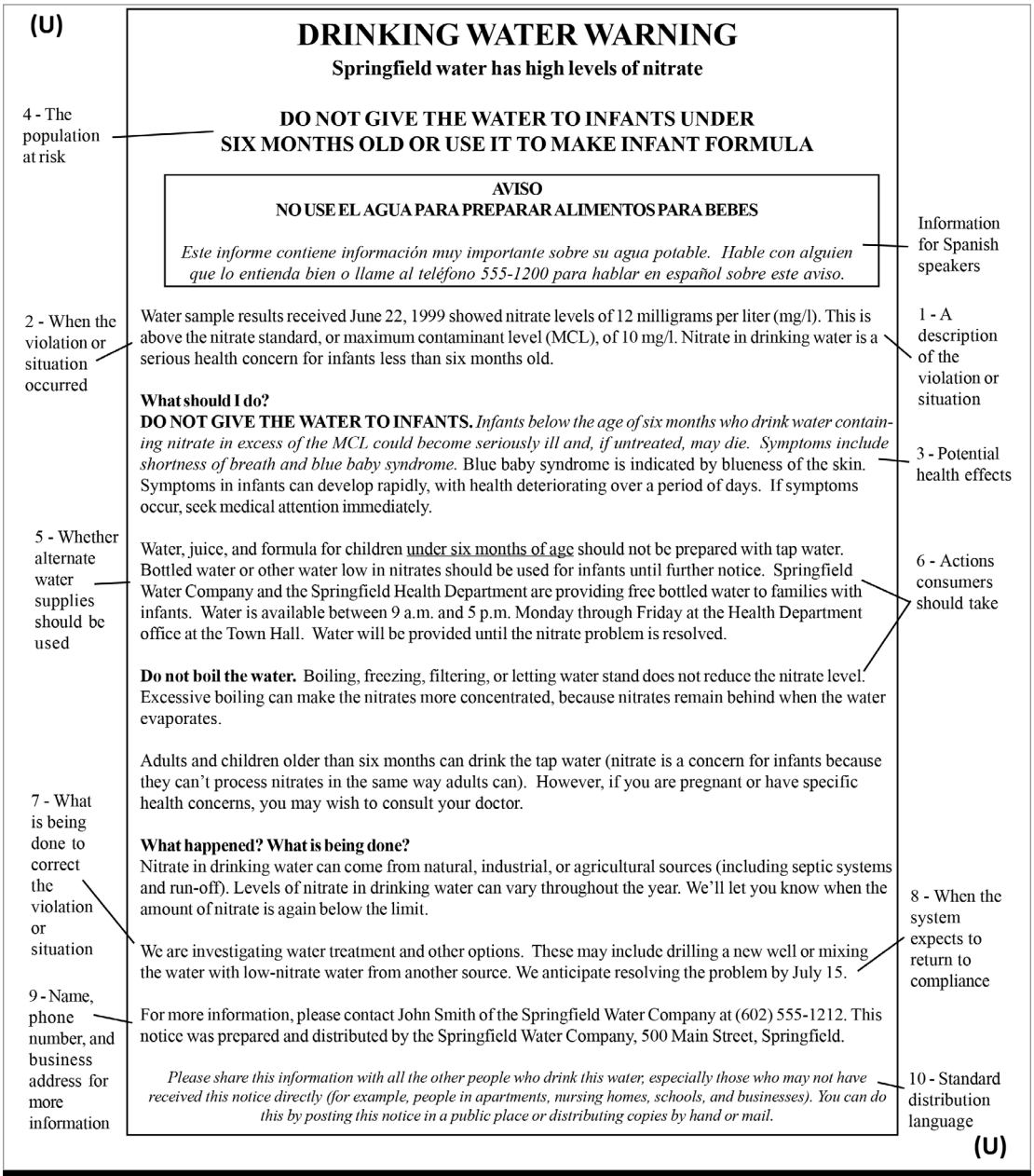


(U)

(U) Figure 15. Flow Chart to Guide the Decision Process for Public Notification
(U) Source: NAVMED P-5010-5, Figure 5-31-1.

(U) Example Public Notice for Community Water Systems

(U) According to the EPA, there are 10 required elements of a public notice for community water systems. As shown in Figure 16, the EPA has an example of a public notice on its website that contains the 10 required elements for owners and operators of community water systems to reference when they need to issue such a notice.



(U) Figure 16. EPA Example of a Public Notice for Public Water Systems with the 10 Required Elements
(U) Source: The EPA; https://www.epa.gov/dwreginfo/required-elements-public-notice-public-water-systems

(U) 2023 Administrative Consent Order Requirements

(U) On June 2, 2023, the EPA Region 9, DLA, and CNRH, on behalf of the Navy, entered into an Administrative Consent Order (ACO), which we refer to as the 2023 AOC.[202] The 2023 ACO required DLA and Navy officials to take specific actions to defuel and close the Red Hill BFSF infrastructure and to properly operate and maintain the JBPHH Community Water System to protect the environment and human health. Specifically, as it relates to the JBPHH Community Water System, the 2023 ACO requires Navy officials to develop and implement, within specified timelines:

- (U) a Source Water Protection Plan, including efforts to safeguard drinking water quality in the Red Hill well during the defuel and closure of the Red Hill BFSF and efforts to safeguard drinking water quality at the other JBPHH Community Water System wells;
- (U) a Drinking Water Long-Term Monitoring Plan that addresses, among other things, a cross-connection control survey;[203]
- (U) inspections, cleaning, and sampling of the drinking water ground storage tanks;
- (U) standard operating procedures for JBPHH Community Water System operators "that describe how operators carry out daily, weekly, monthly, annual, or other regular and non-regular tasks, in accordance with [a] list of minimum requirements provided by EPA" and operator daily log requirements;
- (U) an asset management program that includes an inventory and condition assessment of JBPHH Community Water System components and assets, identification and prioritization of assets, life-cycle cost analysis that addresses costs of operation, maintenance, and capital replacement for critical assets, and a long term funding plan;
- (U) a calibrated hydraulic model of the JBPHH Community Water System;
- (U) a unidirectional flushing plan and a maintenance flushing plan for flushing the entire JBPHH Community Water System annually;
- (U) a valve exercise and replacement program;

[202] (U) EPA Region 9, "Red Hill Bulk Fuel Storage Facility Defueling, Closure, and Joint Base Pearl Harbor-Hickam Drinking Water System 2023 Consent Order," June 2, 2023.

[203] (U) As previously discussed, a cross-connection is any physical link, either direct or indirect, through which contamination can enter a community water system. The flow of contaminated water into a drinking water system, such as a community water system, is called backflow when the flow of contamination occurs due to pressure differences. A cross-connection control and backflow prevention program is a program to find and eliminate existing cross-connections in a community water system and to install, inspect test, maintain, and periodically certify backflow prevention devices when cross-connections cannot be eliminated.

- (U) a cross-connection control program that incorporates the cross-connection control survey from the Drinking Water Long-Term Monitoring Plan; and
- (U) a capital improvement plan that includes a list of projects submitted for DoD funding to address infrastructure repairs and replacements.

(U) Furthermore, the 2023 ACO requires Navy officials to:

- (U) certify JBPHH Community Water System operators;
- (U) revise the risk and resilience assessment and the JBPHH Community Water System ERP;
- (U) comply with specific complaint investigation procedures, including posting written monthly investigation reports on the website; and "submit for EPA's approval a proposal for the establishment of a surveillance and response system to address potential future fuel contamination."

(U) Appendix D

(U) Management Comments

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment)

DEPARTMENT OF THE NAVY
THE ASSISTANT SECRETARY OF THE NAVY
(ENERGY, INSTALLATIONS, AND ENVIRONMENT)
1000 NAVY PENTAGON
WASHINGTON, DC 20350-1000

August 22, 2024

MEMORANDUM FOR THE INSPECTOR GENERAL, DEPARTMENT OF DEFENSE

SUBJECT: Official Management Response: Concerns with the DoD Actions Related to the Red Hill Bulk Fuel Storage Facility's Contamination of the Joint Base Pearl Harbor-Hickam Community Water System (Project No. D2022-DEV0SR-0051.002)

The Department of the Navy's response and comments on the subject report are attached. Corrective action plans are being developed and will be available in approximately 60 days due to the complexity of the subject matter and breadth of stakeholders involved. Thank you for the opportunity to review and provide feedback. My point of contact is [redacted]

Meredith Berger

Attachments:
(1) Management Response
(2) Comment Matrix
(3) Security Marking Review

cc:
NAVINSGEN
COMCNIC
OPNAV N4
COMNAVFAC

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment) (cont'd)

INSPECTOR GENERAL US DEPARTMENT OF DEFENSE
DRAFT REPORT DATED MAY 15, 2024
PROJECT NO. D2022-DEV0SR-0051.002

EVALUATION OF DOD ACTIONS RELATED TO THE RED HILL BULK FUEL STORAGE FACILITY'S CONTAMINATION OF THE JOINT BASE PEARL HARBOR-HICKAM COMMUNITY WATER SYSTEM

SECRETARY OF THE NAVY COMMENTS
TO THE INSPECTOR GENERAL DOD RECOMMENDATIONS

RECOMMENDATION 1: (U) We recommend that the Secretary of the Navy designate an entity to be responsible for ensuring that all laws, policies, and agreements made in response to the 2021 drinking water contamination incident at Joint Base Pearl Harbor-Hickam are implemented, and that appropriate action is taken with regard to recommendations made in prior oversight reports and command investigation reports. Specifically:

a. (U) Implement the requirements of the 2015 Administrative Order on Consent and the 2023 Administrative Consent Order.

b. (U) Implement the requirements put forth in the FY 2024 National Defense Authorization Act (NDAA).

c. (U) Implement the recommendations of the U.S. Environmental Protection Agency Safe Drinking Water Act (SDWA) Investigation.

d. (U) Implement the recommendations of the Agency for Toxic Substances and Disease Registry (ATSDR).

e. (U) Implement the recommendations of the Vice Chief of Naval Operations supplemental command investigation.

f. (U) Implement the recommendations of the Naval Facilities Engineering Systems Command (NAVFAC) command investigation.

g. (U) Implement the requirements of Commander, Navy Installation Command (CNIC) Instruction 5090.7.

(U) DON Response: The Department of Navy (DON) concurs with comment. The Commander, Navy Closure Task Force – Red Hill (NCTF-RH) is the single Point of Contact (POC) for closure and remediation, and the Joint Base Pearl Harbor-Hickam (JBPHH) Commanding Officer is the single POC for the JBPHH Defense Fuel Supply Point (DFSP).

a. (U) The DON is implementing requirements of the 2015 Administrative Order on Consent (AOC) and 2023 Administrative Consent Order (ACO). Provisions governing fuel storage and operation of the underground storage tanks are no longer applicable as the Red Hill Bulk Fuel Storage Facility (RHBFSF) has been defueled and is in the process of permanent closure. The DON works with the Environmental

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment) (cont'd)

Protection Agency (EPA) and Hawaii Department of Health (DOH), as appropriate, to modify the Consent Orders as needed during implementation. The Defense Logistics Agency (DLA) has its own requirements under the 2015 AOC and 2023 ACO separate from Navy's requirements.

b. (U) The DON concurs with this recommendation.
c. (U) The DON concurs with comment. The DON is implementing the applicable recommendations from the EPA Safe Drinking Water Act (SDWA) Investigation.
d. (U) ATSDR has published two Assessment of Chemical Exposures (ACE) reports with recommendations. The DON is implementing activities related to rebuilding community confidence in the drinking water system. The remainder of the recommendations in the ACE reports are outside of the purview of the DON.
e. (U) The DON concurs and continues to track to completion of the recommendations from the Red Hill Command Investigation. Of the original 104 recommendations, 56 are complete, 32 are no longer applicable because of the decision to close the Red Hill facility, and 16 recommendations remain open. These will be addressed in the corrective action plan currently under development due to their complex nature. Of the 16 remaining, 11 relate to the Navy's effort to streamline Command and Control for the Bulk Fuel DFSP.
f. (U) The DON concurs with this recommendation.
g. (U) The DON is implementing requirements in accordance with Commander, Navy Installations Command Instruction 5090.7 (CNICINST 5090.7).

RECOMMENDATION 2: (U) We recommend that the Secretary of the Navy revise Operations Navy Manual 5090.1. Specifically:

a. (U) Include the roles, responsibilities, and training requirements for the Operator in Responsible Charge for Treatment and Distribution.

b. (U) Align requirements of Operations Navy Manual 5090.1 with Commander, Navy Installation Command Instruction 5090.7. Specifically, clarify conflicting requirements for roles and responsibilities, including for the preparation and publication of public notices and contingency plans for alternate drinking water supplies during a drinking water emergency.

(U) DON Response: The DON will review and align Navy instructions as identified in items (a) and (b) with retention of external references. References to external regulatory requirements are utilized to avoid circumstances whereby guidance or requirements evolve outside of an update cycle to ensure DON is following latest regulatory requirements. The revisions to the OPNAV and CNIC Instructions will also take into consideration the more broad Command and Control enhances that CNO has directed to ensure stronger accountability at all Defense Fuel Support Points.

RECOMMENDATION 3: (U) We recommend that the Secretary of the Navy direct the Commander, Navy Installations Command to revise Commander, Navy Installation Command Instruction 5090.7. Specifically:

Attachment (1) 2

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment) (cont'd)

a. (U) Define the roles and responsibilities of the Installation Community Officer.

b. (U) Include the roles, responsibilities, and training requirements for the Operator in Responsible Charge for Treatment and Distribution.

c. (U) Require the standing membership of the Installation Drinking Water Committee to include owners and operators of consecutive water systems.

d. (U) Periodically require the Installation Drinking Water Committee (IDWC) to assess committee membership, no less than annually, to determine whether additional stakeholders with the potential to affect drinking water quality should participate on the committee, such as users of aqueous film-forming foam, owners and operators of oil or hazardous substance facilities, or managers of solid waste facilities.

e. (U) Require that the annual table-top exercise of the installation's drinking water emergency response plan include triggers and timelines for updating and editing the emergency response plan when the table-top exercise identifies a need.

f. (U) Include roles and responsibilities for the risk communication requirements of DoD Instruction 6055.20, including recurring training.

g. (U) Define the requirements for Navy drinking water program management ashore at Navy installations outside of the United States and its Territories.

(U) DON Response: The DON concurs with comment. The Navy concurs with the DoD IG recommendation to revise CNICINST 5090.7 as specified in items (a) thru (f). February 2024 updates to this instruction addressed improvements to drinking water system oversight, assessment and coordination. The DON references roles and responsibilities for system operators required by Federal and State requirements within the CNICINST 5090.7 to ensure latest requirements are presented from source regulations. The DON will review and clarify roles and responsibilities for the IDWC and Emergency Drinking Water Response Plans and incorporate those changes within the CNICINST 5090.7, as applicable. The requirements for drinking water program management ashore at Navy installations outside of the United States and its Territories are defined in the CNICINST 5090.1B, Navy Overseas Drinking Water Program Ashore.

RECOMMENDATION 4: We recommend that the Secretary of the Navy direct the appropriate Joint Base Pearl Harbor-Hickam official to issue a retroactive Tier 1 public notice including the 10 required elements of information for the October 2022 water main break.

(U) DON Response: The DON non-concurs with this recommendation. Regulatory agencies do not provide for retroactive notifications and have not required a retroactive Tier I notification for the October 2022 water line break at JBPHH. According to the relevant EPA regulations, when a Tier I public notice is justified, it must be issued as soon as practical, but no later than 24 hours after the public water system learns of the violation or situation, "in a form and manner ... to fit the specific situation." 40 C.F.R. § 141.202(c). As noted below, a Boil Water Notice was issued in order to alert and inform water system users appropriately.

Attachment (1) 3

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment) (cont'd)

During the water main break, the Joint Base Commander voluntarily issued a boil water advisory on the morning of 14 October 2022, communicated this information via social media (e.g. Facebook), and sent notifications to base commands and privatized entities who utilize Navy water. Additionally, the Joint Base Commander held frequent press conferences and Facebook live events to inform the consumers of the status of the JBPHH water system.

The retroactive Tier 1 public notice recommended by the DoD IG is inconsistent with state and Federal regulatory agencies' requirements for public notice. EPA's responses to comments on the Public Notice Final Rule (see 65 FR 25992 to 65 FR 25995) make clear that public notice requirements are "based on the seriousness of any potential adverse health effects" and that "exceptions to the system-wide notice distribution may be warranted" when certain persons will not be affected. Here, there are no actions for consumers to take and no potential for adverse health effects, because the circumstances that might warrant notice are no longer present. On the other hand, there is significant potential for confusion and distress among water users who receive a Tier 1 notice about a situation that no longer poses a hazard, particularly if receiving the notice implies that a waterborne emergency is currently taking place. Since Tier 1 notices are to be issued no later than 24 hours after a qualifying situation occurs, water consumers are highly likely to be misled.

As an alternative corrective action, the DON proposes expressly incorporating the responsibility for issuing Tier 1 notices into the CNICINST 5090.7 "roles and responsibilities" revisions recommended above and concurred in by the DON.

RECOMMENDATION 5: We recommend that the Secretary of the Navy direct a study to assess the location of Navy owned drinking water systems, identify all co-located infrastructure that pose a threat to the safety of the drinking water, and make plans to mitigate the threats to the drinking water systems.

(U) DON Response: The DON concurs with this recommendation which comment.

The recommendation has been implemented. Following the release of fuel from the Red Hill Bulk Fuel Storage Facility (RHBFSF) VCNO directed that all Navy DFSP's complete Self-Assessments to access the Material, Operational, and Incident Response Readiness in January 2022. These assessments included risks, compliance, and response assessments and were completed in 2022.

In addition, in March 2022 COM CNIC, as Navy Executive Agent for Drinking Water Ashore, directed that all Stateside and Territory Navy Drinking Water Systems complete a Self-Assessment in order to identify risks and mitigation requirements to ensure compliant drinking water for all users of Navy drinking water systems. These assessments were completed in July 2022 and then evaluated for systems of elevated risk. Based on the risk assessments CNIC conducted detailed Sanitary Surveys to identify the highest risk systems. That process has continued to the present. Overseas Navy drinking water systems were and are assessed and managed within the Navy's Overseas Drinking Water (ODW) Program as per CNIC M-5090.1B. In order to ensure similar oversight and continuous monitoring, CNIC developed and issued CNICINST 5090.7 in February 2024. This instruction requires annual drinking water internal assessments, annual emergency response exercises, and associated risk analysis that drives the

Attachment (1) 4

(U) The Assistant Secretary of the Navy (Energy, Installations, and Environment) (cont'd)

current CNIC Stateside and Territory Sanitary Survey Program. This program is also supported by BUMED, NMCFPHC, and NAVFACSYSCOM.

(U) Appendix E

(U) Acronyms and Abbreviations

ACO	Administrative Consent Order
AFB	Air Force Base
AFFF	Aqueous Film Forming Foam
AMR	Aliamanu Military Reservation
AOC	Administrative Order on Consent
BFSF	Bulk Fuel Storage Facility
CFR	Code of Federal Regulations
CNIC	Commander, Navy Installations Command
CNO	Chief of Naval Operations
CNRH	Commander, Navy Region Hawaii
COMPACFLT	Commander, U.S. Pacific Fleet
DFSP	Defense Fuel Support Point
DLA	Defense Logistics Agency
DoDI	Department of Defense Instruction
DoDD	Department of Defense Directive
DODM	Department of Defense Manual
EPA	Environmental Protection Agency
EPA NEIC	EPA Office of Enforcement and Compliance Assurance, National Enforcement Investigations Center
FRP	Facility Response Plan
GWPP	Groundwater Protection Plan
HAR	Hawaii Administrative Rules
Hawaii DOH	Hawaii Department of Health
IDWC	Installation Drinking Water Committee
IDWST	Interagency Drinking Water System Team
JBPHH	Joint Base Pearl Harbor–Hickam
LAT	Lower Access Tunnel
MCL	Maximum Contaminant Level
NAVFAC	Naval Facilities Engineering Systems Command
NAVSUP	Naval Supply Systems Command
NAVSUP FLC PH	Naval Supply Systems Command Fleet Logistics Center Pearl Harbor
NDAA	National Defense Authorization Act
NMCPHC	Navy and Marine Corps Public Health Center
NPDWR	National Primary Drinking Water Regulations

OPNAVINST Chief of Naval Operations Instruction
OPNAV M Chief of Naval Operations Manual
RDWC Region Drinking Water Committee
SDWA Safe Drinking Water Act
SPCC Spill Prevention, Control, and Countermeasures
UFC United Facilities Criteria
USC United States Code
UST Underground Storage Tank System

(U) Appendix F

(U) Glossary

(U) Authority. The powers to command, enforce laws, exact obedience, determine, or judge.

(U) Backflow. The flow of contaminated water into a drinking water system, such as a community water system, that occurs when the pressure of the contaminated source exceeds the pressure of the drinking water source. Backflow can occur where there are cross-connections within the drinking water system infrastructure.

(U) Bulk fuel. Fuel delivered in volumes greater than 55 U.S. gallons by delivery modes, such as tank trucks, pipelines, hydrant systems, and ships.

(U) Causative Research. An investigation of discrepancies such as gains or losses with a complete review of all transactions and supporting documentation to compare transaction level detail reported with the supporting documentation. Causative research ends when the cause of the discrepancy has been discovered or when, after review of the transactions, no conclusive findings are possible.

(U) Command. The authority that a commander in the military service lawfully exercises over subordinates by virtue of rank or position. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions. Command also includes responsibility for health, welfare, morale, and discipline of assigned personnel.

(U) Cross-connection. Physical links through which contaminated materials can enter a community water system. Specifically, any physical infrastructure where the community water system is connected, directly or indirectly, with any other sewer, drain, plumbing fixture, or other device that contains or may contain contaminated water.

(U) Cross-connection control and backflow prevent program. A program to find and eliminate existing cross-connections in a community water system by conducting cross-connection control surveys of all facilities at least every 5 years, preventing new cross-connections, and installing, inspecting, testing, maintaining, and periodically certifying backflow prevention devices when cross-connections cannot be eliminated.

(U) Defense Fuel Support Points. Bulk fuel storage facilities where Defense Logistics Agency-owned fuel is stocked for distribution to multiple military end users. Defense fuel support points range in size and scope from a single tank to a pipeline system with a network of multiple terminals.

(U) Drinking Water Incident. A confirmed occurrence related to drinking water that requires response actions to prevent or minimize loss of life or damage to property and natural resources. A drinking water contamination incident occurs when the presence of a harmful contaminant has been confirmed in drinking water.

(U) Drinking Water Primacy Agency. The agency that has primary enforcement authority and responsibility for national drinking water regulations required by the Safe Drinking Water Act, as amended. Drinking water primacy for a particular state is typically the State Health Agency or the State Environmental Agency.

(U) Effectiveness. Meeting the military mission while fully meeting Federal and state laws, regulations, and DoD policies, including environmental requirements.

(U) Environment (Hawaii). Any waters, including surface water, ground water, or drinking water supply, any land surface or any subsurface strata, or any ambient air within the State of Hawaii or under the jurisdiction of the State.

(U) Environmental Impact. An effect of a practice's aspect on an environmental or other resource. Each practice may have several impacts. Typical impacts associated with practices operated on Navy installations or regional complexes include: personnel exposure, indoor air quality degradation, outdoor air quality degradation, surface water degradation, groundwater degradation, soil quality degradation, wildlife or plant population or habitat disturbance, other resources such as landfill space, consumption, cost to mitigate risk, adverse regulatory exposure, negative public perception, real property damage, historic or cultural resource damage, natural resource disturbance, soil erosion, and human health effects.

(U) Executive Agent. A DoD Executive Agent is the head of a DoD Component assigned specific responsibilities, functions, and authorities by the Secretary of Defense or Deputy Secretary of Defense to provide operational, administrative, or other designated activities involving two or more DoD Components.

(U) Flushing Plan. Flushing is a maintenance technique used by owners and operators of public water systems as part of a regular maintenance program to remove stagnant water, scour pipe surfaces, and remove loose sediment, biofilm, and scale. Flushing may also be performed on an unscheduled basis in response to laboratory testing results that indicate contaminants or to customer water quality complaints. Flushing involves opening a drinking water distribution system connection, such as a hydrant, and allowing water to discharge from the system. Flushing is performed in accordance with a plan tailored to the goal of the flushing that describes the planned, organized, and sequential technique for opening and closing drinking water distribution system connections.

(U) Fuel Incident. Any occurrence or series of occurrences having the same origin involving one or more vessels, facilities, or any combination thereof, resulting in the release or substantial threat of release of oil or hazardous substances (OHS).

(U) Incident. In terms of OHS, an incident is any occurrence or series of occurrences having the same origin, involving one or more vessels, facilities, or any combination thereof, resulting in the release or substantial threat of release of OHS. In terms of water, an incident is a confirmed occurrence that requires response actions to prevent or minimize loss of life or damage to property and natural resources. A drinking water contamination incident occurs when the presence of a harmful contaminant has been confirmed.

(U) Infrastructure. Any structures, systems, and assets, whether physical or cyber-based, that support economic or other activities. For example, facilities and their components, such as the tanks, pipes, and other supporting structures and equipment that make up the Red Hill Bulk Fuel Storage Facility and the wells, pipes, and other supporting structures and equipment that make up the JBPHH Community Water System are infrastructure. Infrastructure also refers to shore facilities and their components, such as the tanks, pipes, and other supporting structures and equipment that make up the DFSP JBPHH shore facility. A shore facility is any refinery, terminal, storage, or port facility taking deliveries of a commodity from or making deliveries of a commodity to a vessel. A shore facility does not have to be on land.

(U) Management. A process of establishing and attaining objectives to carry out responsibilities. Management consists of those continuing actions of planning, organizing, directing, coordinating, controlling, and evaluating the use of personnel, money, materials, and facilities to accomplish missions and tasks. Management is inherent in military command, but it does not include as extensive authority and responsibility as military command.

(U) Military Departments. The Military Departments, created by the National Security Act of 1947, are the Army, Navy, and Air Force.

(U) Mitigate. To lessen or try to lessen the seriousness or extent of something.

(U) Owner or operator. Any person owning or operating an onshore facility or an offshore facility, and in the case of any abandoned facility, the person who owned or operated or maintained the facility immediately prior to such abandonment.

(U) Preventive Maintenance. Regular and recurring maintenance of equipment and infrastructure in order to maintain functionality and prevent unplanned downtime from unexpected failure. Also known as preventative maintenance.

(U) Public Health. The science focused on improving and protecting community health and well-being, with an emphasis on prevention among groups of people, rather than individuals.

(U) Release. Any spilling or substantial threat of spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment of any hazardous substance, including abandoning or discarding of barrels, containers, and other closed receptacles containing any hazardous substance, pollutant, or contaminant. A release may be either aboveground or belowground. An aboveground release is any release to the surface of the land or to surface water. A belowground release is any release to the subsurface of the land and to groundwater.

(U) Risk. An effect of uncertainty. An effect is a deviation from the expected—positive or negative. Uncertainty is the state, even partial, of deficiency of information related to understanding or knowledge of an event, its consequence, or its likelihood. Risk is often characterized by reference to potential "events" or a combination of these. It is often expressed in terms of a combination of the consequences of an event and the associated "likelihood" of occurrence.

(U) Root Cause. The cause of an occurrence that, if corrected, would prevent recurrence of that and similar occurrences. There may be a series of identifiable causes, one leading to another. Commands and practice owners should pursue that series of causes until identifying the fundamental correctable cause, which is the root cause.

(U) Secondary Containment. A release-prevention and release-detection system for a tank or piping. These systems include structures or equipment to prevent a release of OHS from its primary containment tank or piping, where the structure is a liquid-tight container that protects the environment by containing leaks and spills of regulated substances, such as fuel, from piping, dispensers, pumps, and related components in the containment area.

(U) Sump. A pit or low space that collects liquids. Liquids collect in sumps by various means. Any liquid flowing nearby can flow into a sump from openings, such as grates, in the top of the sump. Additionally, liquids can be directed to sump pits through drainage systems that collect the liquid elsewhere and direct it toward the sump, such as floor trenches. Furthermore, subsurface liquids naturally flowing toward the low space can be collected in subsurface drains, such as French drains, and then directed to the sump.

(U) Underground Storage Tanks. Any tank or combination of tanks, including underground pipes connected thereto, used to contain an accumulation of regulated substances, such as OHS. To be considered an underground storage tank system, 10 percent of the volume of the tank or combination of tanks and the associated piping must be located beneath the surface of the ground.

(U) Valve Exercise Program. A program to exercise valves in a drinking water distribution system on a regular schedule to ensure that that each valve operates reliably. To exercise each valve, the valve is operated through a full cycle of fully opened and fully closed and then returned to its normal position. Exercising valves prevents the buildup of rust or corrosion that could otherwise render the valve inoperable or prevent a tight shutoff.

(U) Well. A bored, drilled, or driven shaft whose depth is greater than the largest surface dimension.

(U) Wellhead Protection Program. A program to protect groundwater wells and well fields that contribute drinking water to public water supply systems.

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