Honolulu Board of Water Supply
NASEM Briefing

August 2025

WATER FOR LIFE

Safe, dependable, and affordable water now and into the future

Board of Water Supply
City and County of Honolulu

WATER,
THE GREAT GIFT OF THE GODS

Ka Wai Ola a Kāne

"The Life Giving Water of Kāne" is a term that reflects the special link between the divine and all life forms in nature. The Hawaiians saw gods everywhere in their world: in clouds, trees, stones, and all other parts of the sky, land, and sea that surrounded them.

Man and nature were believed to be part of a larger story of divine creation. Water, the basis of all life, was seen as one of the gods' greatest gifts. The gods would bless the earth with water as long as water was used with respect and water sources were cared for well.

KĀNE AND KANALOA,
The Gods of Hawai'i's Water

Kāne and Kanaloa, the gods of water, traveled throughout the island chain, creating water sources to benefit and sustain all living things.

Both gods were fond of drinking 'awa. When thirst overcame them, each would plunge his digging staff into the ground to bring forth water to be seasoned with 'awa root. Kāne was said to be somewhat gruff and impatient in nature, so the water that he drew from the earth rumbled and roared in the form of large rivers and streams. Kanaloa was said to be very passive and easy-going; he is responsible for calmer water sources, such as springs and pools.

Kāne and Kanaloa were known to roam the drier and more desolate countryside to test the generosity of its people. In areas where fresh water was meager or absent, they would appear and ask for water. If they were turned away without being offered a drink, they would punish the inhospitable by drying up a water source. If they were offered even brackish water, the host would be rewarded with a spring of sparkling fresh water.

Uwē ka lani, ola ka honua "when the heavens weep, the earth lives"

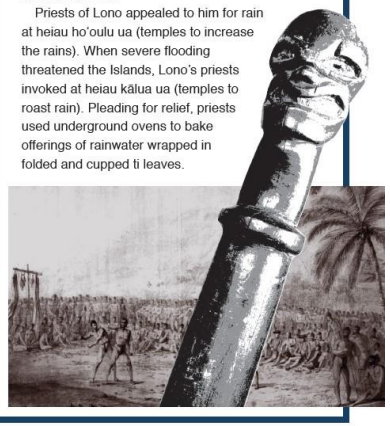
– HE ʻŌLELO NOʻEAU, A WISDOM STATEMENT

LONO,
God of the Winter Rains

Lono was the god of rain clouds, the sea, agriculture, and productivity. Hoʻoilo (winter) was the season of Lono, the time when the rains fell. Hoʻoilo was the time when the harvest occurred, taxes were paid and spectator sports and sham battles took place between chiefs and royal champions.

During Makahiki, the time of rituals and celebrations in honor of Lono, his carved image was always present, a constant reminder of his role in continuing the productiveness and fertility of land and sea.

Priests of Lono appealed to him for rain at heiau hoʻoulu ua (temples to increase the rains). When severe flooding threatened the Islands, Lono's priests invoked at heiau kālua ua (temples to roast rain). Pleading for relief, priests used underground ovens to bake offerings of rainwater wrapped in folded and cupped ti leaves.



E nū mai ana ka ua i ke kuahiwi "the mountain walls leap with rain"

– A KOʻOLAU AU, AN ANCIENT CHANT

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ANCIENT HAWAIIANS LIVED IN HARMONY WITH WATER

In ancient times as now, fresh water was the key to life and prosperity. The early Hawaiians settled by perennial streams and springs where water was plentiful and reliable. The abundance allowed the Hawaiians to develop an extensive agricultural system and a sophisticated aquaculture structure.

An area that had many fishponds was called 'aina momona or a "fat" land. This 1908 photograph of a Kāne'ohe fishpond illustrates the splendor of these structures.

Rivers and Fishponds

Rivers brought life to the landscape. A moderate rainfall sent waterfalls spilling into rivers that carried water to lower elevations. As water flowed to the ocean, it passed through countless wetland taro pondfields before it returned to the river to continue seaward. As it neared the shore, it rejuvenated marshes and wetlands and spilled into lokoi'a (fishponds).

Hawaiians of old were masters of aquaculture. They built lokoi'a at river mouths to take advantage of the blend of fresh water and salt water – a blend that provided a favorite environment for the choicest of fish. Building the kuapā (walls) of a lokoi'a was hard work and took as many as 10,000 men. Every fishpond was unique and built to the contours of the land; kuapā were typically made up of coral or basalt blocks.

The Ahupua'a Encompassed All

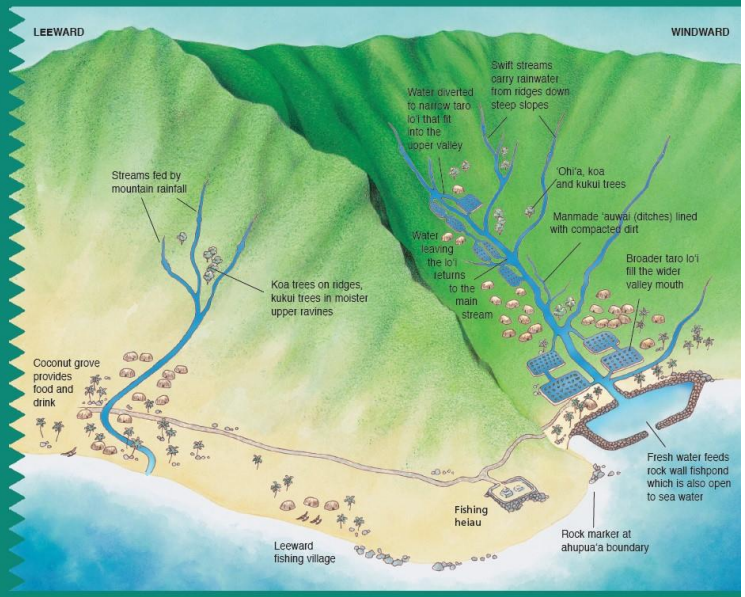
In pre-contact Hawai'i, the land was divided into districts and then into smaller sections called ahupua'a.

Every tenant of an ahupua'a was given access to natural resources. Everyone was allowed to take what they needed to live a full life: spiritually, economically, educationally, and physically.

No one could remove or take more than what they could immediately use. The ahupua'a system ensured that natural systems were kept in balance.

Island topography produced very different communities in leeward and windward areas. Hawaiians gravitated to wetter windward valleys and used abundant stream water to cultivate their staple food, taro. Fishponds built at stream mouths provided a ready source of protein.

Drier leeward areas supported smaller communities which often hugged the coast, giving easy access to ocean fishing areas. Sporadic rainfall and intermittent streams could not support wetland taro. Their main crop was sweet potato. Farmers sometimes carried water to their crops in gourd containers.



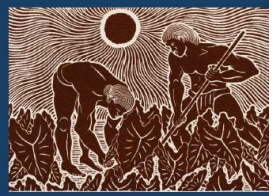
Hawaiians used gourds to transport many things, including water.

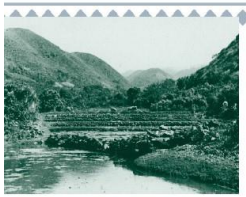
Formal Rules Governed Distribution and Discouraged Waste

Strict rules governed the use of water in ancient Hawai'i, and it was a grievous offense to waste or misuse the precious liquid. The ali'i ai moku (district chiefs) were the trustees of water and exercised control over it as an instrument of the gods. They established and enforced regulations over water use in upland areas of an ahupua'a so that a pure flow was always available to those who lived at lower elevations.

In addition, they set rigid schedules for cleaning and diverting rivers and streams. Rights and privileges to water were earned, not guaranteed. Farmers were expected to keep their taro fields free of weeds and clutter and to help clean communal streams and rivers.

Those who failed in either regard were disposed of their land and banished. If a farmer dared to water his taro fields without the approval of the luna wai, he was put to death. Disobeying water regulations jeopardized all; the gods were seen to be merciless in this regard.



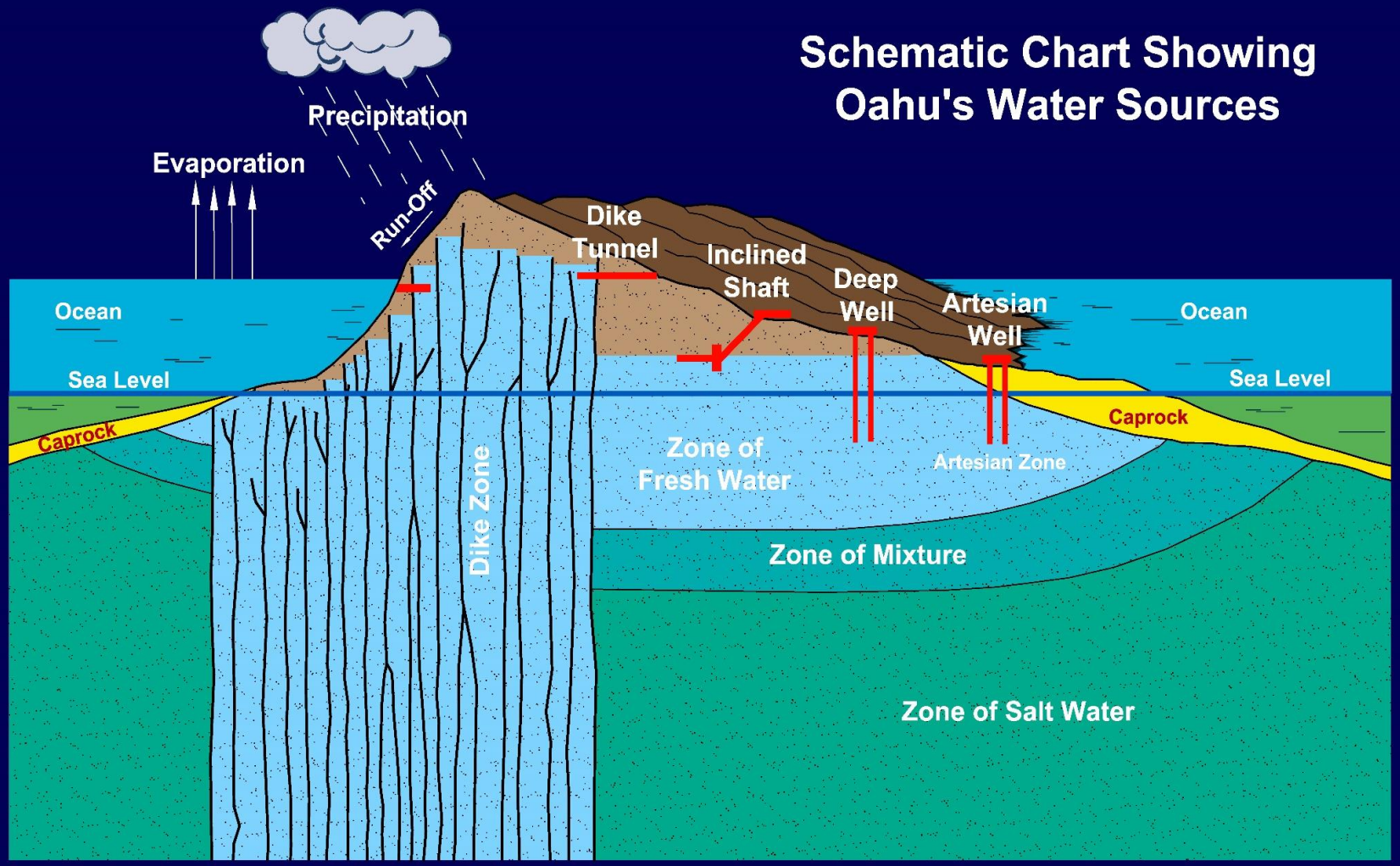


Hāloa - Brother Taro

Taro was central to Hawaiian society; it was known as man's older brother, the first-born child of Papa and Wakea, the earth mother and sky father. Hawaiians grew wet and dry taro. Wet taro was grown largely in lo'i (pondfields), which were irrigated with diverted water that flowed through a complex network of 'auwai (ditches).

'Auwai were continually repaired to prevent seepage and waste. Daily water distribution was overseen by luna wai (water manager); farmers were allowed to use water as long as they kept their lo'i productive and helped to maintain streams and 'auwai.

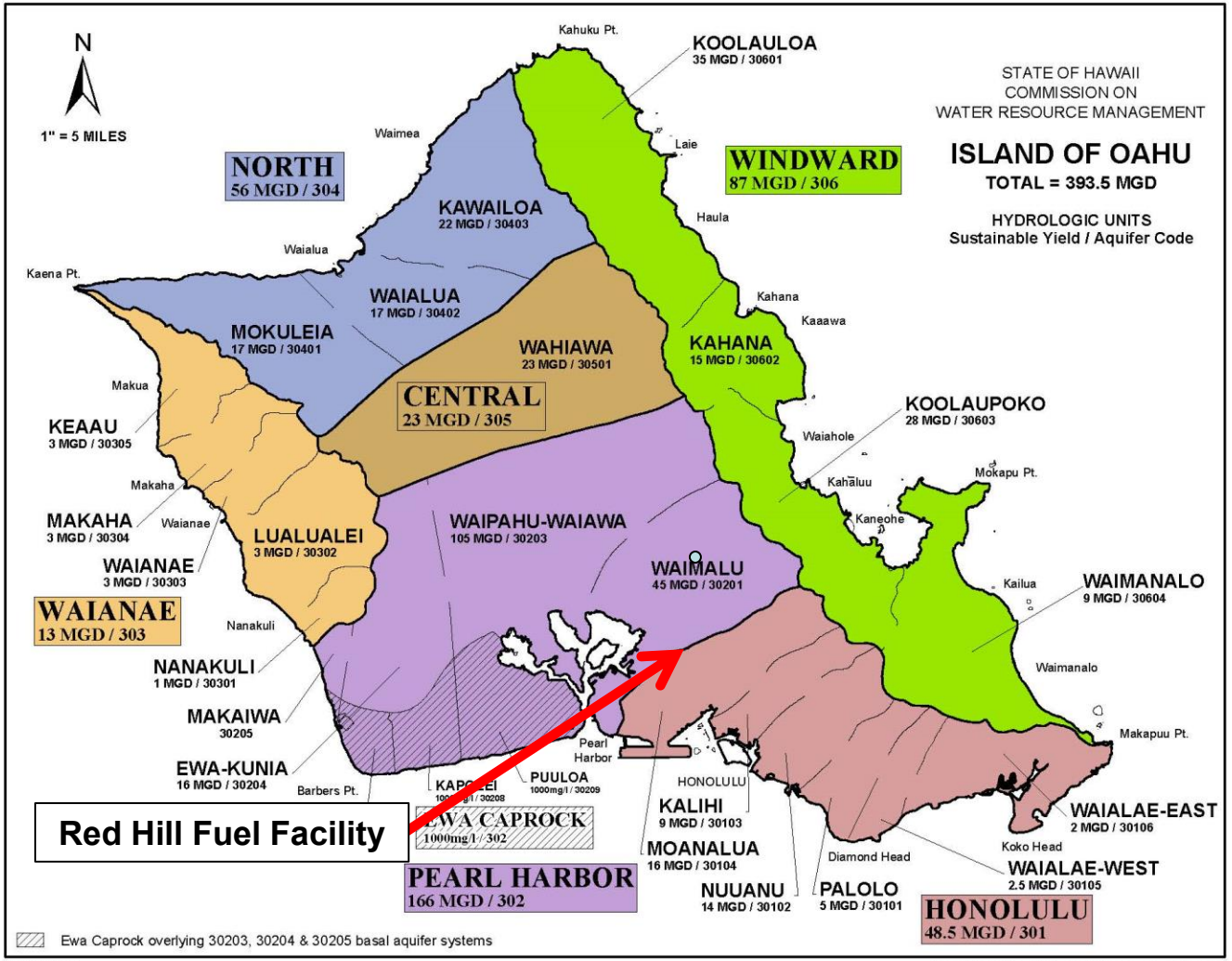
Schematic Chart Showing Oahu's Water Sources



Oahu's Groundwater Bodies and Caprock

- Oahu is 598 square miles
- About 461 square miles of Oahu (77% of the island) are inland of the caprock
- About 137 square miles (23% of the island) are covered by caprock

Ref. Izuka, Engott, Rotzoll, Bassiouni, Johnson, Miller and Mair, Volcanic aquifers of Hawai'i—Hydrogeology, water budgets, and conceptual models, Scientific Investigations Report 2015-5164, United States Geological Survey, 2015



06/20/2018

Map Projection: Universal Transverse Mercator

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THE EARLY YEARS OF THE BOARD OF WATER SUPPLY

How Control of Honolulu's Water Supply Changed Hands

In the hundred years before the Board of Water Supply, government control of water passed from the Kingdom to the Republic to the Territory and then to the City. Engineers laid some water pipes during Kingdom years and drilled municipal wells at Beretania and in Kaimukī and Kalihi during the time of the Republic. During the City's era, the Honolulu Water Commission was established. But no group had devised a comprehensive water system, something the city needed desperately as its population boomed.

Droughts and dropping water tables heightened the public's concern, and when an embezzlement scandal rocked the City Water Works, the public demanded a well-run water system that was above politics. In 1929, after a battle that went all the way to the Hawai'i Supreme Court, the Legislature took unilateral control of water from the City and turned it over to a newly created semi-autonomous City agency, the Honolulu Board of Water Supply.

Act 96 established the structure of the Board of Water Supply. The BWS's policies are set by a seven-member Board of Directors, six of whom are appointed by the Mayor and approved by the Honolulu City Council. The Board of Directors are responsible for appointing the agency's Manager and Chief Engineer.

The Beretania pumping station circa 1940.

The Board Gets Down to Business

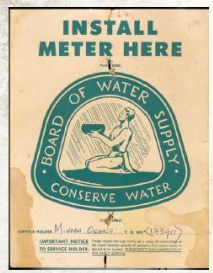
The newly created BWS was given broad powers over water: to develop it, sell it, and plan for its future on O'ahu. The BWS used the mandate to create the island's first truly effective water management system.

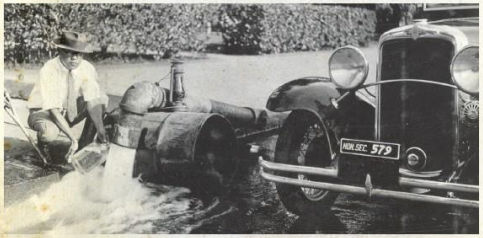
BWS employees located and capped wasteful artesian wells. They put casings inside leaky wells to prevent water loss. They created educational campaigns to teach the public about O'ahu's hydrology. They installed water meters in homes and businesses all across the city and billed water users at fixed rates (in 1930, the going rate for 1,000 gallons of water was 12 cents).

All the efforts paid off. There was a marked reduction in the draw from O'ahu's aquifer and the water table stabilized. To deal with O'ahu's growing population–which doubled in the BWS's first 20 years–BWS staff built water reservoirs, laid larger and better pipes, and made sure the city's pumping stations were in top shape.

They also looked for new sources of water for the city. Just before the outbreak of World War II, they began to develop their first facility outside the city, a new station in Hālawa Valley.

The BWS began sealing wasteful artesian wells as soon as it took control and it continued to seal wells when they fell into disuse. Here BWS employees are shown in 1938 sealing the Star Dairy Well.





BWS employees also tested well water to make sure that it was safe to drink. Here a technician takes a sample from a Navy well circa 1933.

Inside Hālawa Shaft. Concerned about the threat of war, the BWS began developing the new water source. The timing was prescient: the BWS broke ground on the project on December 6, 1941.

BWS employees also continued to put casing inside wells to help catch water that was being lost; this photo was taken in 1940.

WATER SALES 83

The present rate schedule is as follows:

For each service there shall be a charge for the service, based on the size of meter, per month, as follows:

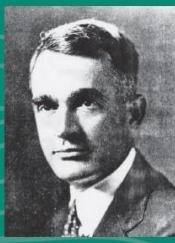
For a service with a ⅝-inch meter	$ 0.50
" " " " ¾ " "	0.75
" " " " 1 " "	1.00
" " " " 1½ " "	1.50
" " " " 2 " "	2.50
" " " " 3 " "	5.00
" " " " 4 " "	7.50
" " " " 6 " "	15.00
" " " " 8 " "	25.00
" " " " 10 " "	45.00
" " " " 12 " "	75.00

	Cents per 1,000 gallons
In addition thereto, for all water drawn there shall be charged:	
For the first 25,000 gallons of water per month, or any part thereof, the Domestic rate of	18
For water in excess of 25,000 gallons and under 250,000 gallons per month, the Intermediate rate of	14

In 1932, the BWS introduced a monthly billing system for its customers. This report from 1935 shows the established rates of the time.

BWS employees inspected wells around the island to check on outflow rates and sample water. Honolulu's water sanitation program was rigidly governed by standards established by the U.S. Public Health Service.

FREDERICK OHRT: Engineer and Visionary



When Frederick Ohrt retired after leading the BWS for nearly 25 years, the Honolulu Star-Bulletin praised his "technical proficiency, mature judgement, far-seeing vision and fearless integrity."

Fred Ohrt was the first Manager and Chief Engineer of the BWS from 1929-1952.

Among Mr. Ohrt's outstanding achievements was his program to locate and seal all leaking wells which resulted in a sharp recovery of diminishing water levels and a marked reduction of over pumping artesian reserves. He was also instrumental in transforming the City and County of Honolulu's water service from a series of separate and inadequate units into a well-engineered and coordinated system that included complete metering of its water customers.

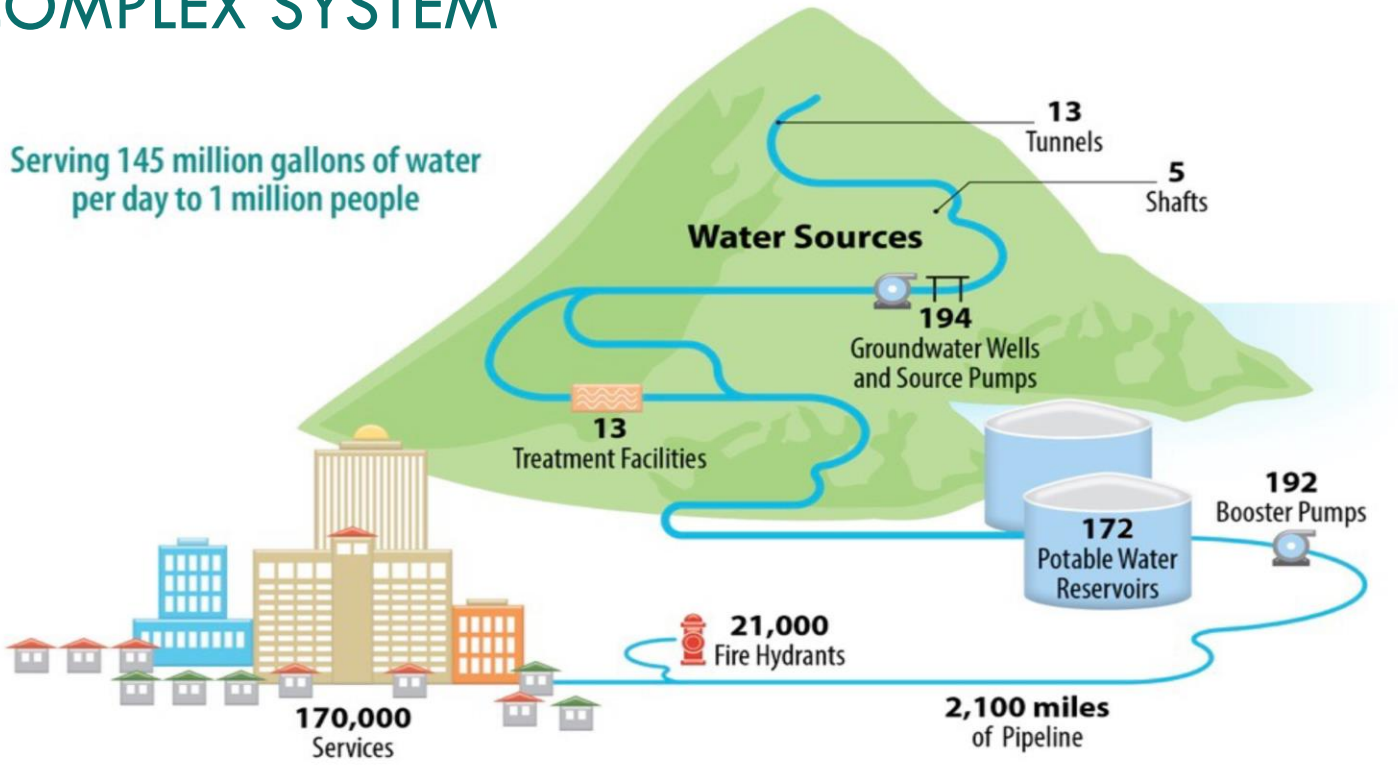
He dedicated himself and the Board to principles that have lasted through time. He believed that water users should be held accountable for their water consumption; that investment in well-designed and attractive water facilities did not sacrifice utility and added value to the community; and that education about water conservation was vital for everyone and the future of water on O'ahu.

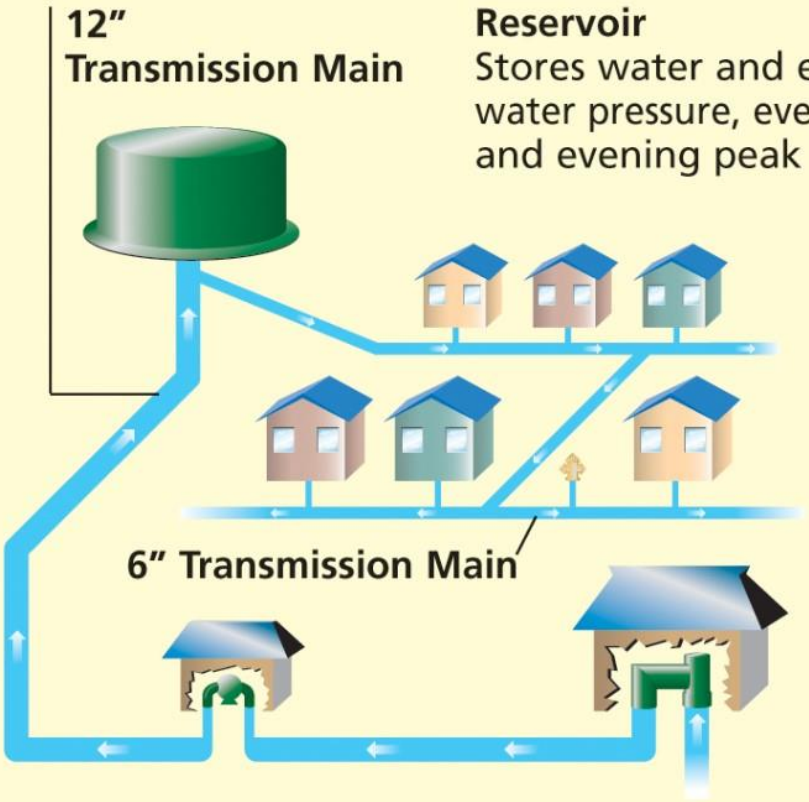
Born in Spreckelsville, Maui, he graduated from Honolulu's St. Louis College (High School) in 1905, attended the University of Oregon, and received his B.S. in Civil Engineering from Cornell University in 1911.

Mr. Ohrt holds the distinction of being Hawai'i's first honorary member of the American Society of Civil Engineers and was also the first honorary member of the Engineering Association of Hawai'i.

The Hawai'i Section of the American Water Works Association named him the first recipient of the George Warren Fuller Award presented posthumously in April 1979.

DELIVERING WATER FROM UNDERGROUND WATER SOURCES TO YOUR HOME REQUIRES A LARGE AND COMPLEX SYSTEM




12"
Transmission Main
Reservoir
Stores water and ensures uniform water pressure, even during morning and evening peak demand times.
Your Home
Most water enters through a 3/4" pipe; pressure is created by pumps and by living lower than the reservoir.
6" Transmission Main
Booster Station
Used to push water over long distances and to higher elevations.
Pumping Station
Pumps water from wells, shafts and tunnels into the transmission system.

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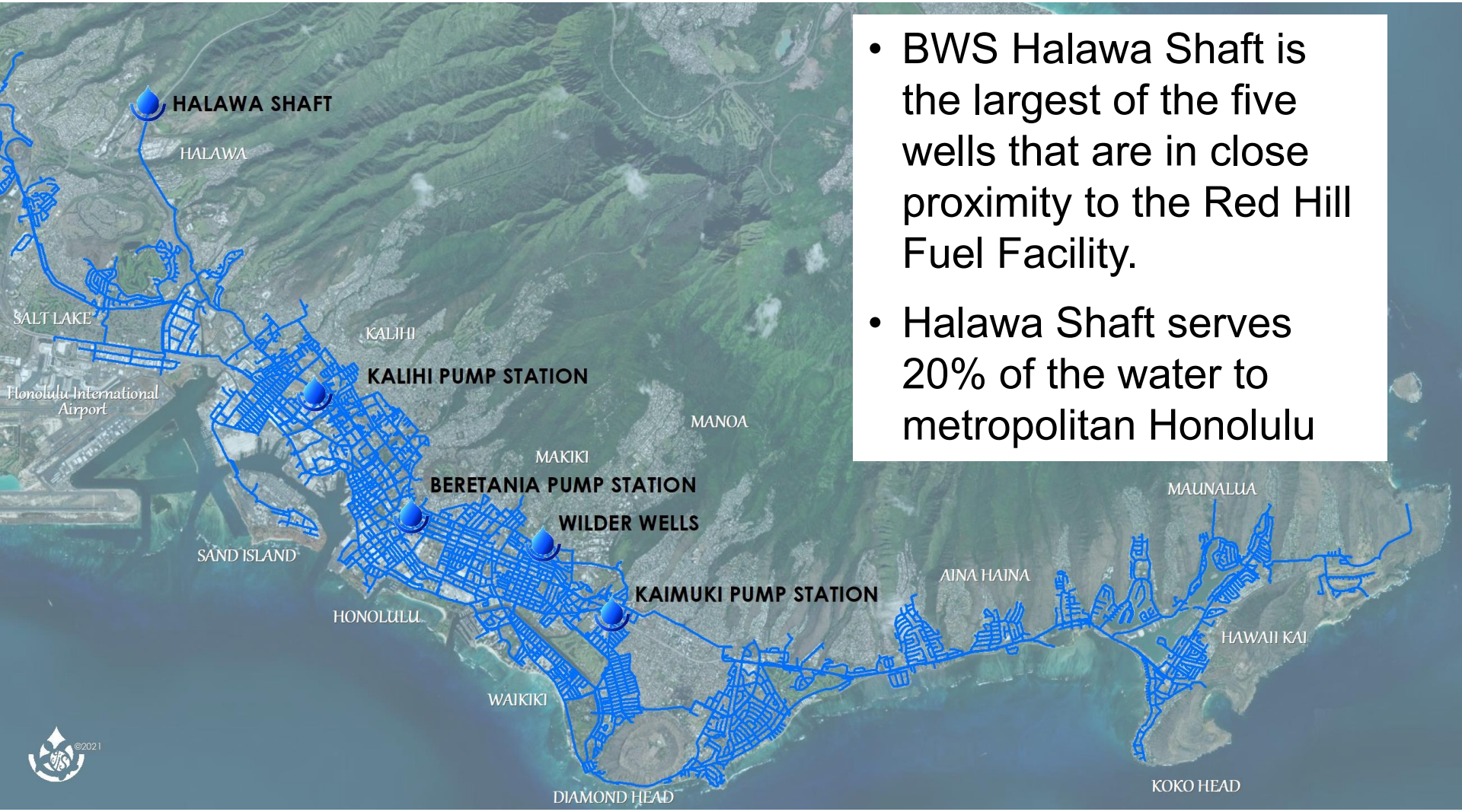
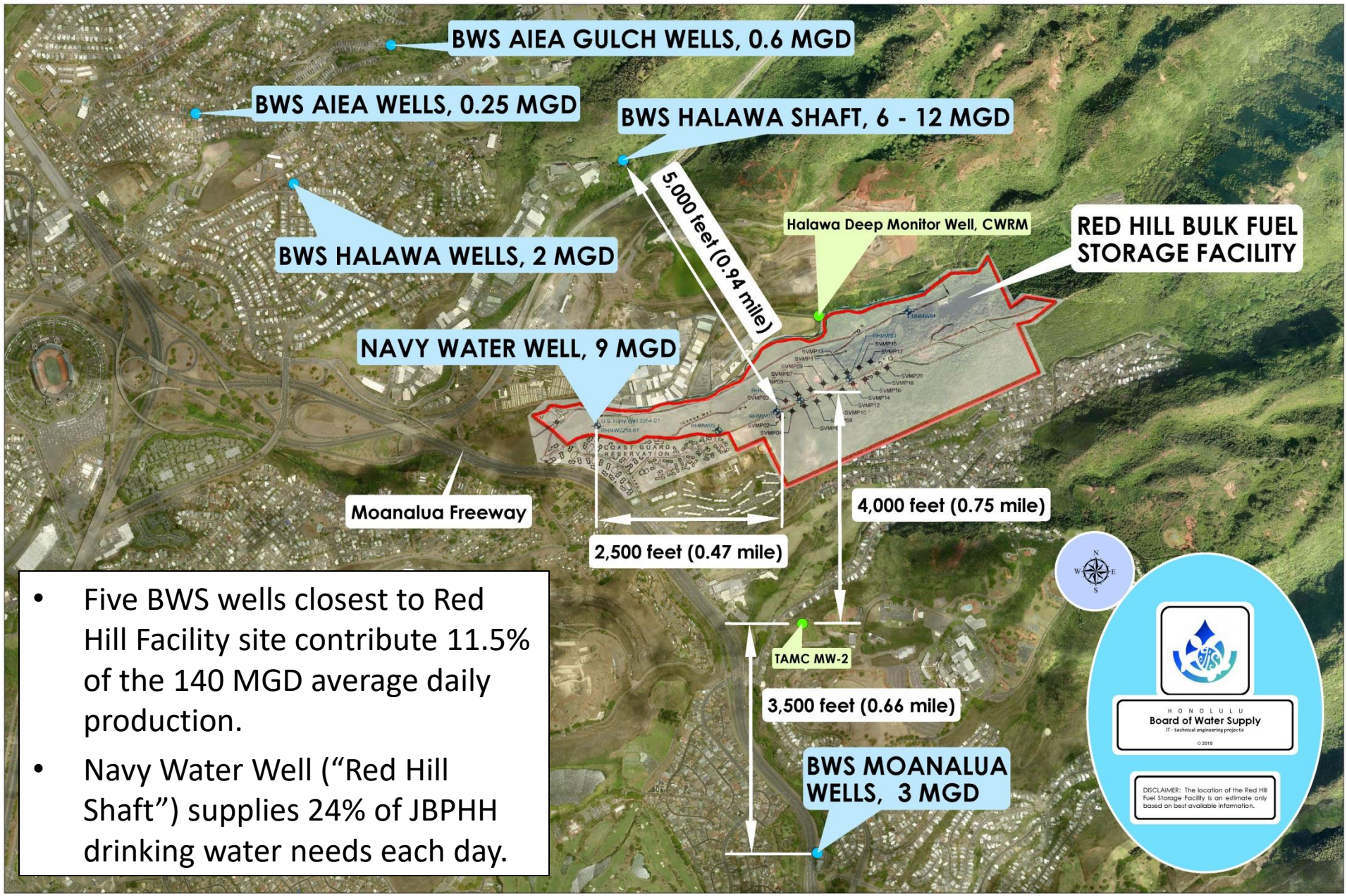
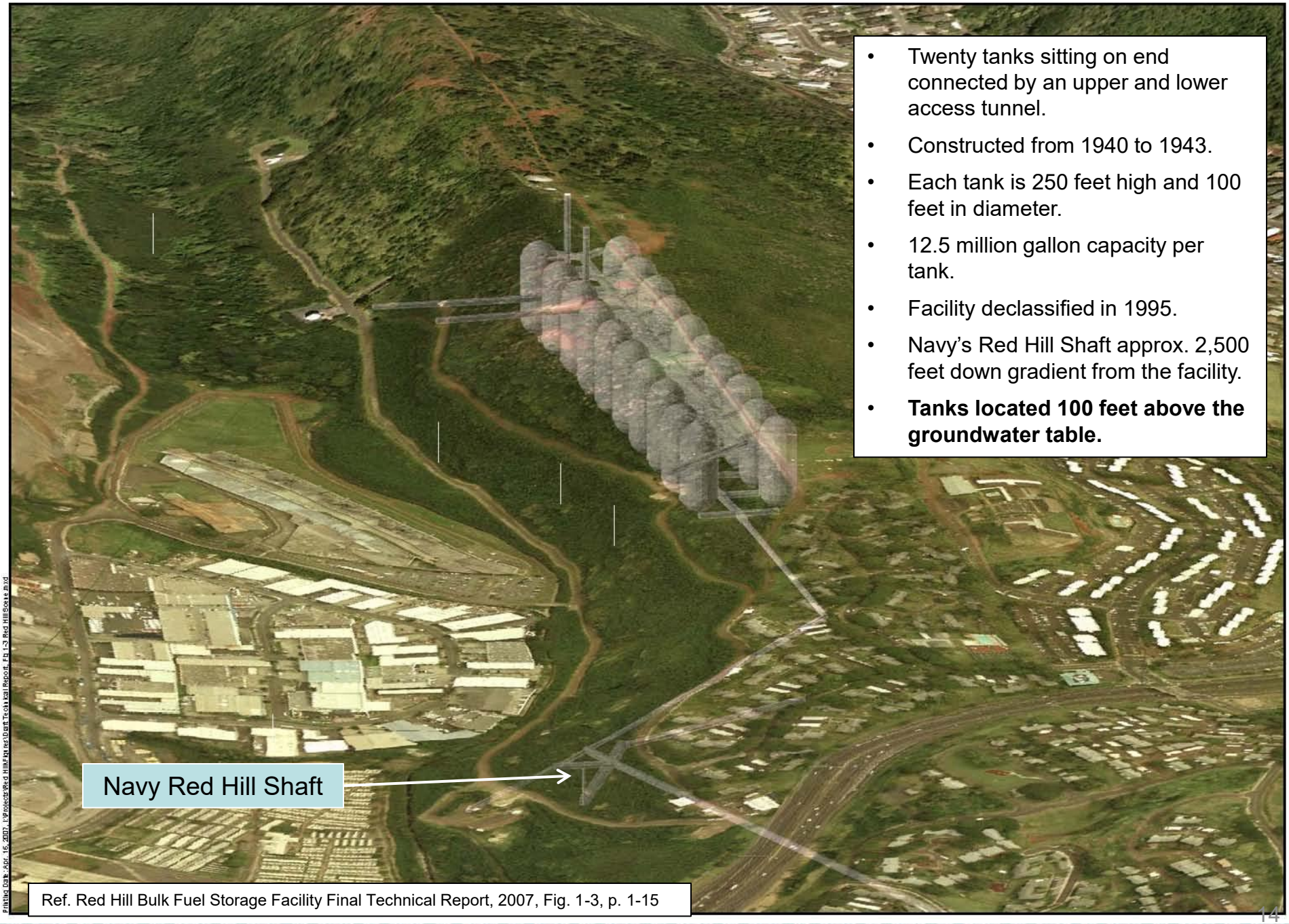


- BWS Halawa Shaft is the largest of the five wells that are in close proximity to the Red Hill Fuel Facility.
- Halawa Shaft serves 20% of the water to metropolitan Honolulu

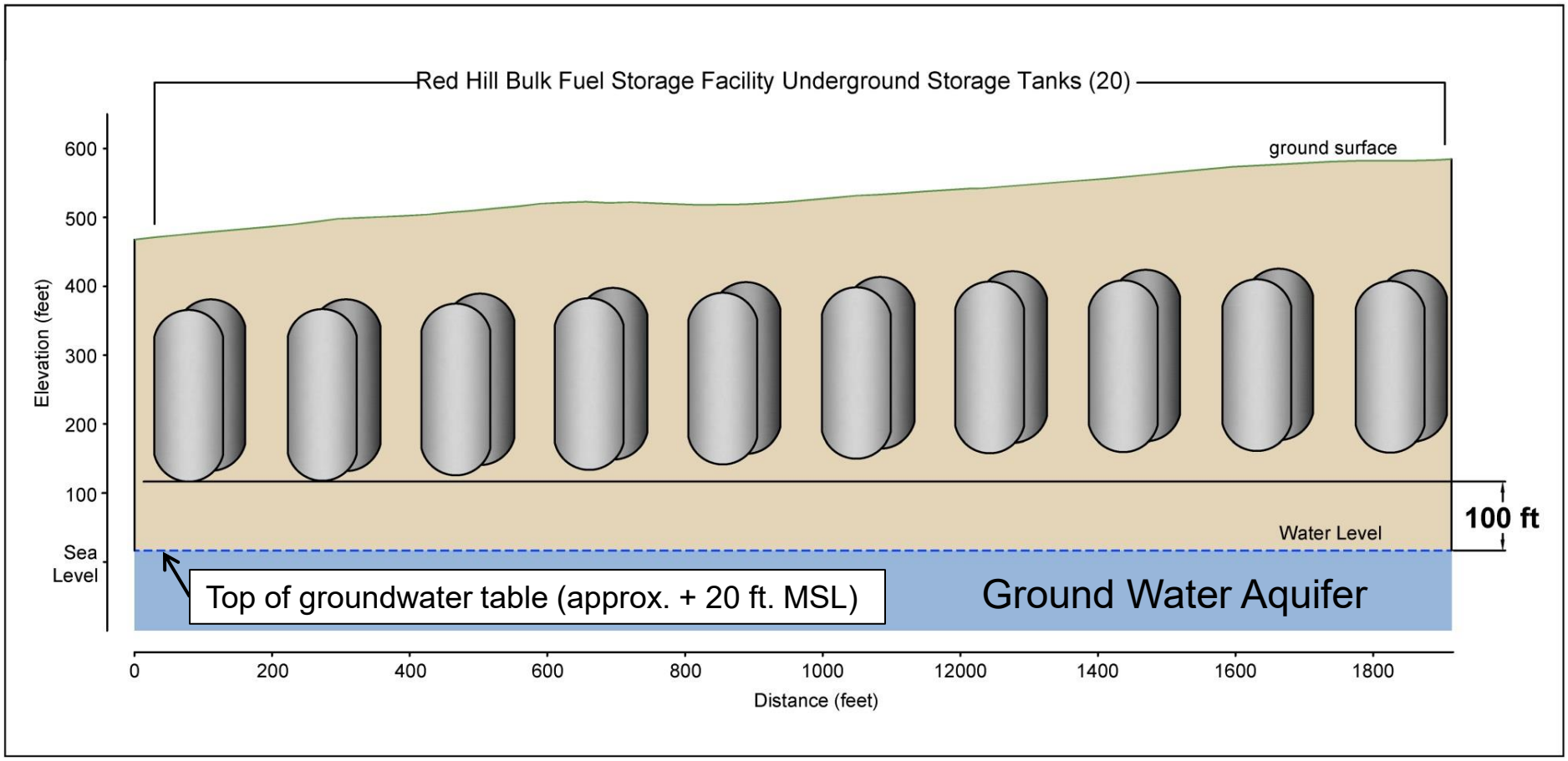


- Five BWS wells closest to Red Hill Facility site contribute 11.5% of the 140 MGD average daily production.
- Navy Water Well ("Red Hill Shaft") supplies 24% of JBPHH drinking water needs each day.



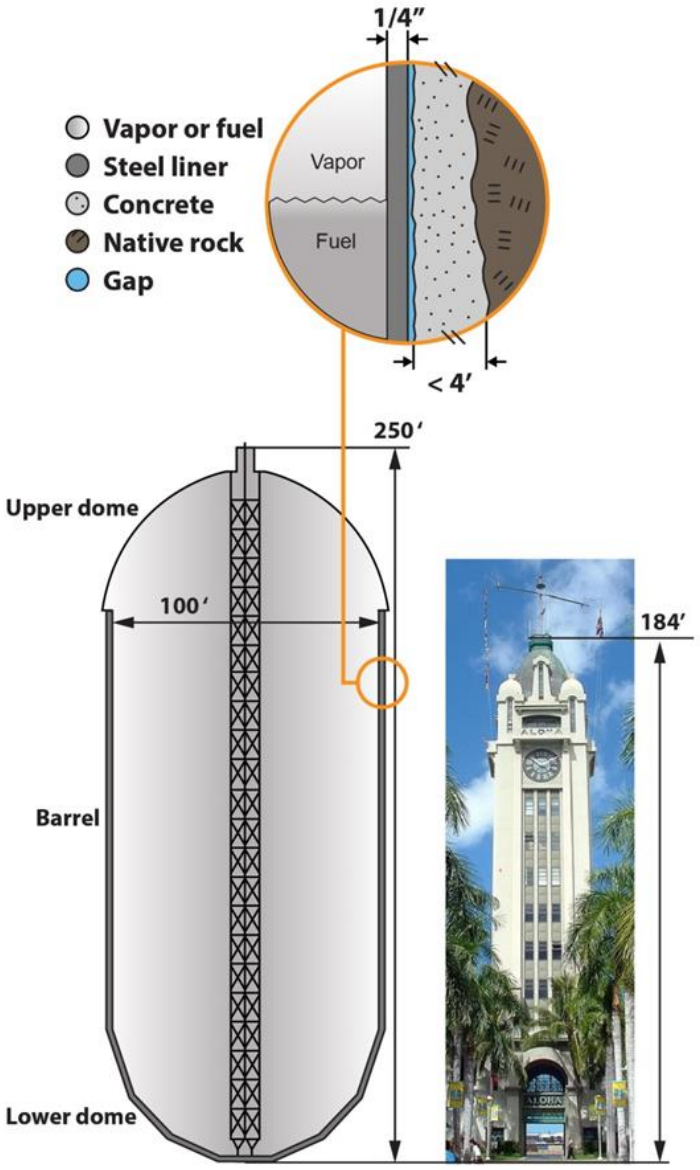
- Twenty tanks sitting on end connected by an upper and lower access tunnel.
- Constructed from 1940 to 1943.
- Each tank is 250 feet high and 100 feet in diameter.
- 12.5 million gallon capacity per tank.
- Facility declassified in 1995.
- Navy's Red Hill Shaft approx. 2,500 feet down gradient from the facility.
- **Tanks located 100 feet above the groundwater table.**

Ref. Red Hill Bulk Fuel Storage Facility Final Technical Report, 2007, Fig. 1-3, p. 1-15

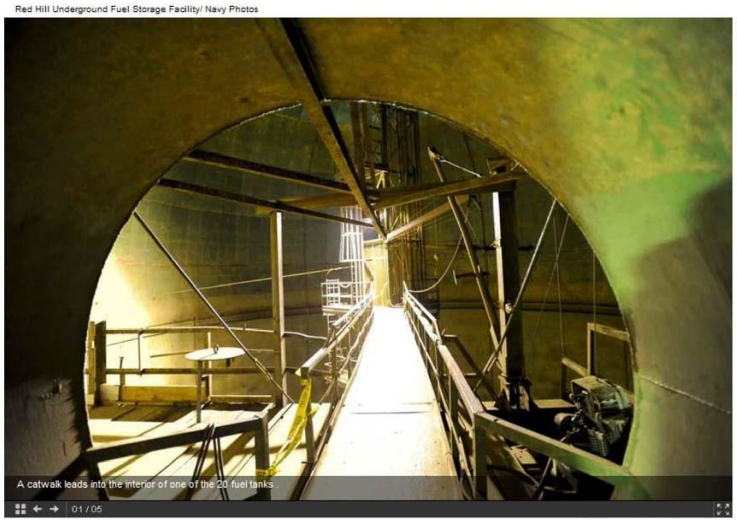

Red Hill Bulk Fuel Storage Facility Underground Storage Tanks (20)
ground surface
600
500
400
300
200
100
Sea Level
Elevation (feet)
100 ft
Water Level
Top of groundwater table (approx. + 20 ft. MSL)
Ground Water Aquifer
0
200
400
600
800
1000
12000
1400
1600
1800
Distance (feet)

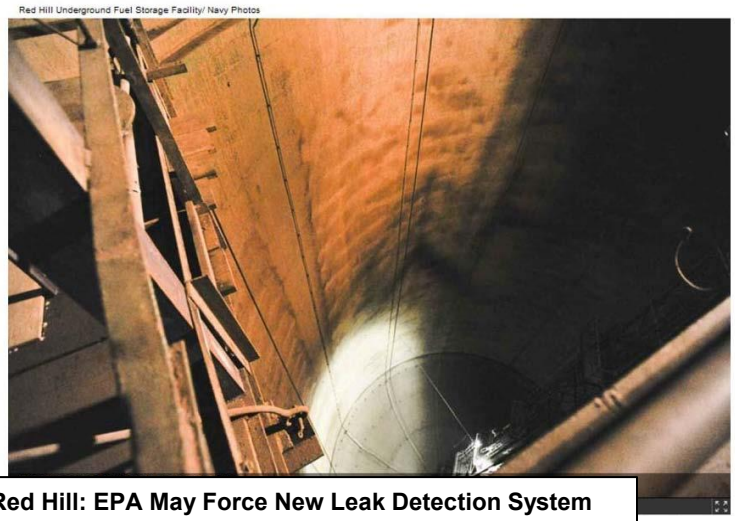
Red Hill Tanks

- Concrete with ¼ inch steel liner. (Upper and lower dome steel is ½ inch), about ten miles of pipelines
- Red Hill Tank large enough to hold Aloha Tower
- Fuel storage
  - Recently stored JP-5, JP-8 and F-76 (marine diesel)
  - Variety of fuels stored over the about 80 years of operation
- Rainwater seeping between ¼ inch steel liner and concrete and corroding steel liner
- History of leaks over its history dating back to the 1940s



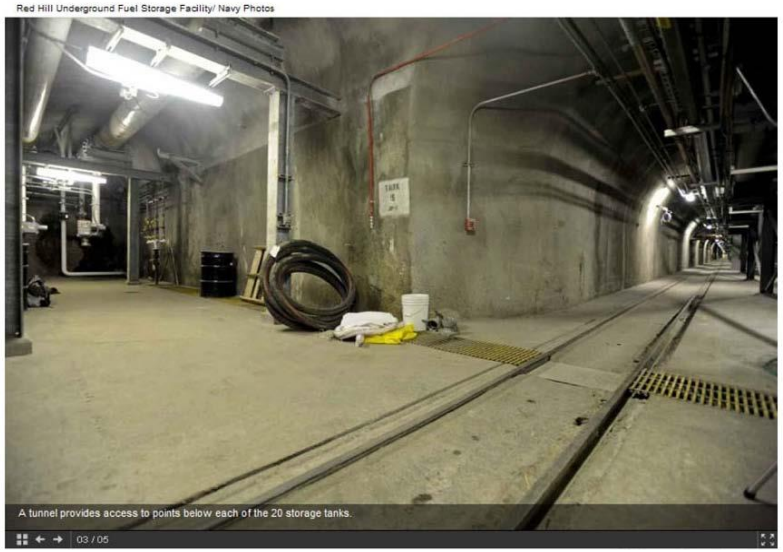
Inside Red Hill Tank

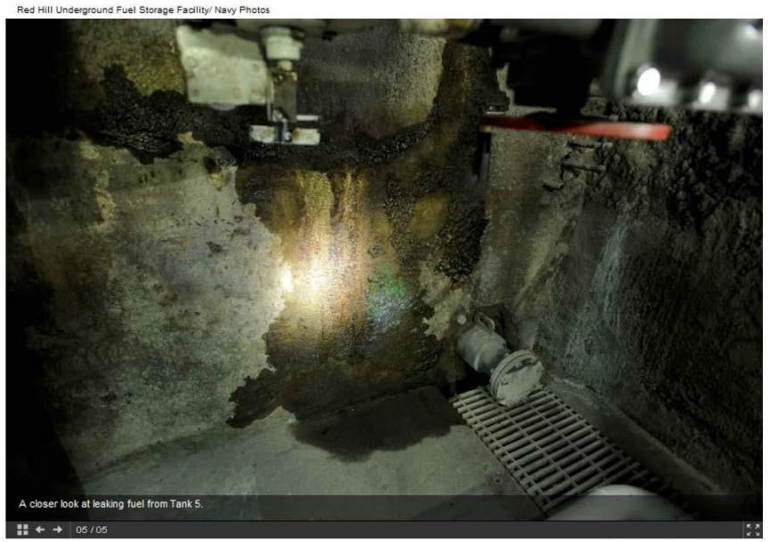


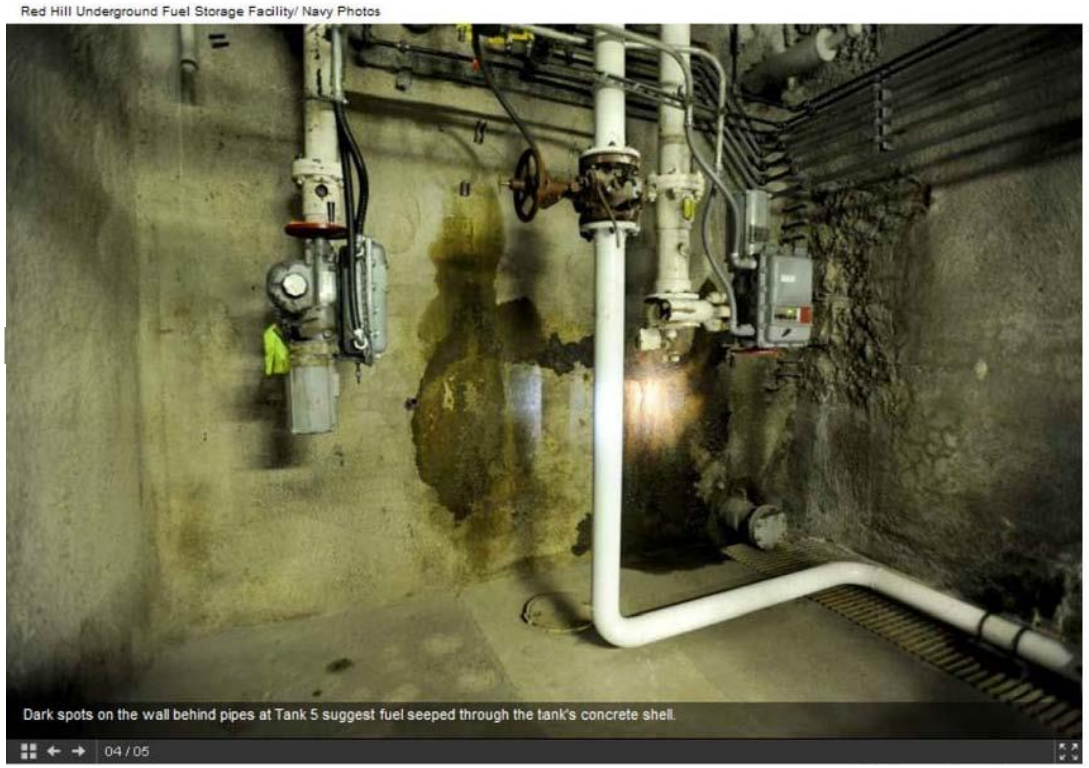


Ref: Red Hill: EPA May Force New Leak Detection System For Toxic Spills, Civil Beat, S. Cocke, 2/14/14

Tank 5 Leak







Ref: Red Hill: EPA May Force New Leak Detection System For Toxic Spills, Civil Beat, S. Cocke, 2/14/14

January 13, 2014 leak from Red Hill Tank No. 5

- While refilling Tank 5 following completion of a clean-inspect-repair process, Navy operators detected a fuel level discrepancy in Tank 5.
- Navy estimated fuel loss up to 27,000 gallons of JP-8 fuel(*).
- The Navy drained the contents of Tank 5.
- Groundwater Monitoring Well test results (e.g., RMW02) showed a spike in levels of hydrocarbons.
- A full inspection of Tank 5 found poor workmanship and lack of oversight as the cause of the leak.

(*) Defense Logistics Agency estimates that fuel loss was 39,312 gallons.

Navy Study and Fuel Record Findings

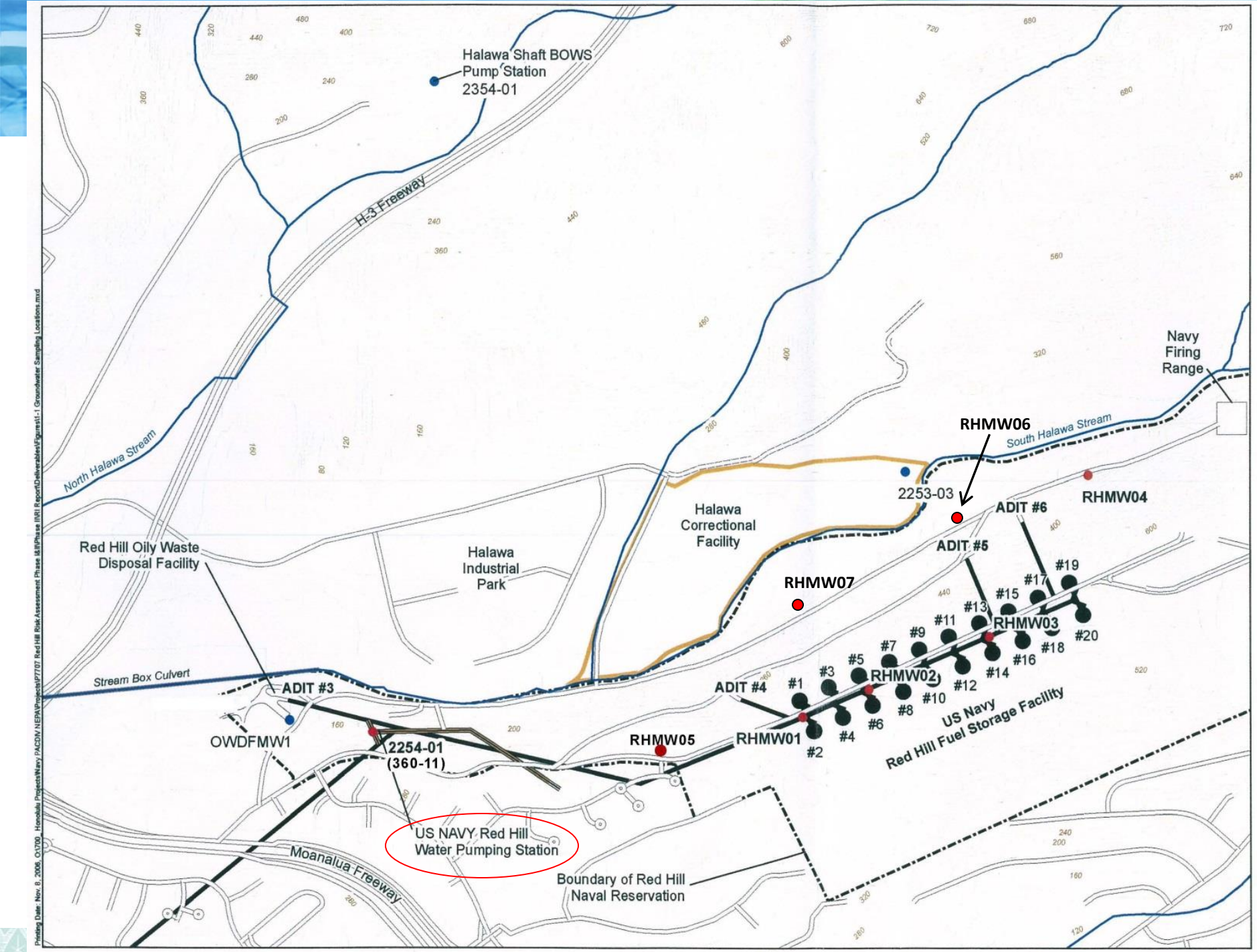
- Navy commissioned studies
  - Petroleum hydrocarbons present in groundwater and rock beneath facility.
  - Warn of increasing facility age and potential catastrophic large volume release.
- Fuel releases
  - Occurred in the past (1947 – 2025)
  - Lack of clear and complete information on releases
  - Information in Red Hill Groundwater Protection Plan indicate 206,190 gallons (1947- mid 1980s)

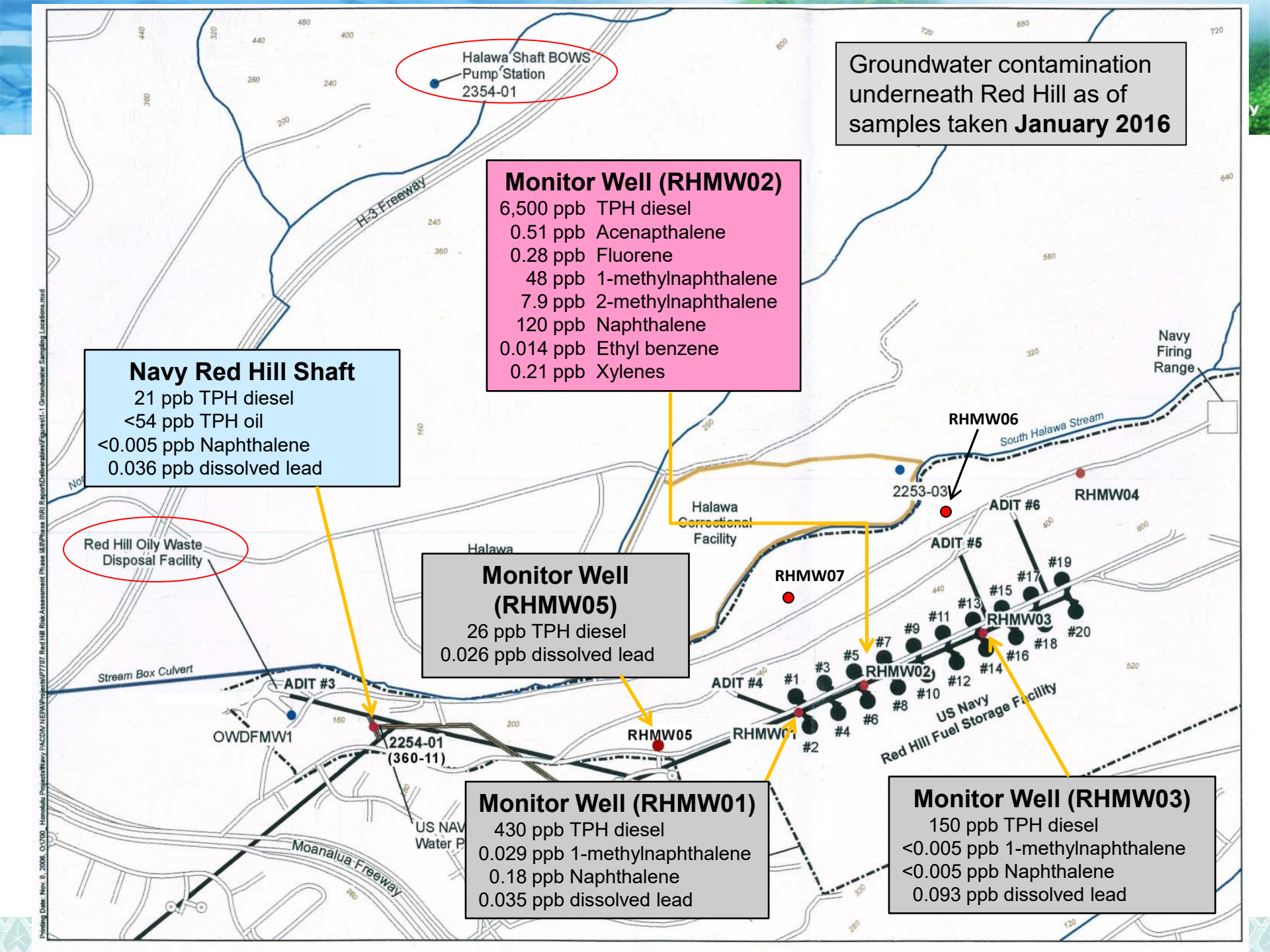
Fuel Contamination Under Red Hill Tanks

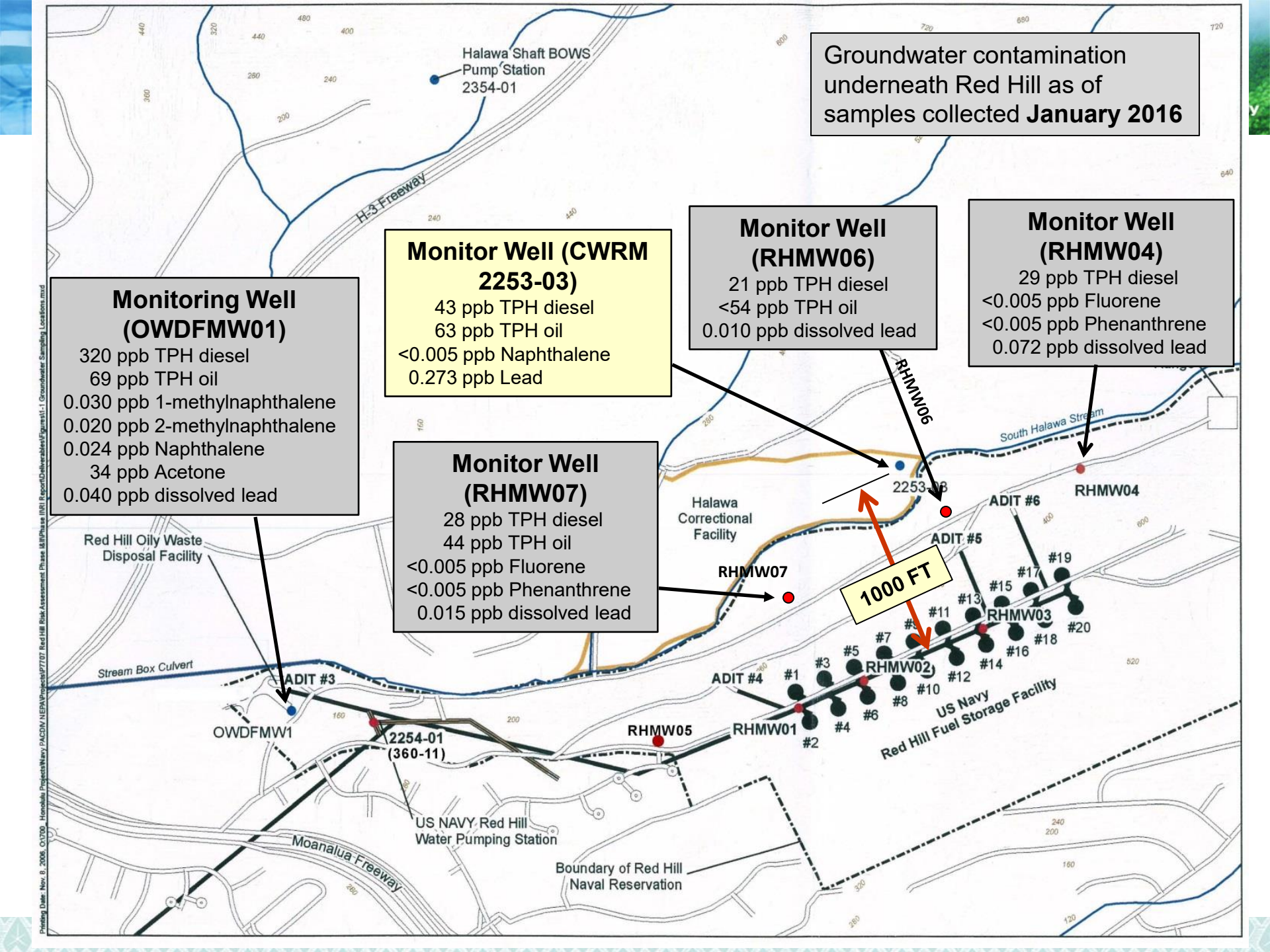
- 1998-2002 Investigations.
- Basalt rock core samples taken from underneath **19 out of 20 tanks show petroleum stains**.

Figure 4-7 Petroleum Stained Core – B16C, 49' to 60'

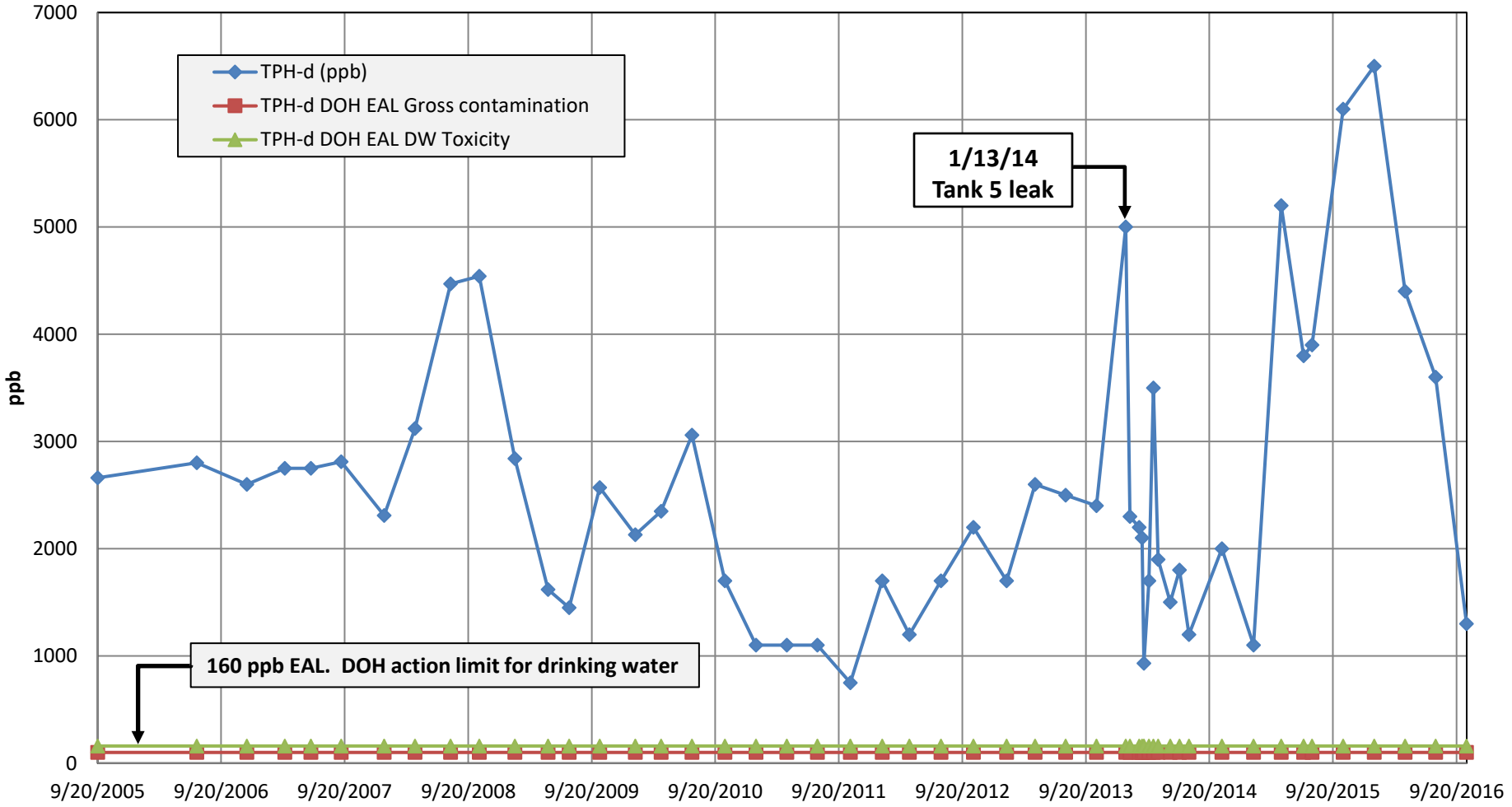
Figure 4-8 Petroleum Stained Core – B16C, 60' to 69'


Halawa Shaft BOWS
Pump Station
2354-01
H-3 Freeway
North Halawa Stream
South Halawa Stream
Navy
Firing
Range
RHMW06
2253-03
RHMW04
ADIT #6
ADIT #5
Halawa
Correctional
Facility
Red Hill Oily Waste
Disposal Facility
Halawa
Industrial
Park
RHMW07
#19
#17
#15
#13
#11
#9
#7
#5
#3
#1
RHMW03
RHMW02
#20
#18
#16
#14
#12
#10
#8
#6
#4
#2
ADIT #4
US Navy
Red Hill Fuel Storage Facility
Stream Box Culvert
ADIT #3
OWDFMW1
2254-01
(360-11)
RHMW05
RHMW01
US NAVY Red Hill
Water Pumping Station
Moanalua Freeway
Boundary of Red Hill
Naval Reservation

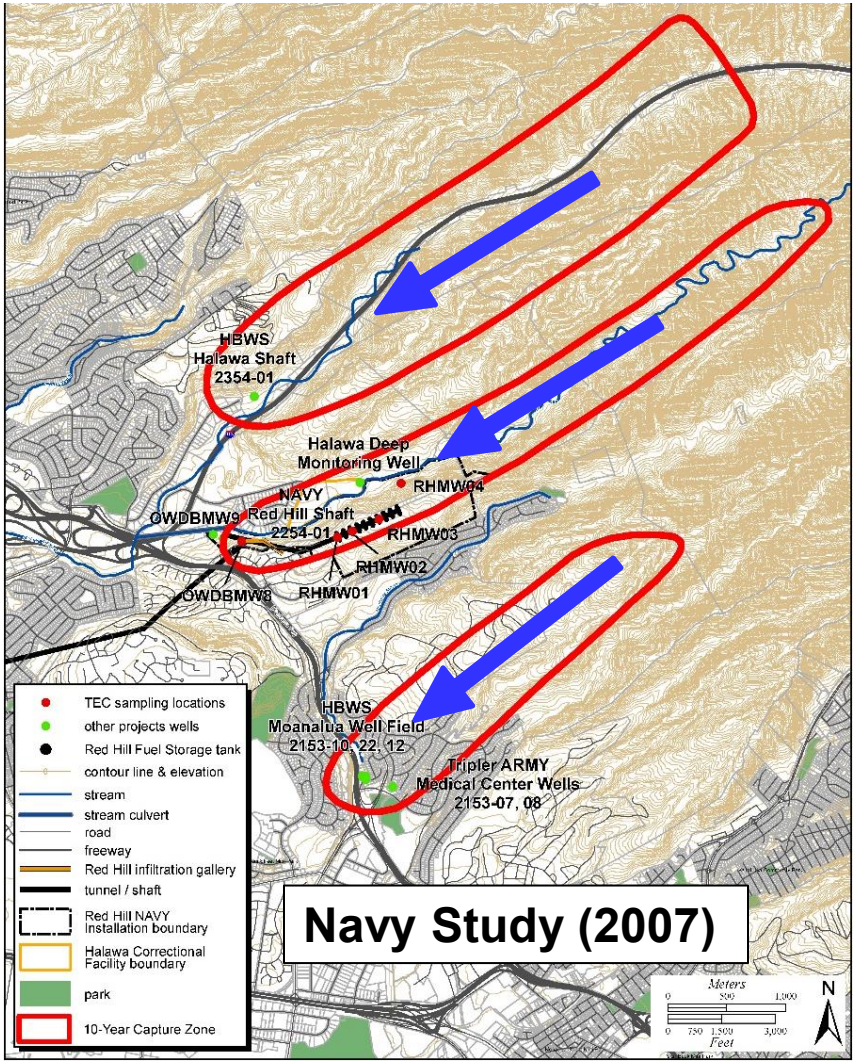

Groundwater contamination underneath Red Hill as of samples taken **January 2016**
Halawa Shaft BOWS Pump Station 2354-01
H-3 Freeway
Monitor Well (RHMW02)
6,500 ppb TPH diesel
0.51 ppb Acenapthalene
0.28 ppb Fluorene
48 ppb 1-methylnaphthalene
7.9 ppb 2-methylnaphthalene
120 ppb Naphthalene
0.014 ppb Ethyl benzene
0.21 ppb Xylenes
Navy Red Hill Shaft
21 ppb TPH diesel
<54 ppb TPH oil
<0.005 ppb Naphthalene
0.036 ppb dissolved lead
Navy Firing Range
RHMW06
South Halawa Stream
2253-03
RHMW04
ADIT #6
ADIT #5
Halawa Correctional Facility
Red Hill Oily Waste Disposal Facility
Halawa
RHMW07
Monitor Well (RHMW05)
26 ppb TPH diesel
0.026 ppb dissolved lead
Stream Box Culvert
ADIT #3
ADIT #4
RHMW03
RHMW02
RHMW01
RHMW05
OWDFMW1
2254-01 (360-11)
US Navy Red Hill Fuel Storage Facility
US NAV Water P
Moanalua Freeway
Monitor Well (RHMW01)
430 ppb TPH diesel
0.029 ppb 1-methylnaphthalene
0.18 ppb Naphthalene
0.035 ppb dissolved lead
Monitor Well (RHMW03)
150 ppb TPH diesel
<0.005 ppb 1-methylnaphthalene
<0.005 ppb Naphthalene
0.093 ppb dissolved lead

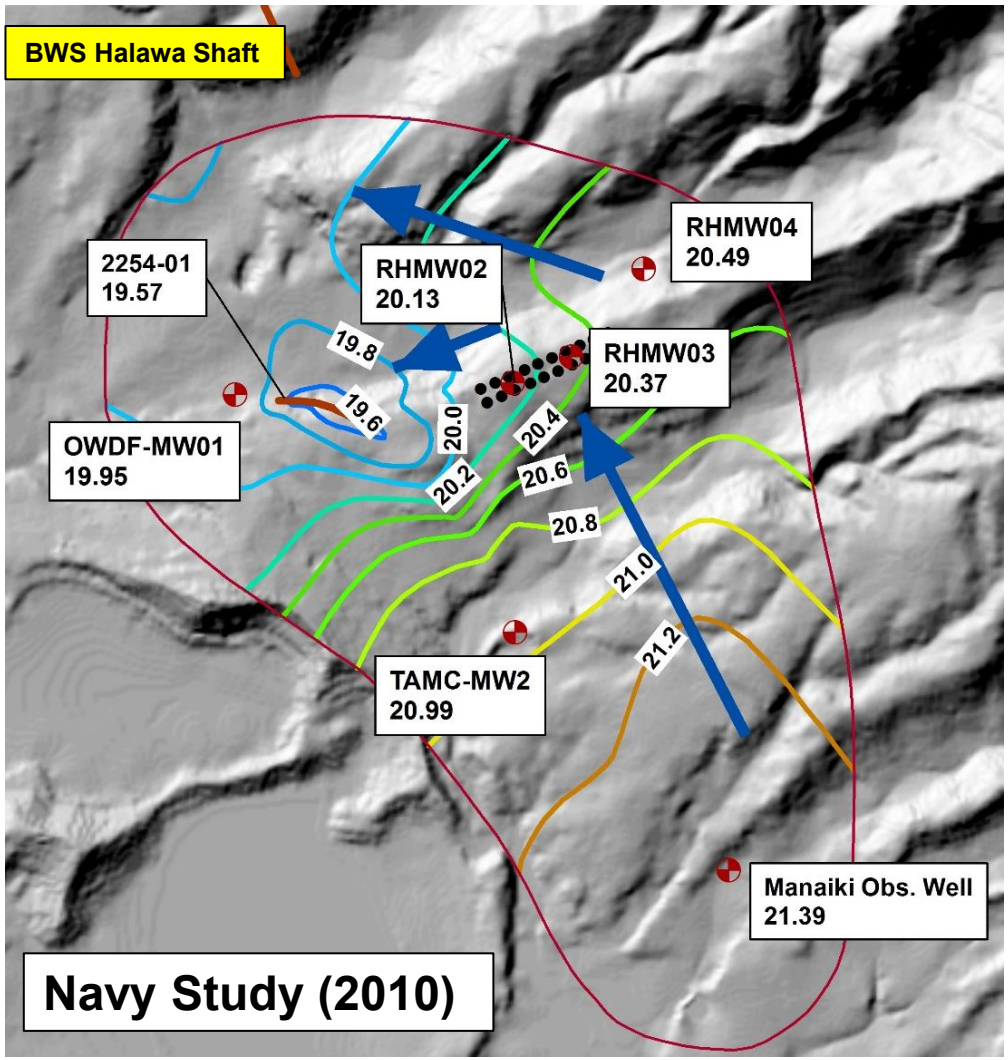

Groundwater contamination underneath Red Hill as of samples collected **January 2016**
Halawa Shaft BOWS Pump Station 2354-01
H-3 Freeway
Monitoring Well (OWDFMW01)
320 ppb TPH diesel
69 ppb TPH oil
0.030 ppb 1-methylnaphthalene
0.020 ppb 2-methylnaphthalene
0.024 ppb Naphthalene
34 ppb Acetone
0.040 ppb dissolved lead
Monitor Well (CWRM 2253-03)
43 ppb TPH diesel
63 ppb TPH oil
<0.005 ppb Naphthalene
0.273 ppb Lead
Monitor Well (RHMW06)
21 ppb TPH diesel
<54 ppb TPH oil
0.010 ppb dissolved lead
Monitor Well (RHMW04)
29 ppb TPH diesel
<0.005 ppb Fluorene
<0.005 ppb Phenanthrene
0.072 ppb dissolved lead
Monitor Well (RHMW07)
28 ppb TPH diesel
44 ppb TPH oil
<0.005 ppb Fluorene
<0.005 ppb Phenanthrene
0.015 ppb dissolved lead
RHMW06
South Halawa Stream
2253-03
RHMW04
Halawa Correctional Facility
RHMW07
1000 FT
ADIT #6
ADIT #5
ADIT #4
ADIT #3
RHMW03
RHMW02
RHMW01
RHMW05
Red Hill Oily Waste Disposal Facility
Stream Box Culvert
OWDFMW1
2254-01 (360-11)
US NAVY Red Hill Water Pumping Station
Moanalua Freeway
Boundary of Red Hill Naval Reservation
US Navy Red Hill Fuel Storage Facility

Groundwater Contamination underneath Red Hill Tanks (RHMW02) as of **October 2016**



Navy Study Show Groundwater Flow from Red Hill toward BWS Halawa Shaft





2010 Navy Audit

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Naval Audit Service

Audit Report

Department of the Navy Red Hill and Upper Tank Farm Fuel Storage Facilities

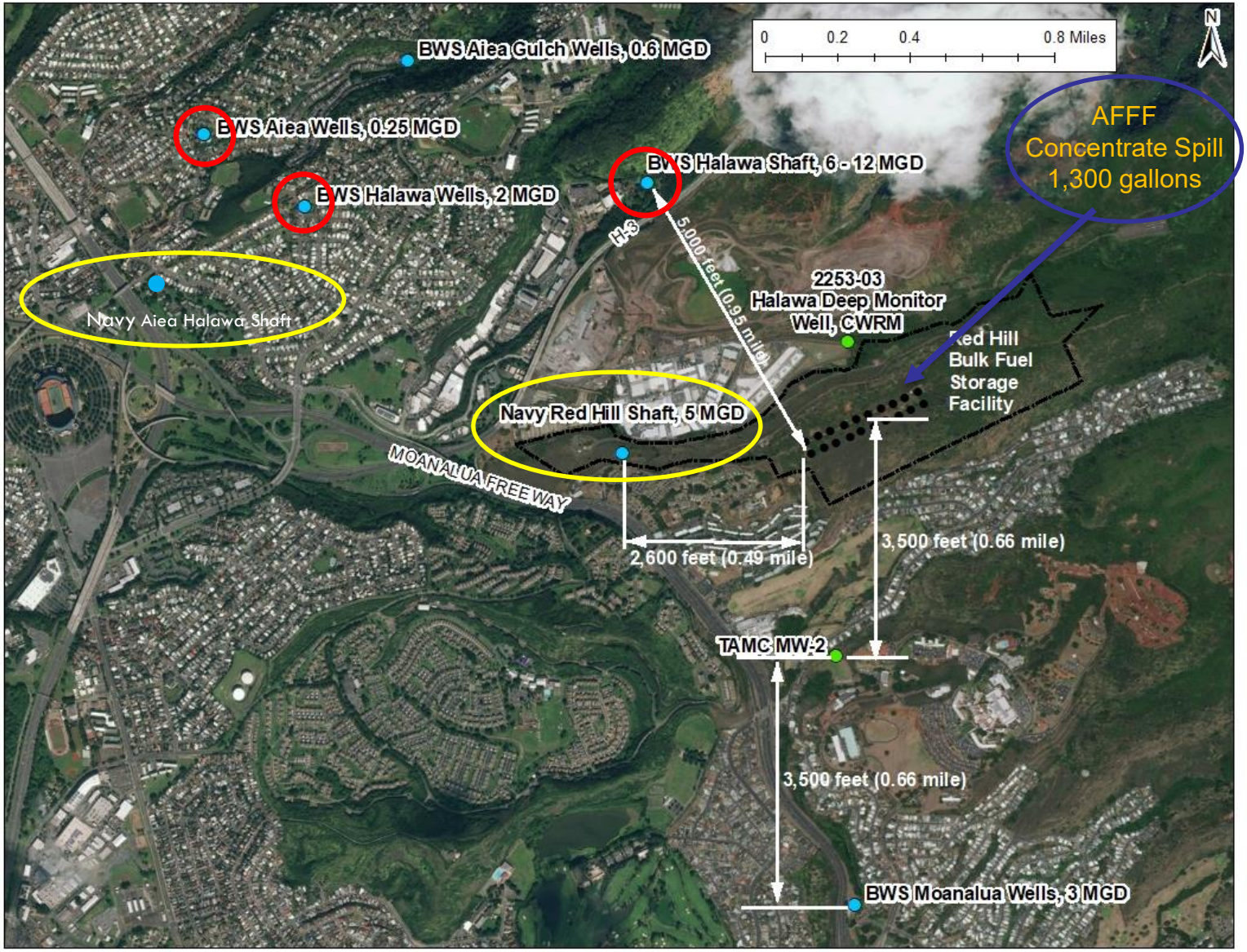
This report contains information exempt from release under the Freedom of Information Act. Exemptions (b)(2) high and (b)(6) apply.

~~Do not release outside of the Department of the Navy, or post on non-Naval Audit Websites or in Navy Taskers, without approval from the Auditor General of the Navy~~

N2010-0049
16 August 2010

~~FOR OFFICIAL USE ONLY~~

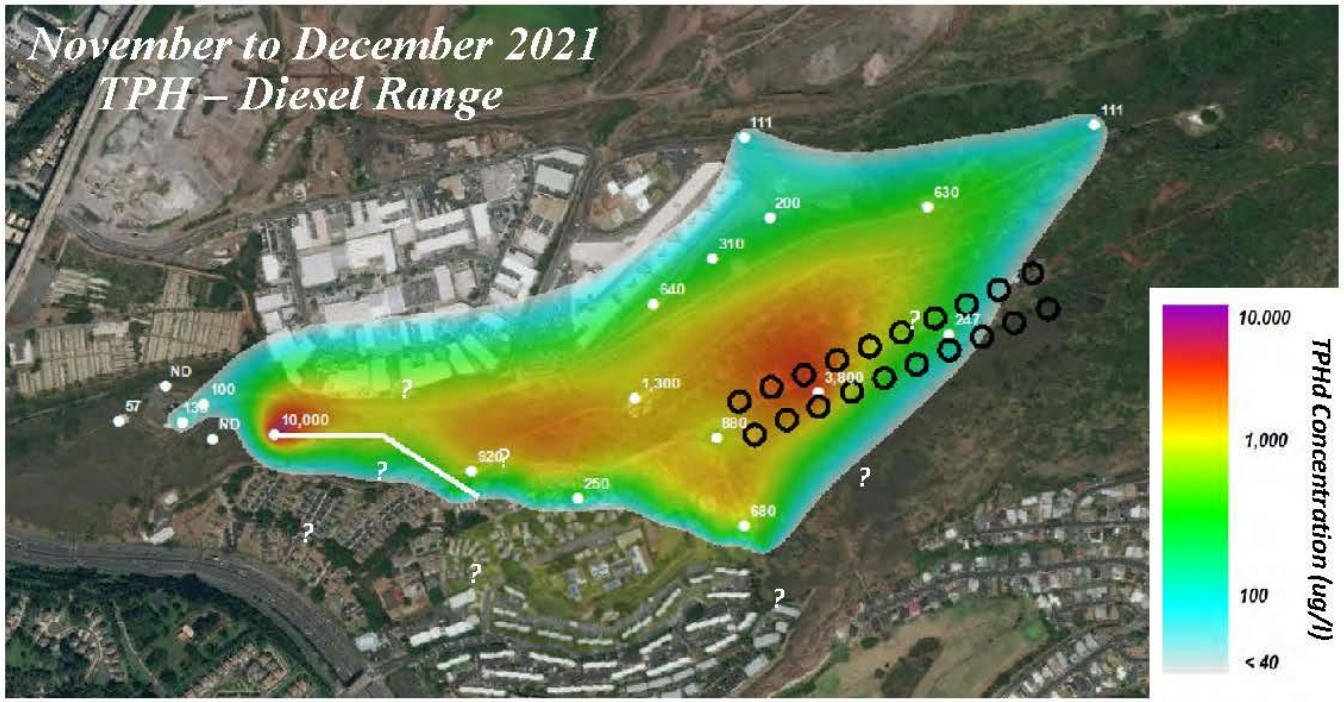
- Findings
  - Groundwater contamination resulting from irregular maintenance and insufficient inspection.
  - Delays in completion of the maintenance cycle due to operational and time constraints.
  - Inability of current leak detection methods in detecting slow, chronic fuel leaks.
  - Non-compliance with terms of the State DOH approved Navy Groundwater Protection Plan (GPP).



Several water sources are shut down in response to JBPHH contamination

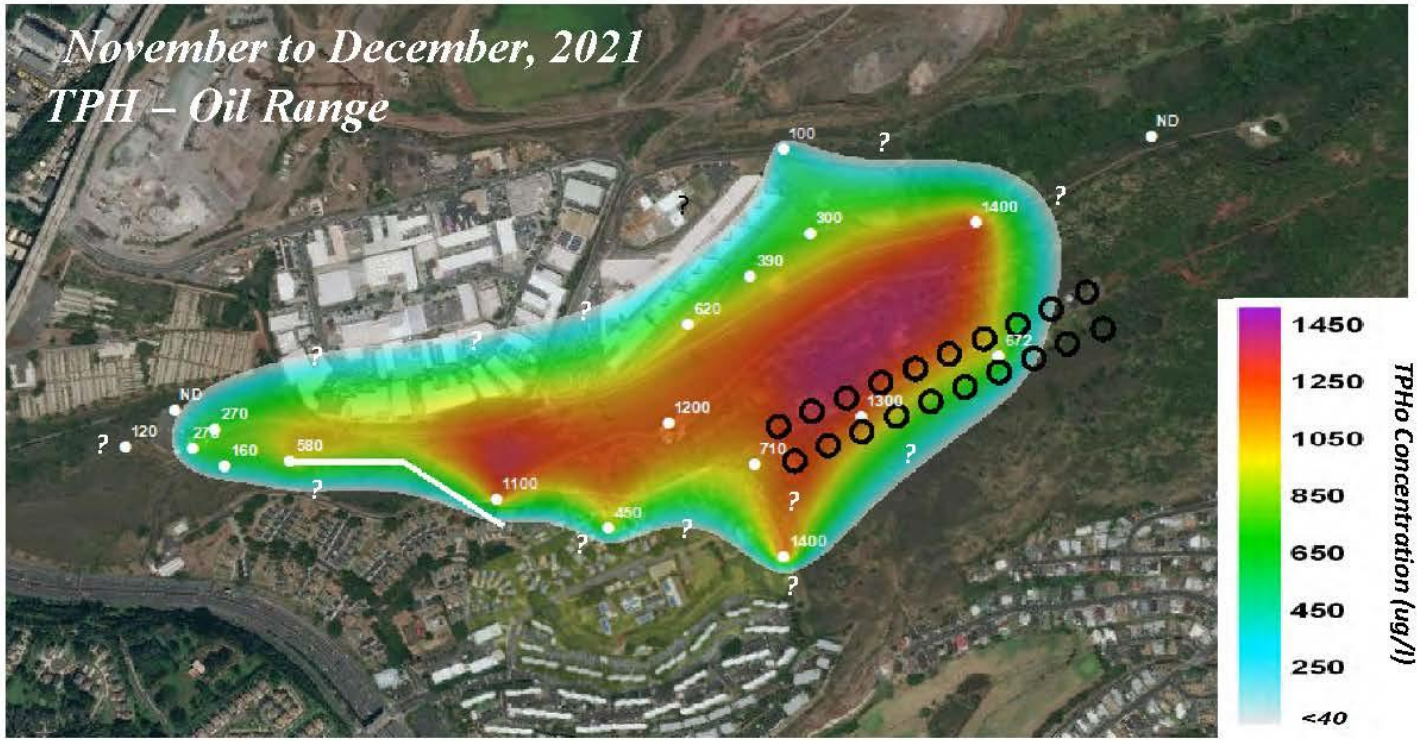
TPH-Diesel Plume Distribution over Time

November to December 2021



TPH-Oil Plume Distribution over Time

November to December, 2021



WATER FOR LIFE

Safe, dependable, and affordable water now and into the future

Board of Water Supply
City and County of Honolulu

EPA 2023 RED HILL CONSENT ORDER

Public can comment through Feb 6, 2023:

regulations.gov/commenton/EPA-R09-RCRA-2022-0970-0002

Defueling

Goal: Enhance infrastructure, testing, and response procedures in preparation for defueling.

Closure

Goal: Establish approval process and steps for safe closure of each tank as it comes out of service.

Drinking Water

Goals:

- Safeguard drinking water quality at the Red Hill Shaft and all Joint Base Pearl Harbor-Hickam (JBPHH) well sites
- Implement a long-term drinking water monitoring plan
- Conduct comprehensive infrastructure assessments and improvements of the JBPHH Drinking Water System.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Recent Events

June 26th
- Monthly Meeting with UH Tracer Study Group

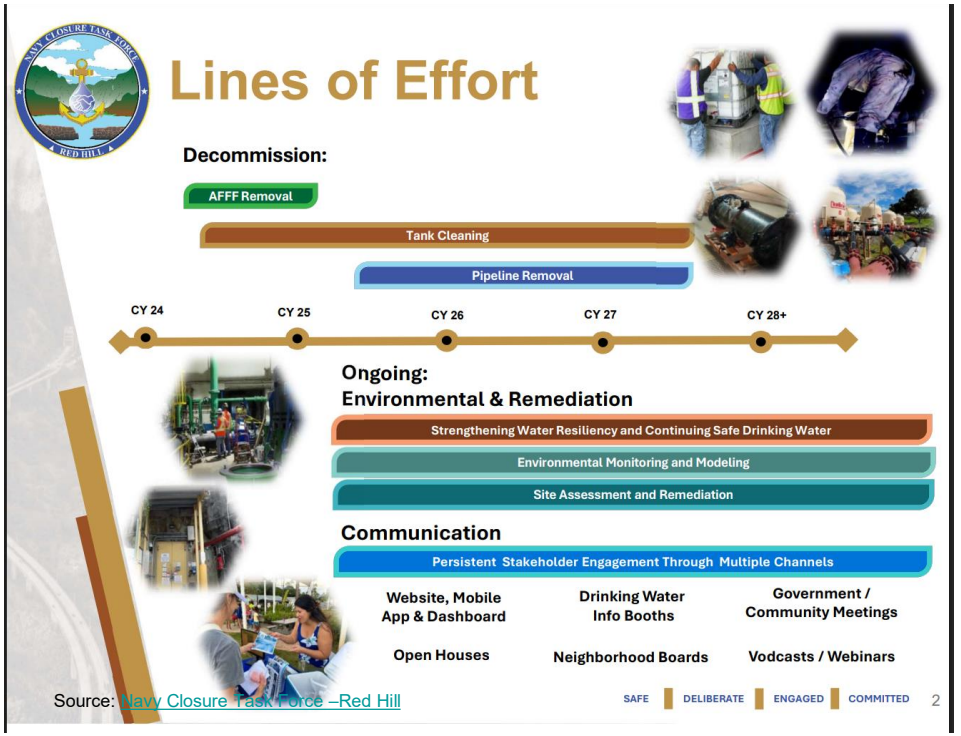
July 1st
- Filing of Federal Tort Claims Act Lawsuit

July 3rd
- Red Hill Bulk Fuel Storage Facility Closure Plan Supplemental #4

July 14th
- Legislature Information Brief –Update from Navy Closure Task Force –Red Hill

Legislature information brief -July 14, 2025

- Rear Admiral Stephen Barnett the Navy Closure Task Force.
- Per- and polyfluoroalkyl substances (PFAS) Investigation following the 2022 Aqueous Film Forming Foam (AFFF) is ongoing under CERCLA at Red Hill. Information can be found on www.redhillern.com.
- Reactivation of Aiea-Halawa Shaft anticipated this year in coordination with Hawai‘i Department of Health (DOH).
- Reactivation of Red Hill Shaft anticipated in 2027 pending installation of treatment system in coordination with DOH.
- Red Hill Facility closure anticipated to complete in 2028. Remediation and monitoring to follow.
- Long term remediation efforts is anticipated to take decades.



Source: Navy Closure Task Force –Red Hill

UPDATES from Navy Closure Task Force – Red Hill

SLUDGE AND RESIDUAL FUEL REMOVAL

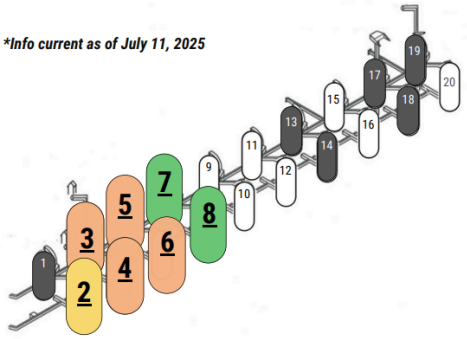
01945.0
GALLONS RESIDUAL FUEL REMOVED

As of July 11, 2025

00323.0
GALLONS SLUDGE REMOVED

Sludge is removed by lowering personnel to the bottom of the tank where it is manually shoveled out and put into drums. The drums are sealed and sent off the island for disposal at a permitted waste disposal facility on the continental U.S.

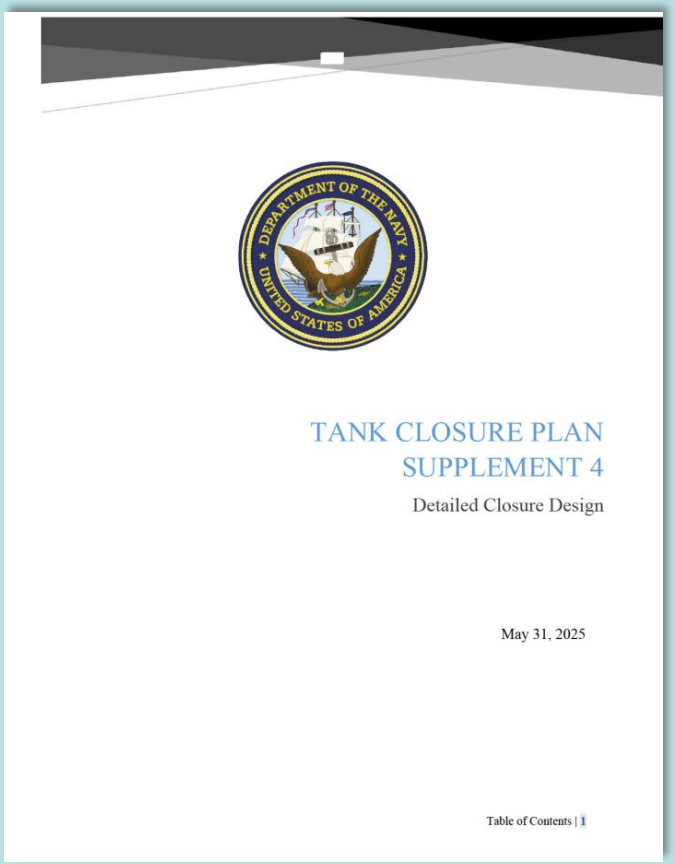
***Info current as of July 11, 2025**



- ❑ **Step 1 – Preparation** (Approx. 2-3 months):
  - Isolate tank and disconnect piping
  - Install tank ventilation equipment and inject water to soften sludge
  - Remove flowable sludge
  - Begin tank ventilation with forced air
- ❑ **Step 2 – Remove Solid Sludge** (Approx. 2-3 months):
  - Inspect and repair central tower and catwalk
  - Install center tower elevator; load test tower and catwalk
  - Remove solid sludge
- ❑ **Step 3 – Pressure Washing** (Approx. 1-2 months):
  - Set up pressure washing system and
  - Pressure wash with 3% Simple Green
  - Rinse, continuously removing rinsate
  - Dry tank interior and validate cleanliness; submit cleaning report
  - Receive regulatory agency final approval that tank is clean
- ❑ **Step 4 – Tank Decommission** (Approx. 1-2 Months):
  - Remove booms and infrastructure
  - Install permanent lockable steel hatch at the entrance

Black tanks were empty and out of service prior to defueling.

Source: Navy Closure Task Force –Red Hill



TANK CLOSURE PLAN
SUPPLEMENT 4

Detailed Closure Design

May 31, 2025

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Tank Closure Plan Supplement 4

SAFE. DELIBERATE. ENGAGED. COMMITTED.

- NCTF-RH is not waiting for 'beneficial re-use' to be established and is proceeding with closing the facility in accordance with regulatory requirements.
- RH tanks and surge tanks: interior and exterior tank components will be verified empty and/or clean or removed. Regulator-approved tank cleaning verification plan available online.
- RH tanks and surge tanks will be closed in place.
- RH tanks will be allowed to passively vent to the upper and lower tunnels.
- Drainage from each RH tank will be open to the main sump, and the drainage pathway via the Fuel Oil Reclamation (FOR) line to Tank 311 will be maintained.

Source: Navy Closure Task Force –Red Hill

Questions?