
WATER FOR LIFE
Safe, dependable, and affordable water now and into the future
Board of Water Supply
Stakeholder Advisory Group
Board of Water Supply
City & County of Honolulu
Thursday October 24, 2019

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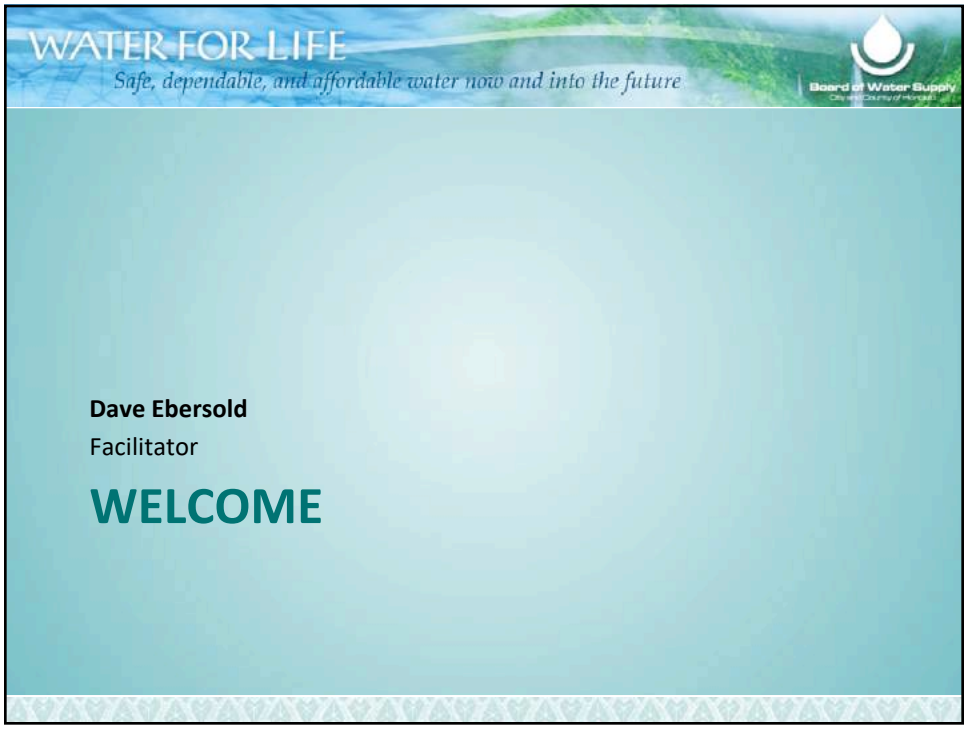
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Dave Ebersold
Facilitator
WELCOME

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Meeting Objectives

- Welcome new stakeholders
- Receive updates regarding the BWS
- Hear about recent Red Hill Fuel Tank news
- Accept notes from meeting 31
- Review the WMP Scorecard
- Input on the Ag WSFC
- Look back at what the Group has accomplished in 2019 and set priorities for 2020

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New Stakeholders

- Kelly Hoen, Outrigger Reef Waikiki Beach Resort

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Ernest Lau
BWS Water Quality Resources Manager
Erwin Kawata,
Water Quality Program Administrator

BWS UPDATES

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Mahalo! **Questions & Answers**

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Red Hill Bulk Fuel Storage Facility

Information Update

Stakeholder Advisory Group Meeting
October 24, 2019

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Today's Discussion

- Navy's Tank Upgrade Alternative (TUA) Decision Document for the Red Hill Bulk Fuel Storage Facility
- Examine the Navy's reasoning for its TUA selection
- Review the basis of the BWS comments to the TUA selection
- Red Hill UST permit status
- Fuel Tank Advisory Committee Meeting

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Requirements for a TUA Selection

- The Red Hill AOC requires the Navy to identify, evaluate TUA options and select a TUA "to prevent releases into the environment" (AOC SOW § 3).
- In a August 2019 letter, EPA and DOH made clear the TUA decision selected must "compare the relative environmental performance of each TUA alternative" and "demonstrate to the Regulatory Agencies' satisfaction that groundwater and drinking water resources will be protected".
- Hawaii Revised Statutes (HRS) § 342L-32(b)(1) also expressly provides that underground (fuel) storage tank (UST) systems "shall be … upgraded … and operated to prevent releases … for the operational life of the tank or tank system."

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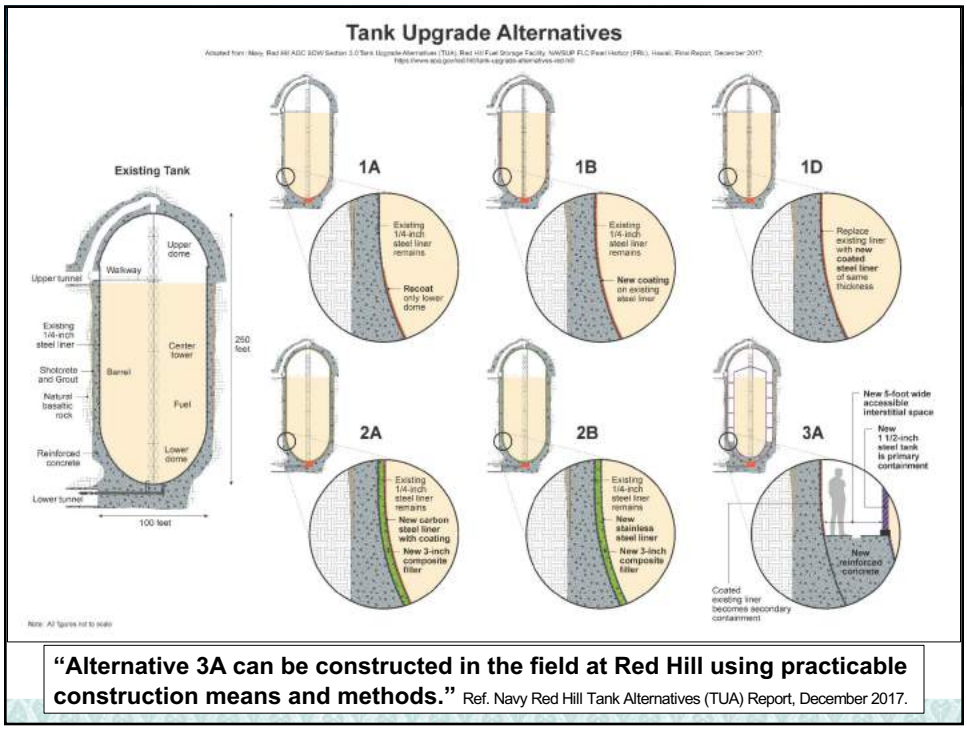

"Alternative 3A can be constructed in the field at Red Hill using practicable construction means and methods." Ref. Navy Red Hill Tank Alternatives (TUA) Report, December 2017.

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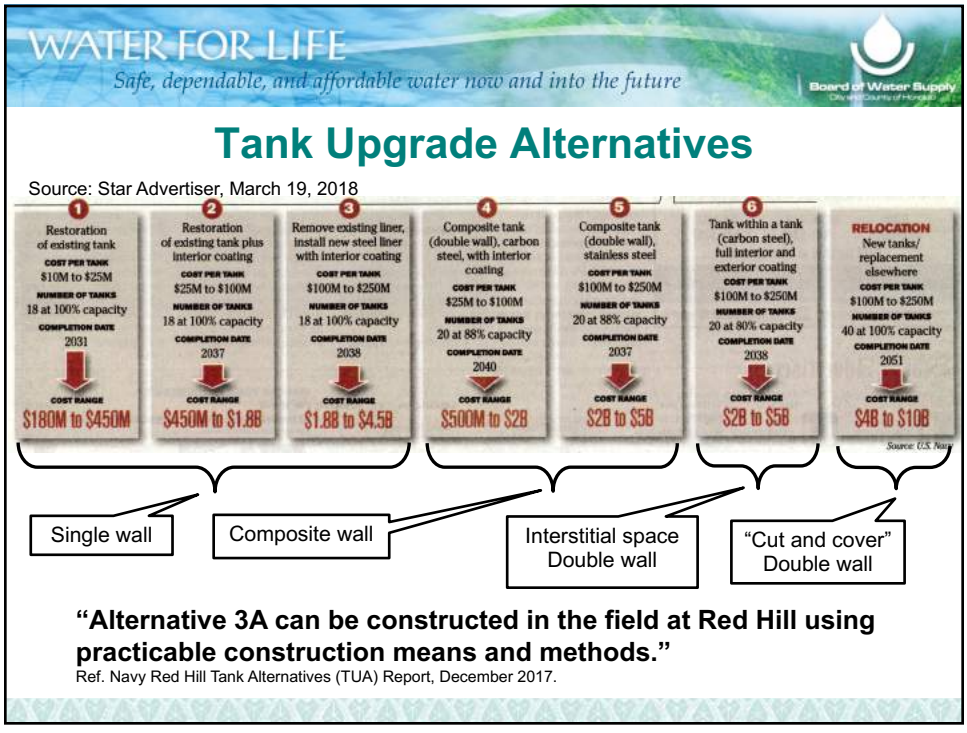

"Alternative 3A can be constructed in the field at Red Hill using practicable construction means and methods."
Ref. Navy Red Hill Tank Alternatives (TUA) Report, December 2017.

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Navy's TUA Selection

- Retain the existing single-walled tanks and current practices (TUA Option 1A)
- "Implement "double-wall equivalency" or removal of fuel in the 2045 timeframe"
- "Determine feasibility for the potential construction of a water treatment plant or equivalent engineering controls"
- Implement other improvements including among others installing permanent leak detection equipment, conduct soil vapor monitoring, apply epoxy coating to the tank lower domes, install eight additional monitoring wells and conduct a pilot project to consider fully coating tank barrels

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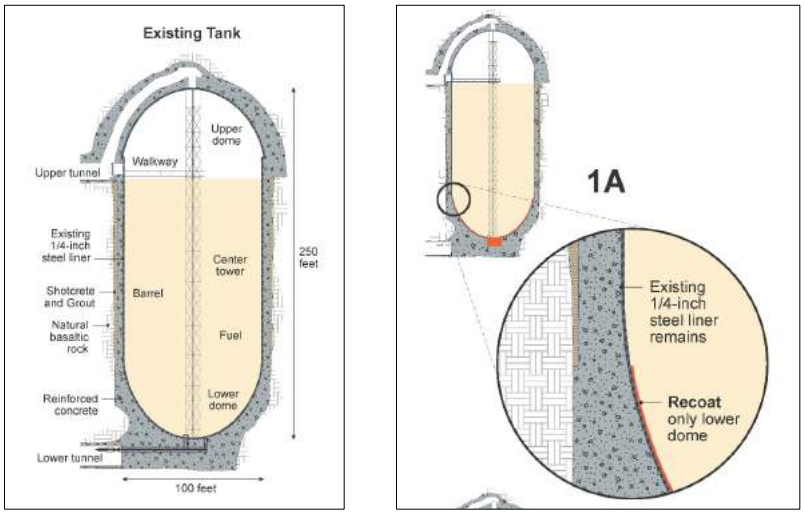
Existing Single-Wall Tank – Option 1A



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Navy Statements on its TUA Selection

"Navy/DLA considers alternative 1A along with all other additional improvements, controls and measures as the best level of environmental protection for all release scenarios."

"These measures thoroughly demonstrate Navy/DLA commitment to ensuring that safe drinking water from the Red Hill aquifer remains available to our military families and Oahu neighbors today and tomorrow."

Ref: Red Hill Bulk Fuel Storage Facility Administrative Order on Consent Tank Upgrade Alternatives and Release Detection Document and cover letter, NAVFAC Hawaii, September 2019.

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EPA and DOH Requesting Comments

- EPA and DOH invite interested parties and members of the public to review the Navy's TUA Decision Document and provide written comments
- EPA / DOH planning public hearing in November to solicit feedback prior to making a decision on the Navy's proposal
- Ultimately, EPA and DOH to decide whether or not to approve the Navy's TUA selection

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What is "Double-Wall Equivalency"?

- According to the Navy:
  - "Double wall equivalency" is its current work with enhanced leak detection, tank tightness testing, groundwater monitoring, soil vapor monitoring, and measuring the height of the fuel in each tank as layers of protection working together to *"provide redundant elements of detection and capture, equivalent to typical provisions of a 'double wall' solution."*
  - The Navy would also use a water treatment plant to create a "capture zone" around the Red Hill tank facility to prevent the spread of contamination to drinking water sources.

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Concern with "Double Wall Equivalency"

- The objective is to prevent releases from the tanks to the environment by keeping the fuel in the tanks as required by Hawaii law and the AOC
- Leak detection, tank tightness testing, and soil vapor monitoring merely detect and/or measure what is already released to the environment
- Navy's "double wall equivalency" relies upon a water treatment plant that does not exist and that the Navy has not committed to constructing nor proven that it works
- The Navy's reliance on a potential water treatment plant assumes the plant can treat for any amount of fuel released

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Navy Key Assumptions for TUA Choice

- After 1983, other than the 2014 release, available records indicate there have been no verified releases of fuel from Red Hill
- The 2014 release was caused by poor workmanship, ineffective quality control and quality assurance, and inadequate response procedures
- The Navy's nondestructive evaluation process is a reliable method for detecting corrosion in the tank liner
- In the unlikely occurrence of a major seismic event or other catastrophic release, all of the TUA options would perform in a similar manner

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Data Does Not Support TUA Selection

- 2014 Release is **NOT** the Only Release
  - Tank 6 in 2002 (Navy, 2002)
  - Tanks 15 and 16 after 1988 (Navy, 2014)
  - The groundwater data from 2005 to present show petroleum chemical contaminants in groundwater samples
  - 1988 Inspections on Tank 5, Tank 10, Tank 17, Tank 19, Tank 20 identified through-wall corrosion and therefore possibly leaks below the detection limit (Navy, 2016)
  - Petroleum staining found in cores taken before 2014 beneath 19 of 20 tanks (AMEC, 2002)
  - Navy's Red Hill Facility Groundwater Protection Plan (GWPP) report documents leaks from various tanks from 1940s – 1980s (Navy, 2008)

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Data Does Not Support TUA – cont.

- Steel liner samples collected from Tank 14 prove rusting (that leads to through-wall holes) is taking place on the side of the liner that cannot be inspected or maintained
  - Coating the interior surface of a tank does not stop corrosion from occurring on the back side of the liner
- Navy destructive testing report confirms:
  - Navy's nondestructive evaluation (NDE) method cannot accurately and reliably identify areas of the liner in need of repair before the next inspection
  - Navy's NDE both significantly overestimated (Samples 3 & 6) and underestimated (Samples 1 & 5) liner thickness
  - Navy's NDE only found 50% of the coupons in need of repair

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Data Does Not Support TUA – cont.

- Navy risk assessment prepared by ABS Consulting calculated:
  - 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]

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Data Does Not Support TUA – cont.

- The Navy does not have a groundwater model that has been approved by regulators
- DOH evaluation of groundwater flow paths indicates:
  - Navy groundwater model unable to reproduce water levels measured in the field
  - Data supports groundwater flow to the Northwest (toward Halawa Shaft)
  - Navy data does not support the existence of deep subsurface features (valley fills) that prevent groundwater flow toward Halawa Shaft, suggesting the feature is not as deep as the Navy claims
- The Navy groundwater model does not recognize that groundwater can also flow from Red Hill toward BWS Halawa Shaft

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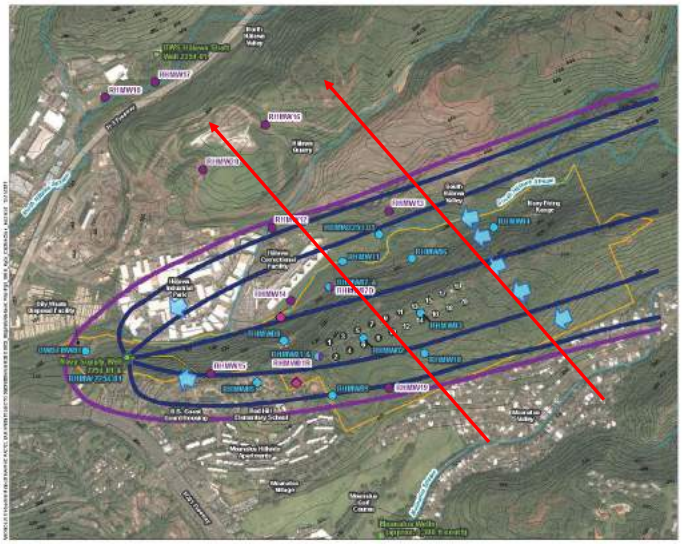
Navy presents that there is no GW flow from Red Hill to any BWS wells and that Red Hill Shaft captures all groundwater flow from beneath the tanks.

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

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Critical Analyses Not Yet Finished

- Navy's conceptual site model, groundwater flow, contaminant fate and transport, and planned additional phases of the risk/vulnerability assessment studies are not yet complete and have not been approved by EPA/DOH
- Experts in hydrogeology, metallurgy, risk and contaminant fate and transport do not support Navy's interpretation of existing data nor its use in making the selection
- If TUA decision must be made now in the absence of data then, TUA decision should be conservative and much more stringent than the status quo (precautionary principle)

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Oahu's Groundwater Aquifer

- Southern Oahu Basal Aquifer designated as a sole source aquifer by EPA on November 30,1987
- EPA has determined that the Southern Oahu Basal Aquifer is the sole or principal source of drinking water and, if contaminated, this aquifer would create a significant hazard to public health

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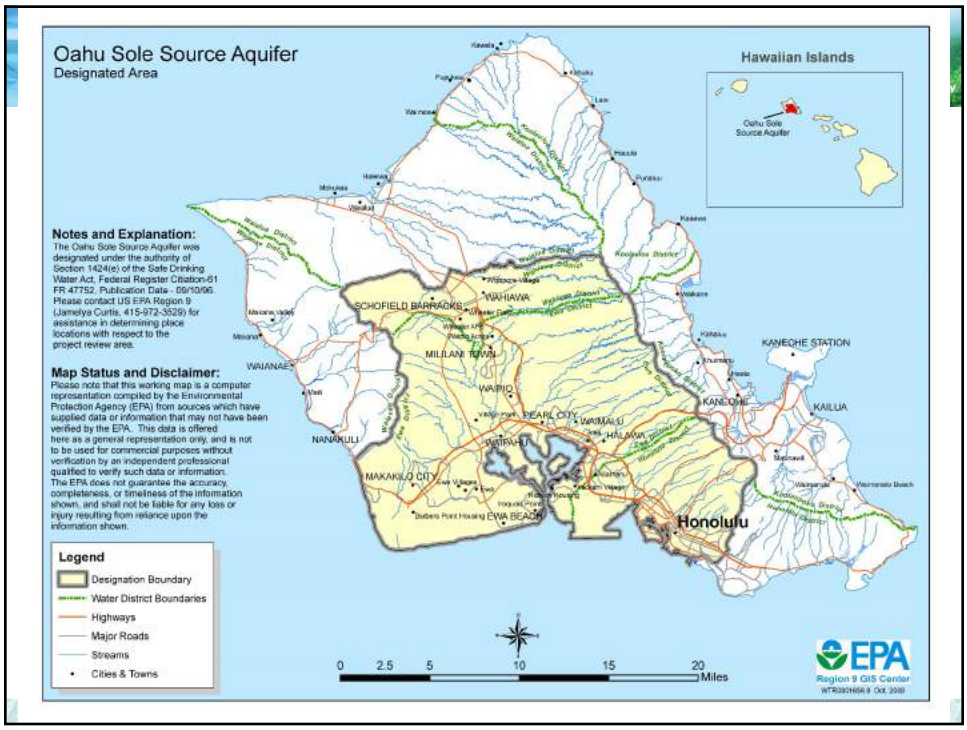
Oahu Sole Source Aquifer
Designated Area
Hawaiian Islands
Oahu Sole Source Aquifer
Notes and Explanation:
The Oahu Sole Source Aquifer was designated under the authority of Section 1424(e) of the Safe Drinking Water Act, Federal Register Citation-61 FR 47752, Publication Date - 09/10/96. Please contact US EPA Region 9 (Jamelya Curtis, 415-972-3529) for assistance in determining place locations with respect to the project review area.
Map Status and Disclaimer:
Please note that this working map is a computer representation compiled by the Environmental Protection Agency (EPA) from sources which have supplied data or information that may not have been verified by the EPA. This data is offered here as a general representation only, and is not to be used for commercial purposes without verification by an independent professional qualified to verify such data or information. The EPA does not guarantee the accuracy, completeness, or timeliness of the information shown, and shall not be liable for any loss or injury resulting from reliance upon the information shown.
Legend
Designation Boundary
Water District Boundaries
Highways
Major Roads
Streams
Cities & Towns
SCHOFIELD BARRACKS
WAHIAWA
MILILANI TOWN
WAIANAE
WAIPIO
PEARL CITY
WAIMALU
HALAWA
NANAKULI
MAKAKILO CITY
KANEOHE STATION
KANEOHE
KAILUA
Honolulu
0 2.5 5 10 15 20 Miles
EPA
Region 9 GIS Center

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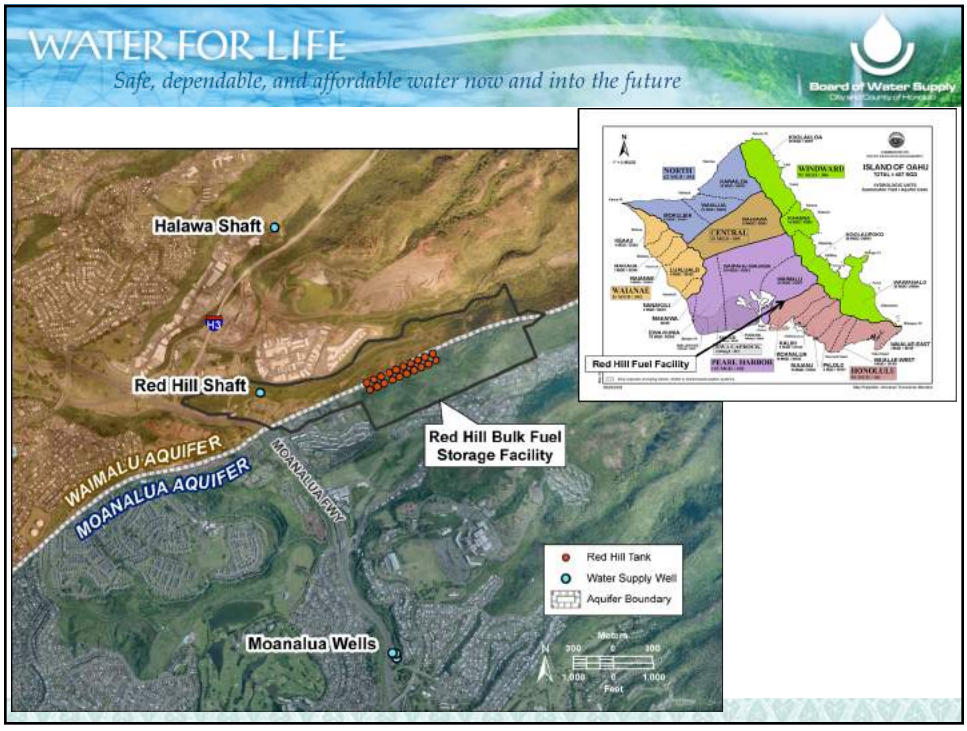
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Halawa Shaft
Red Hill Shaft
Red Hill Bulk Fuel Storage Facility
WAIMALU AQUIFER
MOANALUA AQUIFER
MOANALUA FWY
Moanalua Wells
Red Hill Tank
Water Supply Well
Aquifer Boundary
Meters
Feet
Red Hill Fuel Facility
ISLAND OF OAHU

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Oahu's Groundwater Aquifer – cont.

- Hawaii State Constitution, Article XI, Sections 1 and 7
  - The State and its political subdivisions shall conserve and protect Hawaii's natural beauty and all natural resources, including water
  - All public natural resources are held in trust by the State for the benefit of the people
  - The State has an obligation to protect the use of Hawaii's water resources for the benefit of its people
- There is no "Red Hill aquifer" available to "Oahu neighbors today and tomorrow"
- The aquifer is held in trust by the State <u>for the benefit of the people</u>

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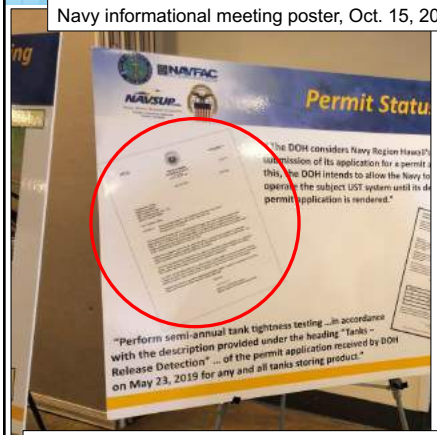
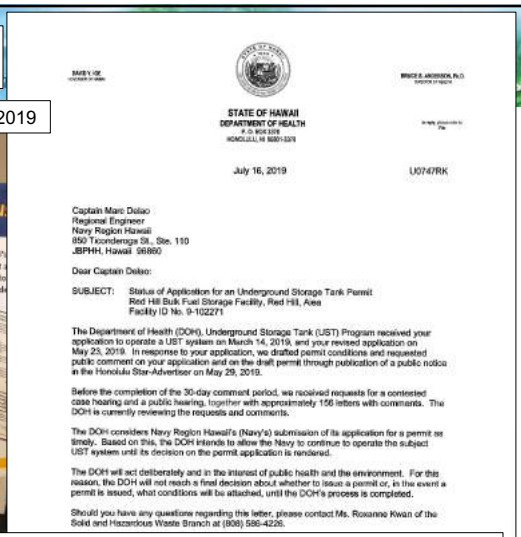
Red Hill UST Permit Status

Navy informational meeting poster, Oct. 15, 2019





STATE OF HAWAII
DEPARTMENT OF HEALTH

July 16, 2019 U0747RK

Captain Marc Delao
Regional Engineer
Navy Region Hawaii
850 Ticonderoga St., Ste. 110
JBPHH, Hawaii 96860

Dear Captain Delao:

SUBJECT: Status of Application for an Underground Storage Tank Permit
Red Hill Bulk Fuel Storage Facility, Red Hill, Aiea
Facility ID No. 9-102271

The Department of Health (DOH), Underground Storage Tank (UST) Program received your application to operate a UST system on March 14, 2019, and your revised application on May 23, 2019. In response to your application, we drafted permit conditions and requested public comment on your application and on the draft permit through publication of a public notice in the Honolulu Star-Advertiser on May 29, 2019.

Before the completion of the 30-day comment period, we received requests for a contested case hearing and a public hearing, together with approximately 156 letters with comments. The DOH is currently reviewing the requests and comments.

The DOH considers Navy Region Hawaii's (Navy's) submission of its application for a permit as timely. Based on this, the DOH intends to allow the Navy to continue to operate the subject UST system until its decision on the permit application is rendered.

The DOH will act deliberately and in the interest of public health and the environment. For this reason, the DOH will not reach a final decision about whether to issue a permit or, in the event a permit is issued, what conditions will be attached, until the DOH's process is completed.

Should you have any questions regarding this letter, please contact Ms. Roxanne Kwan of the Solid and Hazardous Waste Branch at (808) 586-4226.

"…the DOH intends to allow the Navy to continue to operate the subject UST system until its decision on the permit application is rendered."

"…the DOH will not reach a final decision about whether to issue a permit or, in the event a permit is issued, what conditions will be attached, until the DOH's process is completed." – Keith Kawaoka, Deputy Director of Environmental Health, July 16, 2019

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Fuel Tank Advisory Committee Meeting – Oct. 17, 2019

- Navy discussed the TUA decision document
  - Discrepancies between what Navy presented and what is in the TUA document
- Committee expressed concerns with the single wall TUA selection and Navy's ability to implement the improvements in the report
- DOH issued the Navy a letter dated July 16, 2019 allowing the Navy to operate Red Hill pending final review of the permit application
- Public testimony expressed concerns with the Navy's single wall TUA selection and low confidence with the Navy's ability to prevent further releases in the future.

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Questions/Discussion

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Action

Review and accept notes from

- Stakeholder Advisory Group Meeting #31 held on Thursday, July 25, 2019

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Barry Usagawa
BWS Water Resources Program Administrator
David Ebersold
Facilitator

AG WATER SYSTEM FACILITIES CHARGE

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WSFC Is a 1-Time Charge with 2 Purposes

- Charged when connecting to the system for the first time, or when additional capacity is needed
- Purposes
  - Fund growth-related capacity expansions
  - Equitably recover earlier investments in oversizing infrastructure to accommodate new customers

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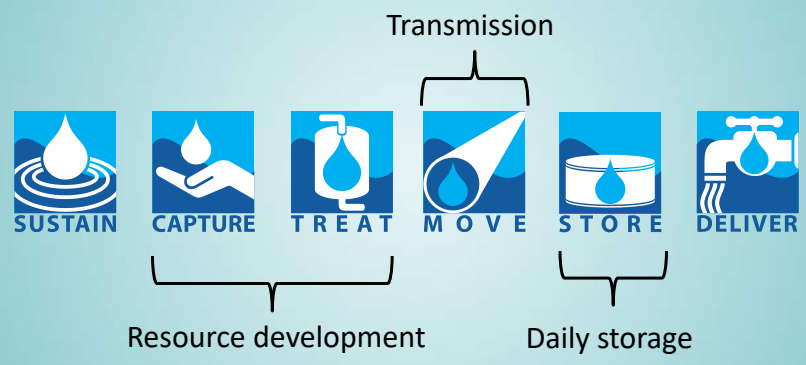
WSFC Is for the Backbone System Only (General Use Facilities)



[AWWA M1 Manual]

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Why Update the WSFC?

- Current charges adopted in 1993
- Water use patterns have changed
- Growth needs have changed
- Available capacities in existing system have changed
- Costs have increased
- Technical analysis needs to be updated
- Implement concurrent with other changes to BWS's rates and charges

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Five Basic Steps to Updating the WSFC

1. Determine existing available capacity in the "backbone system" and its monetary value (buy-in)
2. From WMP and 10-year IIP, identify planned additions and upgrades to meet growth, and their cost (incremental)
3. Estimate how much capacity each customer type needs (gallons per day per fixture unit)
4. Calculate updated costs
5. Evaluate policy and implementation issues

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Water System Facilities Charges Summary of Changes

- Analyses completed for all customer classes

Customer Type	Change
Single-family	+ 18.4%
Multi-unit low rise	+ 6.5%
Multi-unit high rise	+ 7.8%
Non-residential <50 fxtu	- 40%
Non-residential >50 fxtu	Increases as number of fxtu increases
Agricultural	Large increases reflecting actual agricultural usage. Evaluate options to mitigate impacts.

fxtu: fixture unit

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Agricultural WSFC Currently Based on Single Family Residential (SFR) Usage

- "The WSFC for the selected meter size is based on an average single-family residential fixture unit count for that meter size and the correlated average water use for a single-family residential unit."
  Ernst & Young 1993

Meter size	1993 fxtu for SFR	Updated fxtu for SFR
3/4"	36	20.0
1"	59	34.8
1 1/2"	160	63.5
2"	350	147.4

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In 1 day, the average agricultural customer uses 6,000 gallons, more than half of BWS's single family residential customers use in an entire month

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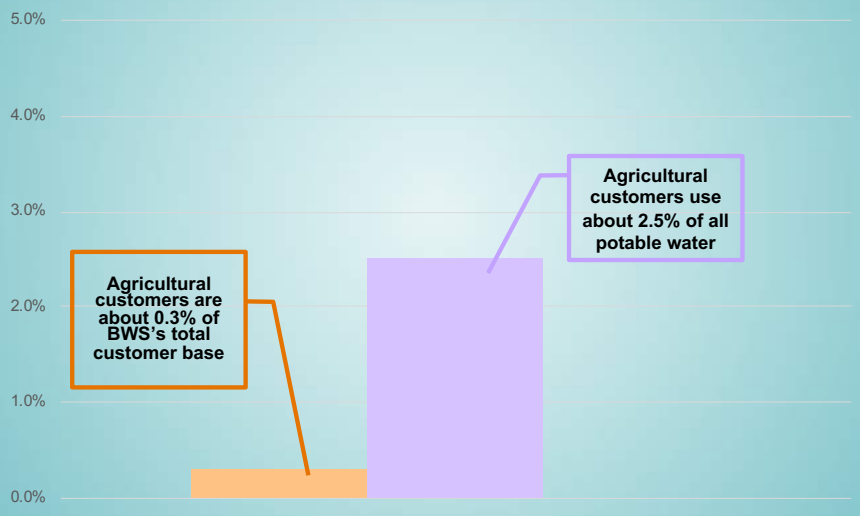
Agricultural Customers are Large Water Users



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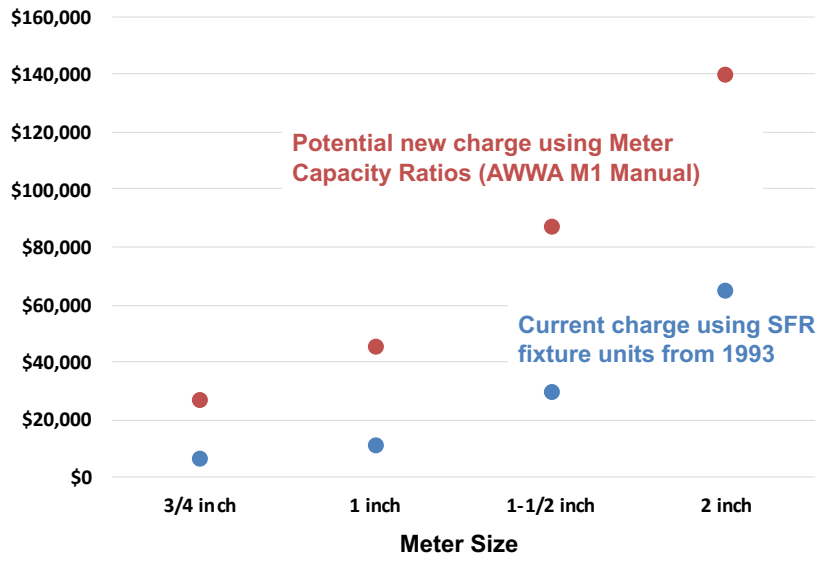
New Non-Subsidized WSFC for Ag



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Policy Considerations for Ag

- Current basis for WSFC significantly underestimates capacity demands that Ag customers place on system
- Any change to better reflect these impacts will result in substantial WSFC increases for Ag
- Charge based on AWWA meter capacity ratios
  - Reasonable fit with BWS customer usage
  - Commonly used
  - Easiest to administer
- Phasing and/or subsidies should be considered to reduce cost impacts

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Estimate of Annual Under-Collection with Current Ag WSFC

Meter Size	Existing	Adjusted
3/4 inch	$6,671	$26,438
1 inch	$10,934	$44,944
1-1/2 inch	$29,651	$87,244
2 inch	$64,866	$140,121
Estimated Revenue from 10 new customers*	$376,954	$938,542
Amount of Annual Under-collection	$561,588	

* Assumes 1 new ¾ inch, 2 new 1 inch, 3 new 1.5 inch and 4 new 2 inch Ag customers

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Agricultural WSFC Comparisons to Other Islands

	BWS Existing	BWS*	Maui	Kauai	Hawaii
3/4”	$6,671	$26,438	$18,884	$21,170	NA
1”	$10,934	$44,944	$33,356	$35,290	$13,750
1.5”	$29,651	$87,244	$71,948	$70,580	$27,500
2”	$64,866	$140,121	$125,012	$112,920	$44,000

*based on meter size methodology

Other islands’ WSFC based on meter size for all customers

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Previous Analyses Considered Wide Range of Options

- Maintain current charge
- 5% annual increase
- 10% annual increase
- 60% recovery – phase in to recover 60% by FY 2023
- Resource Development Waiver – subsidize the resource development portion of the charge and phase in increases to FY 2023
- Double in 5 years – phase in to double (or 100%) current charge by FY 2023
- Full charge - phase in to 100% recovery by FY 2023

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A Fresh Look at Concepts for Ag WSFC

1. Correct current imbalance in % recovery differences by meter size
2. Phase in changes over multiple years to minimize impacts to new Ag customers
3. Agricultural water use plan requirement for new ag customers
4. Partner with agricultural organizations to encourage water conservation for all BWS ag customers
5. Pursue/utilize supplemental funding from legislature for new wells to offset revenue impacts
6. Reevaluate program effectiveness in 5 years

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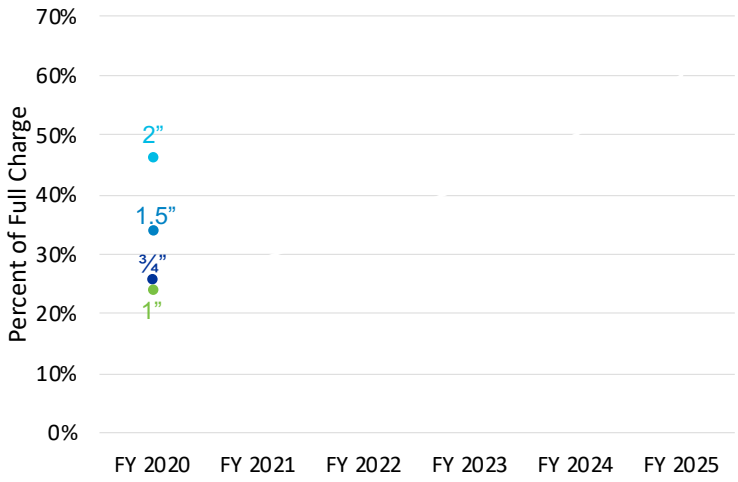
1. Establish Uniform Cost Recovery



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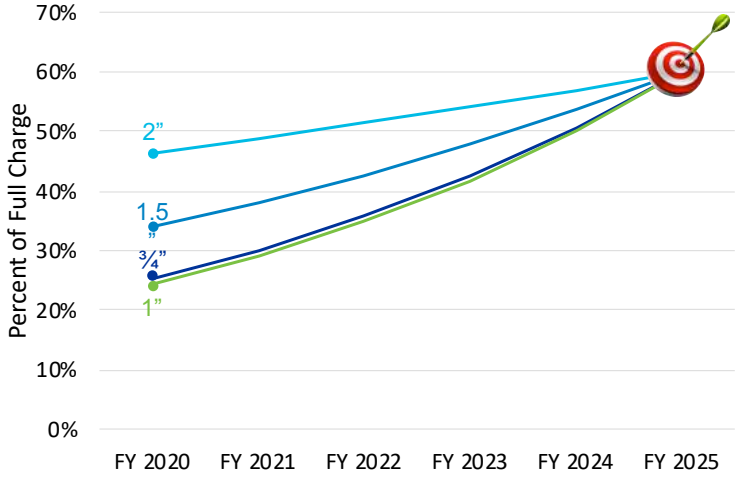
1. Establish Uniform Cost Recovery



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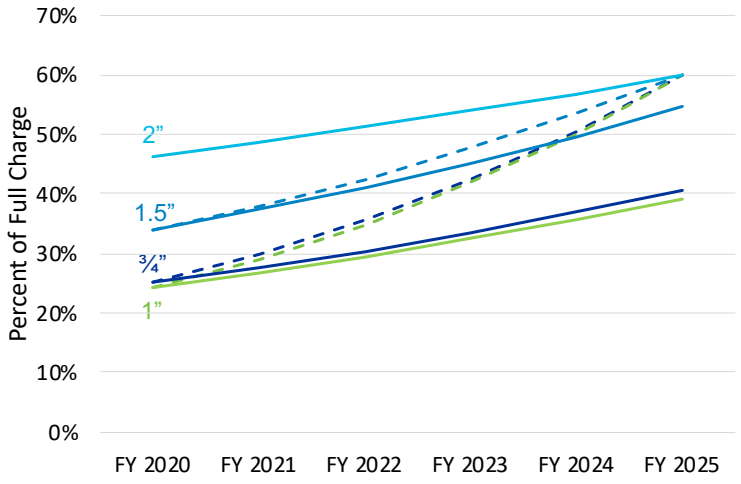
2. Phase in Over Multiple Years to Minimize Impacts – 10% Annual (Max)



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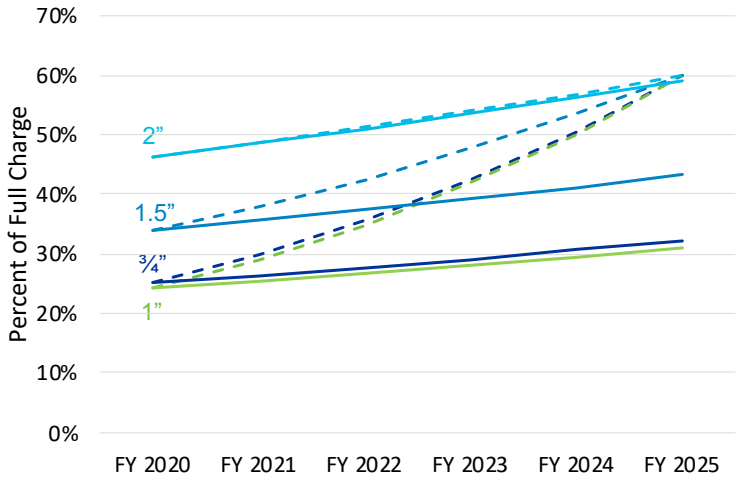
2. Phase in Over Multiple Years to Minimize Impacts – 5% Annual



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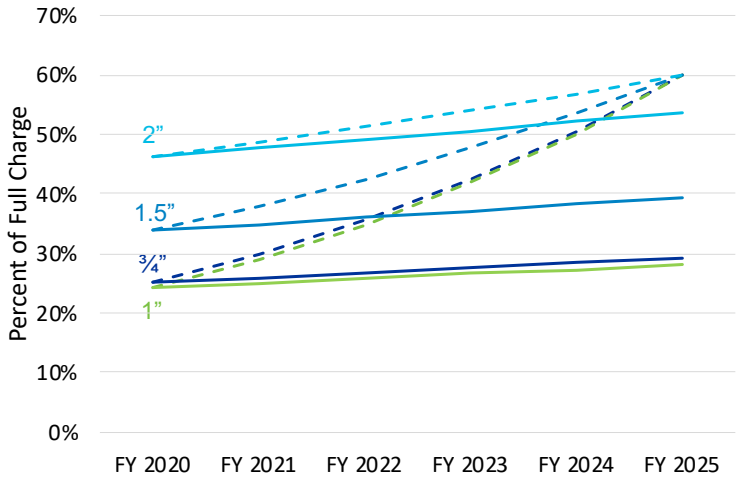
2. Phase in Over Multiple Years to Minimize Impacts – 3% Annual



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2. Phase in Over Multiple Years to Minimize Impacts - 60% in 5 Years

Meter Size	Current	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
3/4"	$6,671	$7,933	$9,434	$11,218	$13,340	$15,863
1"	$10,934	$13,097	$15,689	$18,793	$22,512	$26,966
1.5"	$29,651	$33,220	$37,220	$41,701	$46,721	$52,346
2"	$64,866	$68,319	$71,957	$75,788	$79,823	$84,073

DRAFT – for illustration and discussion only

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2. Phase in Over Multiple Years to Minimize Impacts - 10% Annual (Max)

Meter Size	Current	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
3/4"	$6,671	$7,339	$8,072	$8,880	$9,768	$10,744
1"	$10,934	$12,027	$13,230	$14,553	$16,008	$17,609
1.5"	$29,651	$32,616	$35,877	$39,465	$43,412	$47,753
2"	$64,866	$68,319	$71,957	$75,788	$79,823	$84,073

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2. Phase in Over Multiple Years to Minimize Impacts - 5% Annual

Meter Size	Current	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
3/4"	$6,671	$7,005	$7,355	$7,723	$8,109	$8,515
1"	$10,934	$11,480	$12,054	$12,657	$13,290	$13,954
1.5"	$29,651	$31,133	$32,690	$34,324	$36,041	$37,843
2"	$64,866	$68,109	$71,514	$75,090	$78,845	$82,787

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2. Phase in Over Multiple Years to Minimize Impacts - 3% Annual

Meter Size	Current	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025
3/4"	$6,671	$6,872	$7,078	$7,290	$7,509	$7,734
1"	$10,934	$11,262	$11,600	$11,948	$12,306	$12,675
1.5"	$29,651	$30,540	$31,456	$32,400	$33,372	$34,373
2"	$64,866	$66,812	$68,816	$70,880	$73,007	$75,197

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3. Agricultural Water Use Plan for New Customers

- Required prior to issuance of new or upsized meter
- Identifies planned irrigation area, applies a unit water demand/acre, irrigation methods, range of crop types, etc.
- Used to determine appropriate meter size for planned activities
- Objective is to “right size” the meter to the farm and limit wasteful water use. Smaller meters cost less.

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4. Encourage Conservation for All BWS Ag Customers

- Explore 3-way Memorandum of Understanding with BWS/HDOA/CTAHR for ag water conservation education and programs
- Pursue other collaborations for water conservation training/education, e.g. with Michelle Gorham, West O'ahu Soil and Water Conservation District
- BWS conservation incentives/rebates, e.g. discounted submeters, weather based irrigation controllers, soil moisture sensors, etc.
- Allow water bill adjustments once in 5 years, if leaks are repaired

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5. Pursue/Utilize Supplemental Funding from State to Offset Revenue Impacts

- Hawaii Farm Bureau introduced legislation to fund $1,000,000 for 1 exploratory well in upper Kunia
- Well station is mauka of proposed State Kunia Agriculture Park and could provide potable water for crop washing
- Rep. Ryan Yamane and DLNR supportive
- LEGISLATION PASSED! Working on a funding MOU
- Need to do this regularly!

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6. Reevaluate Program Effectiveness in 5 Years

- Implement Water Use Plan requirement effective with new WSFC
- Establish specific metrics for agricultural water conservation program elements and conservation goals
- Provide annual reporting on number of new ag customers, meter sizes
- Provide annual reporting on conservation program metrics
- Determine cost effectiveness of program and reevaluate during next WSFC update

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Questions & Answers

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Barry Usagawa
BWS Water Resources Program Administrator

WATER MASTER PLAN SCORECARD UPDATE

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Scorecard Purpose

- Track advancement to achieve WMP goals
- Identify progress - what have we done well
- Capture opportunities for improvement - what can we do better
- Annual reporting and accountability to BWS Board and public

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Scorecard Summary

- Organized around BWS's six functions
- Detailed indicators for financial, operational, capacity, structural and management goals
- Annual metrics to quantify results

PLAN	Total Number of Metrics	Met/on track to meet	Miss by 10% of goal	Miss by > 10% of Goal
Strategic Plan	9	6	1	2
Water Master Plan	33*	19	4	9

* 1 result pending

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SUSTAIN CAPTURE TREAT MOVE STORE DELIVER

Indicator	Metric	Goal	Baseline	FY 2017	FY 2018	FY 2019
Supply from nonpotable sources	% of total supply served from nonpotable water system	> 12%	6% (on-track to meet goal)	7.15%	7.10%	7.8%
Annual water resource yield	% of available water resource yield used	< 90%	80%	70%	72%	71%
Watershed management	$ budgeted for watershed management	4% of CIP $3.35M	$1.4M	$1.4M	$1.8M	$1.5M
	Acres of watershed surveyed for invasive plant species removal per year	5,200 acres	1,691 acres	5,262 acres	43,739 acres	112,402 acres
	Watershed area protected by fencing	20% of watershed funding	14%	19.80%	0%	0%

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SUSTAIN CAPTURE TREAT MOVE STORE DELIVER

Indicator	Metric	Goal	Baseline	FY 2017	FY 2018	FY 2019
Conservation	$ budgeted for conservation	4% of CIP $4.80 M	$0.89M	$1.08M	$1.50M	$1.47M
	Per capita consumption	< 145 gpcd (by 2040, starting at 155 gpcd in 2016)	155 gpcd	155 gpcd	155 gpcd	155 gpcd

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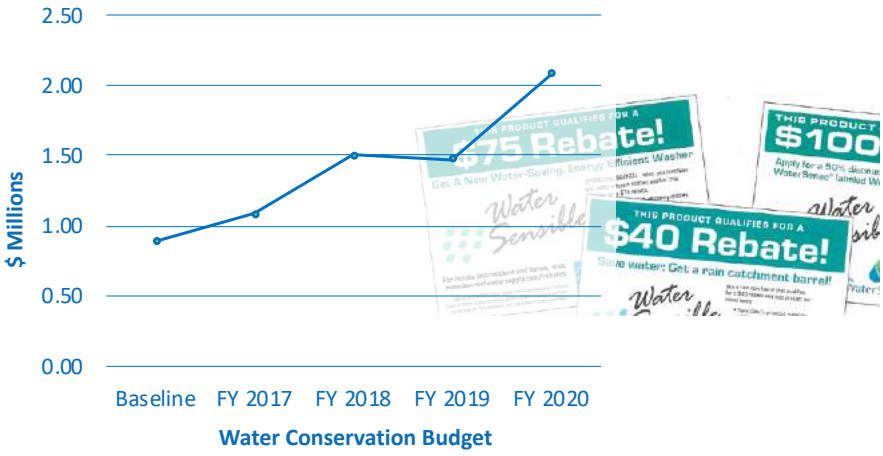
Water Conservation Investments Are Increasing



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New Water Conservation Programs

69

New Water Conservation Programs cont.

BOARD OF WATER SUPPLY

FOOD SERVICE INCENTIVE PROGRAM

The Honolulu Board of Water Supply (BWS) is now offering a water conservation incentive program to the food service category. Through the program, participating food service operations will be given the opportunity to install a high-efficiency aerators and/or high-efficiency pre-rinse spray nozzles as a means of conserving water and to helping to lower their water bill.

Pre-Rinse Spray Valve

Spray Faucet Aerator

Program Information

Interested in participating?

Water Sensible

Call: (808) 237-6877
Email: watersensible@honeywell.com

Saving Water In Restaurants

Restaurants can use a lot of water, with the largest uses taking place in the kitchen and in the restrooms. Download WaterSense® guides from the U.S. Environmental Protection Agency (EPA) from: https://www.boardofwatersupply.com/conservation/watersensible/food-services

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New Water Conservation Programs cont.

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SUSTAIN | CAPTURE | TREAT | MOVE | STORE | DELIVER

Indicator	Metric	Goal	Baseline	FY 2017	FY 2018	FY 2019
Standby source capacity	% of source capacity used at Maximum Day Demand (MDD)	< 50%	44% ●	40% ●	41% ●	41% ●
Water level at index wells	% of wells with stable water levels as determined by BWS	100%	100% ●	100% ●	100% ●	100% ●
Permitted or assessed sustainable yield	Number of sources exceeding source permitted use or assessed sustainable yield (12-month moving avg)	0	0 ●	0 ●	0 ●	0 ●

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Indicator	Metric	Goal	Baseline	FY 2017	FY 2018	FY 2019
Water quality regulatory compliance	Number of water quality regulatory violations	0	0	0	0	0
Treatment on-line	% of chlorination systems on-line	100%	100%	100%	100%	100%
Comprehensive treatment system condition assessment	Perform comprehensive condition assessment of all potable and nonpotable treatment systems	Update every 5 years	On schedule (last 2014)	On schedule	On schedule	Done

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Indicator	Metric	Goal	Baseline	FY 2017	FY2018	FY2019
Sufficient pump capacity	% of pressure zones where firm capacity (not counting largest pumping unit at each station) < MDD	< 5%	2.6%	2.8%	2.8%	2.8%
Pumps available for use	% of pumps that are available to be put in-service	> 90%	82%	81%	82%	83%
Emergency power	% of population served indoor demand (85gpcd) in the event of loss of power	> 85%, distributed geographically	71%	71%	71%	71%
Pump station condition assessment	Perform regularly scheduled condition assessment	Update every 5 years	On schedule (last 2015)	On schedule	On schedule	Done

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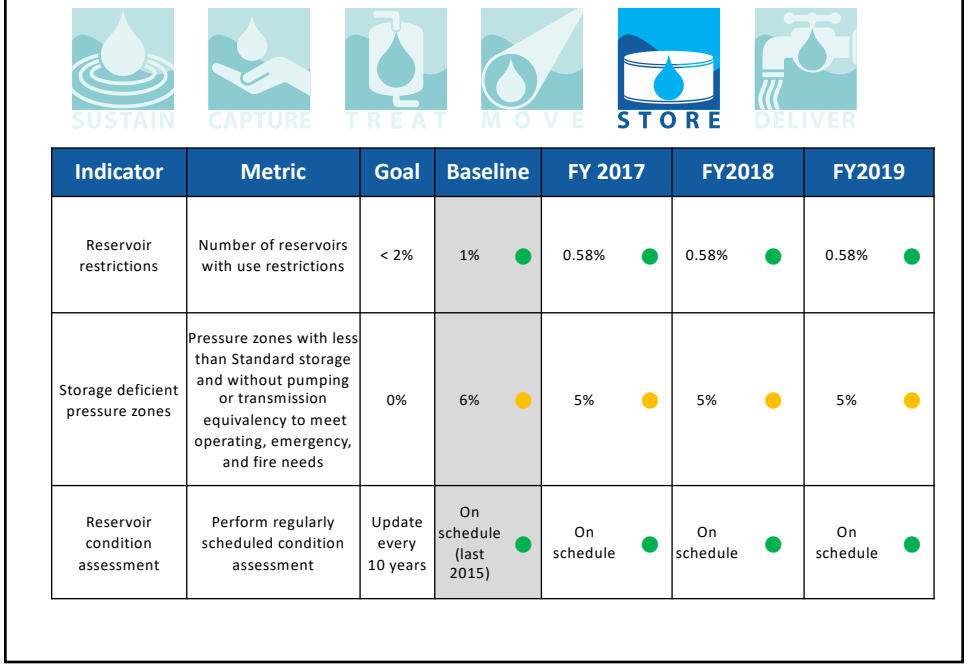

Indicator	Metric	Goal	Baseline	FY 2017	FY2018	FY2019
Reservoir restrictions	Number of reservoirs with use restrictions	< 2%	1%	0.58%	0.58%	0.58%
Storage deficient pressure zones	Pressure zones with less than Standard storage and without pumping or transmission equivalency to meet operating, emergency, and fire needs	0%	6%	5%	5%	5%
Reservoir condition assessment	Perform regularly scheduled condition assessment	Update every 10 years	On schedule (last 2015)	On schedule	On schedule	On schedule

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Indicator	Metric	Goal	Baseline	FY 2017	FY2018	FY2019
Pipeline breaks	Pipeline breaks and leaks repaired per 100 miles per year (3-year average)	< 15	14	15	16	16
	Pipeline breaks and leaks repaired per year (3-year average)	< 300	302	320	331	332
Transmission pipeline breaks	Number of pipeline breaks for ≥ 16 inches in diameter (3-year average)	< 14	10	12	13	12
Non-revenue water	% of water produced but not sold	< 8.1%	7.8% (5-year average)	7.4%	8.54	TBD TBD
High risk pipelines	Portion of pipelines with risk score	< 5%	12%	14%	14%	14%

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SUSTAIN CAPTURE TREAT MOVE STORE DELIVER

Indicator	Metric	Goal	Baseline	FY 2017	FY2018	FY2019
Pipeline R&R	Miles of system pipeline renewed (3-year average)	21 miles	4.7 miles	3.5 miles	3.0 miles	5.1 miles
Fire hydrant supply	Hydrants that meet fire flow standards	> 99%	98%	98%	98%	98%
Pipeline leak detection	% of pipes checked for leaks per year	25%	14%	12%	26%	18%
PWA pipeline condition assessment	Miles of pipelines recommended for PWA by CapPlan framework (currently 6.3 miles), miles assessed per year	6.3 miles (10%)	12 miles (19%)	12 miles	0 miles	0 miles

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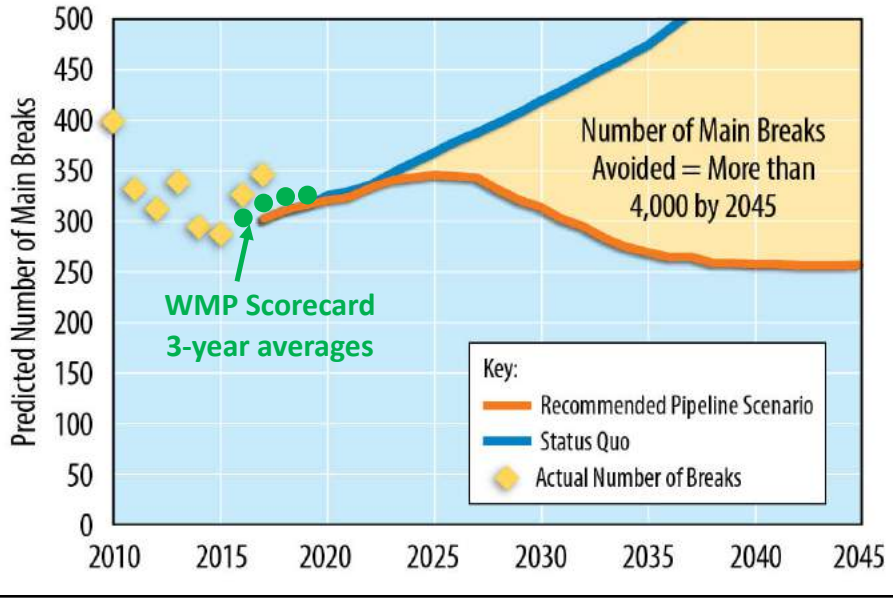
Main Breaks Will Take a Few Years to Decrease



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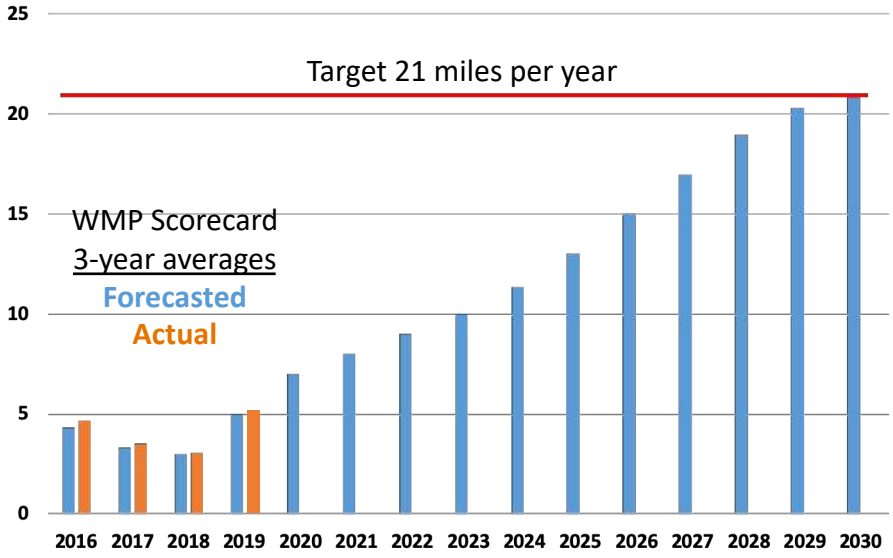
Over 13 Miles of Pipeline Currently Under Construction



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TOOLS

SUSTAIN | CAPTURE | TREAT | MOVE | STORE | DELIVER

Indicator	Metric	Goal	Baseline	FY 2017	FY2018	FY 2019
Water Master Plan update		Update every 10 years	On schedule (last 2016)	On schedule	On schedule	On schedule
Hydraulic models and CapPlan updated		Update every 5 years	On schedule (last 2016)	On schedule	On schedule	On schedule
GIS update		Annually	On schedule (last 2016)	On schedule	On schedule	On schedule
SCADA reliability	% of sources, pump stations, water treatment plants, and reservoirs utilizing microwave backbone for control data	100% (by 2023)	13% (on track)	15%	23%	25%

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Questions & Answers

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Dave Ebersold

Facilitator

WHAT WE ACCOMPLISHED TOGETHER IN 2019 AND PRIORITIES FOR 2020

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BWS's Stakeholder Advisory Group

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Diverse Representation from Across Oahu

- All 9 Honolulu City Council Districts
- Agriculture
- Community Organizations
- Environment
- General Contractors
- Golf
- Hawaiian Culture
- Homeowners Associations
- Large Water Users
- Realtors
- Senior-Low Income
- Small Business
- Travel / Tourism
- Utilities

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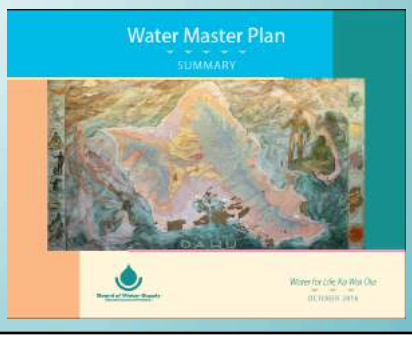
Initially Formed to Advise Long Range Planning and Rate Setting

- Water Master Plan
- Long Range Financial Plan
- 30-Year Capital Improvement Plan
- Rate Study

MISSION ACCOMPLISHED ✓



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Objectives from 2018 BWS Board Authorization

- **Accountability** with our customers for implementation of the Water Master Plan.
- Ongoing **credibility** through transparency with and engagement of the public.
- Gaining regular **feedback** from people in the community who deeply understand BWS issues and challenges and are motivated to seek solutions.
- Strengthening the **partnerships** necessary to ensure success of our most important sustainability and resiliency initiatives including water conservation, watershed protection and climate change adaptation.

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What We Accomplished Together October 2018 – October 2019

- Water Rates Rollout
- Agricultural Water Systems Facilities Charge
- Monitoring Water Master Plan Progress
- Navy's Red Hill Fuel Storage Facility
- Climate Change
- Communications

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What We Accomplished Together October 2018 – October 2019

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Water Rates Rollout

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Stakeholder Guidance

- *"Go beyond the 'usual' to let the public know about rates being raised in July 2019."*
- *"Train employees so that customer service is top-notch."*
- *"Learn from the circumstances that led to difficult rates increase last time."*

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How Input Was Used

- Use of customer feedback in development of rates communications strategy and collateral.
- Implemented largest and most comprehensive public outreach and education program in BWS history.
- Provided specialized training about new rates for employees in customer service and who have regular interface with public.

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Results

- Fewer than 50 calls since new rates went into effect.
- Nearly all calls are with questions rather than complaints.

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Climate Change

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Stakeholder Guidance

- *"Invite others to come talk about climate change-related experiences with the group and expand the discussion to collaboratively include other City agencies." (e.g. invite a representative of Puerto Rico)."*
- *"Because the content of the climate change panel discussion would be of such importance, BWS should video presentations and post them on its website and on Olelo."*

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Stakeholder Guidance Continued

- *"Keep learning more about local, national, and world-wide action being taken on climate change adaptation."*
- *"Recognize interconnections of climate change adaptation:*
  - *Groundwater recharge and new development,*
  - *Reforestation efforts and land use designations and zoning,*
  - *Stream restoration and long-range planning."*

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Stakeholder Guidance Continued

- *"Use students to educate climate change issues."*
- *"Communicate with the public early on sensitive issues like which beaches and communities to harden and protect against sea level rise and which to allow to retreat."*

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Honolulu Board of Water Supply
Stakeholder Advisory Group
CLIMATE CHANGE PANEL DISCUSSION

DR. CHARLES H. FLETCHER III
School of Ocean and Earth Science and Technology
UH Hawaii

DR. THOMAS GIAMBELLUCA
Department of Geography and Environment
UH Hawaii

JOSHUA STANBRO
Office of Climate Change, Sustainability and Resiliency
City & County of Honolulu

BARRY USAGAWA
Honolulu Board of Water Supply
City & County of Honolulu

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Four Years and Counting…

- **Monitor progress** of implementing the Water Master Plan
- **Provide guidance** on BWS's Draft Resiliency Strategy
- **Advise** on BWS's strategies for climate change adaptation
- **Learn** from guest speakers across the country to strengthen water system resiliency and the way we work together
- **Support** BWS's efforts to protect the aquifer from contamination from potential leaks from Red Hill fuel storage tanks
- **Inform** constituencies about BWS's ongoing activities
- Continue to **work with the Ag community** on plans and policies to support local agriculture and water conservation

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We Continue to Seek Your Input

- How would you rate BWS in its implementation of the WMP? What should BWS do to improve its implementation?
- How do YOU want to work with BWS, other City agencies, and your respective groups and interests to foster collaboration?

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We Continue to Seek Your Input

Top 5 Shocks	Top 5 Stresses
Hurricane (77%)	Cost of Living (50%)
Tsunami (51%)	Aging Infrastructure (50%)
Infrastructure Failure (37%)	Climate Change Impacts (47%)
Rainfall Flooding (29%)	Lack of Affordable Housing (40%)
External Economic Crisis (29%)	Over-reliance on Imports (24%)

Engaged stakeholders' responses to the questions "Identify your top three shocks/ stresses?" Percentages indicate the percent of respondents who selected that shock or stress within their top three.

From Ola – Oahu Resilience Strategy, 2019

- What shocks and stresses that you are worried about?
- What holds back the BWS, the City or others from helping get your priorities achieved?
- What can BWS do to help?

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Dave Ebersold
Facilitator

SUMMARY AND NEXT STEPS

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Stakeholder Advisory Group Meetings in 2020

- Thursday, January 16
- Thursday, April 30
- Thursday, July 16
- Thursday, October 15

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Next Meeting

January 16, 2020
4:00-6:30
Blaisdell Center, Hawaii
Suites

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Questions & Answers

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