



STAKEHOLDERS ADVISORY GROUP

Board of Water Supply, City & County of Honolulu
January 20, 2022
Meeting 41 - Virtual

WELCOME & INTRODUCTIONS

DAVE EBERSOLD, FACILITATOR

STAKEHOLDER ADVISORY GROUP MEETING 41

JANUARY 20, 2022



Welcome

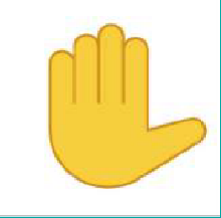
MARKUS KREBS

GENERAL MANAGER

OUTRIGGER REEF HOTEL



VIRTUAL MEETING BEST PRACTICES

- Please stay muted unless you are speaking
- Use  or meeting chat to let us know you want to ask a question
- If you don't have the “raise hand” function or meeting chat, unmute your mic/phone and speak
- Speak one person at a time
- Expect something to go wrong



MEETING OBJECTIVES

- Get the latest on Red Hill
- Receive Update on Water System Facility Charge
- Accept notes from meeting #40
- Introduction to BWS's Upcoming Water Rate Study
- Learn about the Wai'anāe Groundwater Management Area Designation



PUBLIC COMMENT ON AGENDA ITEMS

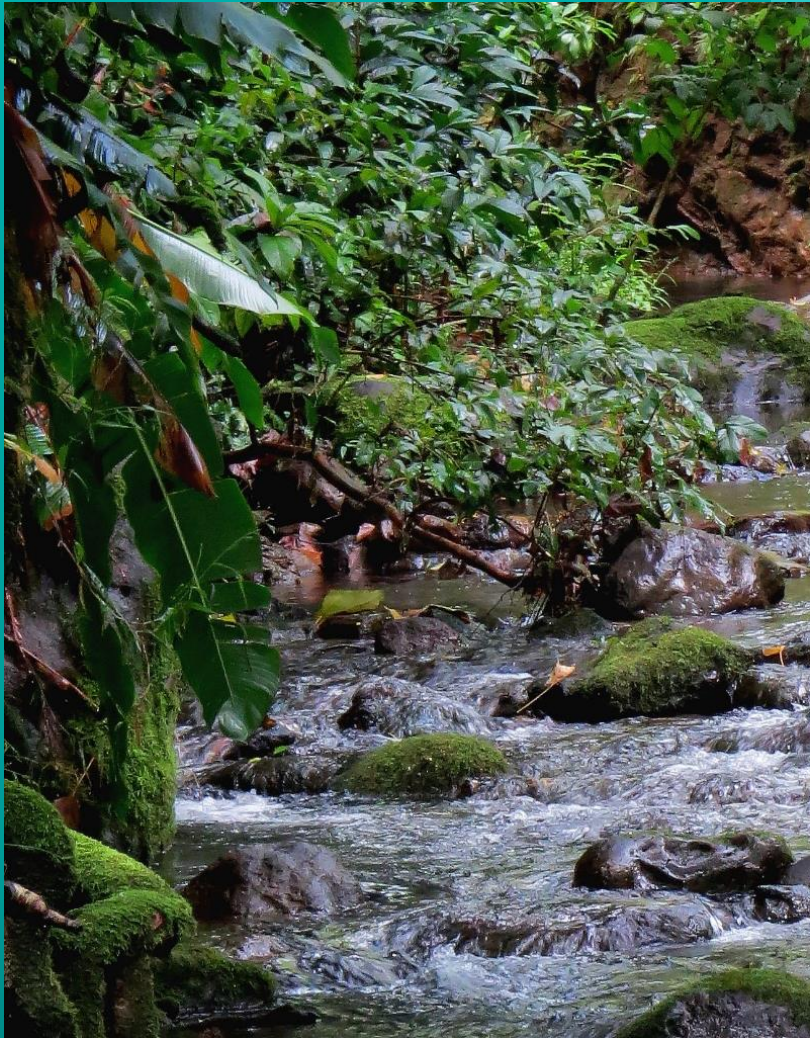


BWS UPDATES

ERNEST LAU, MANAGER AND CHIEF ENGINEER
STAKEHOLDER ADVISORY GROUP MEETING 41

JANUARY 20, 2022





INTRODUCTION TO THE COST OF SERVICE AND WATER RATE MAKING PROCESS

Joe Cooper

Waterworks Controller

January 20, 2022
boardofwatersupply.com



BWS'S AUTHORITY TO MAKE RATES IS ESTABLISHED IN CITY CHARTER

- “The board shall have the power to fix and adjust reasonable rates and charges for the furnishing of water and for water services so that the revenues derived therefrom shall be sufficient to make the department self-supporting.”
- PUC regulates privately owned utilities

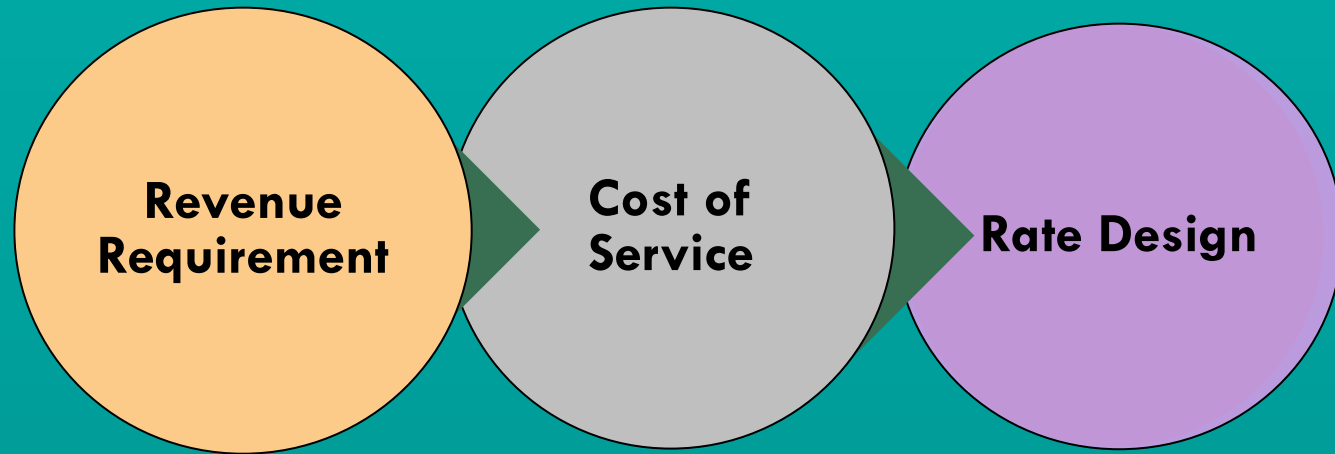


COST-BASED RATEMAKING IS INTENDED TO SUPPORT 3 KEY OBJECTIVES FOR UTILITIES

- Provide sufficient funding to build, operate, maintain and reinvest
- Provide safe and reliable drinking water and fire protection
- Allow for economic development and community sustainability



THREE PRIMARY STEPS OF RATE MAKING



Compare revenue with operating and capital costs

Identify differences in costs to serve each of the customer classes

Consider level and structure of rate design for each class of service





Mahalo!

BOARD OF WATER SUPPLY

WWW.BOARDOFWATERSUPPLY.COM





IMPACT OF RED HILL SHAFT FUEL CONTAMINATION ON BOARD OF WATER SUPPLY

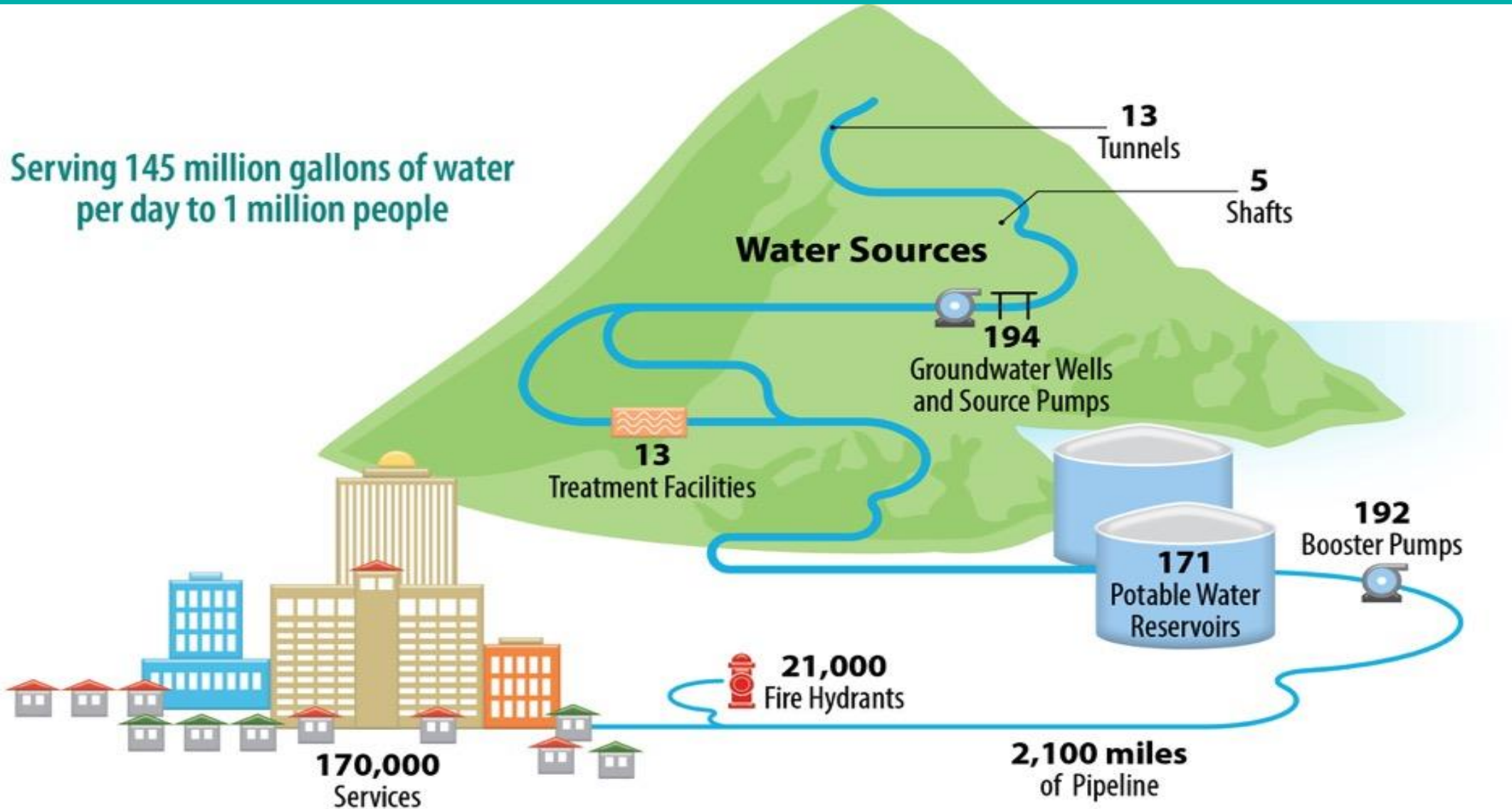
boardofwatersupply.com

WAIWAI – MEANS WEALTH

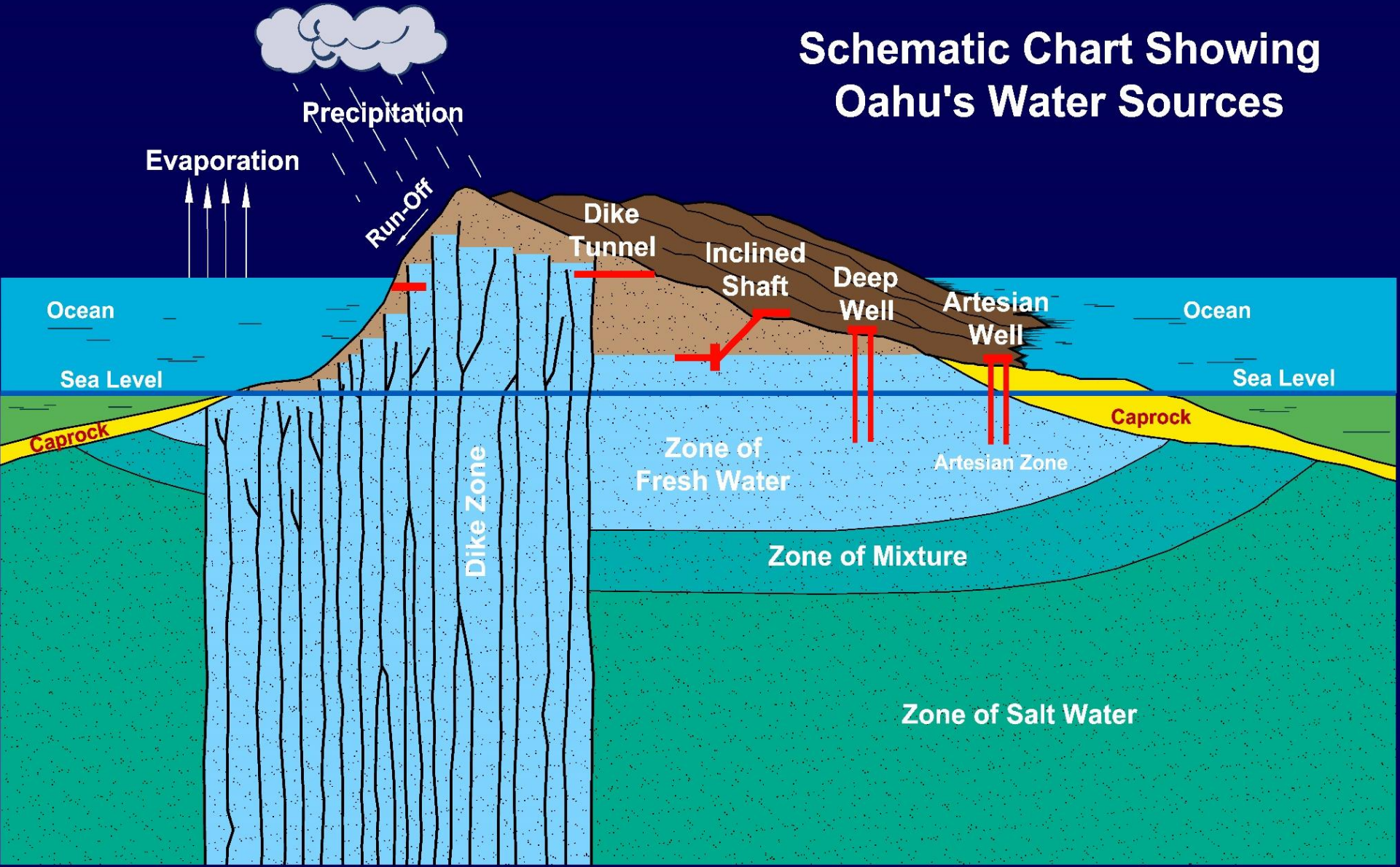
- Water was viewed as a source of wealth for Hawaiians.
- This has not changed since the early days of the Polynesian settlement of Hawai'i.
- Pure, fresh water enriches all of us.
- We must take care of our water supply. It is essential to our survival.



OUR WATER SYSTEM IS LARGE AND COMPLEX



Schematic Chart Showing Oahu's Water Sources



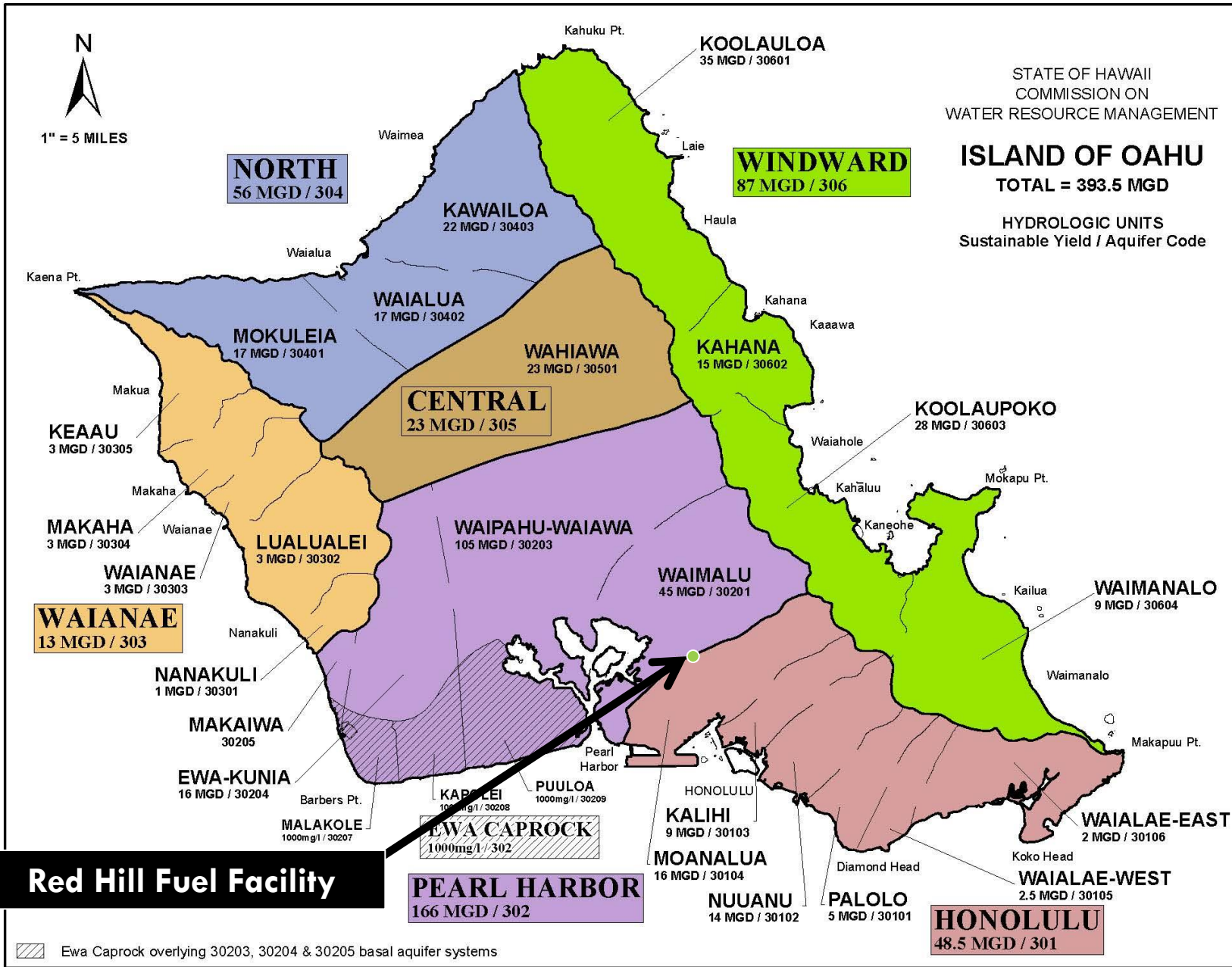
OAHU'S GROUNDWATER BODIES AND CAPROCK

- 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

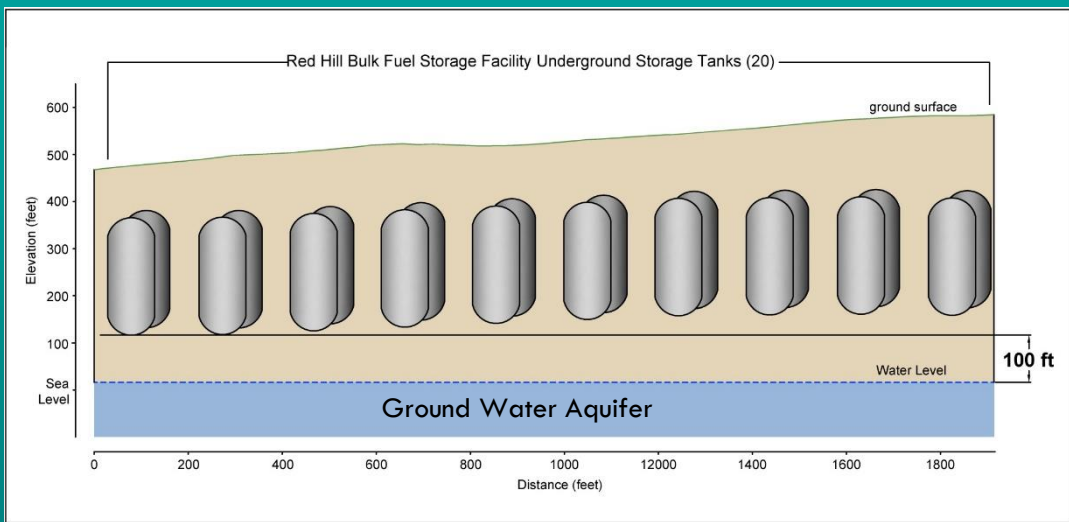




Red Hill Fuel Facility

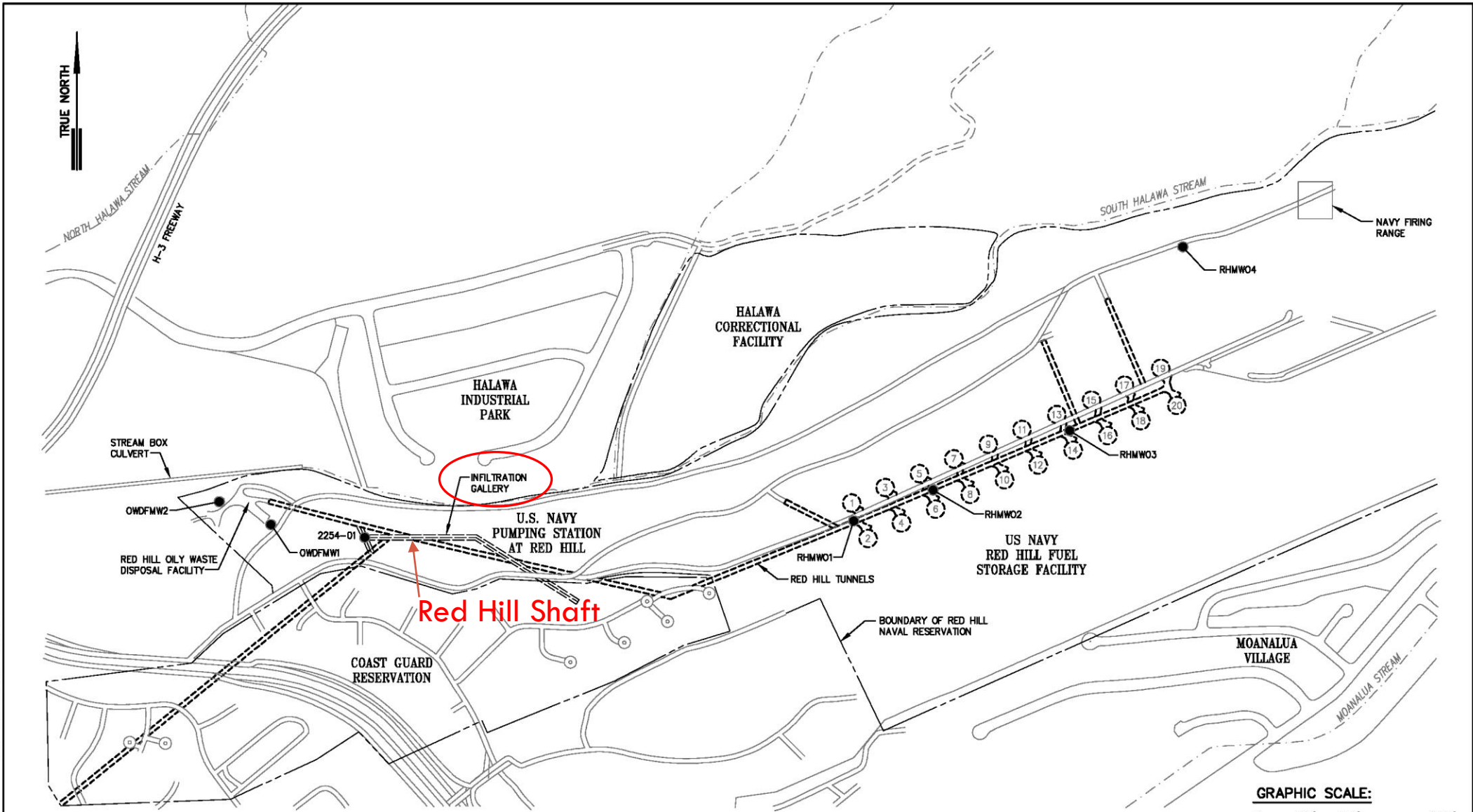
▨ Ewa Caprock overlying 30203, 30204 & 30205 basal aquifer systems





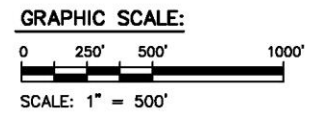
- Twenty tanks sitting on end connected by an upper and lower access tunnel.
- Constructed from 1940 to 1943.
- Each tank is 250 feet high and 100 feet in diameter.
- 12.5 million gallon capacity per tank.
- Concrete with $\frac{1}{4}$ inch steel liner. (Lower dome base is $\frac{1}{2}$ inch)
- Facility 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.**





DATE: 06/12/10
 SCALE: 1" = 1000'
 FILE: 2008014-FIG-14

PTH
 OPER: FAI
 REVISED: -





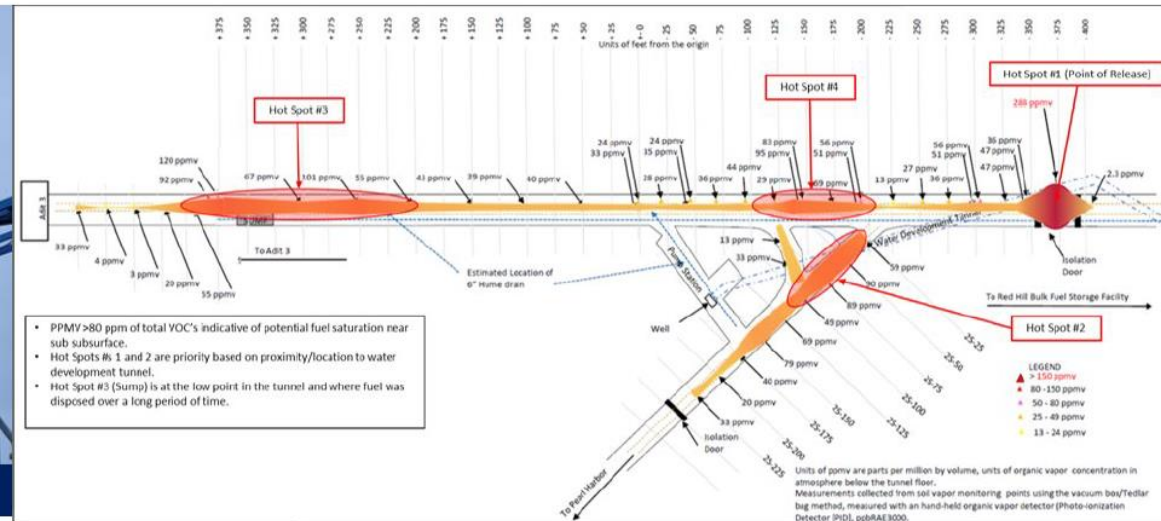
Aquifer Recovery and Remediation

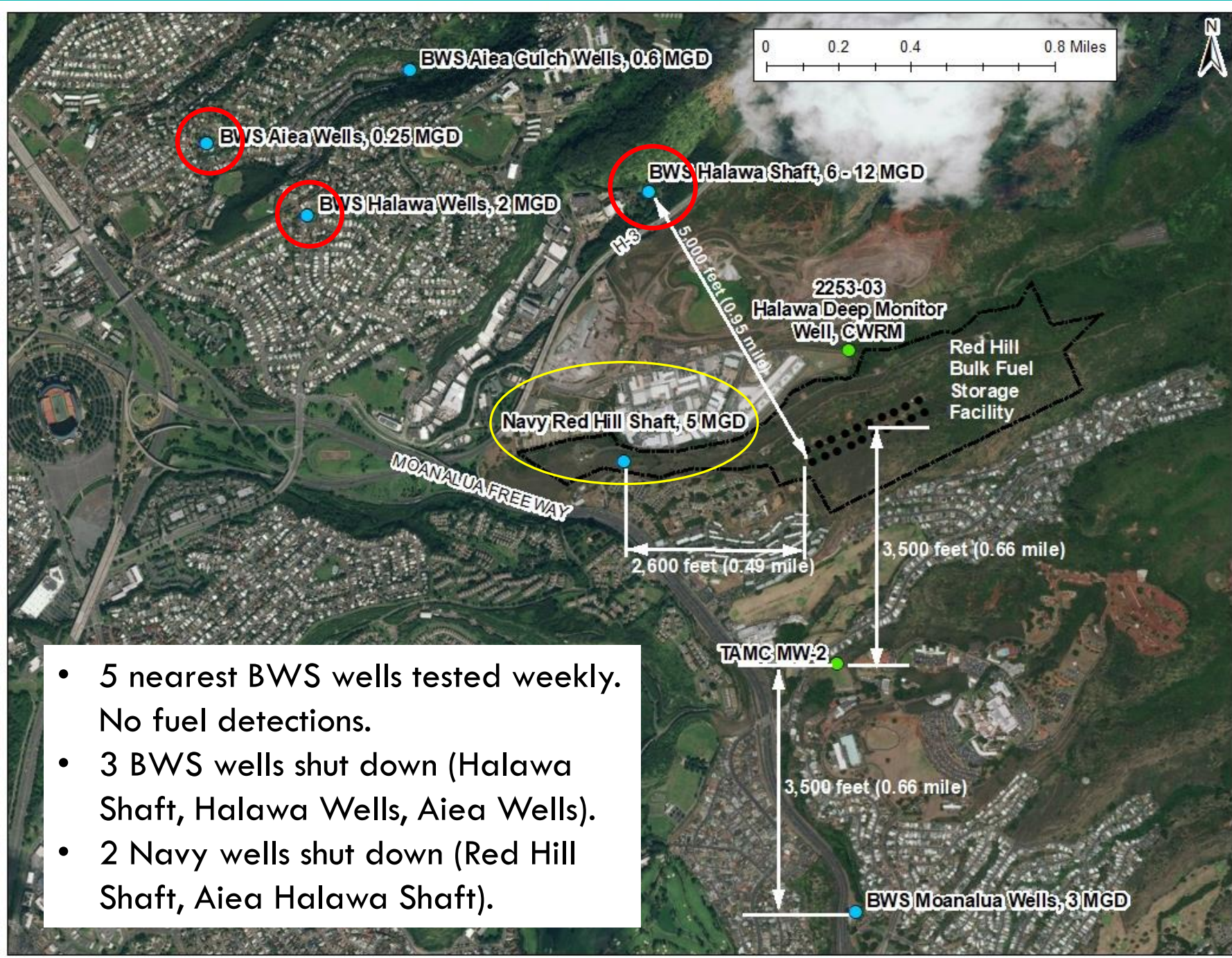
Aquifer Recovery and Remediation

1. Release Investigation, Response, and Characterization
2. Product Recovery from Red Hill Shaft Well
3. Groundwater Capture Zone
4. Future Remediation Actions



Contractor Filling Media Into GAC Tanks





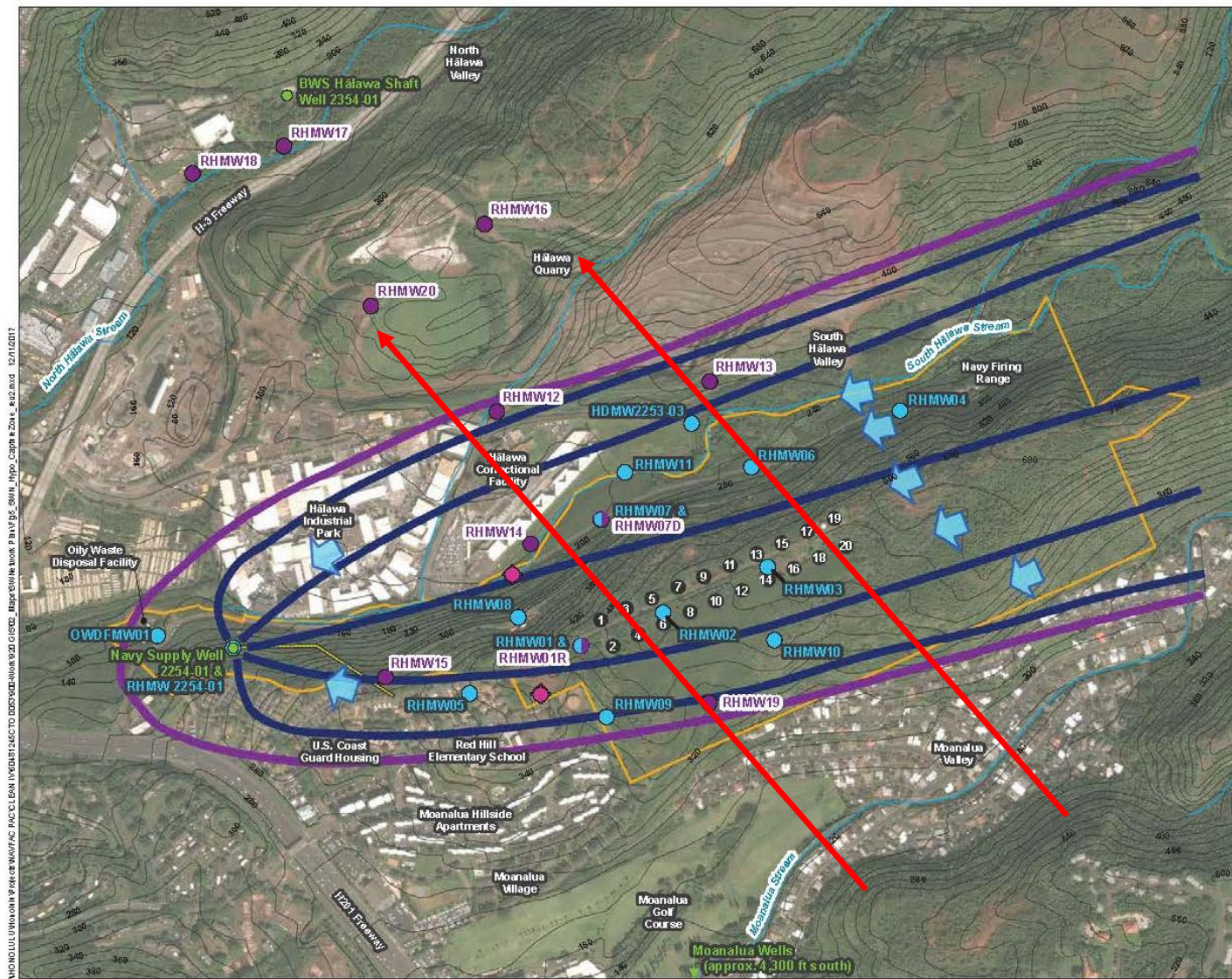
- 5 nearest BWS wells tested weekly. No fuel detections.
- 3 BWS wells shut down (Halawa Shaft, Halawa Wells, Aiea Wells).
- 2 Navy wells shut down (Red Hill Shaft, Aiea Halawa Shaft).



BWS REVIEW – GW FLOW

Navy presents that there is no GW flow from Red Hill to any BWS wells and that Red Hill Shaft captures all groundwater flow from beneath the tanks.

BWS: Pumping test data from 2017-18 show water level changes across the valleys. EPA and DOH have asked the Navy to look at this stating some of the field data contradict Navy interim groundwater model flow paths.



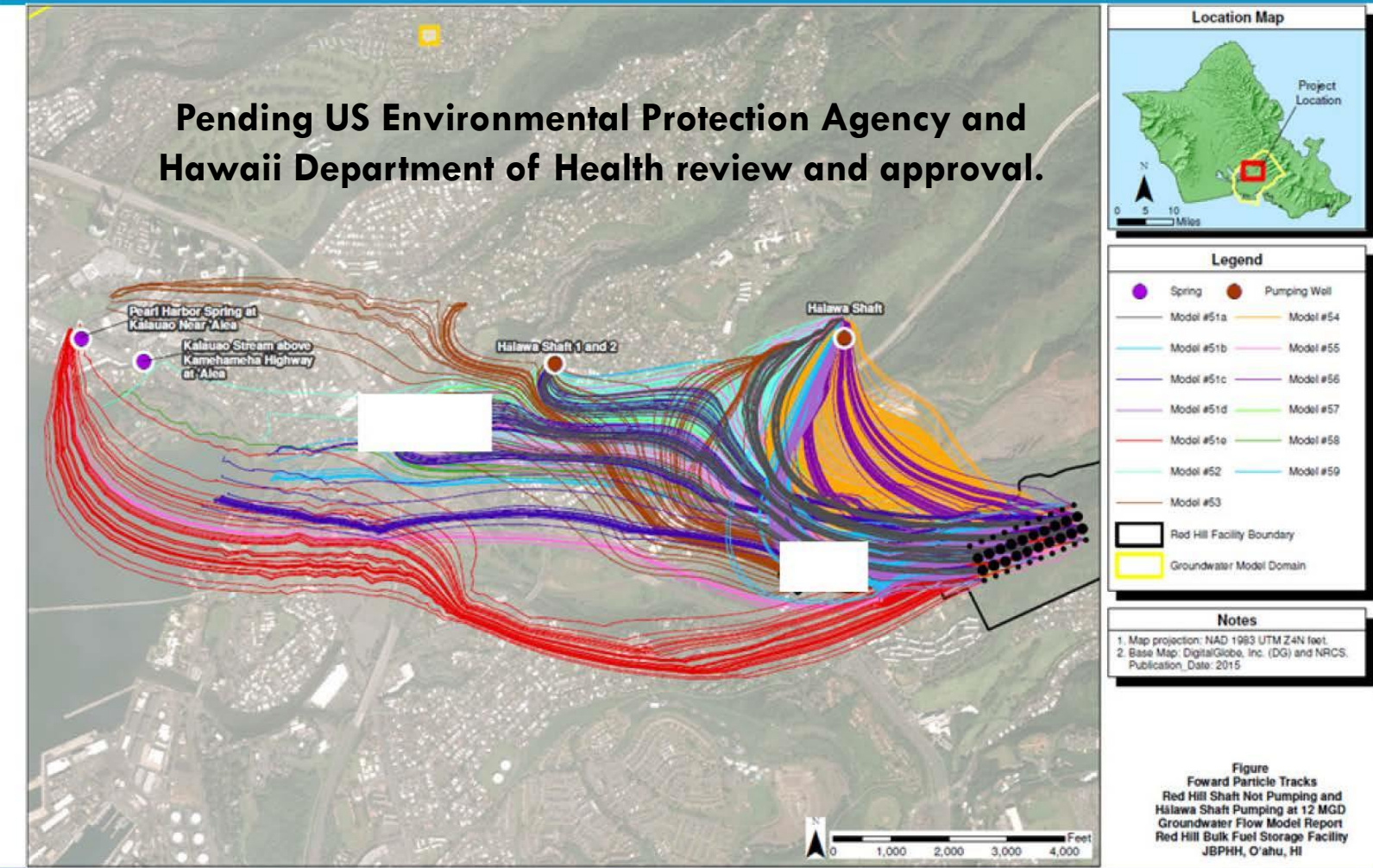
Ref. Sentinel Well Network Development Plan, Red Hill Bulk Fuel Storage Facility, Dec. 11, 2017

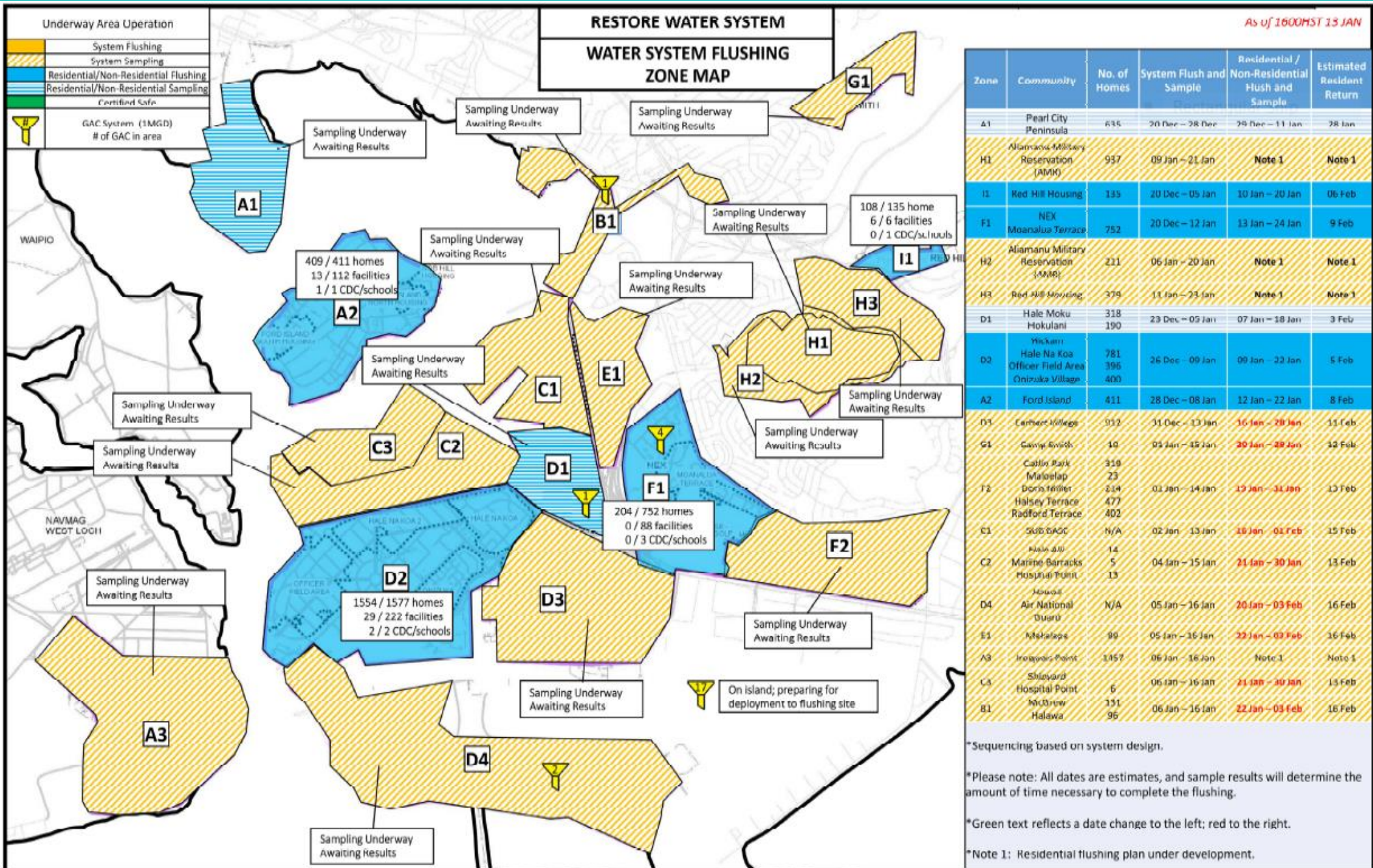


Forward Particle Tracking from All Models with Red Hill Shaft Off and Halawa Shaft Pumping at 12 mgd



- Navy groundwater model of cross valley flow







Drinking Water Distribution System Recovery Plan

www.cpf.navy.mil/jointbasewater | www.dvidshub.net/feature/safewaters

Water distribution flushing

Initiation of GAC filtration of residential water mains prior to discharge into storm drains or overland.



Stage 1

What to expect

- Water discoloration.
- Drop in water pressure.

Best Practices

Water only for showering, bathing, and toilet flushing.

Recommend not washing white clothing until system flush completes.

Residence system flushing

Water samples taken and results evaluated.



Stage 2

Team members visit residence for flushing.



Stage 3

What to expect

- Notification no less than 48 hours before home flushing is scheduled to begin.
- Visitation by team members to residence for flushing operations lasting approximately 2 hours.

Water samples taken from selected homes and results evaluated.



Stage 4

What to expect

- Water samples taken from a representative number of homes.

Best Practices

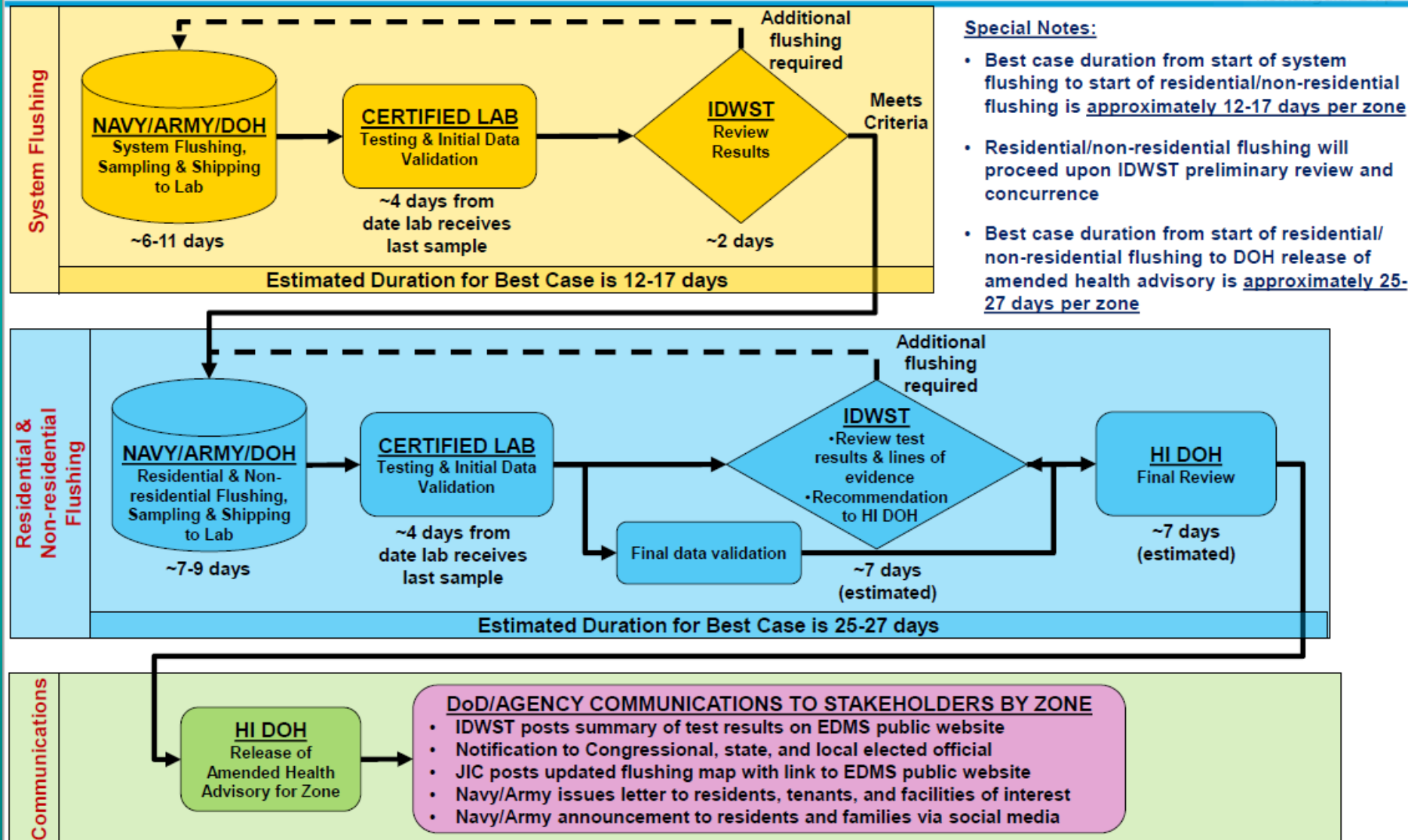
- Drinking water system & homes certified safe.
- Increased long-term drinking water monitoring.

Resident returns to home

Interagency experts review results and declare drinking water is fit for human consumption.



Process by Flushing Zone to Amend Health Advisory





HALAWA SHAFT

HALAWA

KAILUA

MAUNAWILI

KEOLU HILLS

SALT LAKE

KALIHI

KALIHI PUMP STATION

Honolulu International Airport

MANOA

WAIMANALO

MAKIKI

BERETANIA PUMP STATION

WILDER WELLS

MAUNALUA

SAND ISLAND

HONOLULU

KAIMUKI PUMP STATION

AINA HAINA

HAWAII KAI

WAIKIKI

DIAMOND HEAD

KOKO HEAD



©2021

NAVY RISK AND VULNERABILITY ASSESSMENT STUDY

- Greater than 27% probability of a sudden release of between 1,000 and 30,000 gallons of fuel each year
- Greater than 34% chance of a sudden release of more than 120,000 gallons of fuel in the next 100 years
- Greater than 5% probability of a sudden release of more than 1 million gallons of fuel in the next 100 years
- For chronic, undetected releases, the expected fuel release is 5,803 gallons per year (facility-wide)

[For example: 25 years x 5,803 gallons/year = 145,075 gallons released]



RECENT RED HILL RELEASES

- 72 releases reported in Red Hill AOC studies
- **January 2014** – 27,000 gallons from Tank 5
- **March 2020** – Fuel release from Kilo Pier pipelines at Red Hill.
- **May 2021** – Pressure surge releasing approximately 1,600 gallons of jet fuel from supply piping in the lower access tunnel (19,000 gallons??).
- **September 2021** – Navy shut down Red Hill facility for 9 days without informing the DOH due to pressure surges in a pipeline.
- **November 2021** – 14,000-gallon fuel water mixture release in lower access tunnel quarter mile downgradient from Red Hill Shaft (related to May event??)



WATER CONTAMINATION AT JBPHH HOUSING

- Nov. 28 – Navy shuts down Red Hill Shaft in response to complaints of fuel odor in tap water from JBPHH housing residents
- Nov. 30 – BWS reduces Halawa Shaft pumpage to 5 mgd in response to Red Hill Shaft shut down
- Dec. 2 – Navy determines petroleum contamination in Red Hill Shaft as the cause of fuel odor in tap water.
- Dec. 2 – BWS shuts down Halawa Shaft in response to Navy announcement
- Dec. 8 – Navy announces detecting 920 ppb TPH-d at Navy's Aiea Halawa Shaft.
- Dec. 8 – BWS shuts down BWS Halawa Wells and Aiea Wells



DOH EMERGENCY ORDER TO NAVY ON 12/6/21

- Immediately suspend operations including fuel transfers at Red Hill
- Install a drinking water treatment system at Red Hill Shaft
- Within 30 days submit a workplan and implementation schedule to assess the Facility operations and system integrity to safely defuel the tanks. Upon receiving DOH approval of the workplan, make the necessary repairs and changes in operations to address any deficiencies identified in the assessment
- Within 30 days of completing the required corrective actions, defuel the tanks. Any refueling subject to DOH approval.

STATE OF HAWAII
DEPARTMENT OF HEALTH
SOLID AND HAZARDOUS WASTE BRANCH
UNDERGROUND STORAGE TANK SECTION

EMERGENCY ORDER

TO: THE UNITED STATES DEPARTMENT OF THE NAVY, c/o REAR ADMIRAL TIMOTHY KOTT, COMMANDER NAVY REGION HAWAII, 850 Ticonderoga St., Suite 110 JBPBH, Hawaii 96860-5101, Respondent.	Docket No. 21-UST-EA-02 Re: Emergency Change-In-Service and Defueling of 20 Underground Storage Tanks, Red Hill Bulk Fuel Storage Facility
--	--

This Emergency Order ("EO") is an administrative action initiated pursuant to chapters 91 and 342L of the Hawaii Revised Statutes (HRS) and chapters 11-1 and 11-280.1 of the Hawaii Administrative Rules (HAR) by the DEPARTMENT OF HEALTH (the "Department") against THE UNITED STATES DEPARTMENT OF THE NAVY, c/o ADMIRAL TIMOTHY KOTT, COMMANDER NAVY REGION HAWAII (the "Respondent") and is based upon recent impacts on the Respondent's drinking water system incident to the operation of the Red Hill Bulk Fuel Storage Facility (the "Facility"). Respondent is the owner and operator of the Facility. This EO concerns only the issues identified herein and does not function to preclude or limit actions by any public agency or private party. The Department reserves the right to bring other actions as may be necessary to protect public health and the environment.

I. AUTHORITY AND BACKGROUND

Statutes/Rules	Section 342L-9, HRS , states that: "§342L-9 Emergency powers; procedures. (a) Notwithstanding any other law to the contrary, if the governor or the director determines that an imminent peril to human health and safety or the environment is or will be caused by: (1) A release; (2) Any action taken in response to a release from an underground storage tank or tank system; or (3) The installation or operation of an underground storage tank or tank system; that requires immediate action, the governor or the director, without a public hearing, may order any person causing or contributing to the peril to immediately reduce or stop the release or activity, and may take any and all other actions as may be necessary. The order shall fix a place and time, not later than twenty-four hours thereafter, for a hearing to be held before the director. (b) Nothing in this section shall be construed to limit any power which the governor or any other officer may have to declare an emergency and act on the basis of such declaration, if such power is conferred by statute or constitutional provision, or inheres in the office."
----------------	--



SUMMARY

- BWS shut down BWS Halawa Shaft, Aiea Wells and Halawa Wells in response to Navy announcement of petroleum contamination at Navy Red Hill Shaft and distribution system sample point near Aiea Halawa Shaft.
- Continued storage of Red Hill fuel above the aquifer endangers the resource from further contamination.
- Immediately relocate the fuel away from the aquifer.



QUESTIONS / DISCUSSION





PROTECTING WAI FOR WAI'ANAE

*Groundwater management area designation
January 20, 2022*

boardofwatersupply.com

Wai`anae Groundwater Management Area Designation

- Hawai`i Water Law History Background
- Some Key Water Issues in Wai`anae
- What is the BWS Proposing?
- Why was Wai`anae not Designated?
- What Happens if Wai`anae is Designated?
- Some Community Questions so Far



Hawai`i Water Law History Background

- **Ancient times – Māhele (1848 – 52)**
- **Rise of the Plantations – Early Statehood (1852 – 1973)**
- **The “McBryde” cases, ConCon, and the Water Code (1973 - 87)**



Hawai`i Water Law History Background

- **The Water Code (1987)**
- **Determine “Hydrologic Units”**
- **Set “Sustainable Yields”**
- **Management in “Designated” and undesignated areas**

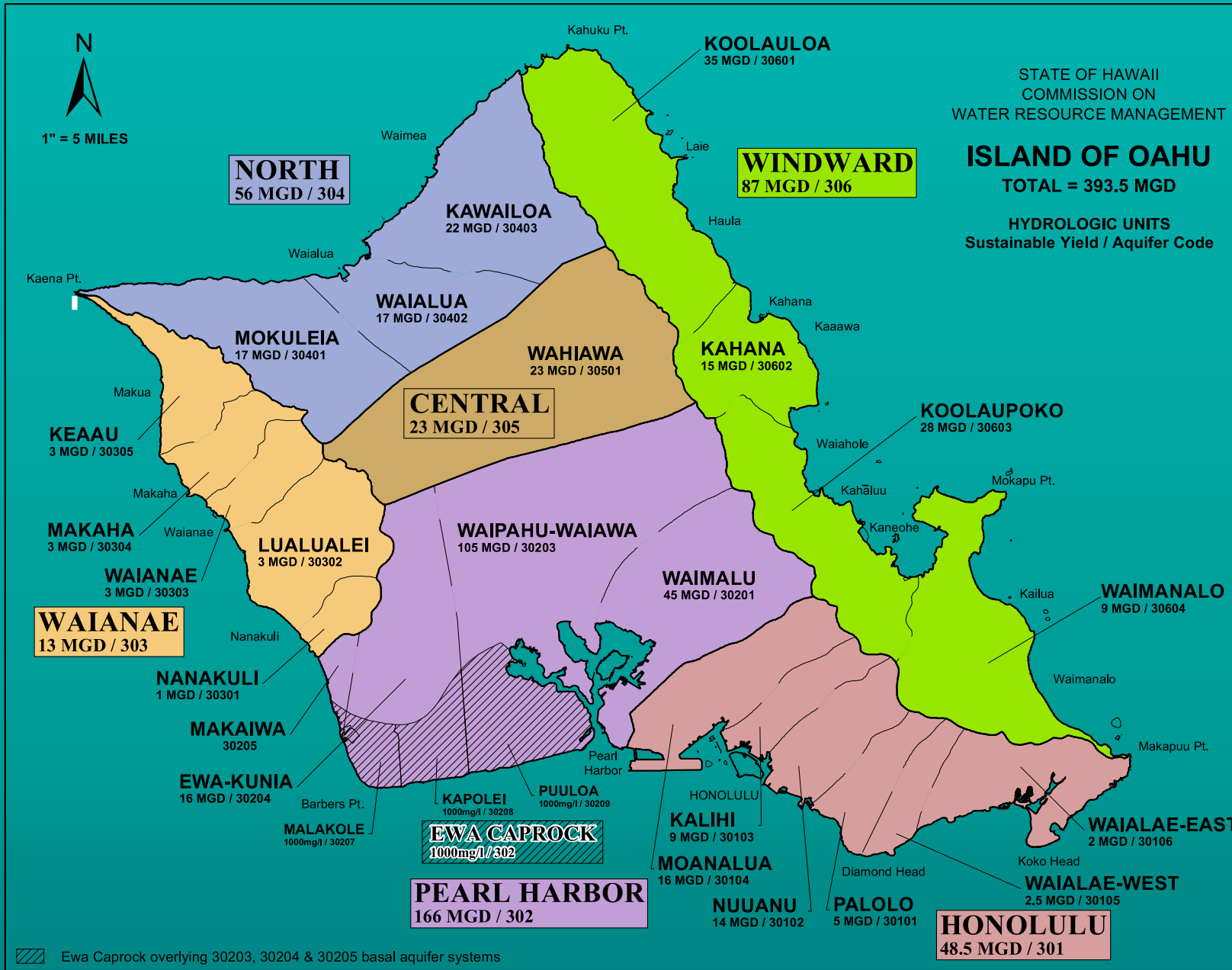


Permits in Non-Designated vs. Designated Areas

Undesignated Areas	Designated Areas
Well Construction Permit	Well Construction Permit
Pump Installation Permit	Pump Installation Permit
	Water Use Permit*

* Water Use Permit Applications have public notice and process requirements

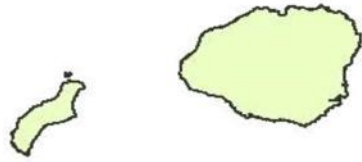




WATER MANAGEMENT AREAS

FOR GROUND WATER ONLY

 Water Management Areas



ISLAND OF OAHU

- North Sector
- Windward Sector
- Honolulu Sector
- Pearl Harbor Sector
- Central Sector



ISLAND OF MOLOKAI

- West Sector
- Central Sector
- Northeast Sector
- Southeast Sector



ISLAND OF MAUI

- Iao System



STATE OF HAWAII
Department of Land and Natural Resources
Commission on Water Resource Management



WHY NOT WAI`ANAE?

- **1961: Groundwater Use Act, HRS chap. 177**
- **1979-82: Pearl Harbor, Honolulu, & Waialua groundwater designated under older Act**
- **1987 Water Code enacted**
- **1988: Petition to designate Windward O`ahu; granted in 1992**
- **No one has petitioned to designate Wai`anae**
- **CWRM has not started the process either**



Some Key Water Issues in Wai`anae

- **Demand exceeds supply → water imports**
- **Climate Change (which can increase demand and decrease supply)**
- **Streamflow and watershed restoration**



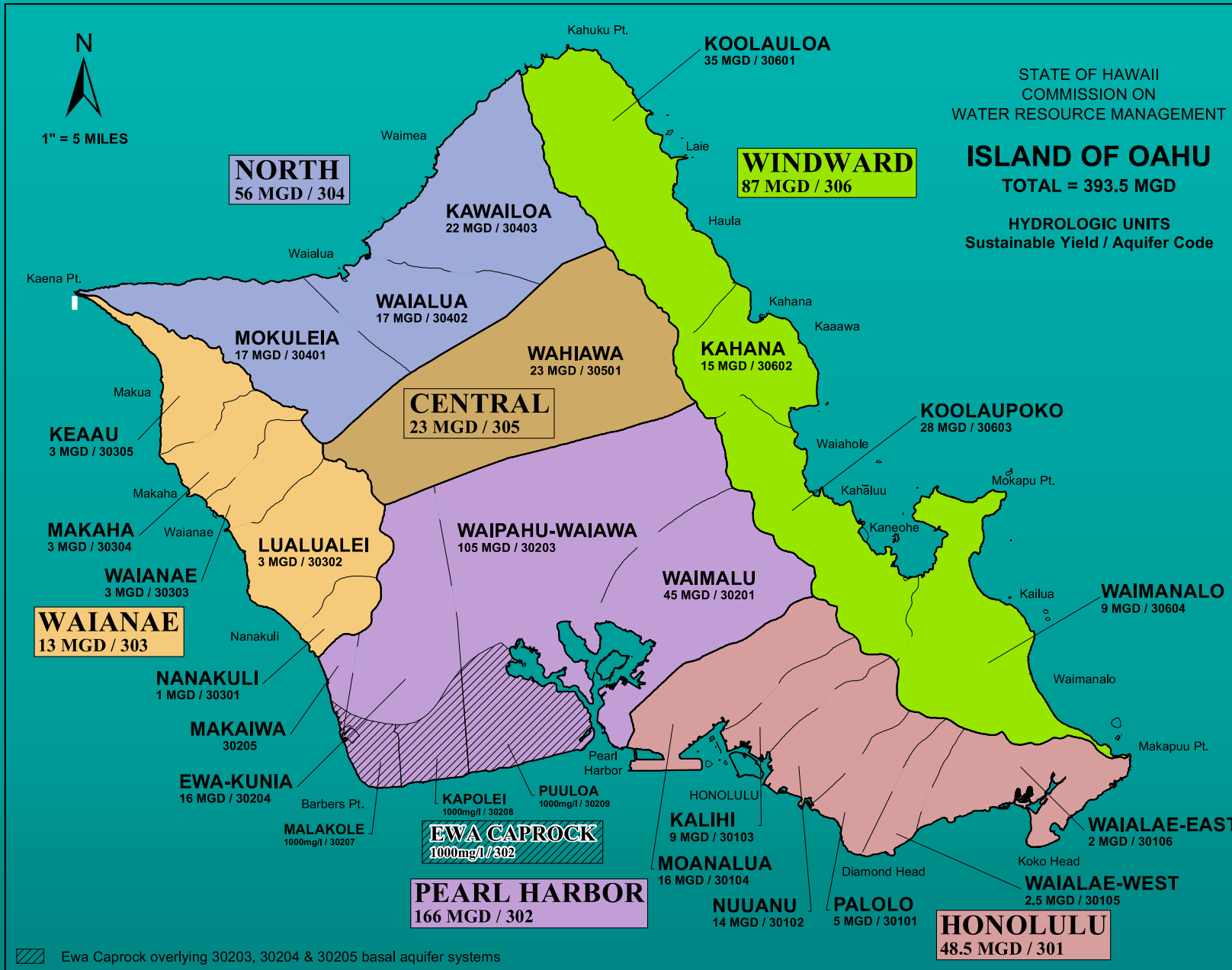
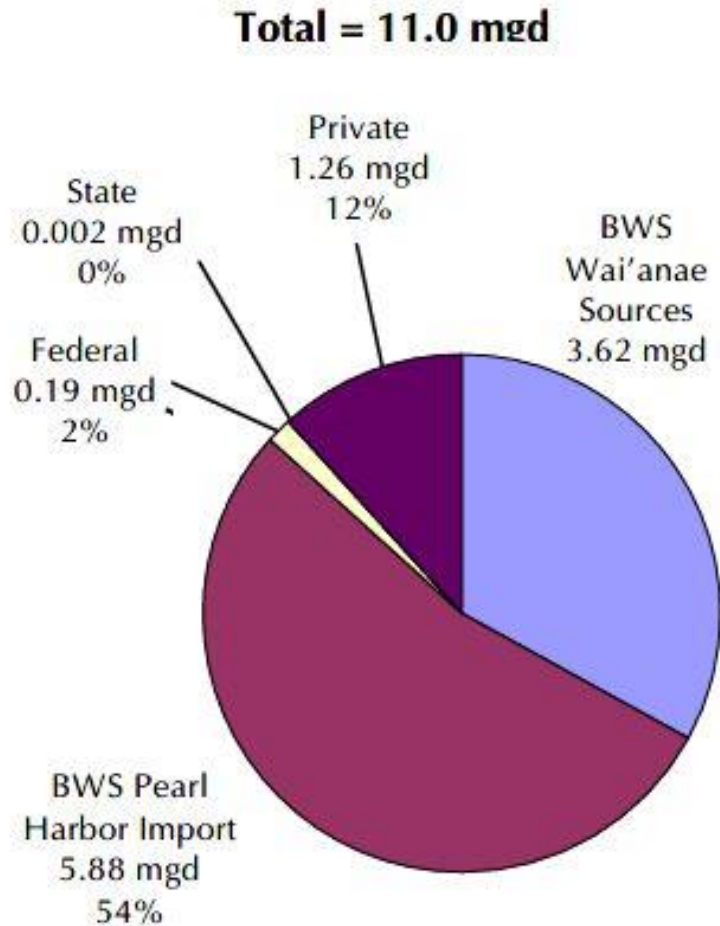


FIGURE 3-1
ESTIMATED WAI'ANAЕ WATER
CONSUMPTION BY WATER
INFRASTRUCTURE OWNER
(CY 2004)



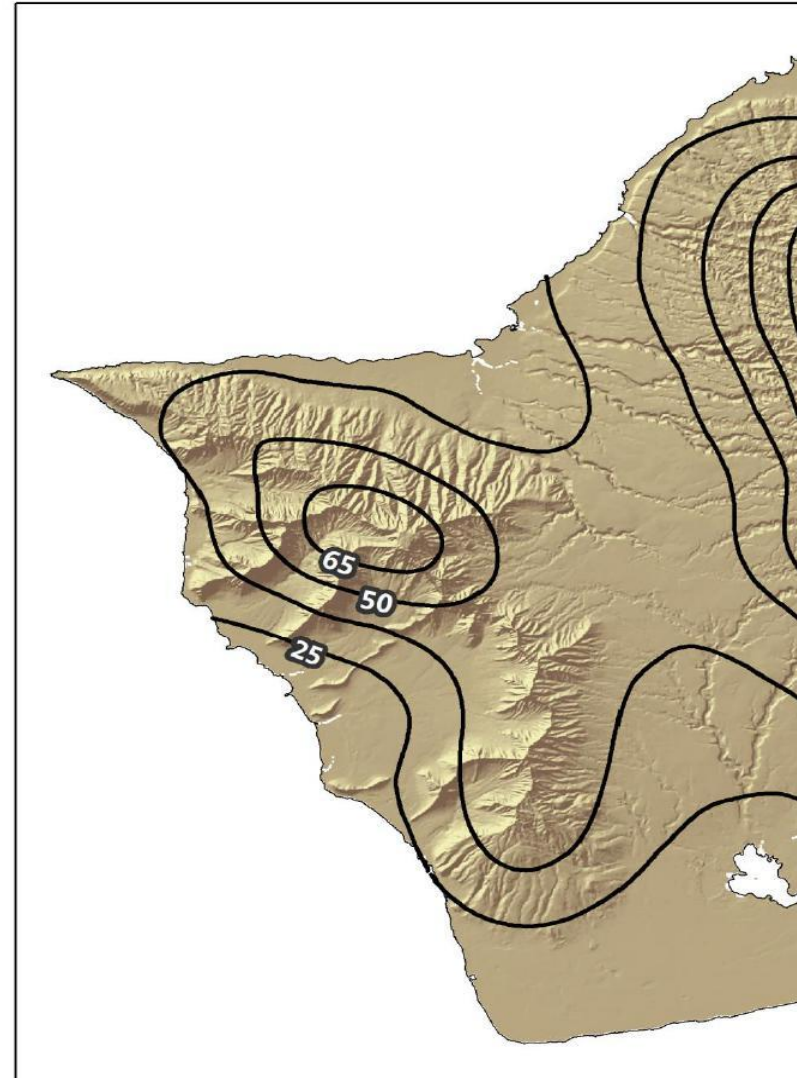
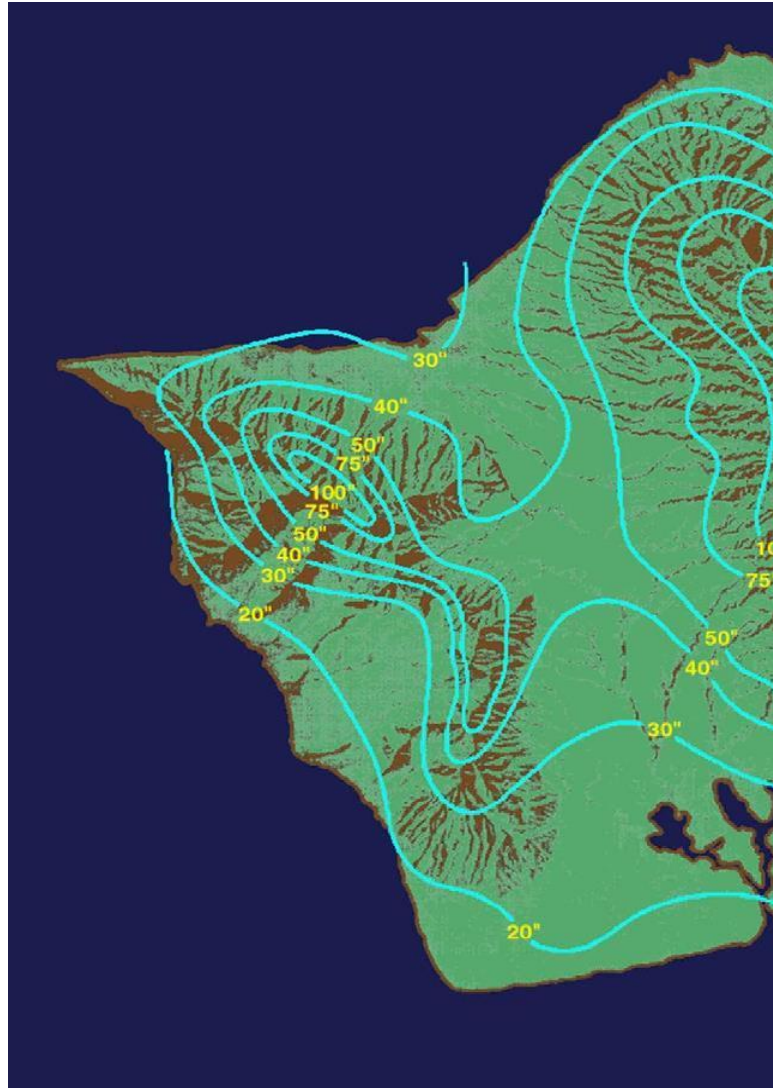
More than 1/2
of Wai'anae
water is
imported from
the Pearl
Harbor Aquifer
Sector



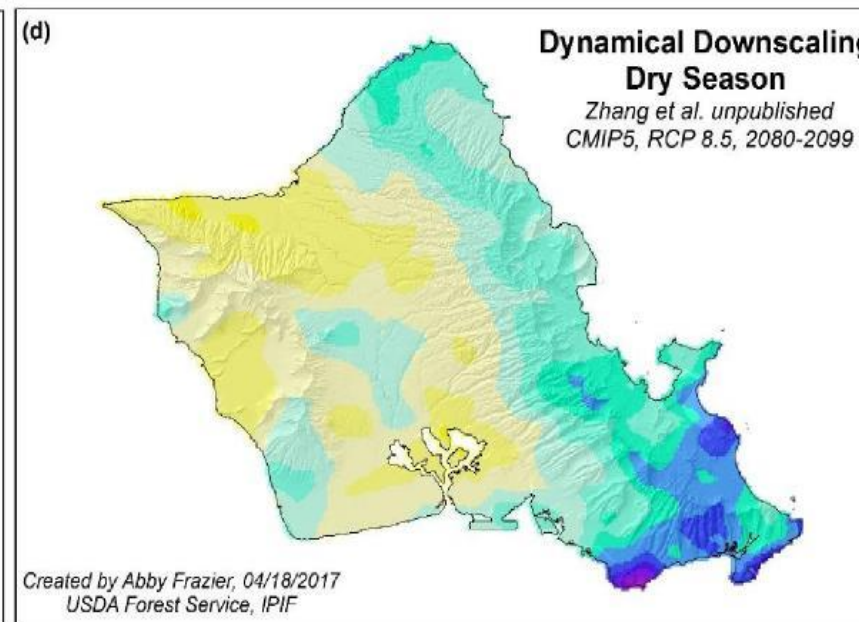
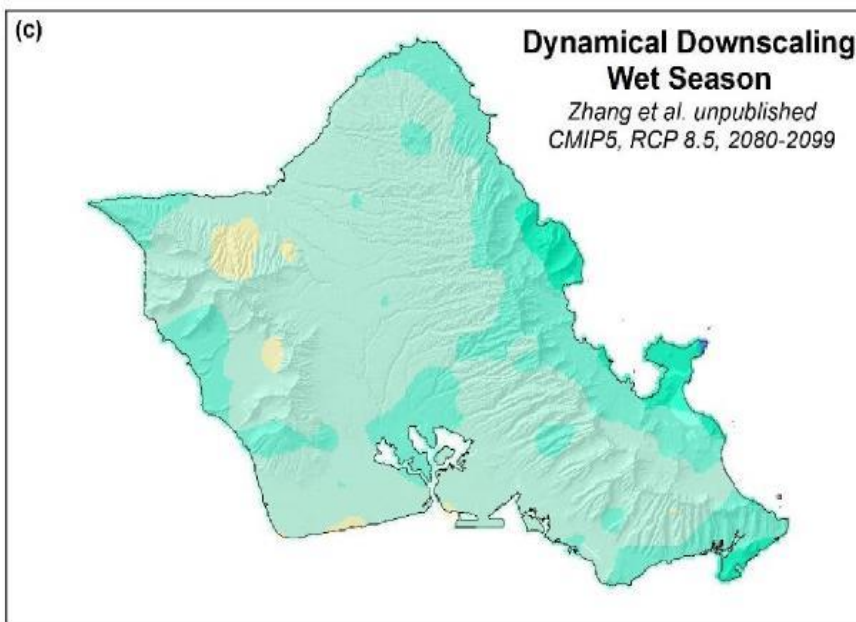
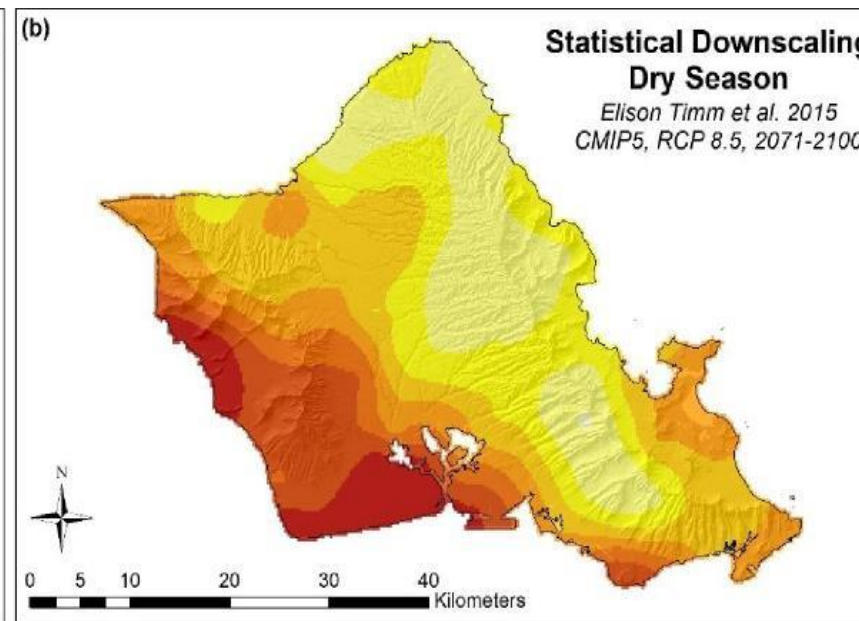
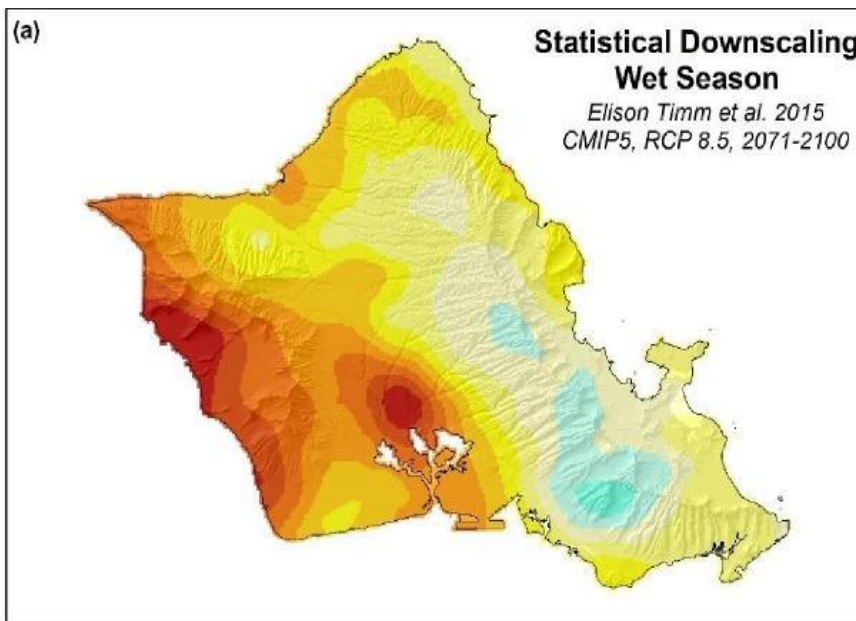
WATER USE DISTRICTS		SUBTOTAL	IMPORT	EXPORT	EFFECTIVE WATER DEMAND
1	HONOLULU	64.22	0.02	-	64.24
2	WINDWARD	13.13	-	0.02	13.11
3	NORTH SHORE	3.94	-	-	3.94
4	MILILANI	4.99	-	-	4.99
5	WAHIAWA	3.09	-	-	3.09
6	PEARL CITY-HALAWA	8.41	-	-	8.41
7	WAIPAHAU-EWA	37.07	-	6.24	30.83
8	WAIANAE	3.27	6.24	-	9.52
TOTAL:		138.11	6.26	6.26	138.11



Mean Annual Rainfall has decreased in Waianae 1970's – 2011 from 100" to 65"



Wetter = "Best Case" Drier = "Worst Case"



A photograph of a stream flowing through a lush forest. The water is clear and reflects the surrounding greenery. The stream is surrounded by large rocks and fallen leaves. A semi-transparent white rectangular box is overlaid on the center of the image, containing text.

WHAT IS THE BWS PROPOSING?

Designation of the Wai`anae Aquifer

Sector as a GWMA



DESIGNATION REQUIREMENTS AND CRITERIA

OVERALL: If the resources in an area *may be* threatened, the commission shall designate.

- 1. Planned use 90% of the sustainable yield**
- 3. Diminishing ground water supply**
- 7. Serious disputes over ground water use**



LEGAL TRIGGERS FOR DESIGNATION

- **Wai‘anae aquifer production meets the 90% criteria**
- **While BWS decreased Mākaha source production in 2020, authorized planned use in Mākaha could increase pumpage to 90% of sustainable yield.**
- **Climate change is impacting groundwater levels and stream flows**



WHAT HAPPENS IF CWRM APPROVES DESIGNATION?

- **Non individual well users (BWS, Military, Ag, Golf Course) are required to prepare a Water Use Permit Application (WUPA) for each source, based on existing use.**
- **Existing water users have one year from the date of designation**
- **The permit application process is significant and permits can be challenged.**



QUESTIONS FROM COMMUNITY

- **Why is BWS the entity petitioning for Wai`anae?**
- **Why does BWS need the Water Commission's help to protect groundwater resources?**
- **Who benefits from water management area designation?**
- **I thought water was taken away from Wai`anae?**
- **Will designation restore streams?**





Jonathan Likeke Scheuer

jllscheuer@gmail.com

Bianca Kai Isaki

bianca.isaki@gmail.com

MAHALO!

Protecting Wai for Wai'anae

January 20, 2022

boardofwatersupply.com

STAKEHOLDER ADVISORY MEETINGS FOR 2022

- Thursday, April 21, 2022
- Thursday, July 21, 2022
- Thursday, October 20, 2022





Mahalo!

BOARD OF WATER SUPPLY

Stakeholder Advisory Group
Meeting 41
January 20, 2022

Providing safe, dependable, and affordable
drinking water, now and into the future.