Fuel Tank Advisory Committee (FTAC) Meeting

Navy Closure Task Force – Red Hill

07 MAR2024

NCTF-RH Mission

SAFE. DELIBERATE. ENGAGED. COMMITTED.

Establishment:

Secretary of Defense approval 6 November 2023

Mission:

The mission of the Navy Closure Task Force - Red Hill (NCTF-RH) will be to safely and expeditiously execute the permanent decommissioning of Red Hill Bulk Fuel Storage Facility (RHBFSF), continue long-term environmental remediation and aquifer restoration efforts in coordination with State and Federal stakeholders in order to protect public health and the environment.

Red Hill Information Resources

SAFE. DELIBERATE. ENGAGED. COMMITTED.

Navy Closure Task Force – Red Hill
navyclosuretaskforce.navy.mil
- Document library for defueling & closure of Red Hill Bulk Fuel Storage Facility
- Photos & media gallery related to water response efforts & drinking water testing

---

Navy Region Hawaii Facebook Page
facebook.com/NavyRegionHawaii
- Frequent updates & information about Joint Base Pearl Harbor-Hickam drinking water

---

Joint Base Pearl Harbor-Hickam Facebook Page
facebook.com/JBPHH
- Features daily joint base water updates
- Imagery & resources related to water response efforts
- Infographics & information

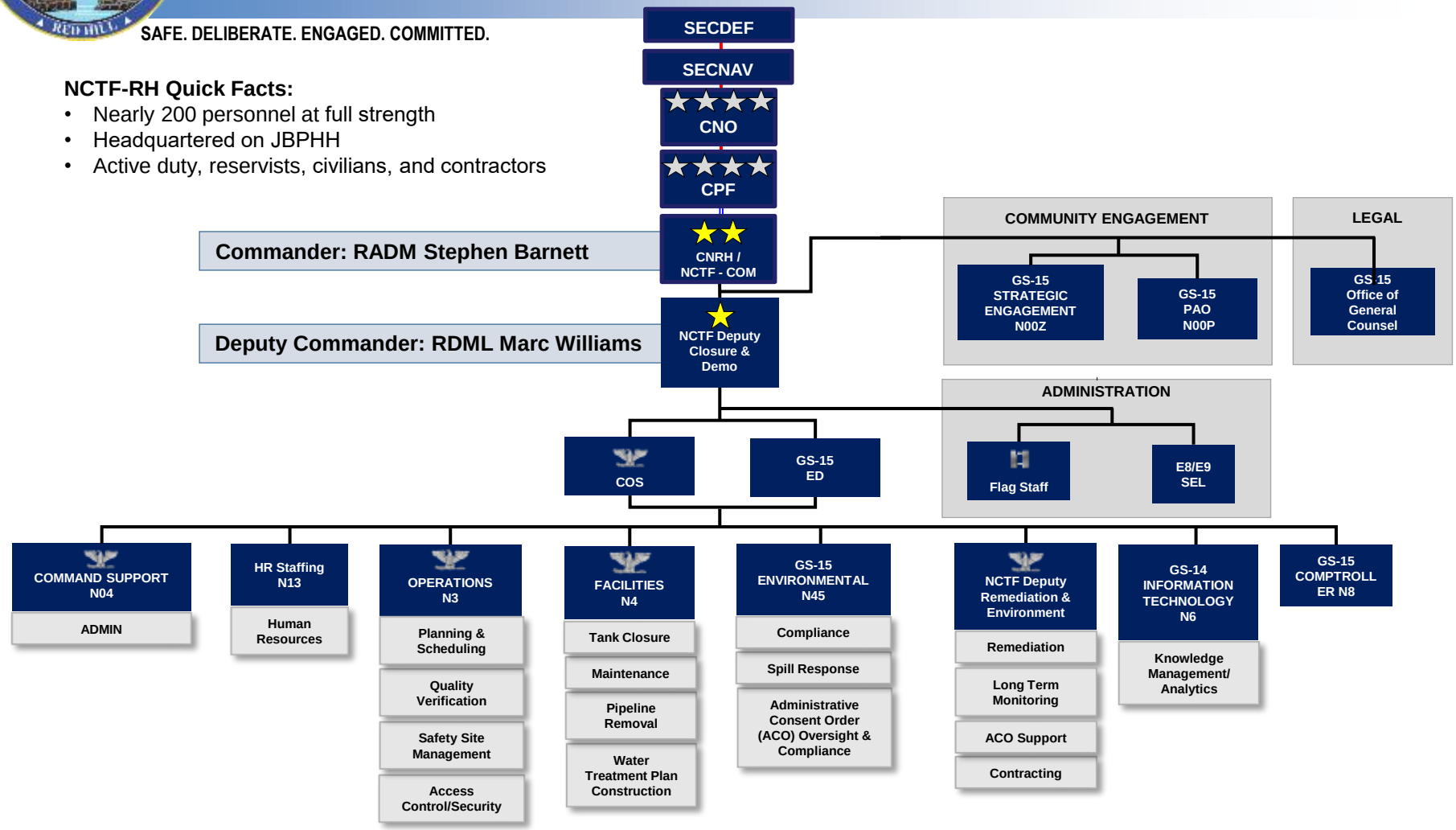
Joint Base Pearl Harbor-Hickam Safe Waters
jbphh-safewaters.org
- Ongoing information on Navy efforts regarding water on the island of Oahu
- Two primary areas: Drinking Water System & Red Hill Environmental Remediation

NCTF-RH Organizational Structure and Mission

SAFE. DELIBERATE. ENGAGED. COMMITTED.

NCTF-RH Quick Facts:

- Nearly 200 personnel at full strength
- Headquartered on JBPHH
- Active duty, reservists, civilians, and contractors



Navy's Commitment

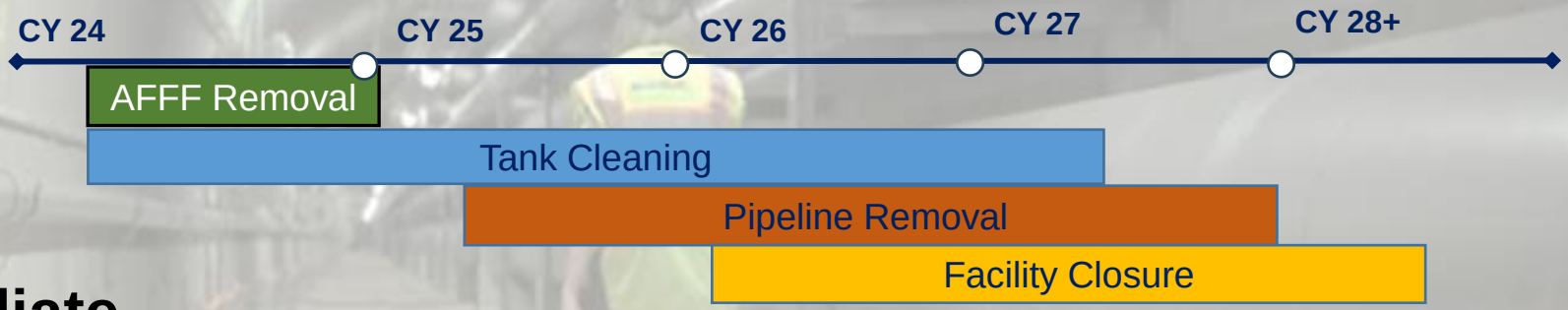
SAFE. DELIBERATE. ENGAGED. COMMITTED.

- **Maintain** safe drinking water
- **Decommission** the tanks at Red Hill and remove pipelines
- **Remediate** the environment
- **Ensure** Red Hill is never again used to store fuel
- **Communicate** transparently with stakeholders

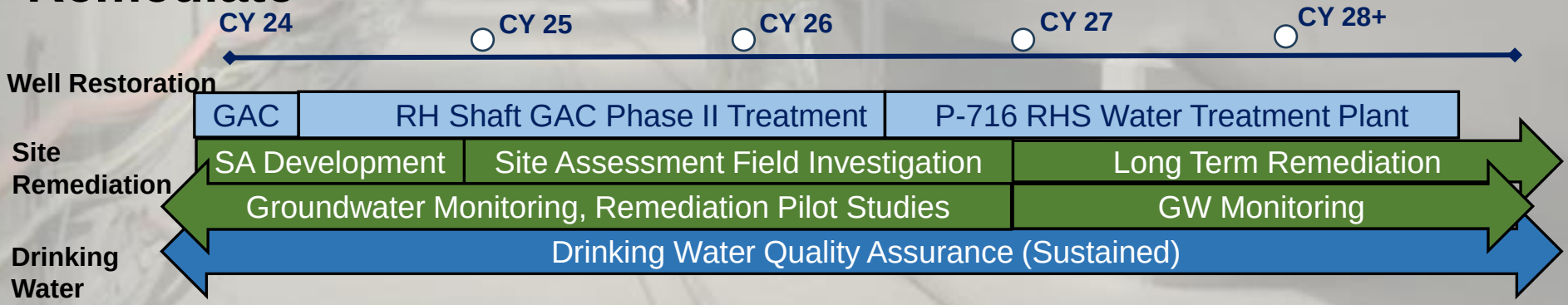
SAFE.DELIBRATE.ENGAGED.COMMITTED

Lines of Effort

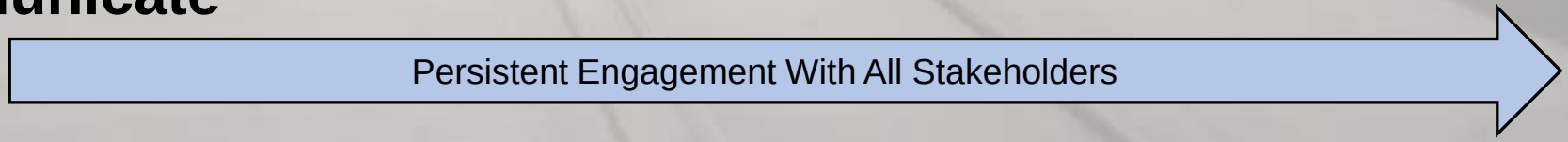
Decommission



Remediate



Communicate



REMEDIATION AND COMMUNICATION ARE ENDURING TASKS

Fuel Tank Advisory Committee (FTAC) Meeting

Closure

Tank Cleaning

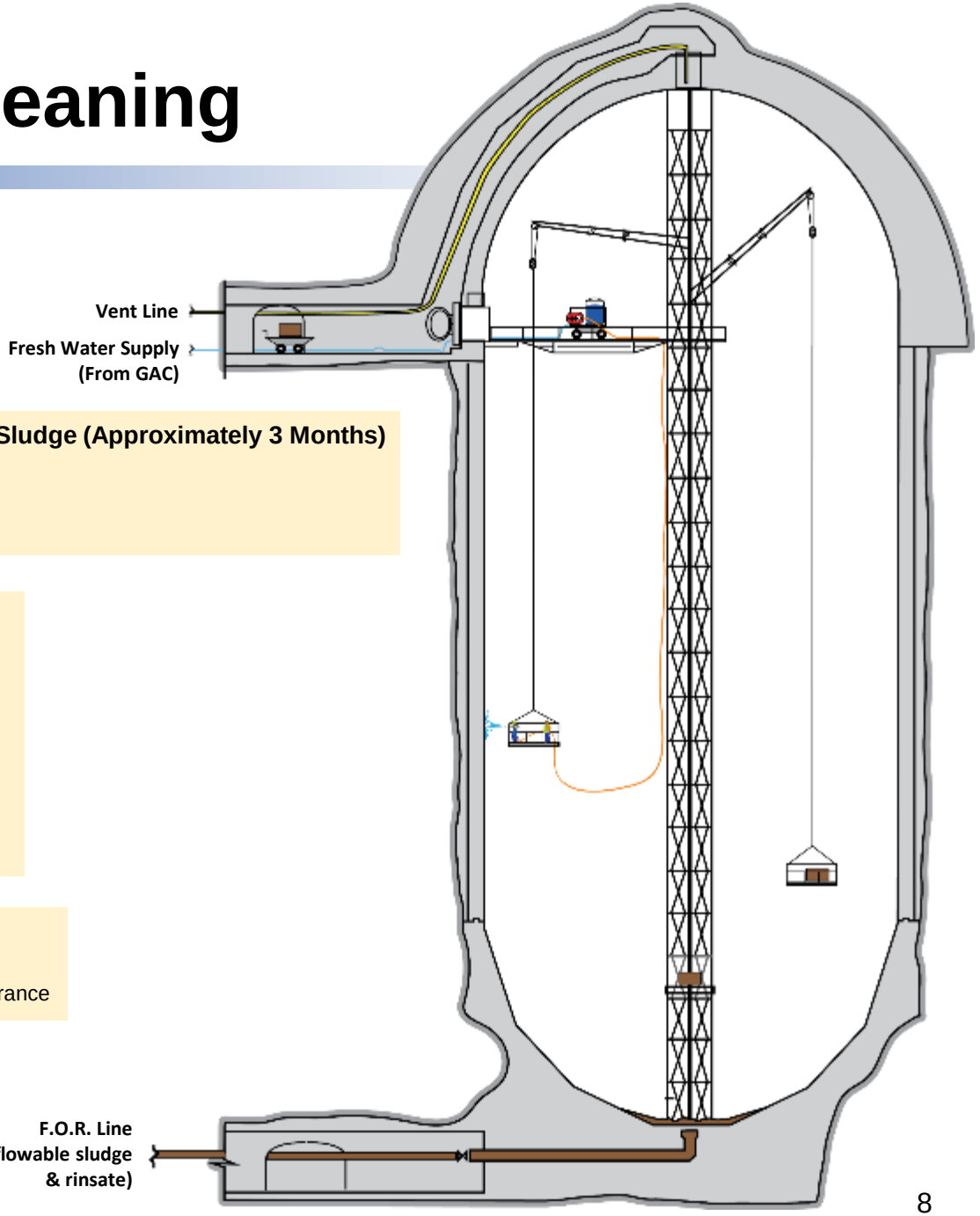
SAFE. DELIBERATE. ENGAGED. COMMITTED.

Step 1 Preparation (Approximately 3 Months)
- Isolate Tank and Disconnect Piping
- Install and Begin Tank Ventilation using Forced Air
- Remove Flowable Sludge

Step 2 Install Cleaning Infrastructure/Remove Solid Sludge (Approximately 3 Months)
- Install Center Tower Elevator
- Inspect and Repair Central Tower and Catwalk
- Load Test Central Tower and Catwalk
- Remove Solid Sludge

Step 3 Pressure Washing (Approximately 2 Months)
- Set-up Pressure Washing System
- Pressure Wash w/ 3% Simple Green
- Rinse
- Continuously Remove Rinsate
- Dry Tank Interior
- Validate Tank Cleanliness
- Submit Tank Cleaning Report
- Receive Regulatory Agency Approval

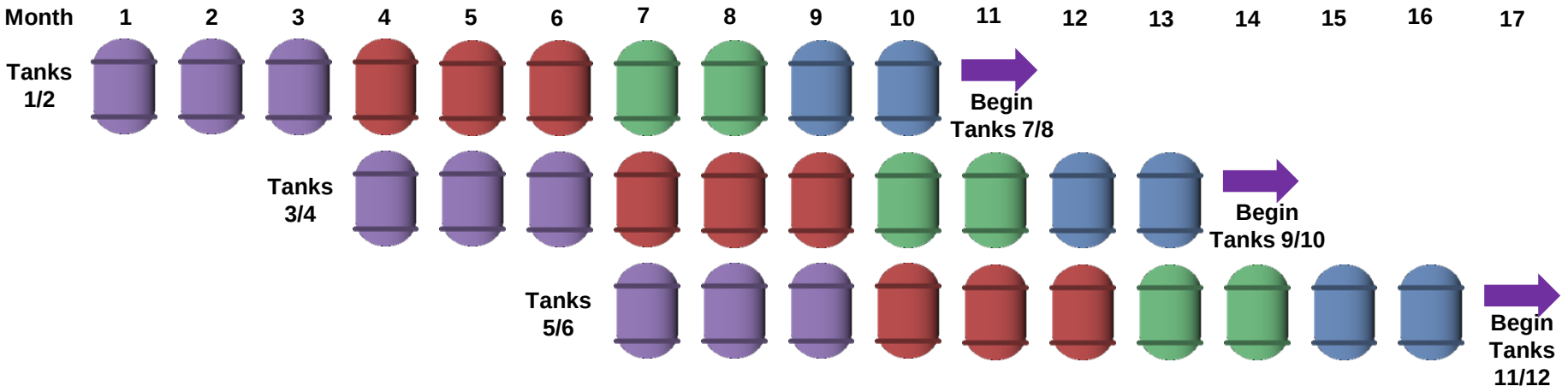
Step 4 De-Mobilization (Approximately 2 Months)
- Remove Booms and Infrastructure
- Install Permanent Lockable Steel Hatch at 8-foot entrance



Tank Cleaning Sequence

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- **Step 1:** Preparation (approximately 3 months)
- **Step 2:** Install cleaning infrastructure (approximately 3 months)
- **Step 3:** Pressure Washing (approximately 2 months)
- **Step 4:** Demobilization (approximately 2 months)



- Sequence of work includes contractor activities in 4-6 tanks at any time, with 2 tanks in simultaneous activities
- Slightly less than 10-month cycle for every 2 tanks
- Each tank represents 1 month
- Process starts over for next two tanks every 9 months

NAVY WILL CLEAN TANKS AT RATE THAT WILL NOT ADD RISK TO ENVIRONMENT OR PERSONNEL SAFETY

Layers of Environmental Protection

SAFE. DELIBERATE. ENGAGED. COMMITTED.

All the waste from tank cleaning (sludge, simple green, etc.) will have the same level of protection as fuel during defueling

SANDBAG PLACEMENT/BARRIERS
- Absorbs and Channels Potential Overflow·
- Redirects Potential Spills Away From Drains to Designated Collection Points
- Robust Containment System to Halt Accidental Spillage

AQUIFER PROTECTION
- French Drain Sealing
- Groundwater Monitoring Well Sealing
- Soil Vapor Points and Vault Sealing
- Sump Station Additive Barriers

FOR Line
- Daily rover inspection
- Integrity Testing

CAMERA SURVEILLANCE SYSTEM
- Around the Clock Facility Monitoring with 52 cameras
- Ensure Equipment Security and Environmental Safety
- Early Anomaly and Risk Detection

SPILL RESPONSE DRILLS
- Navy-Led Drills Aligned with Facility Spill Response Plan
- Realistic Spill Scenarios for Optimal Readiness
- Regulator (EPA & DOH) Supervision for Quality Assurance

DEDICATED SPILL RESPONSE
- Red Hill Q1
- Spill kits located throughout facility

FIRE WATCH TEAM
- 24 Hour Surveillance via roving watchstanders
- Tailored Training for Hazard Detection, Rapid Response and Fed Fire Dept Coordination

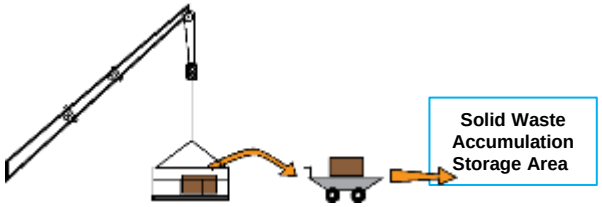
DELIBERATE PREVENTION, PROTECTION AND PREPARATION

Sludge Waste Disposal Process

SAFE. DELIBERATE. ENGAGED. COMMITTED.

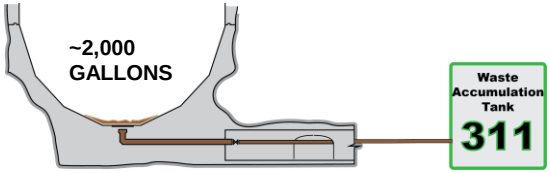
SOLID SLUDGE PROCESS

- After tank ventilation, solid sludge is shoveled into special containers which are then sealed
- Containers lifted out of tank & placed on carts to move waste to an accumulation area
- Containers are accompanied by a spill kit & inside of secondary containment throughout transport
- Accumulation area inspected weekly, containers are labeled and marked to contents, area is provided spill equipment and has secondary containment
- Containers loaded onto a truck, taken to port, then loaded on a ship
- Truck and ship are registered waste transporters
- Waste to be sent to an off-island landfill for ultimate disposal



Common Handling Notes

- Manifest is created identifying generator, transport disposal facility. Each signs upon receipt final copy comes back to Navy to confirm disposal facility received.
- Manifest from disposal facility is received by the Navy
- Copies of manifests sent to DOH/EPA upon their request



LIQUID SLUDGE PROCESS

- Tank flooded and discharge down the FOR Line to Tank 311
- Adit - 3 Tank 311 is the waste accumulation area.
- Tank inspected weekly, label and mark tank to contents, provide spill equipment inside secondary tank containment
- Tank 311 is pumped down to a tanker truck
- Tanker truck is a registered waste transporter
- Waste to be sent to an on-island oil recovery facility
- Contractor will separate oil from wastewater at a pre-treatment facility
- Recovered oil is sold for energy recovery/re-refining
- Leftover wastewater sent off for further treatment at wastewater treatment plant

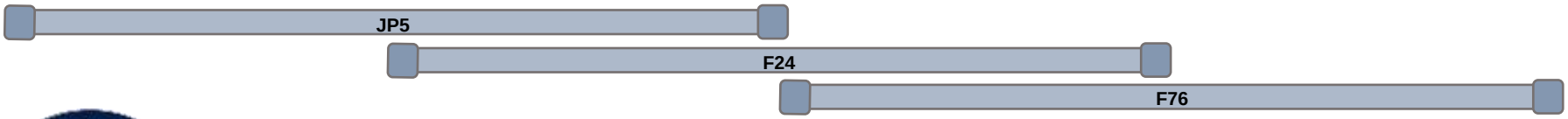
THE NAVY WILL TRACK THE SLUDGE FROM REMOVAL TO DISPOSAL

Pipeline Removal

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- Three pipelines will be removed during decommissioning
- The Navy will drain all residual fuel from the pipelines with robust containment measures prior to any removal
- Pipelines will be safely cut, removed, and transported in accordance with all applicable laws and regulations
- The Navy's contractor will ensure proper disposal or recycling of the removed pipelines

During decommissioning, Red Hill pipelines are estimated to contain approximately 4,000 gallons of residual fuel



If extended end-to-end, the total length of pipelines would match the distance from Pearl Harbor to Diamond Head

APPROXIMATELY 10 MILES OF PIPELINE WILL BE REMOVED

Fuel Tank Advisory Committee (FTAC) Meeting

Drinking Water Investigation

Overview of Presentation

SAFE. DELIBERATE. ENGAGED. COMMITTED.

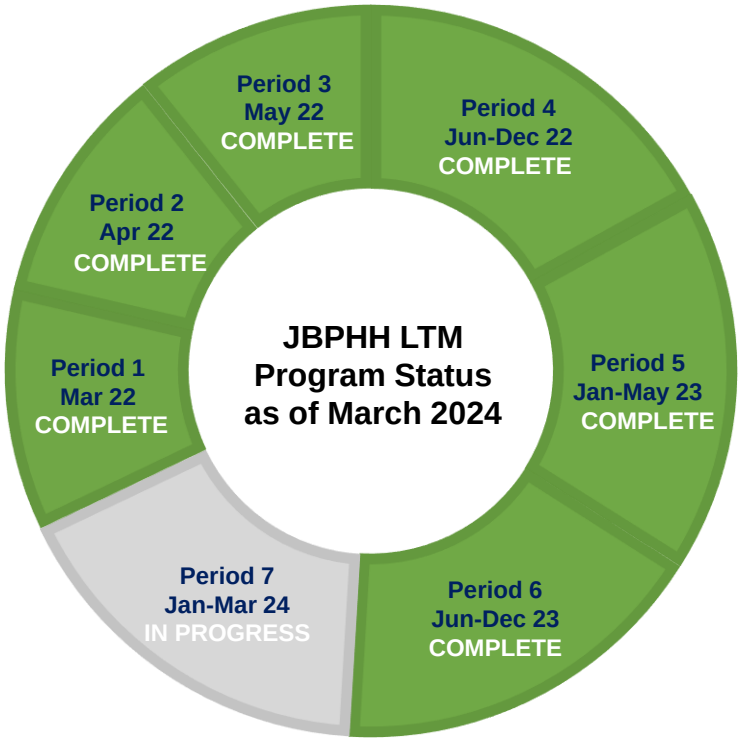
- Status of Long-Term Monitoring (LTM) Program
- Discuss Increase in Low-Level Detections of Total Petroleum Hydrocarbons (TPH) and Consumer Complaints
- Actions Taken by Navy
- JBPHH Water Quality Plan

Drinking Water Long-Term Monitoring

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- LTM Began in March 2022 and will end in March 2024
  - Samples collected monthly for 0 – 3 months of LTM
  - Samples collected every 6 months for 4 – 24 months of LTM
  - As of February 2024, over 8,000 drinking water samples collected as part of LTM Results available on JBPHH Safe Water website
- Drinking water samples collected from Residences, Schools, CDCs, Non-Residences (i.e., medical facilities, workplaces, gyms), Hydrants, and the Waiawa Shaft

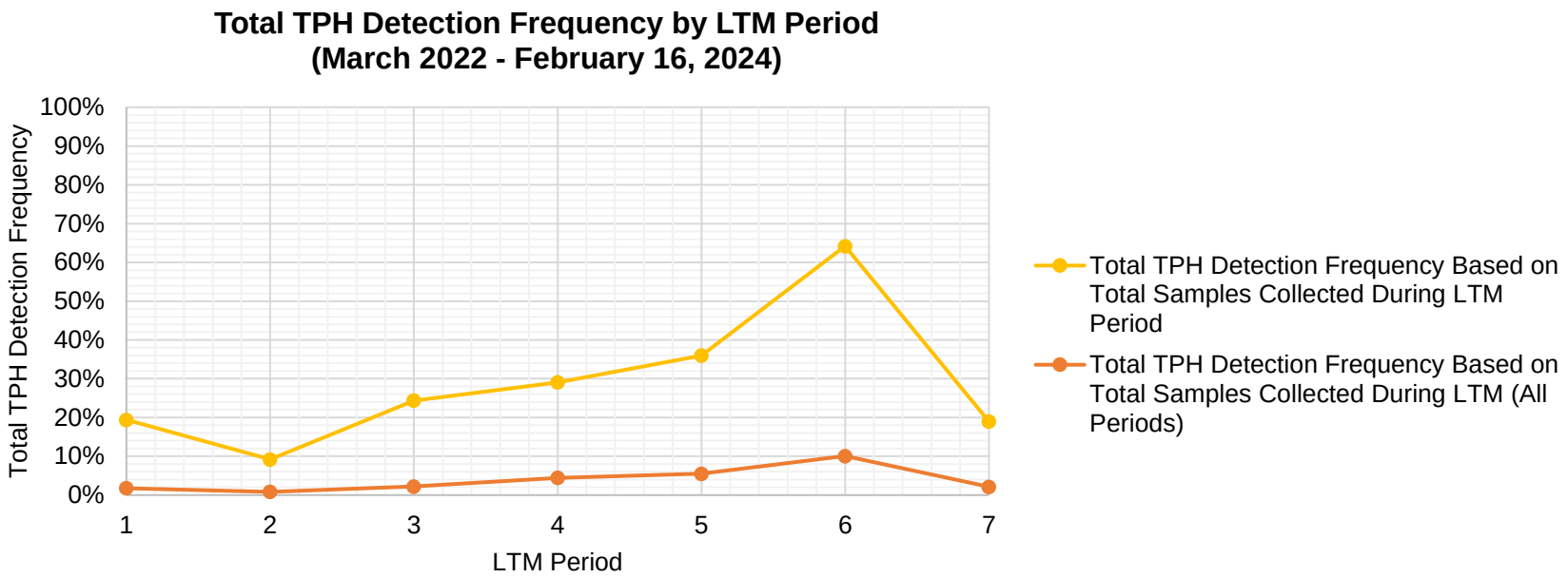
- Validated Navy results from the co-sampling event conducted with DOH in mid-Feb – all (14) sample locations (9 schools, 3 shafts, 2 CDCs) report Non-Detect



Visit the Safe Waters website for more information

Overview of Low-Level TPH Detections

SAFE. DELIBERATE. ENGAGED. COMMITTED.



LTM Period	Number of Samples	Number of Total TPH Detects	Total TPH Detection Frequency (Based on Number of Samples Collected During Current LTM Period)	Total TPH Detection Frequency (Based on Total Number of Samples Collected During All LTM Periods)	Average Detected Concentration
Period 1 (Month 1)	897	174	19%	1.8%	65 ug/L
Period 2 (Month 2)	892	85	9.2%	0.84%	63 ug/L
Period 3 (Month 3)	886	216	24%	2.2%	67 ug/L
Period 4 (Month 4)	1,492	434	29%	4.5%	65 ug/L
Period 5 (Month 10)	1,490	536	36%	5.5%	67 ug/L
Period 6 (Month 16)	1,522	977	64%	10%	80 ug/L
Period 7 (Month 22)*	1,094	208	19% (in-progress)	2.1% (in progress)	73 ug/L

Consumer Complaints/Concerns

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- Increasing amount of low-level TPH detections during recent LTM Period
- Higher volume of EOC calls and residential complaints starting September 2023
- Established “SWARM” Team of DW Experts (01/29/2024)
  - Navy, EPA, DOH, DHA, and technical experts
  - ***Determine root cause of low-level detections of TPHs in JBPHH water system***
- The Navy is committed to engaging with the community through events like Town Halls, Fuel Tank Advisory Committee / Navy Information Sharing Forum meetings, and other events
  - Developing fact sheets and informational packets to keep residents informed

Month	No. EOC Calls	Samples Collected
Sept 2023	35	1
Oct 2023	41	16
Nov 2023	9	7
Dec 2023	10	6
Jan 2024	28	24
Feb 2024	19	17
Total	142	71

Notes: EOC calls also include inquiries and sample requests. Not all EOC calls are water complaints.

NAVY REGCOGNIZES SIGNIFIGANCE OF POTENTIAL HEALTH AND SAFETY CONCERNS AND TAKES THESE ISSUES VERY SERIOUSLY

Actions Taken by Navy

SAFE. DELIBERATE. ENGAGED. COMMITTED.

Compliance Monitoring	• JBPHH water system is monitored in accordance with Federal and State requirements
Rapid Response → Water Quality Action Team	• New and updated training and capability enhancements to address community water quality concerns • Provide bottled water to residents while awaiting results
Improved Communication	• Increase community outreach and fact sheet development
Premise Plumbing Assessment	• Investigating premise plumbing at 10 residences, reviewed drinking water sample results, and investigated hot water heaters
Performed TPH Root Cause Analysis	• 12 primary causes were evaluated. • Results will be summarized in Tech Memo (being developed)
Developed the EDWM Program	• Follow-on to Long Term Monitoring • Focused on Red Hill Fuel Related Constituents

Actions Taken By Navy

What Are Hydrocarbons?

SAFE. DELIBERATE. ENGAGED. COMMITTED.

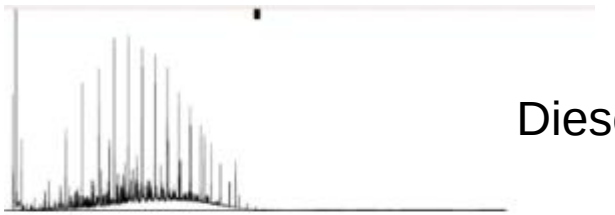
- Hydrocarbons are compromised of Carbon and Hydrogen atoms
- Are all hydrocarbons TPH?
  - There are many sources of hydrocarbons:
    - Petroleum – Crude oil, JP-5, other fuels, oils
    - Biogenic – Originate from a mixture of organic compounds biosynthesized by living organisms (algae, bacteria, etc)
    - Pyrogenic – Produced by combustion
- The TPH Method (8015) is called Total Petroleum Hydrocarbons but this is a misnomer
  - Method 8015 is not specific to fuel, it provides results for all hydrocarbons that are present can include hydrocarbons that are Petroleum, Biogenic, Pyrogenic
- The presence of Biogenic/Pyrogenic Hydrocarbons has greater impact when attempting to Quantify TPH at very low levels, such as Red Hill

Are All Hydrocarbons TPH?

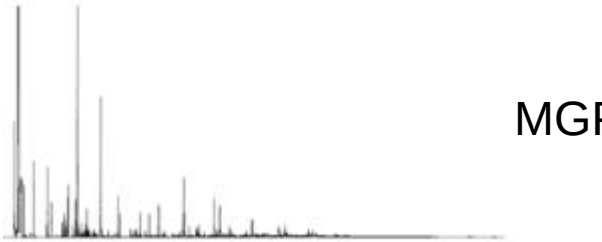
SAFE. DELIBERATE. ENGAGED. COMMITTED.

All will be Detected as TPH Under Method 8015

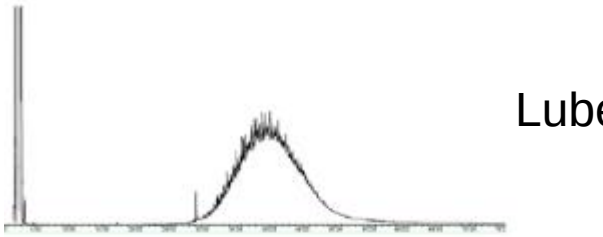
***But Not All Are TPH**



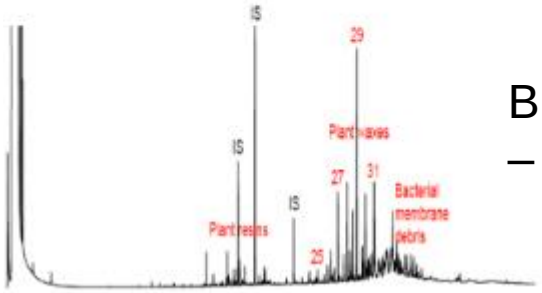
Diesel – **TPH? Yes.**



MGP Tar – **TPH? Yes.**



Lube Oil – **TPH? Yes.**

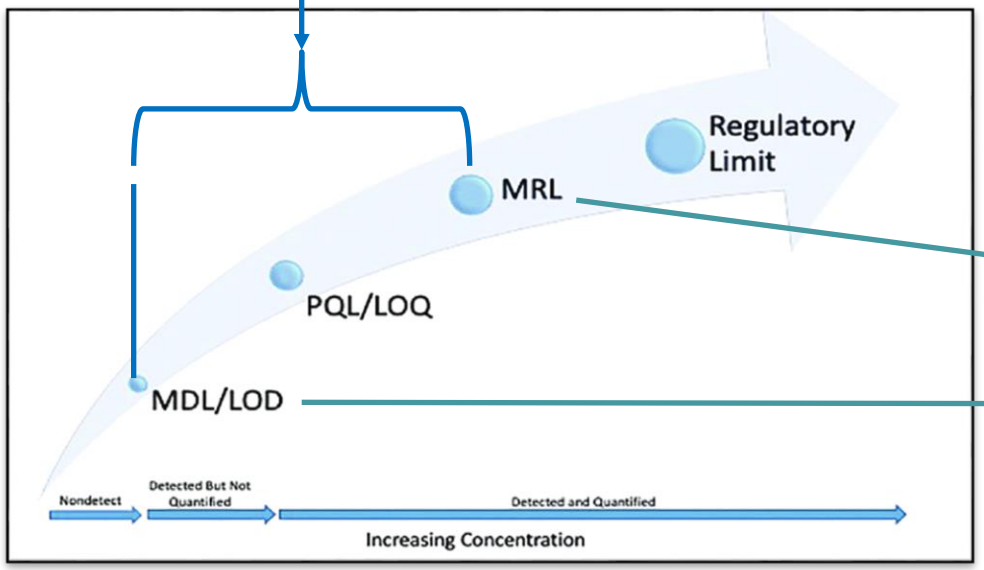


Biogenic Matter (Plant/Bacterial) – **TPH? No*.**

Low-Level TPH Detections: MDL/MRL

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- Majority of TPH detections under LTM between 50-80 ppb
  - Between MDL and MRL*
  - *MDL > Results < MRL are estimates, not reliably quantified



Minimum Reporting Level (MRL) for TPH is 80 ppb

Method Detection Limit (MDL) for TPH is 50 ppb

- Higher level of detection (>150 ppb) provides improved reliability that TPH can be accurately quantified

Low-Level TPH Detections: Spatial Evaluation

SAFE. DELIBERATE. ENGAGED. COMMITTED.

Important Notes/Context When Reviewing the Following Figures:

- Over 12 Billion Gallons of Water Have Moved through System Since LTM Began
  - This is after all Zones were flushed during the emergency response
- All TPH detections are below Incident Specific Parameter (ISP) of 266 ppb
- Majority of TPH detections were between 50-80 ppb*
  - *Between the MDL and MRL, not reliably quantified
  - Pushing Method 8015 to its limits
- Similar trends among all 19 JBPHH sampling zones
  - TPH detections are not clustered in one area
  - TPH detections are bracketed by non-detects
- Similar TPH detections/trends were observed in Zones that did not receive drinking water from Red Hill during the November 2021 Red Hill Release:
  - A1 (Pearl City Peninsula), A2 (Ford Island), B1 (McGrew/Halawa), and G1 (Camp Smith)
- Similar TPH detections/trends were observed in Zones protected by Granular Activated Carbon (GAC) filters, which will remove all organics (including TPH):
  - H1, H2, H3 (Aliamanu Military Reservation) and I1 (Red Hill)

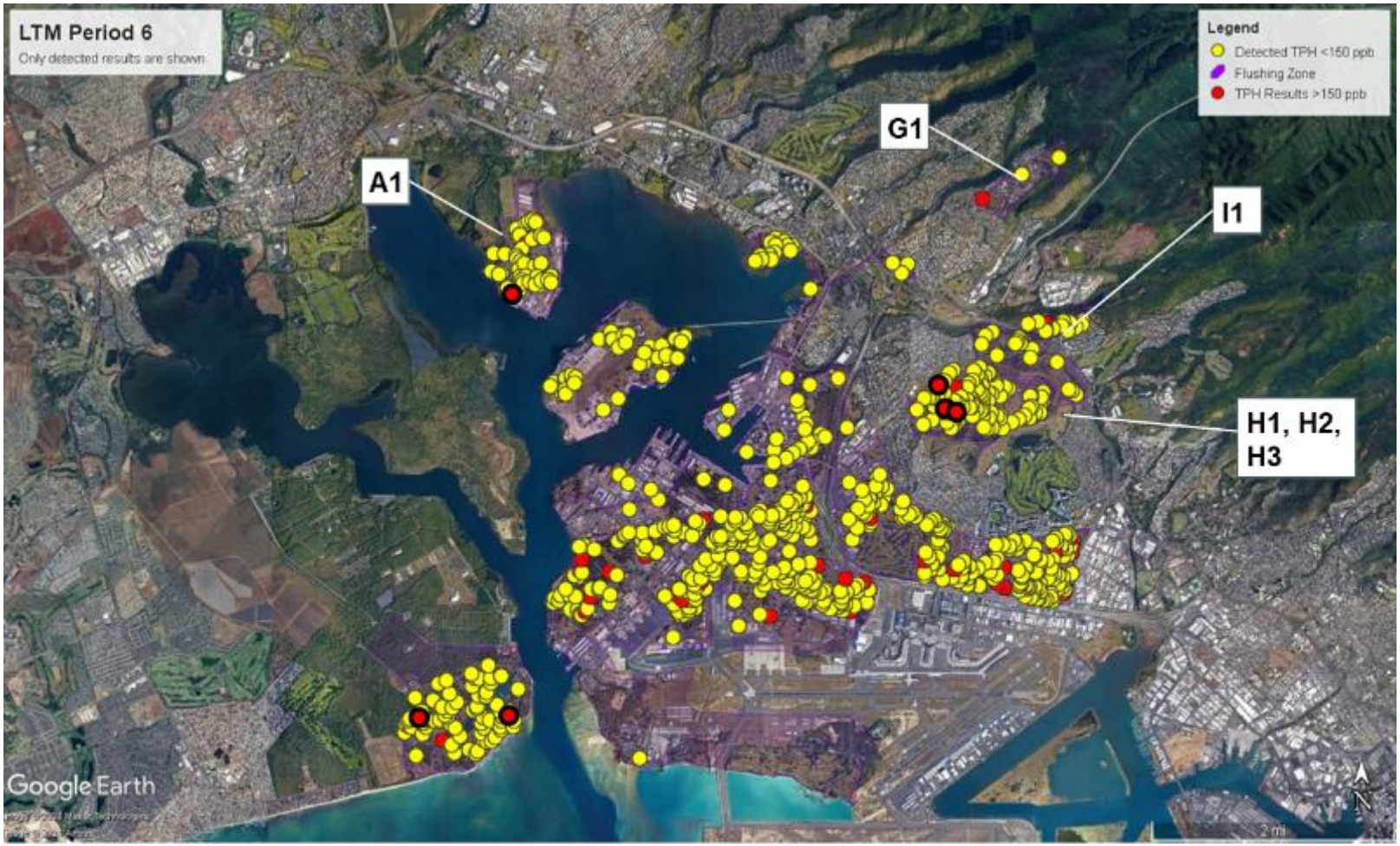
LTM Period 5 – Dec 2022 to Jun 2023

SAFE. DELIBERATE. ENGAGED. COMMITTED.

TPH < 150 ug/L (ppb)
TPH > 150 ug/L (ppb)

LTM Period 6 – Jun 2023 to Nov 2023

SAFE. DELIBERATE. ENGAGED. COMMITTED.



TPH < 150 ug/L (ppb)
TPH > 150 ug/L (ppb)

LTM – TPH Detections: Root Cause Analysis

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- Jan 29, convened Interagency Team of DW Experts from across the country (Navy, EPA, DOH, DHA, and private Industry
- Below is the Interagency Team's assessment of how likely the potential root cause is related to/responsible for the increase in frequency of low-level TPH detections that have been observed during LTM:
  - **Laboratory Method Challenges – *High Likelihood*.**
  - TPH in the Waiawa Source Water – *Extremely Low Likelihood*.
  - Regulated Disinfection Byproducts – *Low Likelihood.*
  - Residual JP-5 in Distribution System – *Extremely Low Likelihood*.
  - Residual Fuel Additives in Distribution System – *Extremely Low Likelihood*.
  - Biofilm Activity – *Medium/Low Likelihood*.
  - Premise Plumbing – *Low Likelihood*.
  - Pipe Scale Sloughing – *Low Likelihood*.
  - Pesticides – *Extremely Low Likelihood*.
  - Change in System Operations – *Extremely Low Likelihood*.
  - Change in Source Water (Waiawa Shaft) Water Quality – *Extremely Low Likelihood*.
  - Contaminant / Debris Introduced During Water Main Breaks – *Extremely Low Likelihood*.
  - Other – *Unknown Likelihood*.

LTM – TPH Detections: Hypothesis

SAFE. DELIBERATE. ENGAGED. COMMITTED.

Hypothesis: Low-level detections of TPH observed during LTM are most likely associated with:

- Laboratory challenges to quantify TPH to the Method Detection Limit
  - Method blank contamination/laboratory cross-contamination
- Method challenges
  - Interaction of residual chlorine in the drinking water samples with reagents required by the method to analyze the samples

Supporting Lines of Evidence[1]:

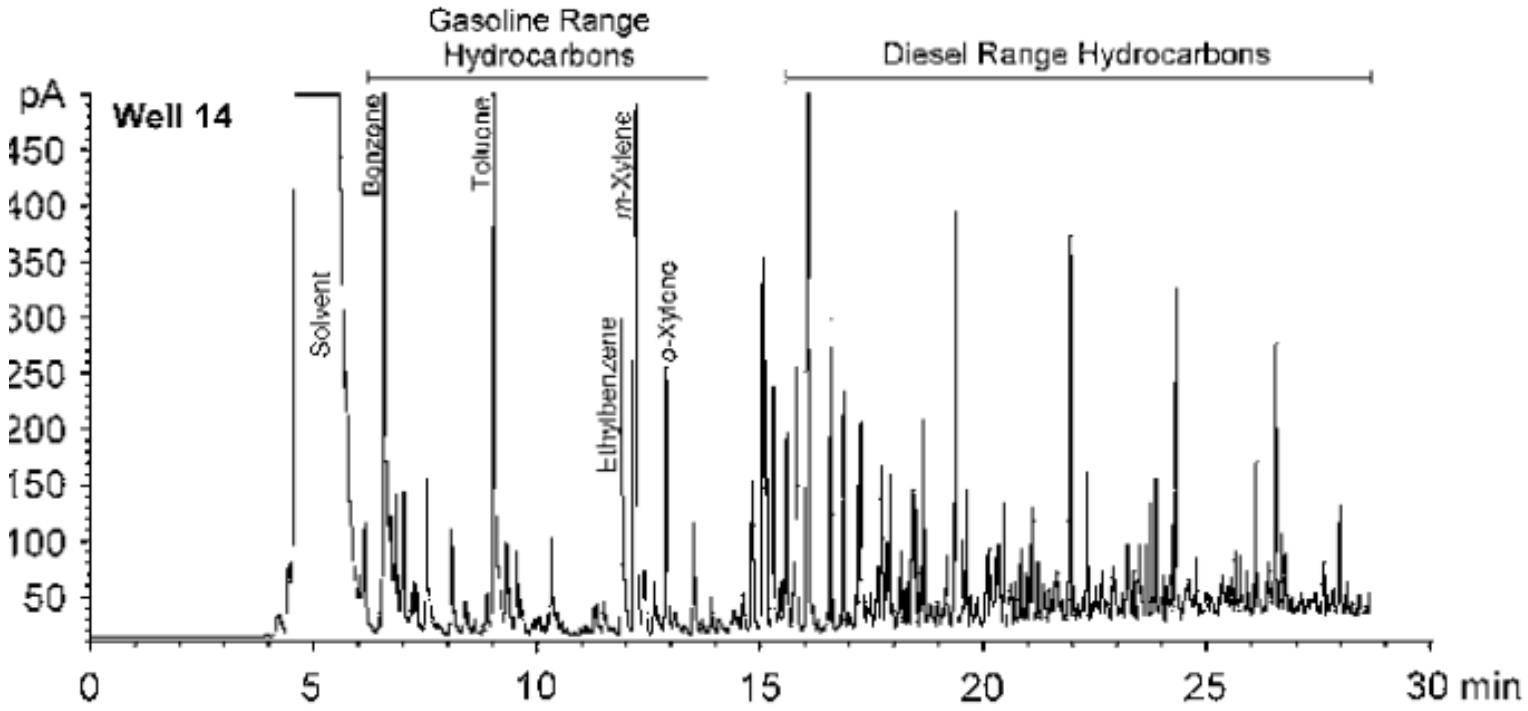
- Spatial and Temporal Trends of TPH Results
- Hydraulic Modeling of the JBPHH Drinking Water System
- **Detailed Review of the Analytical Methods Used to Identify and Quantify TPH**
- Statistical Analysis of Chlorine Residual

[1]Will be documented in Tech Memo (currently being developed).

LTM – TPH Detections: Lines of Evidence

SAFE. DELIBERATE. ENGAGED. COMMITTED.

A Little Chemistry: Chromatograms Showing Gasoline and Diesel

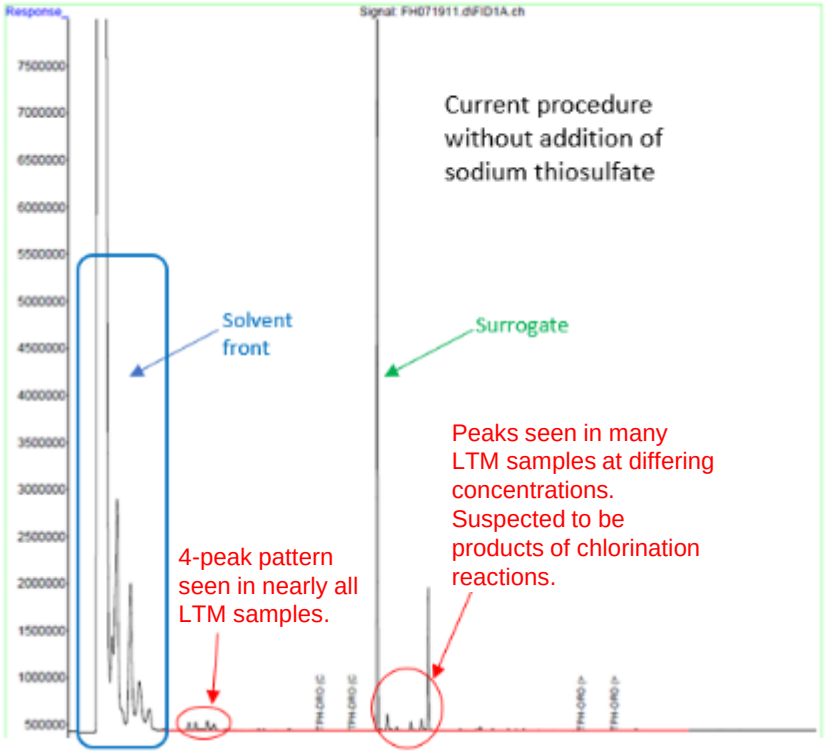


NOTE: There have been no petroleum patterns in the chromatograms that match JP-5 or other petroleum products in drinking water samples collected under the LTM Program

LTM – TPH Detections: Lines of Evidence

SAFE. DELIBERATE. ENGAGED. COMMITTED.

A Little Chemistry: Impact of Quenching to Prevent Chlorine Reactions



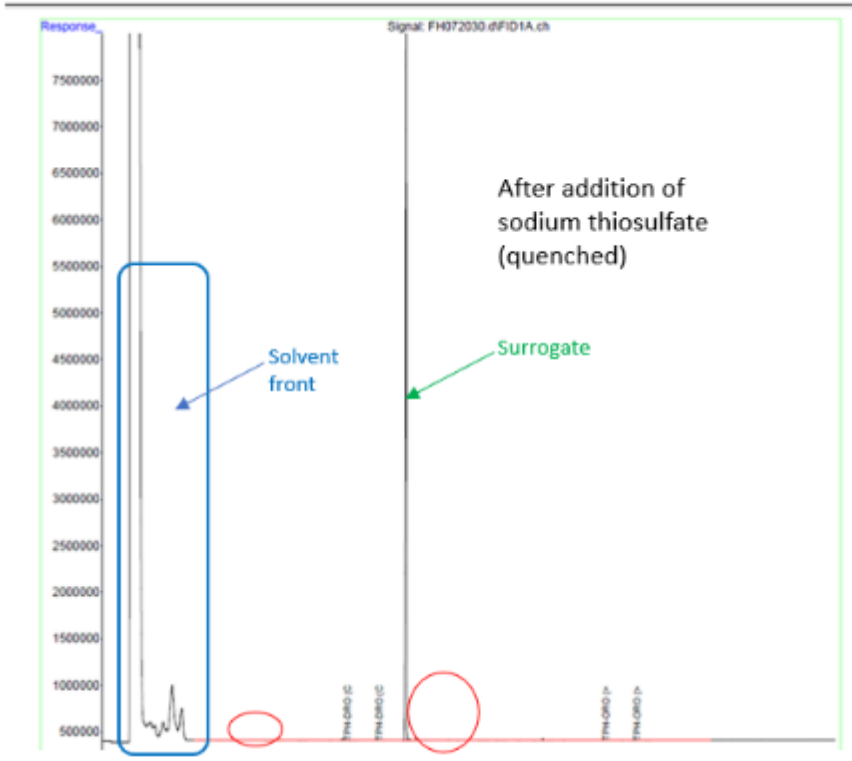
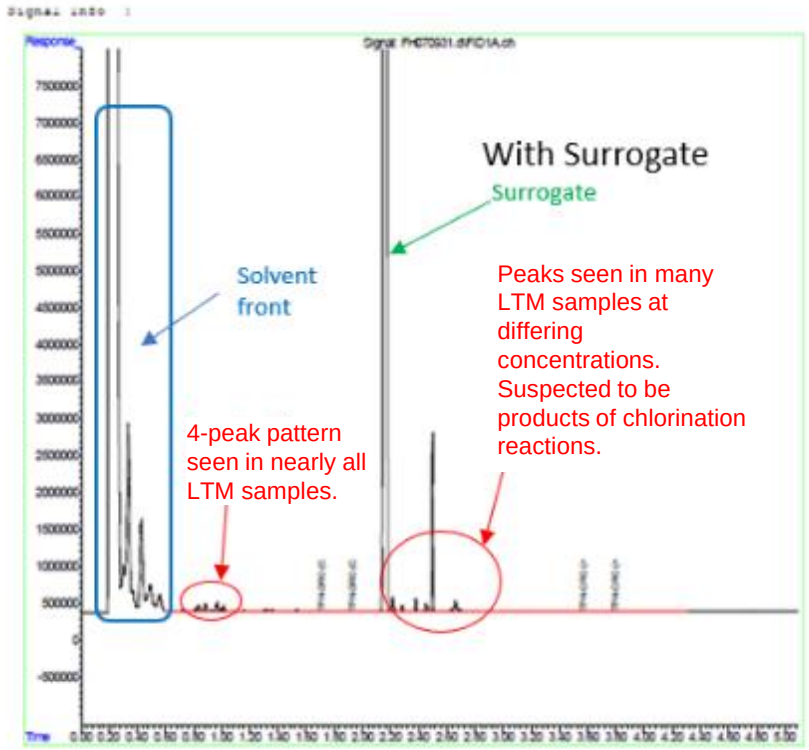


Figure C-1. Effect of Sodium Thiosulfate Addition (Quenching) Sample H3-TW-0013887-23335-A

LTM – TPH Detections: Lines of Evidence

SAFE. DELIBERATE. ENGAGED. COMMITTED.

A Little Chemistry: Impact of Quenching to Prevent Chlorine Reactions



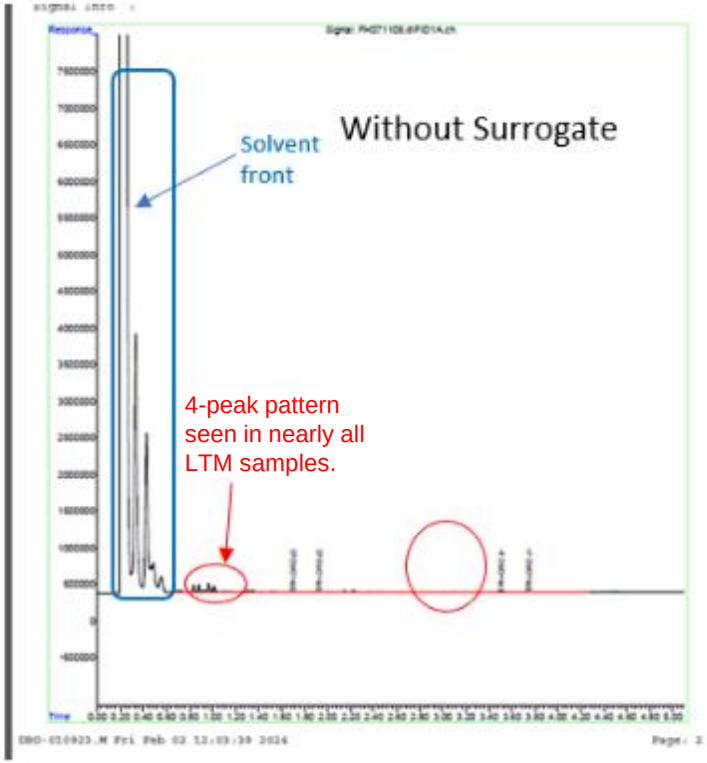


Figure C-2. Surrogate Contribution of Precursors to Halogenation Reaction Sample F2-TW-0009845-23335-N

LTM – TPH Detections: Lines of Evidence

SAFE. DELIBERATE. ENGAGED. COMMITTED.

A Little Chemistry: Any Petroleum Signatures Observed?

- There were no petroleum signatures observed in any of the samples examined
- The only unknown peaks in any of the samples were found to be:
  - Fatty acids (naturally occurring in Fats [Lipids])
    - Similar to hydrocarbons (can have short, long, and very long chains) but also have oxygen atoms (C-**O**-H)
    - Are not petrogenic hydrocarbons but will appear as TPH in Method 8015 results
  - Phthalates (used in plastics – very, very common in laboratories and the environment)
    - Are not petrogenic hydrocarbons but will appear as TPH in Method 8015 results

Extended Drinking Water Monitoring (EDWM)

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- The Navy agreed to voluntary effort to extend monitoring past Long Term Monitoring – EDWM program
  - Original 19 sampling zones + Manana housing (20 zones total)
  - Focus on JP-5 related analytes
  - New analytical method for TPHs – reduce impact from residual chlorine and reduce impact of cross contamination in the lab
  - Sampling will take place monthly for 1 year
  - Results will be posted to Safe Waters and documented in Quarterly Reports
- Goals:
  - Sample Remaining residences on JBPHH water system (~35% have not been sampled)
  - Continue to monitor the JBPHH system to ensure there are no impacts from the 2021 Red Hill release

JOINT BASE PEARL HARBOR-HICKAM DRINKING WATER PROGRAM
ENSURING SAFE AND COMPLIANT DRINKING WATER

Water Quality Action Team

- 24/7 Response to Consumer Concerns through Emergency Operations Center
- Full Water Quality evaluation for consumer concerns, includes Water Quality Professional
- Includes investigations of hydrocarbons, bacteria, residual chlorine, water heater, and plumbing concerns

Compliance Monitoring

- Recurring monitoring in accordance with the Safe Drinking Water Act for all Drinking Water Systems
- Full Drinking Water analytes sampled for plus required operational testing (bacteria/chlorine/etc.)
- Reported to all consumers by the JBPHH Consumer Confidence Report which is completed each summer

Extended Drinking Water Monitoring Program

- Follow-on to Long Term Monitoring Program, will be conducted for an additional 12 months
- Focus of the monitoring will be on petroleum hydrocarbon and fuel-related constituents

Drinking Water System Operations and Maintenance

- Source Water and Wellhead Protection Plan
- Unidirectional Flushing
- Backflow and Cross Connection Program

Medical Monitoring

- Established Red Hill Clinic and authorizing eligible community members to use the clinic
- Established Defense Occupational and Environmental Health Readiness Red Hill Incident Report
- Ongoing CDC/ATSDR Public Health Assessment and establishing Red Hill Registry
- Epidemiological Studies and Medical Record Reviews

Navy Closure Task Force Red Hill

JBPHH

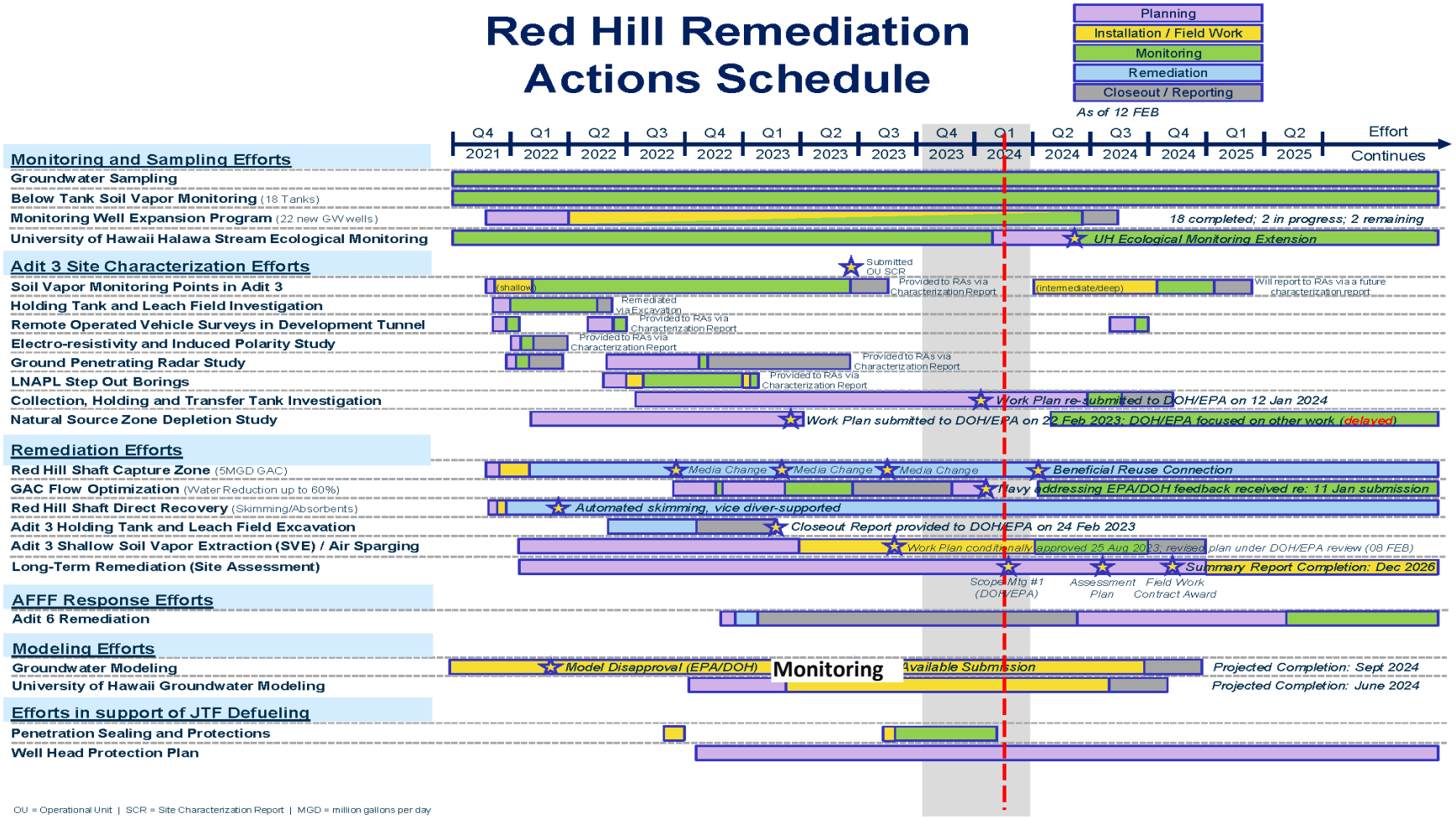
Fuel Tank Advisory Committee (FTAC) Meeting

Site Assessment

Remediation

SAFE. DELIBERATE. ENGAGED. COMMITTED.

Red Hill Remediation Actions Schedule



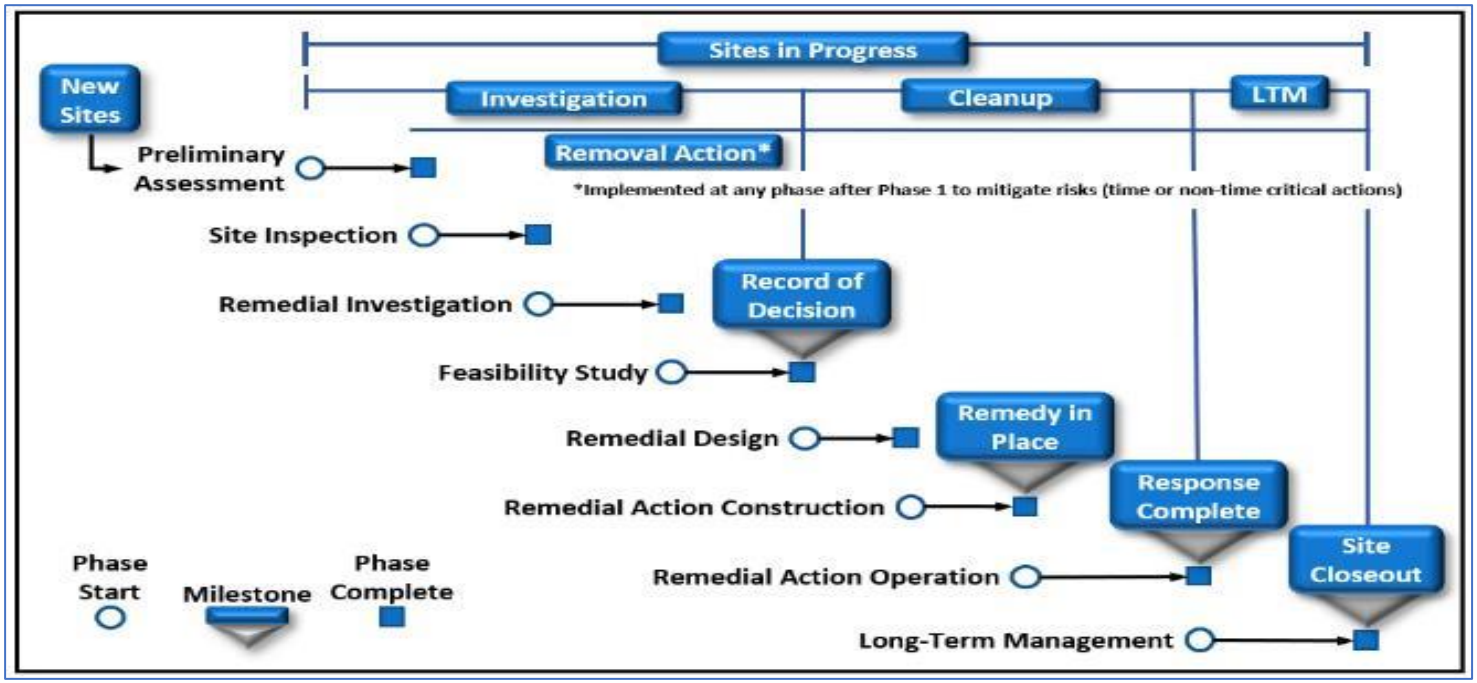
*** Subject to change – dependent on predecessor activity progress, environmental permitting, real estate agreements and negotiations, resource availabilities, and prior activity data interpretation.*

REMEDIATION ACTIVITIES BEGAN IN 2021 AND WILL CONTINUE UNTIL COMPLETE

Site Assessment Process

SAFE. DELIBERATE. ENGAGED. COMMITTED.

DISCOVER-ANALYZE-IDENTIFY



- Remediation is a long-term process of cleaning the affected and surrounding areas around Red Hill to protect our natural resources and human health, and will take many years in close coordination with the EPA and Hawai'i DOH.
- Focus areas include: groundwater monitoring, monitoring well network expansion; soil vapor monitoring and remediation pilot studies; restoration of the Red Hill Shaft; groundwater modeling studies; and remediation of PFAS.

REMEDIATION ACTIVITIES BEGAN IN 2021 AND WILL CONTINUE UNTIL COMPLETE