BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843
www.boardofwatersupply.com

October 18, 2022

NOTICE

The Board of Water Supply, City and County of Honolulu, Regular Meeting on Monday, October 24, 2022, at 2:00 p.m. in the Boardroom, Public Service Building, 630 South Beretania Street, Honolulu, HI 96843.

Limited seating will be available for in-person testifiers in the Boardroom. The public may also view the livestream of the meeting from the lobby of the Board of Water Supply, Public Service Building, 630 S. Beretania St. Honolulu, HI 96843.

TESTIMONY

Testimony may be submitted as follows:

- Written testimony should include the submitter's address, email address, and phone number. Testimony should be received by Monday, October 24, 2022, at noon. Submit written testimony by:
  - Email to board@hbws.org
  - Online at boardofwatersupply.com/testimony
  - Mail to Board of Water Supply, 630 S. Beretania St., Honolulu, HI 96843
  - Fax to (808) 748-5079
- Oral testimony will be accepted remotely and in person during the meeting. Pre-registration is encouraged to facilitate as much remote and in-person testimony as reasonably possible during the time allotted. Testifiers should consider also submitting a written version of their oral testimony.
  - To testify remotely by phone or video using the Zoom videoconferencing platform, please submit your request by:
    - Email to board@hbws.org
    - Online at boardofwatersupply.com/testimony

    Zoom registration instructions, as well as participant guidelines, will be sent to the contact information provided. Once confirmed as registered, testifiers will receive an email containing the links and instructions to join the Zoom session. Submit your request to testify remotely by Friday, October 21, 2022, at noon.
  - To testify in person at the Board of Water Supply, Public Service Building, 630 S. Beretania St., Honolulu, HI 96843, please pre-register by submitting your request by Monday, October 24, 2022:
    - Email to board@hbws.org
    - Online at boardofwatersupply.com/testimony

    In-person testifiers should check-in with building security and then with testimony staff located in the lobby. Testifiers will be escorted to and from the Board Room. On-site registration will be available for walk-in requests.

Testimony is limited to two (2) minutes and shall be presented by the registered speaker only. Testimony submitted in writing or orally, electronicallY or in person, for use in the meeting process is public information. All testimony will be included as part of the approved meeting minutes at boardofwatersupply.com/boardmeetings.

MATERIALS AVAILABLE FOR INSPECTION

Meeting materials ("board packet" under HRS Section 92-7.5) are accessible at www.boardofwatersupply.com/boardmeetings.

VIEWING THE MEETING

The meeting will be viewable via live streaming on:

(1) the BWS website: www.boardofwatersupply.com/live. Video will appear on screen. You may have to click the arrow on video to start it. You may have to unmute audio as muted audio tends to be the default setting.

SPECIAL REQUESTS AND ACCOMMODATIONS

If you require special assistance, an auxiliary aid or service, and/or an accommodation due to a disability to participate in this meeting (i.e., sign language interpreter; interpreter for language other than English, or wheelchair accessibility), please call (808) 748-5172 or email your request to board@hbws.org **at least three business days prior to the meeting date**. If a response is received after the requested three business days before the meeting date deadline, we will try to obtain the auxiliary aid/service or accommodation, but we cannot guarantee that request will be filled.

Upon request, this notice is available in alternate formats such as large print, Braille, or electronic copy.

The agenda for the October 24, 2022, Regular Meeting of the Board of Water Supply is as follows:

ITEMS REQUIRING BOARD ACTION

1. Approval of the Minutes of the Regular Meeting Held on September 26, 2022

2. Adoption of Resolution No. 954, 2022, Acceptance of Gift to the Board of Water Supply from the Hawaii Data Collaborative to Assist in the Red Hill Data Services in Communicating Red Hill Impacts to the Community

3. Authorizing a Public Hearing to Consider the Board of Water Supply Water Shortage Response and Recovery Plan

ITEMS FOR INFORMATION

1. Briefing by the Department of Environmental Services on their Landfill Siting Effort

2. Update on the Board of Water Supply's Response to the Potential Impacts of the Red Hill Fuel Contamination

3. Appointment of Erwin Kawata as Deputy Manager

4. Summary of Revisions to the Prior Fiscal Year 2021-2022 (FY22) Capital Improvement Program (CIP) Budget

5. Recruitment Status

6. Status Update of Groundwater Levels at All Index Stations

7. Water Main Repair Report for September 2022

EXECUTIVE SESSION

1. Approval of the Minutes of the Executive Session Held on September 26, 2022

2. To Consult with the Board's Attorney on Questions and Issues Pertaining to the Board's Powers, Duties, Privileges, Immunities, and Liabilities Pertaining to Matters Concerning the Kalawahine 180 Reservoir Project [HRS §92-5(a)(4)]

MINUTES

THE REGULAR MEETING OF THE
BOARD OF WATER SUPPLY

October 24, 2022

At 2:00 PM on October 24, 2022, in the Board Room of the Public Service Building at 630 South Beretania Street, Honolulu, Hawaii, Board Chair Andaya called to order the Regular Meeting.

Present:
Bryan P. Andaya, Chair
Kapua Sproat, Vice Chair via Zoom
Max J. Sword, Board Member
Na'alehu Anthony, Board Member via Zoom
Jonathan Kaneshiro, Board Member
Jade T. Butay, Board Member, Ex-Officio via Zoom
Dawn B. Szewczyk., Board Member, Ex- Officio via Zoom

Also Present:
Ernest Lau, Manager and Chief Engineer
Erwin Kawata, Deputy Manager
Jason Takaki, Program Administrator, Capital Projects Division via Zoom
Jadine Urasaki, Assistant Program Administrator, Capital Projects Division via Vimeo
Jennifer Elflein, Program Administrator, Customer Care Division via Vimeo
Kathleen Elliott-Pahinui, Information Officer, Communications Office via Zoom
Raelynn Nakabayashi, Executive Assistant I, Executive Support Office via Zoom
Jason Nikaido, Program Administrator, Field Operations Division via Zoom
Joseph Cooper, Waterworks Controller, Finance Division via Vimeo
Michele Thomas, Executive Assistant I, Human Resources Office via Zoom
Henderson Nuuhiwa, Program Administrator, Program Administrator, Information Technology Division via Vimeo
Michael Matsuo, Land Administrator, Land Division via Zoom
Barry Usagawa, Program Administrator, Water Resources Division via Zoom
Kevin Ihu, Program Administrator, Water System Operations Division via Vimeo
Kathy Mitchell, Administrative Services Officer via Vimeo
Deanna Thyssen, Manager Secretary

Joy Cruz-Achiu, Board Secretary
Steven Norstrom, Information Specialist II,
Communications Office
Stella Bernardo, Information Specialist II,
Communications Office via Zoom
Michele Harman, Community Relations Specialist I,
Communications Office via Zoom
Keoni Mattos, Information Specialis t II,
Communications Office via Zoom

Others Present: Jeff Lau, Deputy Corporation Counsel
via Zoom
Jessica Wong, Deputy Corporation Counsel
via Zoom

REGULAR MEETING

Chair Bryan Andaya welcomed everyone to the October 24, 2022, Regular Meeting of the Board of Water Supply (BWS). Before beginning the meeting Chair Andaya went over a few meeting regulations required by law. Board Members attending the Board Meeting remotely must be visible to the public to be considered present and meet quorum guidelines. He also stated that during roll call Board Members participating remotely must disclose their location and anyone that may be present at their location.

Chair Andaya announced that the public would be allowed to attend Board Meetings at the BWS, Public Service Building, 630 S. Beretania Street, Honolulu, HI 96843, via interactive conference technology. Masks are not required to be worn.

Chair Andaya requested a roll call for the Regular Meeting and asked Board Members participating remotely to keep their cameras on during the meeting to comply and meet quorum guidelines. Chair Andaya asked each Board Member to respond verbally and state who is present in the room if participating via WebEx when their names were called. Vice Chair Kapua Sproat, aye and alone at her current location; Board Member Jonathan Kaneshiro, aye and in the Board room; Board Member Max Sword, aye and in the Board room; Board Member Jade Butay, aye and alone at his location; and Board Member Dawn Szewczyk, aye and alone at her current location. Chair Andaya was present in the Boardroom.

Chair Andaya asked all attendees calling in or video conferencing to please mute their microphones when not speaking to the audience. When intending to speak, unmute their microphone and identify themselves before speaking.

Chair Andaya introduced those present in the Boardroom, Manager Ernest Lau, Deputy Manager Erwin Kawata, Board Secretary Joy L. Cruz-Achiu, the Managers Secretary Deanna Thyssen, and Steven Norstrom, Information Specialist II, Communications Office. Joining from the City and County Corporation Counsel were Deputy Jeff Lau and Deputy Jessica Wong via Zoom. Joining via Zoom to monitor public testimony are Keoni Mattos and Wayne Maria, both Information Specialist II, Communications Office.

The following procedures are in effect for the meeting:

Chair Andaya shared the various ways to submit testimony: Written testimony may be submitted by email to board@hbws.org, by fax to (808) 748-5079; mailed to Board of Water Supply, 630 S. Beretania St., Honolulu, HI 96843; or online at the boardofwatersupply.com/testimony, which were all due on Monday, October 24, 2022, at noon. However, late testimony will be accepted by email, fax, or mail. Videoconference testimony was accepted by registering at boardofwatersupply.com/testimony by Friday, October 21, 2022. In-person testimony is being accepted at the Board of Water Supply, Public Service Building located at 630 S. Beretania St. Honolulu, HI 96843. Pursuant to HRS Section 92-7.5, Board Meeting materials are available to view on our website at www.boardofwatersupply.com/boardmeeting.

Chair Andaya also announced the Board Meeting is broadcasted live on the BWS website at www.boardofwatersupply.com/live.

At 2:10 PM, Chair Andaya announced that Board Member Na'alehu Anthony joined the Board meeting via Zoom.

Board Member Na'alehu Anthony stated he was alone in his office.

Chair Andaya announced that he would be taking the agenda out of order, starting with the item for information, item number one, "Briefing by the Department of Environmental Services on their Landfill Siting Effort".

ITEM FOR INFORMATION NO. 1

"October 24, 2022

BRIEFING BY THE DEPARTMENT OF ENVIRONMENTAL SERVICE ON THEIR LANDFILL SITING EFFORT

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chair and Members:

Subject: Briefing by the Department of Environmental Service on their Landfill Siting Effort

Mayor Rick Blangiardi, Michael Formby, Managing Director, and Roger Babcock, Director, Department of Environmental Service, will provide a briefing on the Department of Environmental service Landfill Siting Effort.

Respectfully Submitted,

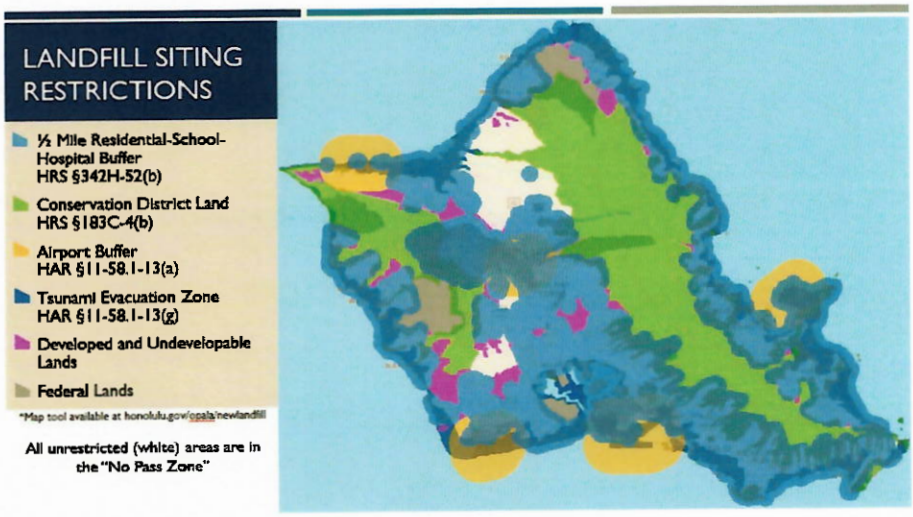
/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

The foregoing was for information only.

DISCUSSION: Mayor Rick Blangiardi, Michael Formby, Managing Director, and Roger Babcock, Director, Department of Environmental Services, gave the report.

There was discussion between Board Member Max Sword, Director Roger Babcock, Department of Environmental Services (ENV), and Manager Ernest Lau regarding "No Pass Zones" within Landfill Siting Restrictions.



Board Member Na'alehu Anthony and Director Babcock discussed the Landfill Siting Restrictions Map for clarification and the decision-making on the landfill issue.

Board Member Anthony expressed his concern regarding choosing the right site for a landfill, especially since dealing with the Red Hill issues. He commented that 80 years from now will the BWS have this item come back before the Board due to the decision made to have the landfill over an aquifer.

Mayor Rick Blangiardi responded that he is confident with today's technology and that preventative steps will be taken to protect the aquifer.

Vice Chair Kapua Sproat inquired if a District Boundary Amendment was considered.

Director Babcock stated that the ENV wasn't given the opportunity to contest the order when it was created in 2018 and 2019. Therefore, ENV must comply.

Deputy Managing Director (MD) Krishna Jayaram stated that the purpose of the Landfill briefing is to obtain an understanding of the BWS's direction and legal position before taking any further steps.

Board Member Sword inquired if Corporation Counsel could decide on the Landfill siting which is present here at the Board meeting today.

Director Babcock responded that Corporation Counsel could make the decision.

Deputy MD Jayaram also responded that the City Administration is mindful of the BWS's semi-autonomous status, which is the purpose of this discussion.

Mayor Blangiardi commented that the Landfill site has been discussed, however, given the circumstances with Red Hill, the City Administration felt obligated to take into consideration the BWS and the community that would be affected.

Chair Andaya stated that this is the first time that the BWS is hearing about the Landfill site, he asked when is the deadline to make a final decision.

Mayor Blangiardi replied that the Landfill site must be determined by the end of December 2022.

Vice Chair Sproat asked Director Babcock to look into District Boundary Amendment due to the difficulty of finding a location that isn't in the "No Pass Zone". She asked if areas of the caprocks were explored?

Director Babcock responded that based on the existing restrictions, there aren't any other areas available other than the white areas shown on the map.

Chair Andaya stated that the question is if the BWS has the legal authority on the Landfill site issue, therefore, suggested that a Permitted Interaction Group (PIG) find a solution. He asked the Board if anyone was ready to make a decision.

Mayor Blangiardi explained that the City Administration didn't expect the BWS to make a decision, but to discuss the Landfill site and how as a whole agency to proceed.

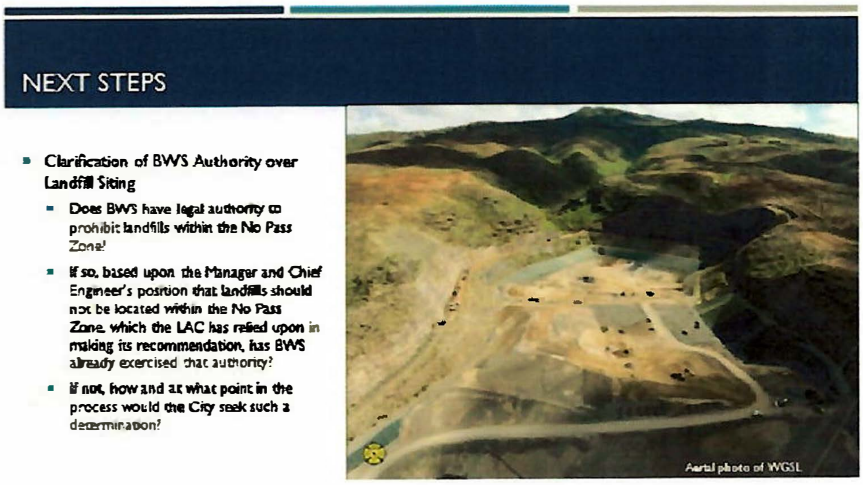
Chair Andaya inquired if it would possible to form a PIG to begin discussing the Landfill site issue as a Board.

Manager Lau asked if the creation of the PIG is an action item by the Board. He asked Jessica Wong for advice.

Ms. Jessica Wong, Corporate Counsel, replied that because the "Briefing by the Department of Environmental Service on their Landfill Siting Effort", is listed as an informational item. Therefore, no action can be taken at this meeting. She explained that the action cannot be added to the agenda because the subject matter is important and may impact the general public, and must be properly noticed in the agenda. Ms. Wong stated that the subject matter can be added to the November or Special Meeting agenda for action to be taken and/or to form a PIG.

Chair Andaya and Manager Lau agreed to look into the different options available to meet and discuss with the Board.

Board Member Anthony requested for slide #7 of the PowerPoint to be displayed. He asked Counsel if they had an answer to the questions listed or if had it been discussed currently or in the past.



Ms. Wong replied that she didn't have an answer but other colleagues may.

Mr. Jeff Lau, Corporate Counsel, reiterated the question, "Does the BWS have the legal authority to prohibit landfills within a "No Pass Zone?" and responded that the Rules and the Charter provide the BWS the authority, in Section 7-105 of the Revised Charter of the City and County of Honolulu, which gives the BWS the power to prescribe and enforce rules and regulations having the force and effect of law, and Section 3-301 of the BWS Rules and Regulations.

Vice Chair Sproat commented that due to the importance of the issue the Board should get a better understanding of the legal aspect and all information available to make an informative decision. She suggested that outside legal counsel be obtained.

Board Member Dawn Szewczyk asked Director Babcock how the landfill was sited before 1989 and if the BWS part of the process.

Director Babcock stated that he wasn't aware of the process that was taken during that time. He explained that the next step after the December 31, 2022 deadline would be to do an environmental impact statement, followed by public meetings, and if the chosen site passes, then procurement, design, and construction would begin. The City Administration is in the decision phase.

Board Member Jonathan Kaneshiro inquired since there is a process after the December 31, 2022 deadline, must the BWS's authority over the "No Pass Zone" be decided on immediately or could be done after the selection process.

Director Babcock responded that the Landfill is not in the procurement, or design and construction stage, therefore, the BWS's authority can be decided on after the site selection process which may be modified.

Board Member Anthony asked Director Babcock if there would be a possibility to get an extension on the December 31, 2022 Landfill site deadline

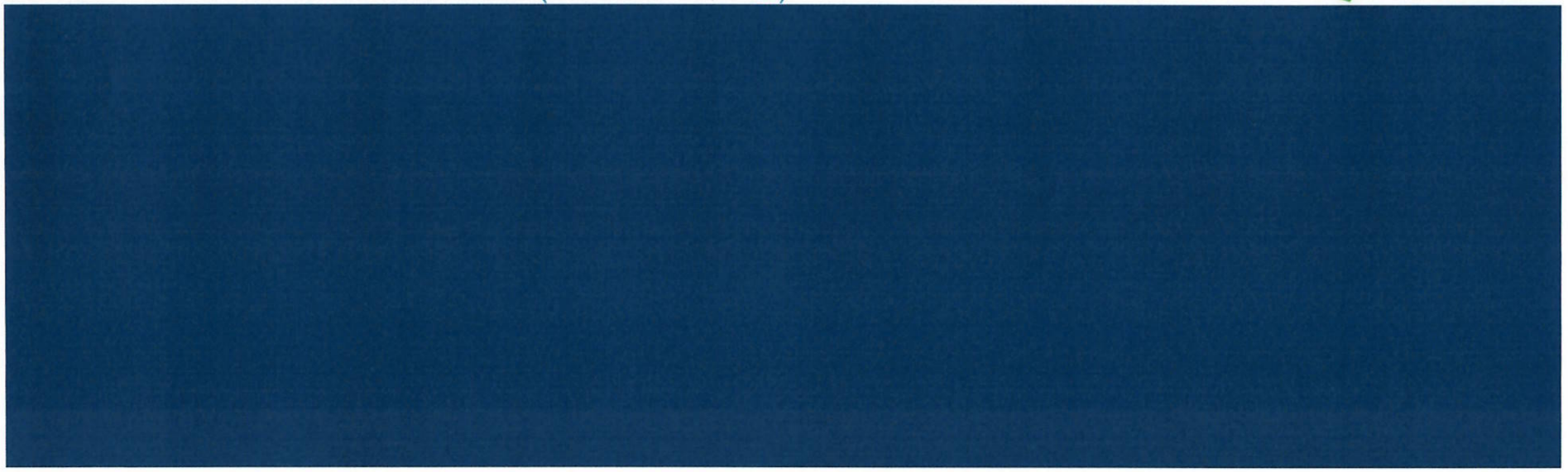
Director Babcock replied that there isn't an opportunity for an extension, the City must comply with the decision and order (DNO), and a response must be submitted by the end of the year.

Before proceeding with the October 24, 2022 agenda, Chair Andaya noted a correction to the September 26, 2022 Notice and Agenda, Items Requiring Board Action Item #1 Approval of the Minutes of the Regular Meeting Held on August 26, 2022, should have been Approval of the Minutes of the Regular Meeting Held on August 22, 2022. The Approval of the Minutes of the Regular Meeting Held on August 22, 2022, were approved at the September 26, 2022 Board Meeting and an Amended Notice and Agenda were submitted to the City Clerk's Office.

Chair Andaya announced that the Item for Information number two, Update on the BWS's Response to the Potential Impacts of the Red Hill Fuel Contamination, would be heard and discussed before returning to the original order of the October 24, 2022 agenda.

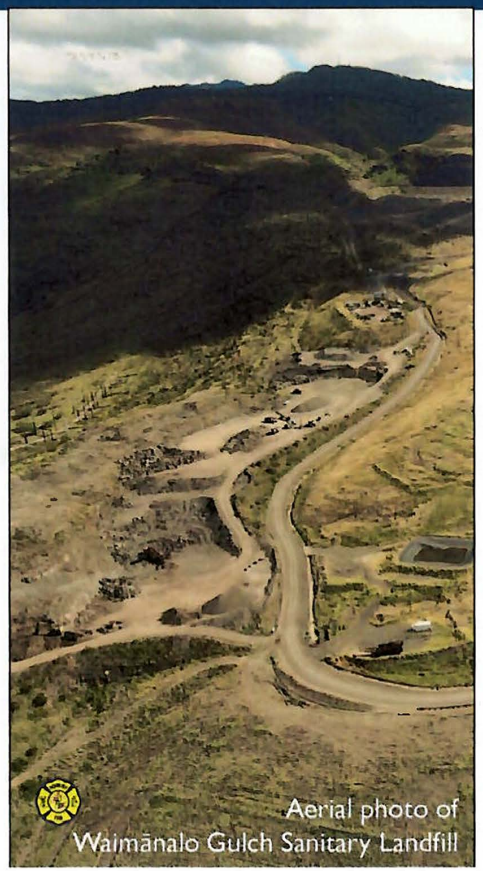
CITY LANDFILL SITING PROJECT

BOARD OF WATER SUPPLY PRESENTATION (OCTOBER 24, 2022)



CONTENTS

- Land Use Commission Decision & Order
- Landfill siting restrictions
- Landfill siting process recap
- Next steps



Aerial photo of
Waimānalo Gulch Sanitary Landfill

LAND USE COMMISSION, DOCKET NO. SP09-403 (11/1/2019)

Decision & Order - Significant Conditions:

1. "The WGSL [Waimānalo Gulch Sanitary Landfill] shall close by no later than March 2, 2028. The WGSL shall not accept any form of waste after March 2, 2028."

2. "By no later than December 31, 2022, the Applicant [ENV] shall identify an alternative landfill site that may be used upon closure of WGSL. Upon identification of the alternative landfill site, the Applicant shall provide written notice to the Planning Commission and the LUC."

Active ash and MSW subareas of WGSL

LANDFILL SITING RESTRICTIONS

- ½ Mile Residential-School-Hospital Buffer
  HRS §342H-52(b)
- Conservation District Land
  HRS §183C-4(b)
- Airport Buffer
  HAR §11-58.1-13(a)
- Tsunami Evacuation Zone
  HAR §11-58.1-13(g)
- Developed and Undevelopable Lands
- Federal Lands

*Map tool available at honolulu.gov/opala/newlandfill

All unrestricted (white) areas are in the "No Pass Zone"

LANDFILL SITING PROCESS RECAP: LANDFILL ADVISORY COMMITTEE (LAC)

- Eight-member committee appointed by Mayor in September 2021
  - Role: Learn about, evaluate and score potential sites
- Eight meetings* over nine months, from October 2021 to June 2022, covering:
  - Evaluation process and criteria determination
  - City's solid waste program
  - Landfill design and operation
  - Site tours of H-POWER, WGSL and PVT Landfill
  - BWS presentation on groundwater and landfills
  - Acceptance of the final report

*Held in accordance with the Sunshine Law

LAC Meeting 7

LAC SITE SCORING AND RANKING

- LAC evaluated and scored six potential sites

Rank	Area	Site	Score
1	6	1	4,200
2	7	1	4,061
3	3	1	3,841
4	3	2	3,685
5	3	3	3,634
6	2	1	3,596

NEXT STEPS

- Clarification of BWS Authority over Landfill Siting
  - Does BWS have legal authority to prohibit landfills within the No Pass Zone?
  - If so, based upon the Manager and Chief Engineer's position that landfills should not be located within the No Pass Zone, which the LAC has relied upon in making its recommendation, has BWS already exercised that authority?
  - If not, how and at what point in the process would the City seek such a determination?

Aerial photo of WGSL

ITEM FOR INFORMATION NO. 2

"October 24, 2022

UPDATE ON THE BOARD OF WATER SUPPLY'S RESPONSE TO THE POTENTIAL IMPACTS OF THE RED HILL FUEL CONTAMINATION

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843
Chair and Members:

Subject: Update on the Board of Water Supply's Response to the Potential Impacts of the Red Hill Fuel Contamination

Ernest Lau, Manager & Chief Engineer, will give an Update on Board of Water Supply's Response to the Potential Impacts of the Red Hill Fuel Contamination

Respectfully Submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

The foregoing was for information only.

DISCUSSION:

Ernest Lau, Manager & Chief Engineer gave the report.

Chair Andaya asked if there were any testifiers.

Board Secretary Joy Cruz-Achiu responded that there are testifiers are waiting to testify.

Chair Andaya stated that he would have Manager Lau present the Update on the Board of Water Supply's Response to the Potential Impacts of the Red Hill Fuel Contamination and then allow for testifiers to testify.

Board Member Anthony inquired if there have been any new developments in the remediation of the aquifer.

Manager Lau reported that the BWS reached out directly to three admirals at Pearl Harbor and has been in discussions with Rear Admiral Stephen Barnett, Rear Admiral John Wade, and Rear Admiral Jeffrey Kilian. The idea is to collaborate with the Navy on the installation of monitoring wells to increase the understanding of what is happening in the aquifer. He asked Deputy Erwin Kawata to explain the discussions regarding monitoring wells.

Deputy Manager Erwin Kawata stated that the Navy has shared its map showing the locations of their current monitoring wells and future monitoring wells, one of which is close to the BWS Moanalua pipeline tunnel. Therefore, the BWS is scanning that particular monitoring well to

ensure the work doesn't impact the tunnel and the pipeline in that facility. He shared that the BWS is also moving forward with installing monitoring wells which are in the design and permitting stage.

Manager Lau shared that Navy Rear Admiral Barnett contacted him during the weekend of Friday, October 21, 2022, when the Navy suffered multiple main breaks in the Pearl Harbor area, and requested the BWS's help. He commented that it is important to work together for the good and benefit of the community.

Chair Andaya interjected, he stated that he is proud to be part of the BWS, a magnanimous organization that helped the Navy in their time of need.

Manager Lau commented that the BWS agreed to assist because 93,000 people still depend on water. The BWS has the capacity that the Navy doesn't.

Board Member Sword commented that he didn't realize how extensive the Navy's network was. He inquired if the Navy's water main and pipelines run parallel to the BWS's water main and pipeline. If the BWS encounters a water main break and repairs need to be made does the Navy get affected.

Manager Lau responded the Navy's water system is spread throughout a large service area and separate from the BWS system. He stated in some cases the BWS and the Navy water mains and pipelines can be in close proximity to each other. As an example, Manager Lau explained that the Navy's 36-inch cast iron pipe that broke, which was installed in 1951, is located under the bike path that is along the shores of Pearl harbor and can be fully submerged underwater like the Navy's pipelines that cross under Pearl Harbor. This condition can make the repair work difficult. By comparison, BWS pipelines in the area are located in the public right-of-way Kam highway making it easier to access to make repairs.

Board Member Dawn Szewczyk expressed her appreciation to Manager Lau for choosing to support the 93,000 people on the Navy line.

Manager Lau stated that he made it very clear to the Navy Rear Admirals that there may be a time that the BWS may not be able to accommodate the Navy due to the water shortage should the Navy lose all their source and water.

Chair Andaya announced that testimony would be heard.

Request Received	Submitter's Name	Specify Action/Info Item	Format	Confirmed
October 24, 2022	Susan Pcola-Davis	Info #1- Landfill	Zoom Oral Testimony	Yes
October 24, 2022	Susan Pcola-Davis	Info #2- Red Hill	Zoom Oral Testimony with attachment	Yes
October 24, 2022	Susan Pcola-Davis	Info #3- Appointment of Deputy Manager	Zoom Oral Testimony	Yes
October 24, 2022	Meredith Wilson	Info #2- Red Hill	Zoom Oral Testimony	Yes

Ms. Susan Pcola-Davis testified on three information items:

- Information item #1 Briefing by the Department of Environmental Services on their Landfill Siting Effort- Ms. Pcola-Davis commented that there's possibly an extension on naming the landfill site.
- Information item #2 Update on the Board of Water Supply's Response to the Potential Impacts of the Red Hill Fuel Contamination- Ms. Pcola-Davis stated that she is happy to hear that new monitoring wells are being set up. She also commented that she was happy to hear that civilians are being included.
- Appointment of Erwin Kawata as Deputy Manager- Ms. Pcola-Davis congratulated Deputy Manager Kawata on his new position.

Ms. Meredith Wilson testified on the Board of Water Supply's Response to the Potential Impacts of the Red Hill Fuel Contamination and expressed her gratitude to the BWS for taking upon the "kuleana" to protect the people and our water. She asked if the BWS uses the same testing laboratory that the Navy uses to test the water and ensure that bacteria and other contamination are clear for BWS customers.

Manager Lau responded that the BWS has its own microbiological laboratory to perform water tests to ensure that results are received in a timely manner. He further explained that the BWS also performs thousands of biological contamination test in its own laboratory to ensure that our water is safe and meet drinking water regulations.

10/24/22 BWS Board Meeting—Public Testimony

Aloha, Good Afternoon, my name is Meredith Wilson.

I wanted to thank this Board and the entire BWS operation for their sometimes thankless efforts throughout other years. Normally, when water main breaks happened before, the text alert would come through my phone and I just assumed it was getting taken care of by you folks and I rerouted my morning traffic to get to work. Municipal workers are truly unsung heroes.

Now, I obviously don't know the full extent of the 36" main break in the Navy water system that recently sent their 93,000 users yet again without clean water, but I noticed during that span of time, BWS had a 24" main break and from the outside, it went on without a hitch, even with few customers impacted.

Then, after fixing your own system, you graciously supplied an emergency connection to a Navy system neighborhood with low pressure. To me, this is the full definition of my favorite Hawaiian word that I learned while living in Hawaii: "kuleana"

You put aside that you were the only fully capable entity left out of the 2015 AOC,
That you're rarely given field data on time if at all from the Navy,
That Mr. Lau & others have been ringing alarm bells about Red Hill for years to no avail,
And then when a crisis called, you saw fellow families in need and came to the rescue.

That was your responsibility, yournkuleana. If only the Navy felt that same sense of responsibility for its own people and most importantly the land that sustains the life on it.

A question I'll leave you with is that if BWS were to in the future experience a boil order like the Navy just did, would you use the same on-island "3rd party lab" to lift the order? How would you ensure bacteria and any other contamination is clear for your customers' confidence in their water? Is this another example of how Hawaii needs an EPA-certified lab in the state?

APPROVAL OF MINUTES

Approval of the Minutes of the Public Hearing and Regular Meeting Held September 26, 2022

MOTION TO APPROVE

Max Sword and Dawn Szewczyk motioned and seconded, respectively, to approve the Minutes of the Public Hearing and Regular Meeting of September 26, 2022.

In lieu of a roll call vote, Chair Andaya requested a voice vote on the motion and requested that Board Members in favor of the motion say "Aye." The Board members present responded with a verbal "Aye." Chair Andaya then inquired if any Board Members would like to object or vote "Nay" on the motion. There were no objections or "Nay" votes. Board Member Jonathan Kaneshiro announced that he would abstain from voting. Chair Andaya announced that the motion was unanimously carried.

THE MINUTES OF THE PUBLIC HEARING AND REGULAR MEETING HELD ON SEPTEMBER 26, 2022 WERE APPROVED AT THE OCTOBER 24, 2022 BOARD MEETING			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT	X		
MAX J. SWORD	X		
NA'ALEHU ANTHONY	X		
JONATHAN KANESHIRO			ABSTAIN
JADE T. BUTAY	X		
DAWN B. SZEWCZYK	X		

"October 24, 2022

ADOPTION OF RESOLUTION NO. 954, 2022, ACCEPTANCE OF GIFT TO THE BOARD OF WATER SUPPLY FROM THE HAWAII DATA COLLABORATIVE TO ASSIST IN THE RED HILL DATA SERVICES IN COMMUNICATING RED HILL IMPACTS TO THE COMMUNITY

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chair and Members:

Subject: Adoption of Resolution No. 954, 2022, Acceptance of Gift to the Board of Water Supply from the Hawaii Data Collaborative to Assist in the Red Hill Data Services in Communicating Red Hill Impacts to the Community

We recommend the adoption of the attached Resolution No. 954, 2022, to accept the proposed gift to the Board of Water Supply (BWS), City and County of Honolulu in support of the need for data services relevant to identifying and communicating the impacts from recent fuel leaks from the Red Hill Bulk Fuel Storage Facility. The Hawaii Data Collaborative (HDC) has offered to assist with these services and will Provide said services as a gift (in-kind) to the BWS. The total value of the gift is $8,750.

The work will cover:

- Geocode measurement wells
- Scripting to prepare electronic data deliverables for data analysis
- Data cleaning and data preparation for ArcGIS
- Create ArcGIS web map and layout for the audience (to be specified)
- Load data into ArcGIS web map, develop web map functionality
- Final data and ArcGIS web map validity checks
- Transition data transposition and ArcGIS products to the BWS team for ongoing use

The work that HDC will do for the BWS will allow our agency to take the data we have collected from various sources (the Navy, State of Hawaii Department of Health, and the BWS) and develop a dashboard that will help the community better understand the impacts of the contamination to our aquifer and water sources. HDC did similar work for the State and helped develop the COVID dashboard.

The HDC is a 501c(3) non-profit organization that collaborates with community partners to make data meaningful for addressing pressing challenges in Hawaii. For mission-aligned projects such as this, they do not charge a fee for services. They anticipate devoting approximately 70 hours of HDC staff time to this project, representing a value of $8,750. They do not anticipate additional expenses outside of direct staff time. Should there be the need for additional HDC support beyond the estimated

70 hours, the value of that support would be approximately $125 per additional HDC staff hour.

Respectfully Submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

DISCUSSION: Ernest Lau, Manager, and Chief Engineer gave the report.

Board Member Anthony reported that the BWS is working with the Hawaii Data Collaborative (HDC) to develop a database that makes the large amount of groundwater monitoring well test results being collected easier to access and read. HDC completed a similar project during the Covid pandemic that made information easily accessible and understandable to the public.

Board Member Sword inquired if the Department of Health (DOH) distributes that information on a timely basis.

Manager Lau replied that when the DOH receives the data from the Navy that is made available to the public. The information is important but not easy to read in the present 700+ page PDF format. Any trends in the data and how it's changing over time should be easily communicated to the public.

Board Member Sword asked if HDC will be responsible to separate the data for an average person to understand.

Manager Lau replied that making the information easier to understand is the objective and asked Deputy Manager Kawata to explain the electronic data deliverable format that BWS prefers.

Deputy Manager Kawata responded that the electronic data deliverable is a large Excel spreadsheet that has all the information by column, and can be sorted alphabetically and by concentration. He explained the information is normally sent to the regulatory agencies, which is included in their database and makes it easier and coherent to review the information. Deputy Manager Kawata stated that an initiative with HDC would help simplify the data tremendously and make the information more readable and user-friendly.

MOTION TO APPROVE Max Sword and Jade Butay motioned and seconded, respectively, to approve the Adoption of Resolution No. 954, 2022, Acceptance of Gift to the Board of Water Supply from the Hawaii Data Collaborative to Assist in the Red Hill Data Services in Communicating Red Hill Impacts to the Community.

In lieu of a roll call vote, Chair Andaya requested a voice vote on the motion and requested that Board Members in favor of the motion say "Aye." The Board members present responded with a verbal "Aye." Chair Andaya then inquired if any Board Members would like to object or vote "Nay" on the motion. There were no objections or "Nay" votes. Chair Andaya announced that the motion was unanimously carried.

ADOPTION OF RESOLUTION NO. 954, 2022, ACCEPTANCE OF GIFT TO THE BOARD OF WATER SUPPLY FROM THE HAWAII DATA COLLABORATIVE TO ASSIST IN THE RED HILL DATA SERVICES IN COMMUNICATING RED HILL IMPACTS TO THE COMMUNITY WAS ADOPTED ON OCTOBER 24, 2022			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT	X		
MAX J. SWORD	X		
NA'ALEHU ANTHONY	X		
JONATHAN KANESHIRO	X		
JADE T. BUTAY	X		
DAWN B. SZEWCZYK	X		

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

RESOLUTION NO. 954, 2022

ACCEPTANCE OF GIFT TO THE BOARD OF WATER SUPPLY FROM THE HAWAII DATA COLLABORATIVE TO ASSIST IN THE RED HILL DATA SERVICES IN COMMUNICATING RED HILL IMPACTS TO THE COMMUNITY

WHEREAS, the spill at Red Hill Bulk Fuel Storage Facility in November of 2021 caused the shutdown of three Board of Water Supply wells; and that these wells are located near the Navy's Red Hill Bulk Fuel Storage Facility; and there exists a concern about potential contamination of these wells from the Red Hill spill; and that the contaminant data provided by the Navy, Board of Water Supply and the State of Hawaii Department of Health is organized in a way not easily understood by the public; and that there is a need for data services relevant to identifying and communicating the impacts from the recent fuel leaks to the public; and

WHEREAS, the Hawaii Data Collaborative works with businesses, government agencies, and the community to make data meaningful for addressing pressing challenges in Hawaii; and the Hawaii Data Collaborative worked closely with the State of Hawaii Department of Health in developing a COVID-19 dashboard that allowed the public to understand important information regarding the pandemic in Hawaii; and

WHEREAS, the Hawaii Data Collaborative has offered to assist with these services and will provide said services as a gift (in-kind) to the Board of Water Supply; the total value of the gift is $8,750.00; and

WHEREAS, Hawaii Data Collaborative is a tax-exempt Hawaii nonprofit organization whose mission is to make data meaningful to the community; and

WHEREAS, the BWS may accept gifts to the Department as long as it does not provide special consideration, treatment, advantage, privilege, or exemption for or coerces a potential donor; and

BE IT RESOLVED that the Board of Water Supply hereby accepts the gift valued at $8,750.00 from the Hawaii Data Collaborative and directs the Manager and Chief Engineer, or his delegate, to accept and thank the Hawaii Data Collaborative for its support.

ADOPTED:

BRYAN P. ANDAYA
Chair

Honolulu, Hawaii
October 24, 2022

ADOPTION OF RESOLUTION NO. 954, 2022, ACCEPTANCE OF GIFT TO THE BOARD OF WATER SUPPLY FROM THE HAWAII DATA COLLABORATIVE TO ASSIST IN THE RED HILL DATA SERVICES IN COMMUNICATING RED HILL IMPACTS TO THE COMMUNITY WAS ADOPTED ON OCTOBER 24, 2022			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT	X		
MAX J. SWORD	X		
NA'ALEHU ANTHONY	X		
JONATHAN KANESHIRO	X		
JADE T. BUTAY	X		
DAWN B. SZEWCZYK	X		

"October 24, 2022

AUTHORIZING A PUBLIC HEARING TO CONSIDER THE BOARD OF WATER SUPPLY WATER SHORTAGE RESPONSE AND RECOVERY PLAN

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chair and Members:

Subject: Authorizing a Public Hearing to Consider the Board of Water Supply Water Shortage Response and Recovery Plan

We recommend that the Board authorize a public hearing to be held at 2:00 p.m. on November 28, 2022, to consider the resolution to adopt the Board of Water Supply Water Shortage Response and Recovery Plan.

Attached is the draft of the "Notice of Public Hearing" to be published prior to the hearing date.

Respectfully Submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

DISCUSSION:

Barry Usagawa, Program Administrator, Water Resources Division, gave the report. There were no comments or discussion.

Manager Lau stated that the Board of Water Supply has presented the Water Shortage Response and Recovery Plan to two Stakeholder Advisory Groups (SAG) and will be distributed for further comments.

Chair Andaya inquired if the draft BWS Water Shortage Response and Recovery Plan will be available for advance review.

Manager Lau responded that the plan will be distributed amongst the Board Members and viewable on the BWS website.

Chair Andaya asked if the BWS Water Shortage Response and Recovery Plan is in response to the Red Hill contamination.

Manager Ernest Lau responded that the Red Hill issue created a unique condition, it impacted several wells which reduced the BWS pumping wells capacity. Therefore the BWS Water Shortage Response and Recovery Plan were constructed not for only Red Hill but for broader use. He asked Mr. Barry Usagawa to share the other uses for the BWS Water Shortage Response and Recovery Plan.

Mr. Usagawa explained that the BWS Water Shortage Response and Recovery Plan explains how contamination can cause disruptions to the BWS system could reduce the available supply to meet the max day demand, and the guidance to reduce water demand through progressively restrictive recommended trigger actions.

Board Member Szewczyk asked if interconnectivity into military sources would be an option in the event the BWS experiences water shortages.

Mr. Usagawa replied the BWS Water Shortage Response and Recovery Plan is designed for only the BWS.

MOTION TO APPROVE

Jade Butay and Jonathan Kaneshiro motioned and seconded, respectively, to Authorize a Public Hearing to Consider the Board of Water Supply's Water Shortage Response and Recovery Plan.

Chair Andaya requested Board Secretary, Ms. Joy Cruz-Achiu to conduct the roll call vote.

Ms. Cruz-Achiu conducted a roll call vote: Vice Chair Kapua Sproat, aye; Board Member Max Sword, aye; Board Member Na'alehu Anthony, aye; Board Member Jonathan Kaneshiro, aye; Board Member Jade Butay, aye; Board Member Dawn Szewczyk, aye; and Chair Bryan Andaya, aye.

Ms. Cruz-Achiu announced that the motion passed with seven ayes.

AUTHORIZING A PUBLIC HEARING TO CONSIDER THE BOARD OF WATER SUPPLY'S WATER SHORTAGE RESPONSE AND RECOVERY PLAN WAS APPROVED ON OCTOBER 24, 2022			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT	X		
MAX J. SWORD	X		
NA'ALEHU ANTHONY	X		
JONATHAN KANESHIRO	X		
JADE T. BUTAY	X		
DAWN B. SZEWCZYK	X		

NOTICE OF PUBLIC HEARING

NOTICE IS HEREBY GIVEN that the BOARD OF WATER SUPPLY (BWS), CITY AND COUNTY OF HONOLULU, will hold a PUBLIC HEARING in the Board Room, Public Service Building, 630 South Beretania Street, on Monday, November 28, 2022, at 2:00 p.m. or soon thereafter, where all interested persons shall be afforded the opportunity of being heard on the adoption of the Board of Water Supply Water Shortage Response and Recovery Plan. You may find a copy on the website boardofwatersupply.com/boardmeetings.

Some Board members may be participating in the meeting by interactive conference technology from remote locations. The public may attend the meeting from the lobby of the Board of Water Supply, Public Service Building, 630 S. Beretania St. Honolulu, HI 96843, via interactive conference technology.

TESTIMONY CAN BE SUBMITTED AS FOLLOWS:

- Written testimony should include the submitter's address, email address, and phone number. Testimony should be received by Monday, November 28, 2022, at noon. Submit written testimony by:
  - Email to board@hbws.org
  - Online at boardofwatersupply.com/testimony
  - Mail to Board of Water Supply, 630 S. Beretania St., Honolulu, HI 96843
  - Fax to (808) 748-5079
- Oral testimony will be accepted remotely and in person during the meeting. Pre-registration is encouraged to facilitate as much remote and in-person testimony as reasonably possible during the time allotted. Testifiers should consider also submitting a written version of their oral testimony.
  - To testify remotely by phone or video using the Zoom videoconferencing platform, please submit your request by:
    - Email to board@hbws.org
    - Online at boardofwatersupply.com/testimony

    Zoom registration instructions, as well as participant guidelines, will be sent to the contact information provided. Once confirmed as registered, testifiers will receive an email containing the links and instructions to join the Zoom session. Submit your request to testify remotely by Friday, November 25, 2022, at noon.
  - To testify in person at the Board of Water Supply, Public Service Building, 630 S. Beretania St., Honolulu, HI 96843, please pre-register by submitting your request by Monday, November 28, 2022:
    - Email to board@hbws.org
    - Online at boardofwatersupply.com/testimony

In-person testifiers should check-in with building security and then with testimony staff located in the lobby. Testifiers will be escorted to and from the Board Room. On-site registration will be available for walk-in requests.

MATERIALS AVAILABLE FOR INSPECTION

Meeting materials ("board packet" under HRS Section 92-7.5) are accessible at boardofwatersupply.com/boardmeetings. Persons requesting a printed copy of the materials should contact Julie Siazon at (808) 748-5925.

VIEWING THE MEETING

The public may attend the meeting at the Board of Water Supply, Public Service Building, 630 S. Beretania St. Honolulu, HI 96843, via interactive conference technology.

The meeting will be viewable via live streaming on:

(1) the BWS website: www.boardofwatersupply.com/live. Video will appear on screen. You may have to click the arrow on video to start it. You may have to unmute audio as muted audio tends to be the default setting.

Persons wishing to present testimony are requested to register by 1:00 p.m. on Friday, November 25, 2022, with Julie Siazon (808)748-5925, by providing your name, phone number, and subject matter of testimony. Testimony is limited to two (2) minutes and shall be presented by the registered speaker only. Any person requiring special assistance may contact Julie Siazon at (808) 748-5925 no later than November 23, 2022, so that appropriate accommodations can be provided.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

DRAFT BWS Water Shortage Response and Recovery Plan

Abstract

Procedures to control water demand and optimize supply during water shortage from low groundwater levels, contamination and infrastructure disruptions

Water Resources October 12, 2022

Table of Contents

Introduction

The purpose of this Water Shortage Response and Recovery Plan is to provide the Honolulu Board of Water Supply (BWS) with strategic and tactical steps to assess the need to declare a water shortage and manage water demands related to a water shortage condition

> *A water shortage condition exists when water supply is not available to meet existing and/or future max day water demands due to degradation of water quality or extended drought or disruptions to water system delivery infrastructure.*

The different phases of water shortage provides possible actions BWS can take to mitigate the emergency. Figure 1 shows the different phases of water shortage covered in this plan.

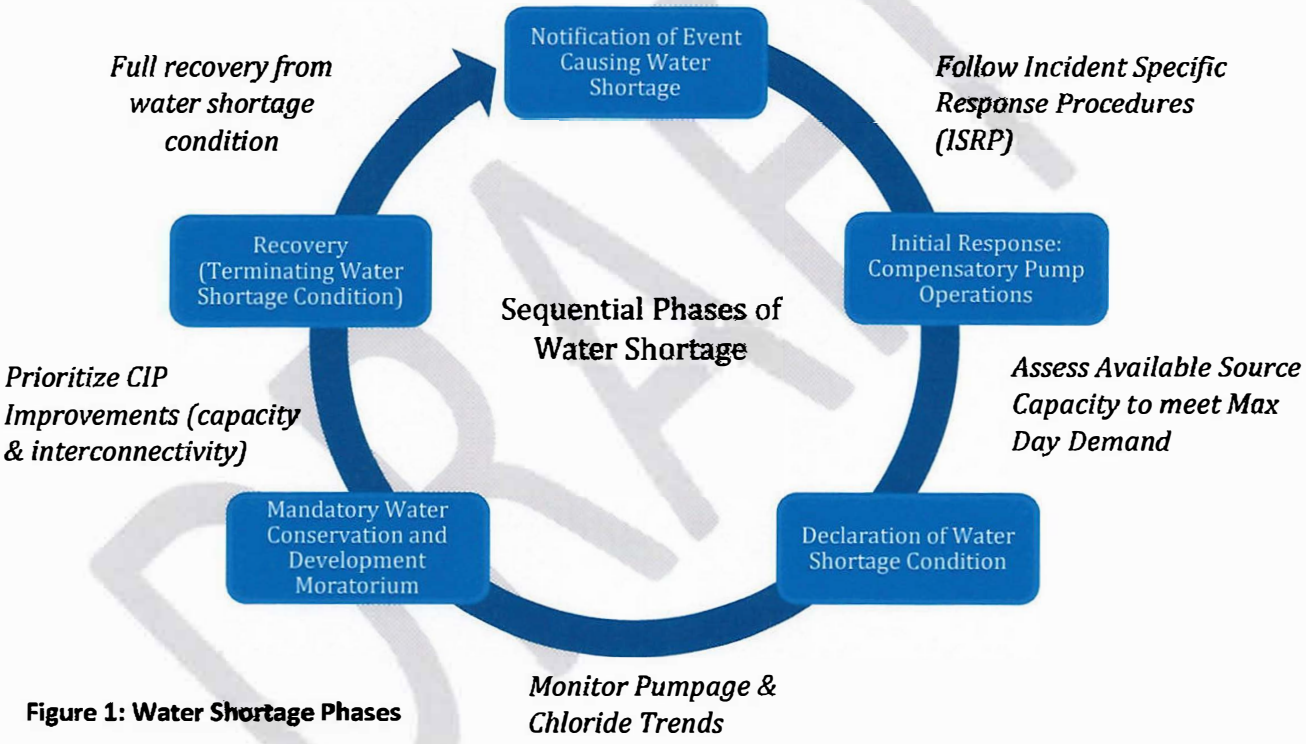


Figure 1: Water Shortage Phases

This Water Shortage Response and Recovery Plan provides recommended triggers, procedures and implementation actions to respond to a water shortage condition. The actual order in which response procedures are implemented during any specific water shortage will be at BWS's discretion to most effectively respond to the situation.

The objectives of the water shortage procedures are to reduce potable water use, prevent water service disruptions, low water pressures and groundwater quality degradation from overdraft.

Authorization

Definitions:

BWS means the Department of Water, known as the "Board of Water Supply," consisting of a Board of Water Supply, Manager and Chief Engineer and the necessary staff.

Board means the policy-making body, consisting of seven members of the Board of Water Supply

Water Shortage Condition: A water shortage condition exists when water supply is not available to meet existing and/or future max day water demands due to degradation of water quality, extended drought or disruptions to water system delivery infrastructure.

Authorization:

The **Honolulu City Charter**, under **Article VII, Section 7-105 (j), Powers, Duties and Functions of the Board of Water Supply,** directs the Board to:

Prescribe and enforce Rules and Regulations having the force and effect of law to carry out the provisions of this article of the charter, including

1. The regulation of water systems and necessary appurtenances for subdivisions and other properties and requirements for adequate water supply and storage facilities for domestic use and fire protection,
2. **The prevention of waste and pollution of water,**
3. The manner in which new wells or shafts may be bored, drilled or excavated, cased and capped or re-cased,
4. The manner in which wells or shafts shall be maintained, controlled and operated to prevent waste of water or the impairment of potability,
5. **The limitation to beneficial uses of all water,**
6. **In times of shortage or threatened shortage of water or of danger to potability of the water of any ground water basin or area by overdraft on such basin, the restriction of the drawing of water in all wells supplied from such basin on a basis proportionate to the proper and beneficial uses served by them respectively,** and
7. Other matters having for their object the proper conservation and beneficial use of the water resources available for the city.

BWS Rules and Regulations provide the authorization to restrict water use to prevent water shortages:

Sec. 2-209: Conservation Measures and Interruption of Water Supply

1. The Department will exercise reasonable diligence to deliver water to the consumer and avoid shortages or interruptions in service, but will not be liable for any interruption, shortage, insufficiency of supply, or any loss or damage occasioned thereby.

2. **Whenever, in the Department's opinion, special conservation measures are advisable in order to forestall water shortages, the Department may restrict the use of water by any means or method of control.**

A summary of the low groundwater condition rules Sections 3-318 to 3-322 provide progressively restrictive response requirements and procedures.

Sec. 3-318: Low Groundwater Level Conditions

- Establishes Caution, Alert & Critical Low Groundwater Conditions and response actions to reduce water demand to protect water resources
- 3 or more index wells must be in low groundwater condition

Sec. 3-319: Mandatory Restrictions Related to Alert Low Groundwater Condition

- The Board may set lawn and ground cover water irrigation restrictions on any of the Department's consumers.
- The Board may establish water allotments for commercial, residential, industrial, military, governmental, and agricultural consumers.

Sec. 3-320: Mandatory Restrictions Related to Critical Low Groundwater Condition

- The Board may restrict irrigation, car washing, filling pools, washing sidewalks and operating fountains.
- Require rate surcharges for excess water use and allotments

Sec. 3-321: Penalties

- Any violation by any person of the restrictions declared by the Board under Sections 3-319 and 3-320 of this Chapter shall be punishable according to Chapter II, Section 2-205 and Chapter V, Section 5-501 of these Rules and Regulations.
- Require flow restrictors for excess water use
- Charge $50 for installation and removal of the flow restrictor.
- Discontinue water service for violations after the flow restrictor is installed in accordance with Ch. II, Sec. 2-205

Sec. 3-322: Procedures for Control of Water Use During Low Groundwater Level Condition

- Declaration of Low Groundwater Level Condition
- Notice of Restrictions
- Notice of Water Allotment to Consumers
- Notice of Maximum Monthly Water Allotment to Private Well Operators
- Exceptions
- Termination of Low Groundwater Level Condition.

Sec. 5-501: Penalty (misdemeanor, pursuant to Chapter 1, Article 3, Section 1-3.1, ROH)

Water Shortage Declaration

A water shortage condition exists when water supply is not available to meet existing and/or future max day water demands due to degradation of water quality, extended drought or disruptions to water system delivery infrastructure.

During a water shortage condition, BWS will inform and coordinate response actions with the State Department of Health, Safe Drinking Water Branch and the State Commission on Water Resource Management (CWRM), and other agencies as needed. Note that a water shortage condition caused by extended drought has specific head levels and/or chloride triggers and CWRM coordination requirements listed within the Low Groundwater Response, Recovery Plan, a separate document.

In accordance with Sec. 3-318, *BWS may at any time during the period in which a low groundwater condition exists* or is anticipated:

a. *Declare that a water shortage condition exists. A water shortage condition shall continue to exist, once it is declared, until such time as BWS declares that the condition is terminated.*

b. *Implement mandatory restrictions within the scope of BWS Rules and Regulations.*

c. *Punish offenders within the scope of these Rules and Regulations.*

The Manager shall, at each regular Board meeting while a declared water shortage condition as provided herein is in effect, report to the Board the status of the head and chloride levels and water system capacity; the weekly average of daily pumpage and demands; the effectiveness of the restrictions and allotments in force; recommendations to increase or reduce restrictions and allotments; and such other information.

BWS may terminate the declared water shortage condition when the event causing degradation of water quality or disruptions to water system delivery infrastructure has been resolved.

In a Critical Water Shortage Condition where Mandatory Conservation is required because of insufficient response to voluntary conservation, the Board may declare a Building Moratorium.

BWS Water Shortage Condition Triggers

A BWS Water Shortage Condition can be declared by an actual or imminent contamination of a water source(s) that requires curtailing or shutting off wells and diverting flow from another part of the water system to meet the water demands or an extended (multi-year potential) infrastructure disruption event. A water shortage condition may also result in declining groundwater head levels or rising chloride levels in BWS water sources used to compensate for the temporary loss of available water pumping capacity. An extended drought may also cause a water shortage condition. To the extent practicable, BWS will manage pumping within the integrated water system such that the combined 12-month moving averages of the BWS sources

within each aquifer system will be within the total State permitted use, as to not detrimentally impact water resources.

BWS Water System Standards provide requirements for total pump capacity for water systems.

Section 111.08 Total Pump Capacity

- The total pump capacity for each site shall be based on the criteria that yields the maximum pumpage.
- Meet maximum day demand with an operating time of 16 hours. The largest pumping unit shall be considered out of service (standby).

Triggers for Alert and Critical Water Shortage Conditions

A trigger framework can be based on the ability for available (in-service) pump capacity in the target water system to meet max day demand (summer dry season) in progressive run times between 16 hours to 24 hours a day. Increasing pumping must be monitored for head and chloride levels to ensure a low groundwater condition does not develop.

- **Adequate pump capacity** is defined in BWS Water System Standards as meeting max day demand in 16 hours of pump run time, with the largest pumping unit considered standby. Standby pumps will be identified using pump operations experience and engineering judgement specific to the target water system.

- In a water shortage condition, **max day demand is defined as the 95th percentile (Q_{95}) of actual production**. During a water shortage condition, water conservation is assumed to flatten the highest 5% of the max day demand profile.

- **Alert Water Shortage Condition** is defined as available pumping units to meet Q_{95} max day demand in 20 hours, standby pumps are not included in pump run time calculation.

- **Critical Water Shortage Condition** is defined as available pumping units cannot meet Q_{95} max day demand in 22 hours of pump run time, standby pumps are not included in pump run time calculation.

- **Requirement for Monitoring** chloride trends, well production (peak hour and total) by pump station, index monitoring well head levels will be sampled more frequently (weekly, instead of monthly). Available remaining pumping stations may have to be pumped harder to meet Q_{95} max day summer demand and may increase chloride levels and decrease head levels into Alert or Critical low groundwater levels.

    - In accordance with Sec. 3-318 Low Groundwater Conditions, *whenever chloride content rises 16 ppm or more over three consecutive months at sufficient sources to hamper operations.*

- Index well head levels decrease into Alert or Critical low groundwater levels in 3 or more index wells within the target water system.

Table 1 presents the triggers for each Water Shortage Condition. Note that an exceedance of either source capacity/demand or chloride trigger could result in a water shortage condition. A reduction in sufficient sources to hamper operations due to rising chlorides are dependent on pump operations experience and engineering judgement specific to the target water system.

Table 1: BWS Water Shortage Condition Triggers

Water Shortage Condition	Source Capacity/Demand Trigger	Chloride Content Trigger*
No Water Shortage	Available pumping units meet max day demand in 16 hours, standby not included.	Stable Chloride and Head Level Trends
Alert	Available pumping units meet Q_{95} max day demand in 20 hours, standby pumps not included.	Chloride content rises between 12 ppm and 16 ppm over three consecutive months at sufficient sources to hamper operations.
Critical	Available pumping units cannot meet Q_{95} max day demand in 22 hours, standby pumps not included	Chloride content rises over 16 ppm over three consecutive months at sufficient sources to hamper operations.

*Chloride content must rise at sufficient wells to hamper operations to activate a Low Groundwater Condition

The Low Groundwater Condition water level triggers for each index well are presented in Table 2.

Table 2: BWS Index Wells and Low Groundwater Condition Water Level Triggers

CWRM Aquifer System	BWS Index Area	BWS Index Well Name	Avg. Median GW Elevation (ft MSL)	Caution Level (ft MSL)	Alert Level (ft MSL)	Critical Level (ft MSL)
Palolo	Kaimuki	Kaimuki H.S. 25-1A Deep MW	25.0	23.5	22.5	20.5
Nuuanu	Beretania	Thomas Square 83 MW	23.0	21.0	20.0	17.5
Kalihi	Kalihi	Kalihi "Kapalama" MW	23.0	20.5	19.5	17.0
Moanalua	Moanalua	Manaiki T-24 MW	20.0	18.5	17.5	15
Waimalu	Halawa	Halawa T-45 MW	17.0	15.5	14.5	12.0
	Kalauao	Upper Waimalu T-52 MW		15.5	14.5	12.0
Waipahu-Waiawa	Pearl City	Waiawa T-27 MW	17.0	14.0	13.0	12.0
	Waipahu	Waipahu 241 Deep MW		17.0	16.0	15.0
	Hoaeae-Kunia	Kunia T-41 Deep MW		13.0	12.0	11.0
Makaha	Makaha	Makaha V Well	18	7.0	6.0	4.0
Waialua	Helemano	Helemano MW	11	11.0	10.5	10.0
Koolauloa	Punaluu	Punaluu Deep MW	18	17.0	16.0	14.0
	Kaluanui	Kaluanui Deep MW		16.0	15.0	14.0
Waialae-West	Waialae-West	Kapakahi Well (State Well Number 3-1746-003)	8	7	6.5	6

Median groundwater elevation based on available historical data, typically available since the 1990s
Ft. MSL – Feet above mean sea level

BWS Response Objectives, Strategies, and Tactics

Water Shortage response objectives aims to ensure safe, dependable and affordable water supply for public health and safety.

- Prevent source water and water system contamination and extended delivery infrastructure disruptions
- Meet max day water demand
- Reduce potable water use through progressively restrictive water conservation measures
- Minimize low water pressure incidents
- Minimize overdraft conditions and excessive salt-water intrusion
- Pursue new water source development and water system connectivity improvements

Fire flow is expected to be available as long as storage tanks are operated within normal operating levels.

These BWS water shortage response objectives shape the compensatory water system operations, water conservation, conditions for development approvals, monitoring and tactics in this plan. Figure 2 presents the Objectives, Strategies and Tactics for the Water Shortage Response and Recovery plan.

For the purposes of this plan:

- Objectives are the goals, what needs to be achieved.
- Strategies are the approach and measurable steps on how to achieve the objective.
- Tactics are the concrete actions, tools and measures pursued associated with each strategy.

Table 3 presents progressively restrictive water conservation responses by Water Shortage Condition if water use reduction targets are not achieved and if infrastructure improvements that resolve the water shortage condition extends more than 2 years.

Table 3: Progressive Conservation Responses by Water Shortage Condition

Water Shortage Condition	Source Capacity/Demand Trigger	Conservation Response
No Water Shortage	Available pumping units meet max day demand in 16 hours, standby pumps not included	Voluntary – General Seasonal Messaging
Alert	Available pumping units meet Q_{95} max day demand in 20 hours, standby pumps not included.	Voluntary – Targeted Seasonal Messaging Requesting 10% Water Use Reductions
Critical	Available pumping units cannot meet Q_{95} max day demand in 22 hours, standby pumps not included	Mandatory in Progressively Restrictive Order 1) Require Targeted Water Use Reductions 2) Water Allotments, Flow Restrictors, Rate Surcharges 3) Moratorium if improvements extend more than 2 years

Figure 2: BWS Water Shortage Response and Recovery Objectives Strategies and Tactics

Water Shortage Response Procedures

In the assessment of meeting the water shortage objectives, relative risk can provide additional guidance in decision making. In the BWS water master plan, Risk is defined as the Consequence of Failure x the Likelihood of Failure and can be applied to water shortages from contamination, overdraft, low pressures, service disruptions, drought, etc.

Risk = Consequence of Failure x Likelihood of Failure

For example, the consequence of contaminating a water source and water system is extremely high, but the likelihood may be difficult to assess without a viable monitoring and reporting network. The consequence of losing a major source from overdraft is high, but the likelihood of over pumping a source can be managed with frequent chloride reporting and changes in pump

operation such as "Last On–First Off", limited to meeting max day demand peaks and backed off during the wet season.

A contamination event or long-duration infrastructure outage event that triggers an Alert Water Shortage Condition begins with the Initial Response. During the Initial Response, the BWS Water Shortage Response Team can recommend voluntary or progressive mandatory conservation measures from customers to prevent a Water Shortage Condition, per Section 2-209 of the BWS Rules & Regulations.

The BWS Water Shortage Response Team, will implement compensatory water system operations, monitoring, voluntary and/or mandatory conservation measures, water use allotments, flow restrictors and fines, building controls and water system improvements as presented in this plan.

Mandatory Water Conservation

In Critical Water Shortage Conditions, the BWS will declare mandatory conservation measures and progressive water use restrictions including the Restricted Irrigation and Other Outdoor Uses procedures because of insufficient response to voluntary conservation. If Mandatory Conservation is required and if infrastructure improvements are necessary, the Board may declare a Building Moratorium extending until the improvements are completed.

Building Moratorium Rules

BWS Rules and Regulations Section 1-101 Availability of Water states:

Availability of Water for Proposed Developments. The Department may issue water commitments to proposed developments as follows:

> *Category 1: Areas with Adequate Water Supply. The Department may issue advance water commitments to proposed developments in areas where the water system has adequate supplies to assume new or additional services.*
>
> *Category 2: Areas with Limited Additional Water Supply. The Department may restrict the issuance of advance water commitments to proposed developments in areas where the water system has limited additional supplies to assume new or additional services.*
>
> *Category 3: Areas with No Additional Water Supply. The Department shall not issue water commitments to proposed developments in areas where the water system has no additional supplies to assume new or additional services. The only exception shall be the issuance of a single 3/4-inch meter to proposed developments on existing single vacant lots.*

BWS typically operates under Category 2 water availability, where water commitments are confirmed when residential subdivision construction plans are approved or when building permits are approved for all other developments. In a Critical Water Shortage Condition with Mandatory Conservation, BWS will operate under Category 3, for water systems with no additional water supply until the water system improvements to increase capacity are completed.

Building Moratorium Controls

In a Critical Water Shortage Condition, if voluntary and mandatory conservation measures and available pumping units are insufficient to accommodate existing and/or future growth, BWS may implement building development conditions to control the rate of water demand growth and the risk of water shortage. The moratorium should extend until the infrastructure improvements that restore or expand water system capacity are completed. Limitations may include:

- Limit approvals to a single minimum size water meter for existing vacant lots.
- For redeveloped residential and non-residential parcels, limit water demands to:
    - Existing use or previous water allocations (previously paid WSFC), or
    - Existing water meter sizes, (meters may have more capacity than existing use)
- Require alternative onsite water supplies such as grey water reuse, stormwater catchments, A/C condensate recovery and high efficiency plumbing fixtures. Refer to the National Blue Ribbon Committee Distributed Nonpotable Water Manual.
- Fee In-Lieu: Retrofit another building to high efficiency plumbing fixtures and obtain fixture credits for the redevelopment, (No Net Gain in Water Use)

Additional Options, as long as No Detrimental Impacts to Existing Customers:

- Allow affordable and homeless housing providing critical social services.
- Allow an additional dwelling unit (ADU) on existing lots, per DPP rules, no increase in meter size.
- Allow Department of Hawaiian Homeland projects because of priority water rights.

Declarations and Notifications for Conditional Building Moratoriums:

- Board Action for the Declaration of a Building Moratorium is required.
- Before declaring moratoriums, verify that growth forecasts and development approvals (building permit and construction status) are accurate, and existing source production trends are not decreasing with conservation efficiencies offsetting incremental growth. Account for the timing of new sources and pipeline inter-connections improvements. Typical timeframes for P&E, Design and Construction of new sources are approximately 5 to 7 years. Ensure developer proposed water demands are calculated consistently and are accurate.
- The Manager shall inform and obtain approval of the Board to declare a water shortage condition building moratorium and report to the Board the status of head and chloride levels and water system capacity; the weekly average of daily pumpage and demands; the effectiveness of the restrictions and allotments in force; recommendations to increase or reduce restrictions and allotments; and such other information.

- Notify affected elected officials, agencies, landowners and developers.
- The Board may terminate the declared water shortage condition building moratoriums when the event causing degradation of water quality or disruptions to water system delivery infrastructure has been resolved.

Water Shortage Response Team

The Water Shortage Response Team is comprised of BWS Divisions and Water Resources branches that will assess the extent of the water shortage condition, support compensatory pump operations, control water demand and recommend any system improvements in support of the Incident Specific Response Plan. Figure 3 presents the Water Shortage Response Team.

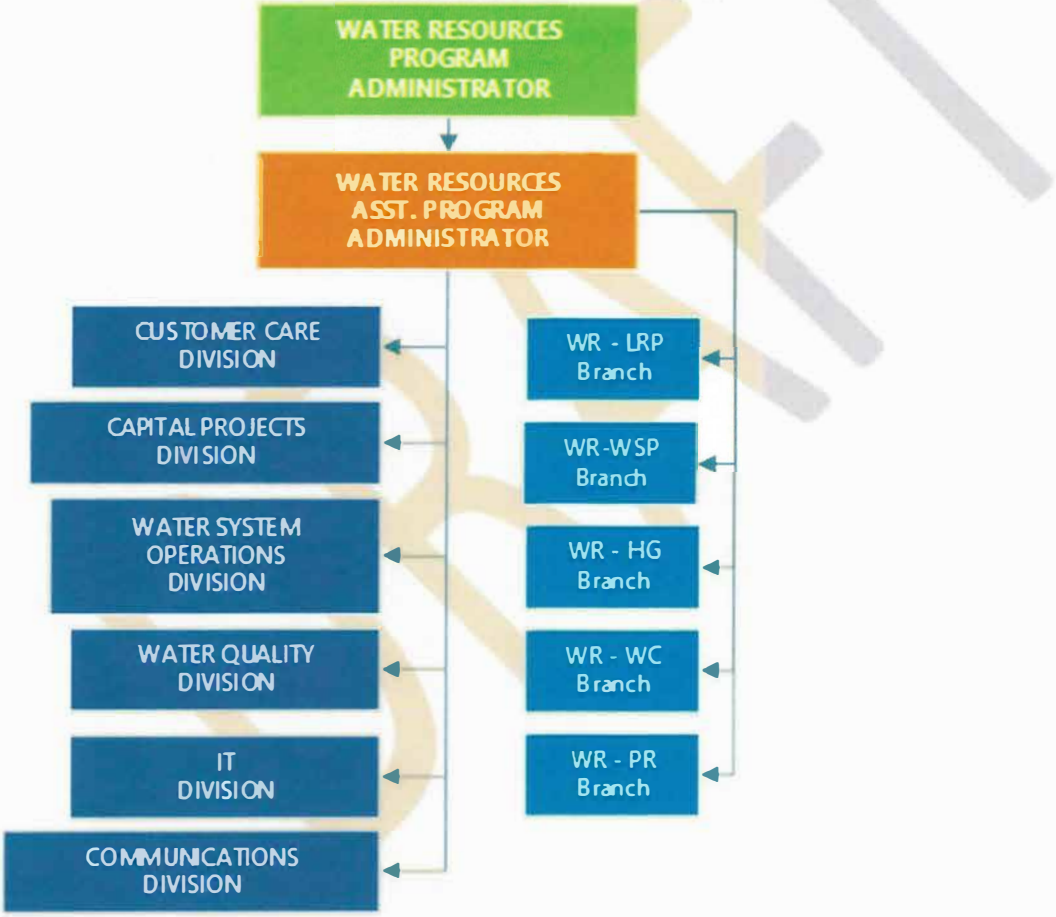


Figure 3: Water Shortage Response Team

Consistent with the Drought Response and Recovery Plan, the Water Resources Division Program Administrator will lead of the Water Shortage Team and act as liaison to the BWS Manager and Deputy Manager, and Incident Command. The Water Resources Assistant Division Head is the co-coordinator. Initial Response procedures are presented in the next section.

Initial Response

The BWS declares a water shortage condition after a contamination event or long-duration infrastructure outage event. Table 4 presents the Initial Response procedures available to BWS during a water shortage.

Table 4: Initial Response Procedures

Tactic		Responsible BWS Division
Data Collection and Analysis	▪ Increase frequency of water supply and well production monitoring to detect changes in supply availability. ▪ Monitor available pumping units and run times relative to max day demand ▪ Track rainfall across the aquifers sectors to determine potential for an eventual Low Groundwater Condition	Water Resources
	▪ Initiate annual or more frequent water loss audits, determining possible pressure zones in need of improvements to reduce water loss ▪ Identify and prioritize non-essential uses such as outdoor landscaping, decorative pools, swimming pool refilling, irrigation or recreational facilities; determine which uses can be reduced or eliminated during the Water Shortage Conditions	Water Resources
Inter-Agency Coordination	▪ Establish direct communication with City Dept. of Emergency Management to keep them informed of water shortage conditions for critical facilities where public health and safety is threatened, such as hospitals, government facilities, etc ▪ Meet with CWRM, developers, landowners, and other stakeholders (as needed) to discuss anticipated water shortages o Exchange ideas, advocate for joint solutions, and share media and public information messaging and costs fairly ▪ Partner with other agencies, utilities, and private sector and volunteer organizations that share common interests or special expertise, such as water-efficient landscaping o Share ideas and potential ways to save water o Coordinate shortage response activities, apply for funding, share resources, and work through regulatory issues ▪ Require HFD to notify BWS when they connect their portable wildland fire fighting dip tanks to the BWS system o Portable dip tank pad locations and BWS reservoirs near them are shown in Appendix H	OMCE
Stable Condition Operation Guidance	▪ Update water shortage operational guidance: o Update the stable condition pumping recommendations (see Appendix A) for previously analyzed sources: Beretania PS, Kalihi PS, Kaimuki PS, Halawa Shaft, Punanani Wells, Kalauao Wells ▪ Analyze and determine stable pumping recommendations for additional wells/aquifers. o Recommended sites in Appendix A	Water Resources, Water Systems Operations, Water Quality
Public Outreach and Education	▪ Expand the rainwater barrel and catchment program ▪ Implement end user leak detection programs and expand current leak detection outreach: o Conduct outreach activities	Water Resources, Communications

	○ Implement a leak and minor plumbing repair program for low-income households ○ Offer free inspections to identify leaking toilets and plumbing fixtures ○ Implement irrigation inspections for automatic sprinkler and irrigation systems	
	▪ Hire a water conservation education specialist to give classes to local K-12 students ○ Funding may be provided, fully or in part, by the County and BWS	OMCE, HRO, ESO
Public Communication	▪ Use social media and traditional media and newsletters to disseminate water shortage information and conservation goals and tips ▪ Keep messages clear, simple, and consistent; collaborate with other utilities and agencies to share the same message ○ Include easily accessible and useful info on BWS website related to the water shortage condition, conservation tips, and how customers can access their own water use data from meters ▪ Prepare a presentation and talking points for BWS staff to provide clear, accurate, and consistent information to customers and the community on conservation measures	Communications

Water Shortage Condition

The BWS may declare a Water Shortage Condition based on an analysis of available pumping units and run times to determine when water supply is not available to meet existing and/or future water demands due to degradation of water quality or extended disruptions to water system delivery infrastructure.

BWS will activate the Water Shortage Response Team (WSRT) to lead and coordinate the Water Shortage response and planning activities.

The WSRT shall meet regularly, with increasing frequency as the water shortage conditions worsens, as recommended in Table 5.

Table 5: Recommended Meeting Schedule per Water Shortage Condition

Water Shortage Condition	Recommended Meeting/Update Schedule
Alert	Convene and provide updates bi-weekly to the Manager and monthly to the Board and as needed to City Council and other agencies
Critical	Convene and provide updates weekly to the Manager and monthly to the Board and as needed to City Council and other agencies

Water Shortage Procedures

Table 6 presents the tactics and procedures that the Water Shortage Response Team may recommend during Water Shortage Conditions, along with the responsible BWS Divisions. The procedures are increasingly restrictive as the situation moves to an Alert Condition and to a Critical Condition.

Table 6: Procedures in Response to Water Shortage Conditions

Tactic	Pre-Declaration Procedures (prior to summer)	Alert Condition Procedures	Critical Condition Procedures	Responsible Party
Data Collection	Customer Care collect reports from the public of observed wasteful water usage and forward to Water Resources Division	▪ Customer Care forwards data on non-compliance with voluntary conservation program to Water Resources Division ▪ Customer Care Division prepares and mails letters requesting voluntary reductions of water use to identified customers	▪ Customer Care initiates patrolling program to identify violators of the mandatory water use irrigation restrictions and allotments. ▪ Water Resources assists as needed	▪ Customer Care ▪ Water Resources ▪ Finance
	Increase chloride content data collection to monthly for wells near affected index wells		Increase chloride content data collection to weekly for wells near affected index wells	Water Resources
	Request and/or assist CWRM with increasing deep monitor well monitoring frequency			Water Resources
	Implement the following if CWRM mandates pumpage reductions if water resources are being impacted: ▪ Finance conducts a financial impact analysis of lost revenue due to CWRM's mandated pumpage reduction at varying durations. o Evaluate financial reserve, projected spending, and identify if mitigation measures are needed. ▪ Water Resources increases sampling of source water to continuously monitor water quality ▪ WSRT coordinates with CWRM on their planned spot checks of BWS deep monitor wells and pumpage.			▪ Water Shortage Response Team ▪ Water Resources ▪ Finance
Improve System Efficiency	▪ Identify and prioritize non-essential uses such as outdoor landscaping, decorative pools, swimming pool refilling, and irrigation or recreational facilities. Determine which uses can be reduced or eliminated during certain water shortage stages ▪ Install centralized weather-based irrigation controls in large landscaped areas to adjust irrigation rates depending on rainfall.			Water Shortage Response Team
	Increase frequency of water loss audits – determine areas of improvement to minimize potential water loss. Adjust AMR meters to hourly reads for large users and install meter masters on high off-hour (usually early morning) water use.			Water Resources, Field Operations
Triage Water Supply Sources	Kalihi, Beretania and Kaimuki wells ("in-town" wells) are utilized extensively during high demand periods. To manage average annual production from these wells, prioritize production from Pearl City and Ewa areas wells as much as feasible during the fall, winter and spring season in anticipation of exceeding the average annual production rates from "in-town" wells.			Water Resources Operations

Tactic	Pre-Declaration Procedures (prior to summer)	Alert Condition Procedures	Critical Condition Procedures	Responsible Party
Inter-Agency Coordination	▪ Ensure City properties comply with all BWS demand reduction measures ▪ Meet with CWRM, private well users, and other stakeholders (as needed) to discuss anticipated water shortages o Exchange ideas, advocate for joint solutions, and share media and public information messaging and costs o Coordinate water shortage response activities, apply for funding, share resources, and work through regulatory issues ▪ Discuss communication plans with CWRM, DOE, DOT, DPR, DES, etc. ▪ Water Resources to stay apprised of water levels and water quality and provide information to Water Shortage Response Team ▪ Communications to lead communications with public and private agencies			▪ Water Shortage Response Team ▪ Water Resources ▪ Communications
Voluntary Conservation Measures for Alert Water Shortage Conditions	▪ Request military, commercial, industrial, and agricultural users and government agencies reduce their usage by 10% ▪ Include some water conservation strategies and current usage in communication	Request the following of all customers: ▪ Use automatic shut-off nozzles on all hoses. ▪ Only wash cars, boats, trailers, or other vehicles with automatic shut-off nozzle hoses and buckets ▪ Do not hose or wash sidewalks, walkways, driveways, parking lots, or other hard surfaces ▪ Require customers to make a reasonable effort to repair water leaks in toilets, plumbing fixtures, and customer-side water lines within 24 hours		Water Shortage Response Team
Mandatory Conservation Measures for Critical Water Shortage Conditions		Require the following of applicable customers: ▪ Do not fill swimming pools and other types of pools and ponds. Close public pools, outdoor fountains and other water features ▪ Serve water in restaurants only when requested by the customer, provide a notice of water shortage on each table ▪ Post a notice of water shortage and tips for water conservation in each hotel and motel room ▪ Use re-circulating water only in ornamental fountains and post signage nearby that states that re-circulated water is being used ▪ Limit use of potable water for recreational purposes ▪ Coordinate with commercial water recreational facilities (such as water parks) on restrictions to minimize impact to businesses ▪ Eliminate use of decorative water features and outdoor misting systems		▪ Water Shortage Response Team ▪ Communications

Tactic	Pre-Declaration Procedures (prior to summer)	Alert Condition Procedures	Critical Condition Procedures	Responsible Party
Mandatory Conservation Measures for Critical Water Shortage Conditions			Implement mandatory BWS construction restrictions: ▪ Halt all approvals of temporary water meters ▪ Halt all approvals of new permanent water meters ▪ Halt all approvals of pipeline chlorination or disinfection using potable water	▪ Capital Projects
	Implement mandatory restrictions for City agencies: ▪ Restrict turf watering/landscaping irrigation at City facilities other than parks and right-of-way ▪ Inspect automatic sprinkler and irrigation systems		▪ Partner with HFD to reduce non-essential training ▪ Increase use of reclaimed water for irrigation, construction activities, fire-fighting storage, agriculture, or other non-potable uses	Water Shortage Response Team
Water Allotments & Flow Restrictors (Only applies to Critical Condition)		Establish water allotments and flow restrictors: For commercial, residential, industrial, military, governmental, and agricultural consumers ▪ At no less than 90% of user's previous 12-month average billed consumption ▪ At no less than 350 gals/day for SFD and duplex residences ▪ At no less than 270 gals/day/unit for Multi Family low rise and 180 gals/day/unit for High Rise Apts.	Establish water allotments and flow restrictors: For commercial, residential, industrial, military, governmental, and agricultural consumers: ▪ At no less than 70% of user's previous 12-month average billed consumption ▪ At no less than 300 gallons/day for SFD and duplex residences ▪ At no less than 210 gals/day/unit for Multi Family low rise and 140 gals/day/unit for High Rise Apts. ▪ At different times and different levels for the various classes of consumers	▪ Water Shortage Response Team
		▪ Customer Care Division notifies each customer of billing period water use allotment by printing such amount on their bill or by direct mail to them ▪ Customer Care Division requests flow restrictors installed by Field Operations Division.		▪ Customer Care ▪ Field Operations
		Process all written applications for exceptions to the customer allotment and appeals to any adverse action and notify all Divisions of any exceptions that are granted appeals to any adverse action.		Customer Care

Tactic	Pre-Declaration Procedures (prior to summer)	Alert Condition Procedures	Critical Condition Procedures	Responsible Party
Non-Residential Conservation Targets	Government agencies; military and commercial, industrial, and agricultural users reduce their usage by 10% during Alert Water Shortage Conditions and 30% during Critical Water Shortage Conditions. Include applicable strategies and/or tactics and current usage in communication			Water Shortage Response Team
Irrigation Schedule	Implement the voluntary irrigation schedule ▪ Goal: Overall reduction of 25% in irrigation ▪ No watering during rain or within 48 hours following rain. ▪ Parks, highways, cemeteries, schools o Between the hours of 7 AM and 9 AM o Irrigation days for odd digit address: Tuesday, Thursday and Saturday o Irrigation days for even digit address: Wednesday, Friday, Sunday ▪ Domestic: Between the hours of 5 PM and 7 PM ▪ Military and golf courses: Between the hours of 12 AM and 5 AM			Water Shortage Response Team
		Implement the mandatory irrigation schedule ▪ Goal: Overall reduction of 50% in irrigation ▪ No watering during rain or within 48 hours following rain. ▪ Parks, highways, cemeteries, schools o Between the hours of 7 AM and 11 AM o Irrigation days for odd digit address: Tuesday, Thursday and Saturday o Irrigation days for even digit address: Wednesday, Friday, Sunday ▪ Domestic: Between the hours of 5 PM and 7 PM ▪ Military and golf courses: Between the hours of 12 AM and 5 AM ▪ Turf replacement rebate / xeriscape incentives $3.65/sf cost to remove turf only (CA)		Water Shortage Response Team
Stable Condition Operation Guidance	Update and follow the Low Groundwater operational guidance (see Appendix A): ▪ Update chloride level, transition zone mid-point, and pumpage data ▪ Identify the stable condition operation limits for previously analyzed sources: Beretania PS, Kalihi PS, Kaimuki PS, Halawa Shaft, Punanani Wells, Kalauao Wells ▪ Analyze and determine stable pumping recommendations for additional wells in the Water Management Areas of concern o Recommended sites in Appendix A			Water Resources
Engage Critical Customers		▪ Collaborate with major water users to identify water-saving measures that would not harm their business		▪ Water Resources ▪ Communications

Tactic	Pre-Declaration Procedures (prior to summer)	Alert Condition Procedures	Critical Condition Procedures	Responsible Party
	▪ Engage with stakeholders (especially industrial users) of any expected changes in water quality and/or water supply reliability due to the water shortage.			Water Shortage Response Team
Public Outreach and Education	▪ Partner with private sector and volunteer organizations that share common interests or special expertise, such as water-efficient landscaping o Reach out to local community partners, other utilities, and agencies to share ideas and potential ways to save water ▪ Implement or enhance the following end user leak detection programs: o A leak and minor plumbing repair program for low income households o Free inspections to identify leaking toilets and plumbing fixtures o Incentive programs or tax credits for installing water saving fixtures o Irrigation inspections for automatic sprinkler and irrigation systems			Water Shortage Response Team
	▪ Implement incentive programs such as: o Incentives to follow through with voluntary measures o Incentives or tax credits to install water saving fixtures ▪ Hire a water conservation education specialist who gives classes to local elementary and high school students o Seek funding assistance through the ODC and SDC			▪ Water Shortage Response Team Finance
	Consider meeting with business who may be affected by mandatory water restrictions, including but not limited to: car washes, golf courses, water parks or other commercial water recreational facilities, resorts, hotels			Water Shortage Response Team
Public Communication	▪ Use social media, traditional media, and bill inserts ▪ Keep messages clear, simple, and consistent. Collaborate with other utilities and agencies to share the same message o Include easily accessible and useful info on BWS website related to the current water shortage condition, conservation tips, and how customers can access their own water use data from meters ▪ Conservation messaging templates should: o Use simple messages, short sentences, and provide one to three recommendations o Have specific conservation measures or restrictions per customer type in bill inserts ▪ Provide a telephone hotline or website for customers to report leaks, with resources tied to field crew work orders to prioritize leak repairs			▪ Communications
	▪ Establish a schedule for frequent, frank communication using all available methods for customers to understand the severity of the water shortage and encourage reduced water use ▪ Engage major employers, local businesses, and county officials to help spread water shortage-related messages and act as water conservation "models" within the community ▪ Ask school and religious leaders, youth groups, and service organizations to promote conservation to their students, congregations, and members			▪ Communications ▪ Water Shortage Response Team

Tactic	Pre-Declaration Procedures (prior to summer)	Alert Condition Procedures	Critical Condition Procedures	Responsible Party
Public Communication	▪ Prepare information on the status of the water supply sources, the need for conservation, and suggestions on how to conserve water, and disseminate the information to the public through the mass media ▪ Prepare focused letters to government leaders requesting support of these conservation efforts ▪ Prepare a presentation and talking points for BWS staff to provide clear, accurate, and consistent information to customers and the community on conservation measures ▪ Develop a FAQ template with answers that change as different low groundwater conditions occur, thus forming a consistent message for communications, Neighborhood Board reps, and other staff who engage customers		▪ Provide weekly updates to media and public on: o Water supply conditions o Status of community demand reduction response o Recommended conservation measures enforcement information, including fines and reporting procedures ▪ Require all commercial customers to prominently display "save water" signage and develop conservation plans	▪ Communications ▪ Water Resources

Surcharges, Exceptions, Appeals and Penalties

Special rates and charges during mandatory water shortage conditions

During a mandatory water shortage condition, a surcharge schedule for excess water use shall be established for customers whose monthly consumption is in excess of their water allotment, in accordance with the following:

- Maximum allowable exceedance of water allotments:
- Residential (single family and duplex): 5,000 gallons per monthly billing period
- Resort, commercial, multi-family, industrial, agricultural, military, and government: Difference between allotment and previous 12-month monthly average

Table 7: Surcharges for Exceedance of Water Allotment by Percentage and Meter Size

Gallons in Excess of Allotment for Meter Sizes 2" and Larger*	Gallons in excess of Allotment for Meter Sizes 5/8" to 1-1/2" (Monthly Billing)	Gallons in excess of Allotment for Meter Sizes 5/8" to 1-1/2" (Bi-Monthly Billing)	Surcharge
25% or less	3,000 or less	6,000 or less	2 Times Existing Water Rate
26% - 50%	3,001 – 6,000	6,001 - 12,000	3 Times Existing Water Rate
51% - 75%	6,001 – 9,000	12,001 - 18,000	4 Times Existing Water Rate
76% - 100%	9,001 – 12,000	18,001 - 24,000	12 Times Existing Water Rate
Over 100%	Over 12,000	Over 24,000	20 Times Existing Water Rate

*Surcharge for 2" and larger meters are the same for either monthly or bi-monthly billing

- For residential consumers, the surcharge will be charged at the block rate that the allotment falls in. Surcharges will be assessed for each consumer after receipt of the first water bill following the establishment of allotments by the BWS Board. Upon termination of allotments by the Board, surcharges shall cease.

Exceptions and Appeals

Sec. 3-322(5) Procedures for Control of Water Use During Low Groundwater Level Condition provides a process to consider exceptions:

Consideration of written applications for exceptions regarding the allotment system or regulations and restrictions on water use set forth in this Chapter shall be as follows:

a. Written applications for exceptions shall be accepted, and may be granted, by the Manager.

b. Grounds for granting such exceptions are:

(1) Failure to do so would cause an unnecessary and undue hardship to the Applicant, including but not limited to adverse economic impacts such as loss of production or jobs;

(2) Failure to do so would cause an emergency condition affecting the health, sanitation, fire protection, or safety of the Applicant or the public;

(3) For single family residences with more than four persons permanently residing in the home, if a written application for an exception is granted as provided herein, the applicable allotment shall be increased by 40 gallons per person per day for each person permanently residing in the home in excess of four persons;

(4) For multiple residential units with more than two dwelling units where the allotment is less than 280 gallons per day per dwelling unit, if a written application for an exception is granted as provided herein, the applicable allotment shall be 280 gallons for each unit;

(5) Denial of an application for exception may be appealed in writing to the Board.

Penalties:

Sec. 3-321 Penalties, provides the following:

1. Any violation by any person of the restrictions declared by the Board under Sections 3-319 and 3-320 of this Chapter shall be punishable according to Chapter II, Section 2-205 and Chapter V, Section 5-501 of these Rules and Regulations.

2. Any consumer who violates the restrictions declared by the Board under Sections 3-319 and 3-320 of this Chapter or who consumes water in excess of the amount designated below for their class shall be subject to the installation of a flow restriction device by the Department and punishable according to Chapter V, Section 5-501, (charged with a misdemeanor, pursuant to Chapter 1, Article 3, Section 1-3.1, ROH). An offender shall pay $50.00 for the installation and removal of a flow restriction device by the Department. Water service may be discontinued for an offense committed after the installation of a flow restrictor in accordance to Chapter II, Section 2-205.

BWS can implement penalties for customers whose monthly consumption is in excess of their water allotment, in accordance with the following:

Maximum allowable exceedance of water allotments:

Residential (single family and duplex): 5,000 gallons per monthly billing period, 10,000 gallons per bi-monthly billing period

Resort, commercial, multi-family, industrial, agricultural, military, and government: Difference between allotment and previous 12-month monthly average

First two offenses if the excessive use does not exceed the maximum allowable as specified above and in Section 3-321 of the BWS Rules and Regulations.

A warning letter will be issued after the first offense

A flow restrictor may be installed after the second offense

Declaration and Termination of Water Shortage Condition

The Manager shall inform the public and the Department's consumers of the declaration and termination of an alert or critical water shortage condition by publishing such declaration and termination in a newspaper of general circulation on the island of Oahu at least once a day for three consecutive days. The alert or critical water shortage condition and all restrictions and allotments associated therewith shall terminate at midnight on the first day of a publication terminating such condition. Flow restrictors will be removed.

Recovery Phase

If the Water Shortage included the trigger and declaration of a Water Shortage Condition, a recovery phase will be needed for over-pumped sources. The recovery phase of the Water Shortage Response & Recovery Plan is crucial, as rolling back voluntary and/or mandatory conservation measures and operational restrictions may slow or even reverse the recovery.

The Water Shortage Response Team will determine when it is appropriate to reduce the severity of the Water Shortage Condition, based on the restoration of available pumping units, water level and chloride data from ongoing monitoring of supply wells and customer conservation implementation. This water shortage recovery process will be undertaken conservatively and may take a minimum of three months. Figure 4 presents an example of a water shortage recovery process from the Critical Water Shortage Condition and the potential triggers for stepping down to each lower condition.

The water shortage conditions should be characterized to understand the applicable length of time of the declaration and whether it extends annually or only through the summer seasons.

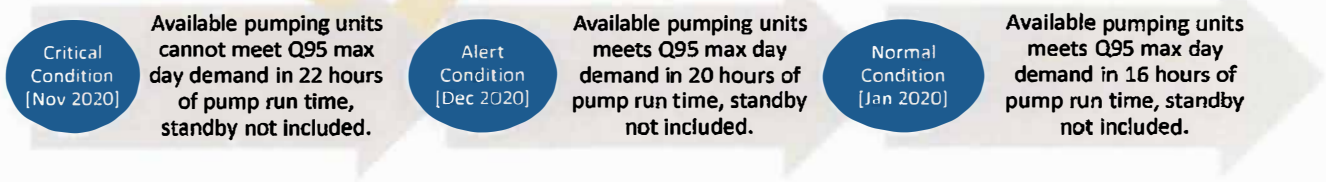


Figure 4: Example of Recovery from a BWS Water Shortage Critical Condition

During the Recovery Phase, procedures are split between WSRT procedures which mainly deal with decision-making on when to rollback voluntary/mandatory conservation measures and agency

coordination. BWS Divisions and Sections will also have operational procedures. These procedures are shown in the next sections.

Recovery Procedures

The WSRT will still be needed to monitor the effectiveness of the water shortage response and as long as a Water Shortage Condition is active, even while improving, the WSRT remains the group in charge of water shortage actions and other BWS Divisions will continue certain Water Shortage Condition procedures through recovery. The BWS should implement the organizational procedures listed in Table 8 to ensure recovery from a Water Shortage Condition, depending upon the severity.

Table 8: Recovery Procedures

Procedures	Responsible Division
▪ Write an after-action report that describes effective water shortage response actions and areas that could be improved o The after-action report will be submitted to the Water Shortage Response Team and the Manager for inclusion in the County after-action report	Water Shortage Response Team
Identify new standard operating procedures for future Water Shortage Conditions and for routine operations	Water Shortage Response Team
▪ Revise the BWS Water Shortage Response and Recovery Plan based on lessons learned o Did the Initial Response procedures, Low Groundwater Condition triggers and procedures achieve the anticipated results? o Were the demand reduction measures too prescriptive, or did they not provide enough direction to customers?	Water Shortage Response Team
▪ Conduct a debrief with BWS staff and stakeholders shortly after the water shortage event to discuss the effectiveness of or improvements to response activities. o Continue to engage the public by providing tips to use water efficiently throughout public and private facilities, such as installing low-flow fixtures, retrofitting landscapes, and replacing inefficient irrigation systems o Engage with large water users and local businesses to help them prepare for the next water shortage	Water Shortage Response Team
▪ Document how water demand in the system changed during water shortage response o Use production and consumption data to estimate the lag time between different public announcements and voluntary and/or mandatory measures o This information can help revise trigger levels for when procedures are implemented o Pre-Water shortage information can be found in Appendix G	Water Shortage Response Team
▪ Document how the aquifers and wells reacted to the water shortage condition, (chlorides and heads) o How did the Sources of concern react to the water shortage condition? o What emergency operations were put in place due to restricted pumping in certain wells or aquifers? o Where there any damages to the system incurred as a result of the water shortage condition? o Did a CWRM Water Shortage Warning Stage occur and if so, how did the BWS respond? Was the 15% mandated cutback in pumpage met? o Did the trigger index wells recover to pre-Water shortage conditions?	Water Shortage Response Team
▪ Keep the Water Shortage Response Team active by conducting water shortage preparedness activities o Once BWS and the aquifers have recovered from the water shortage, the WSRT should meet annually and conduct water shortage planning and exercises	Water Shortage Response Team

Work with County, State, and Federal officials to secure funding and technical assistance to implement large projects to build longer-term water shortage resilience, such as new groundwater wells, resilient water sources, and interconnections	OMCE
Develop a plan to implement projects that address long-term needs to make BWS more resilient to future water shortage	Water Resources
Continue the water loss program to conduct annual water loss audits and provide recommended improvements	Water Resources
Continue or increase monitoring activities to maintain a full awareness of water supply conditions	Water Resources
Continue to implement leak detection and repair programs that ensure a prompt response mechanism for staff to make repairs	Water Resources
Keep communicating frequently and frankly with all customers about the water shortage recovery progress	Communications Water Resources
Reframe messages to a focus on long-term water supply reliability; continue to stress the importance of conserving water, actions BWS is taking, and actions the public can take	Communications

ITEM FOR INFORMATION NO. 3

"October 24, 2022

APPOINTMENT OF ERWIN KAWATA AS DEPUTY MANAGER

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chair and Members:

Subject: Appointment of Erwin Kawata as Deputy Manager

Ernest Lau, Manager & Chief Engineer is pleased to announce the appointment of Mr. Erwin Kawata as the Deputy Manager of the Board of Water Supply, effective October 16, 2022.

Respectfully Submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

The foregoing was for information only.

DISCUSSION: Ernest Lau, Manager & Chief Engineer, gave the report.

Manager Lau stated Mr. Erwin Kawata decided to serve as Deputy Manager. He has 40 years of experience and has been working on the Red Hill issue since 2014.

Deputy Manager Kawata thanked the Manager and the Board for the opportunity to serve as Deputy Manager. He expressed his appreciation to the OMCE office for assisting with the smooth transition, but especially expressed his gratitude to his wife, Alison, for her encouragement and continuous support.

ITEM FOR INFORMATION NO. 4

"October 24, 2022

SUMMARY OF REVISIONS TO THE PRIOR FISCAL YEAR 2021-2022 (FY22) CAPITAL IMPROVEMENT PROGRAM (CIP) BUDGET

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chair and Members:

Subject: Summary of Revisions to the Prior Fiscal Year 2021-2022 (FY22) Capital Improvement Program (CIP) Budget

Raelynn Nakabayashi, Executive Assistant I, Executive Support Office, will provide information on Revisions to the Fiscal Year 2021-2022 (FY22) Capital Improvement Program (CIP).

Budget Amendment #1:

1. Reduce the appropriations for the following CIP projects:

Item No. 33	GAC INTERIOR CORROSION CONTROL AT VARIOUS LOCATIONS		
Appropriation		Present	Proposed
OPERATING FUND	CONST	3,000,000	2,000,000

Description: Perform interior corrosion control of selected BWS GAC facilities.

Reason: The funding for this project is being reduced based on the amount of GAC interior corrosion control performed in the prior fiscal year. The proposed amount reflects the total amount of funding required to perform interior corrosion control of selected BWS GAC facilities in Fiscal Year 2022.

2. Increase the CIP Contract Adjustment Account:

Appropriation	Present	Proposed
OPERATING FUND	15,600,000	16,600,000

The following is a summarization of the FY 2022 CIP Budget Amendment No. 1:

FY 2022 CIP Budget (as Adopted)	$179,976,000
Projects – Modified Appropriations	($1,000,000)
Contract Adjustment Account	+$1,000,000
FY 2022 CIP Budget (as Amended)	$179,976,000

Budget Amendment #2:

1. Add appropriations for the following CIP project:

Item No. 3A HALAWA VALLEY GROUNDWATER MONITORING WELLS, PHASE II

Appropriation		Present	Proposed
OPERATING FUND	CONST	0	2,000,000

Reason: Installation of two (2) monitoring wells in the Halawa Valley near the Navy Red Hill Underground Bulk Fuel Storage Facility.

2. Delete the appropriation for the following CIP project:

Item No. 25 NEW SERVICE LATERAL INSTALLATIONS AT VARIOUS LOCATION

Appropriation		Present	Proposed
OPERATING FUND	CONST	1,750,000	0
OPERATING FUND	P&E	250,000	0

Reason: The funding for this project will be deferred to a future fiscal year.

The following is a summarization of the FY 2022 CIP Budget Amendment No. 2:

FY 2022 CIP Budget (as Adopted)	$179,976,000
FY 2022 – Amendment No. 1	
Projects – Modified Appropriations	($1,000,000)
Contract Adjustment Account	+$1,000,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 2	
Projects – Added	+$2,000,000
Projects – Deleted	($2,000,000)
SUB-TOTAL	$179,976,000
FY 2022 CIP Budget (as Amended)	$179,976,000

Budget Amendment #3:

1. Delete the appropriation for the following CIP project:

Item No. 3 NEWTOWN RIDGE AND ROYAL SUMMIT RELIABILITY IMPROVEMENTS

Appropriation		Present	Proposed
OPERATING FUND	P&E	400,000	0

Description: Prepare Environmental Assessment (EA) and obtain Conservation District Use Permit and Public Infrastructure Map amendment.

Reason: The EA is the first step in a chain of four projects spanning the course of six budget years. The overall project is intended to provide redundancy for customers in the upper Newtown & Royal Summit ridges; however, at this point in time it has been determined we may defer the EA project for one year without significant impact to service in these areas. Dependent on the timing and speed of the EA and design processes, there is a possibility that this deferral will not impact the final construction dates.

2. Increase the CIP Contract Adjustment Account:

Appropriation	Present	Proposed
OPERATING FUND	16,600,000	17,000,000

The following is a summarization of the FY 2022 CIP Budget Amendment No. 3:

FY 2022 CIP Budget (as Adopted)	$179,976,000
FY 2022 – Amendment No. 1	
Projects – Modified Appropriations	($1,000,000)
Contract Adjustment Account	+$1,000,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 2	
Projects – Added	+$2,000,000
Projects – Deleted	($2,000,000)
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 3	
Projects – Deleted	($400,000)
Contract Adjustment Account	+$400,000
SUB-TOTAL	$179,976,000
FY 2022 CIP Budget (as Amended)	$179,976,000

Budget Amendment #4:

1. Modify appropriations for the following CIP projects:

Item No. 44 FACILITY REPAIR AND RENOVATION

Appropriation		Present	Proposed
OPERATING FUND	P&E	1,500,000	1,850,000

Description: Repair, renovation, reroofing, fencing, and repainting of selected BWS facilities.

Reason: The funding will be used for additional costs associated with the Waialae Nui Well condition assessment; this effort evaluates an existing well for the viability of the well as a production source. This project will be executed in an effort to establish a potential additional water source to supply Honolulu. Because of the Red Hill contamination crisis, compounded by a dry winter, spring and a forecasted dry summer, establishing additional water source capacity is imperative to maintaining water distribution stability for Honolulu.

Item No. 3A HALAWA VALLEY GROUNDWATER MONITORING WELLS, PHASE II

Appropriation		Present	Proposed
OPERATING FUND	CONST	2,000,000	1,650,000

Description: Installation of two (2) monitoring wells in Halawa Valley near the Navy Red Hill Underground Bulk Fuel Storage Facility.

Reason: Only one monitoring well, Site H, can be awarded for construction in Fiscal Year 2023; as such the funding in this line item is being reduced commensurate with the funding required for the single well.

2. Reduce the appropriation for the following CIP project:

Item No. 18 NORTH SCHOOL STREET WATER SYSTEM IMPROVEMENTS

Appropriation		Present	Proposed
IMPROVEMENT FUND	CONST	11,500,000	0

Description: Install 16-inch mains and appurtenances along North School Street, from Kamehameha IV Road to Houghtailing Street - approx. 4,510 lin. ft. Install 8-inch mains and appurtenances along Ahonui Street, from North School Street to Linapuni Street; along

Hulali Place, from Ahonui Street to end; along North School Street, from Amelia Street to Leilani Street; along North School Street, from Likelike Highway to Houghtailing Street; along Amelia Street, from North School Street to Waikoae Road; along Waikoae Road, from Amelia Street to Martin Street; along Martin Street, from North School Street to Waikoae Road; along Kapalama Avenue, from North School Street to Peter Buck Street; and along Brigham Street, from Kapalama Avenue to Kapalama Avenue - approx. 8,330 lin. ft. Install 4-inch mains and appurtenances along Palapala Place, from Kapalama Avenue to end - approx. 205 lin. ft.

Reason: This project is being deferred to a future fiscal year.

3. Increase the CIP Contract Adjustment Account:

Appropriation	Present	Proposed
IMPROVEMENT FUND	0	11,500,000

The following is a summarization of the FY 2022 CIP Budget Amendment No. 4:

FY 2022 CIP Budget (as Adopted)	$179,976,000
FY 2022 – Amendment No. 1	
Projects – Modified Appropriations	($1,000,000)
Contract Adjustment Account	+$1,000,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 2	
Projects – Added	+$2,000,000
Projects – Deleted	($2,000,000)
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 3	
Projects – Deleted	($400,000)
Contract Adjustment Account	+$400,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 4	
Projects – Modified Appropriations	+$350,000
Projects – Modified Appropriations	($350,000)
Projects – Modified Appropriations	($11,500,000)
Contract Adjustment Account	+$11,500,000
SUB-TOTAL	$179,976,000
FY 2022 CIP Budget (as Amended)	$179,976,000

Budget Amendment #5:

1. Increase appropriations for the following CIP project:

Item No. 44 FACILITY REPAIR AND RENOVATION

Appropriation		Present	Proposed
OPERATING FUND	P&E	1,850,000	2,110,000

Description: Repair, renovation, reroofing, fencing, and repainting of selected BWS facilities.

Reason: The funding will be used for additional costs associated with the Waialae Nui Well condition assessment; this effort evaluates an existing well for the viability of the well as a production source. This project will be executed in an effort to establish a potential additional water source to supply Honolulu. Because of the Red Hill contamination crisis, compounded by a dry winter, spring and a forecasted dry summer, establishing additional water source capacity is imperative to maintaining water distribution stability for Honolulu.

2. Delete the appropriation for the following CIP project:

Item No. 39 Honouliuli Water Recycling Facility Reroofing

Appropriation		Present	Proposed
OPERATING FUND	CONST	260,000	0

Description: Reroofing of the Honouliuli Water Recycling Facility Buildings.
Reason: This project is being deferred to a future fiscal year.

The following is a summarization of the FY 2022 CIP Budget Amendment No. 5:

FY 2022 CIP Budget (as Adopted)	$179,976,000
FY 2022 – Amendment No. 1	
Projects – Modified Appropriations	($1,000,000)
Contract Adjustment Account	+$1,000,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 2	
Projects – Added	+$2,000,000
Projects – Deleted	($2,000,000)
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 3	

Projects – Deleted	($400,000)
Contract Adjustment Account	+$400,000
SUB-TOTAL	$179,976,000

FY 2022 – Amendment No. 4	
Projects – Modified Appropriations	+$350,000
Projects – Modified Appropriations	($350,000)
Projects – Modified Appropriations	($11,500,000)
Contract Adjustment Account	+$11,500,000
SUB-TOTAL	$179,976,000

FY 2022 – Amendment No. 5	
Projects – Modified Appropriations	+$260,000
Projects – Deleted	($260,000)
SUB-TOTAL	$179,976,000

FY 2022 CIP Budget (as Amended)	$179,976,000

Budget Amendment #6:

1. Delete appropriations for the following CIP project:

Item No. 48 HONOULIULI WWTP EXPANSION 16-INCH MAIN

Appropriation		Present	Proposed
OPERATING FUND – SRF	CONST	4,300,000	0

Description: Install 16-inch mains and appurtenances along Roosevelt Avenue from Renton Road to Geiger Road and Kamakana Street – approx. 4,500 lin. ft.

Reason: The project is not SRF eligible.

2. Increase appropriations for the following CIP project:

Item No. 48 HONOULIULI WWTP EXPANSION 16-INCH MAIN

Appropriation		Present	Proposed
OPERATING FUND	CONST	0	4,300,000

Description: Install 16-inch mains and appurtenances along Roosevelt Avenue from Renton Road to Geiger Road and Kamakana Street – approx. 4,500 lin. ft.

Reason: The project is not SRF eligible.

The following is a summarization of the FY 2022 CIP Budget Amendment No. 6:

FY 2022 CIP Budget (as Adopted)	$179,976,000
FY 2022 – Amendment No. 1	
Projects – Modified Appropriations	($1,000,000)
Contract Adjustment Account	+$1,000,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 2	
Projects – Added	+$2,000,000
Projects – Deleted	($2,000,000)
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 3	
Projects – Deleted	($400,000)
Contract Adjustment Account	+$400,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 4	
Projects – Modified Appropriations	+$350,000
Projects – Modified Appropriations	($350,000)
Projects – Modified Appropriations	($11,500,000)
Contract Adjustment Account	+$11,500,000
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 5	
Projects – Modified Appropriations	+$260,000
Projects – Deleted	($260,000)
SUB-TOTAL	$179,976,000
FY 2022 – Amendment No. 6	
Projects – Modified Appropriations	($4,300,000)
Projects – Modified Appropriations	+$4,300,000
SUB-TOTAL	$179,976,000
FY 2022 CIP Budget (as Amended)	$179,976,000

Respectfully Submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

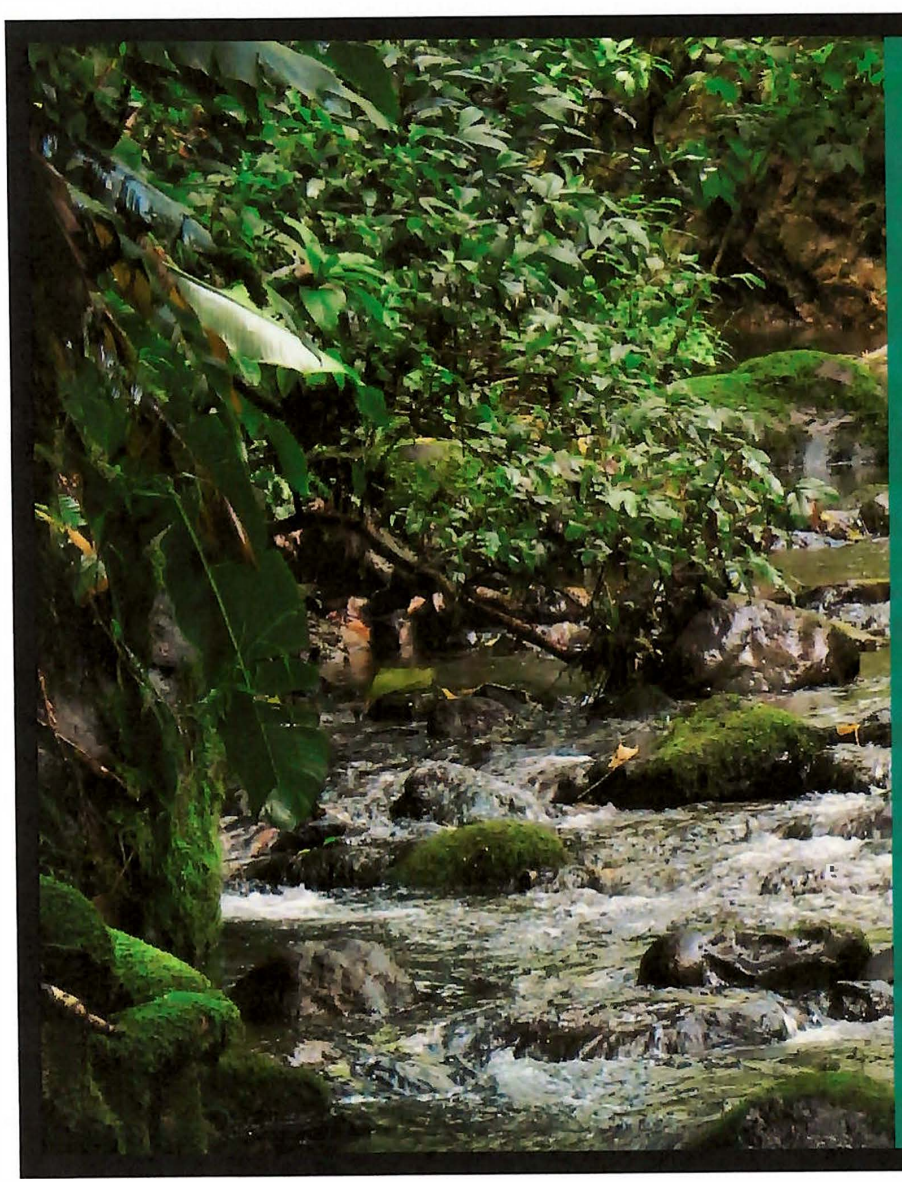
The foregoing was for information only.

DISCUSSION: Raelynn Nakabayashi, Executive Assistant I, Executive Support Office, gave the report.

Board Member Sword inquired about a previous amendment for $2 million (M) which would allow for two new monitoring wells. However, in the presentation today one monitoring well is eliminated. He asked how much is the cost for one monitoring well.

Ms. Raelynn Nakabayashi replied that she didn't have the cost for the monitoring well at site H on hand but would get back to the Board with that information. She confirmed that the amendment that Board Member Sword was referring to was Budget Amendment #4.

After Information Item #5 was presented, Ms. Nakabayashi provided the awarded contract amount for the groundwater monitoring well at site H, which was about $900,000.



REVISIONS TO THE FISCAL YEAR 2021-2022 (FY22) CAPITAL IMPROVEMENT PROGRAM (CIP) BUDGET

Raelynn Nakabayashi

October 24, 2022

boardofwatersupply.com

RESOLUTION 923, 2021 (ANNUAL BUDGET)

Appropriated $179,976,000

Operating Fund:	$66,026,000
Improvement Fund:	$93,350,000
Special Expendable Fund:	$20,600,000

ADOPTION OF RESOLUTION NO. 923, 2021, ADOPTING THE OPERATING AND CAPITAL IMPROVEMENT PROGRAM BUDGET FOR THE FISCAL YEAR 2021-2022 AND APPROPRIATING FUNDS THEREFOR, ADOPTED ON MAY 24, 2021			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT	X		
RAY C. SOON	X		
MAX J. SWORD	X		
NA'ALEHU ANTHONY	X		
JADE T. BUTAY	X		
ROGER BABCOCK JR.	X		

"BE IT FURTHER RESOLVED that the **Manager and Chief Engineer, at his discretion, shall have the authority to adjust the method of funding the Capital Improvement Program Budget** and that the Manager and Chief Engineer may increase or decrease the amount appropriated out of the Operating Fund, Improvement Fund, and Special Expendable Fund in the Capital Improvement Program Budget, **provided that the total consolidated appropriation of the Operating Budget and Capital Improvement Program Budget remains the same;"**

BUDGET AMENDMENT NO. 1

	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Resolution No. 923, 2021	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000
Amendment No. 1					
#33 GAC Interior Corrosion Control at Various Locations	-1,000,000				
Contract Adjustment Account	1,000,000				
Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000

Justification(s):

Project #33 - The funding for this project is being reduced based on the amount of GAC interior corrosion control performed in the prior fiscal year. The proposed amount reflects the total amount of funding required to perform interior corrosion control of selected BWS GAC facilities in Fiscal Year 2022.

The reduction in funds from this project will be reappropriated to provide additional funding to the Contract Adjustments Account.

The Contract Adjustment Account is used to provide additional funding for other CIP projects and to provide funding for contract change orders to previously awarded contracts.

RESOLUTION 932, 2022 – AMENDMENT NO. 2

Appropriated $179,976,000

Operating Fund:	$66,026,000
Improvement Fund:	$93,350,000
Special Expendable Fund:	$20,600,000

ADOPTION OF RESOLUTION 932, 2022, AMENDING THE 2021-2022 CAPITAL IMPROVEMENT PROGRAM BUDGET AND APPROPRIATING FUNDS THEREFOR AND REVISION OF THE 2021-2022 CAPITAL IMPROVEMENT PROGRAM BUDGET – AMENDMENT NO. 2 WAS ADOPTED ON JANUARY 6, 2022			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT	X		
RAY C. SOON	X		
MAX J. SWORD	X		
NA'ALEHU ANTHONY	X		
JADE T. BUTAY			ABSENT
DAWN B. SZEWCZYK	X		

"BE IT FURTHER RESOLVED that the **Manager and Chief Engineer, at his discretion, shall have the authority to adjust the method of funding the Capital Improvement Program Budget** and that the Manager and Chief Engineer may increase or decrease the amount appropriated out of the Operating Fund, Improvement Fund, and Special Expendable Fund in the Capital Improvement Program Budget, **provided that the total consolidated appropriation of the Operating Budget and Capital Improvement Program Budget remains the same;**"

BUDGET AMENDMENT NO. 2

	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Amendment No. 1 Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000
Amendment No. 2 (Resolution 932, 2022)					
#3A Halawa Valley Groundwater Monitoring Wells, Phase II	2,000,000				
#25 New Service Lateral Installations at Various Locations	-2,000,000				
Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000

Justification(s):

Project #3A - Installation of two (2) monitoring wells in the Halawa Valley near the Navy Red Hill Underground Bulk Fuel Storage Facility.

Project #25 - The funding for this project will be deferred to a future fiscal year.

BUDGET AMENDMENT NO. 3

	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Amendment No. 2 (Resolution 932, 2022) Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000
Amendment No. 3					
#3 Newtown Ridge and Royal Summit Reliability Improvements	-400,000				
Contract Adjustment Account	400,000				
Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000

Justification(s):

Project #3 - The EA is the first step in a chain of four projects spanning the course of six budget years. The overall project is intended to provide redundancy for customers in the upper Newtown & Royal Summit ridges; however, at this point in time it has been determined we may defer the EA project for one year without significant impact to service in these areas. Dependent on the timing and speed of the EA and design processes, there is a possibility that this deferral will not impact the final construction dates.

The reduction in funds from this project will be reappropriated to provide additional funding to the Contract Adjustments Account.

BUDGET AMENDMENT NO. 4

	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Amendment No. 3 Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000
Amendment No. 4					
#44 Facility Repair and Renovation	350,000				
#3A Halawa Valley Groundwater Monitoring Wells, Phase II	-350,000				
#18 North School Street Water System Improvements				-11,500,000	
Contract Adjustment Account				11,500,000	
Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000

Justification(s):

Project #44 - The funding will be used for additional costs associated with the Waialae Nui Well condition assessment; this effort evaluates an existing well for the viability of the well as a production source. This project will be executed in an effort to establish a potential additional water source to supply Honolulu. Because of the Red Hill contamination crisis, compounded by a dry winter, spring and a forecasted dry summer, establishing additional water source capacity is imperative to maintaining water distribution stability for Honolulu.

BUDGET AMENDMENT NO. 4 CONT'D

	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Amendment No. 3 Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000
Amendment No. 4					
#44 Facility Repair and Renovation	350,000				
#3A Halawa Valley Groundwater Monitoring Wells, Phase II	-350,000				
#18 North School Street Water System Improvements				-11,500,000	
Contract Adjustment Account				11,500,000	
Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000

Justification(s) Cont'd:

Project #3A - Only one monitoring well, Site H, can be awarded for construction in Fiscal Year 2023; as such the funding in this line item is being reduced commensurate with the funding required for the single well.

Project #18 - This project is being deferred to a future fiscal year.

The reduction in funds from project #18 will be reappropriated to provide additional funding to the Contract Adjustments Account.

BUDGET AMENDMENT NO. 5

	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Amendment No. 4 Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000
Amendment No. 5					
#44 Facility Repair and Renovation	260,000				
#39 Honouliuli Water Recycling Facility Reroofing	-260,000				
Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000

Justification(s):

Project # 44 - The funding will be used for additional costs associated with the Waialae Nui Well condition assessment; this effort evaluates an existing well for the viability of the well as a production source. This project will be executed in an effort to establish a potential additional water source to supply Honolulu. Because of the Red Hill contamination crisis, compounded by a dry winter, spring and a forecasted dry summer, establishing additional water source capacity is imperative to maintaining water distribution stability for Honolulu.

Project #39 - This project is being deferred to a future fiscal year.

BUDGET AMENDMENT NO. 6

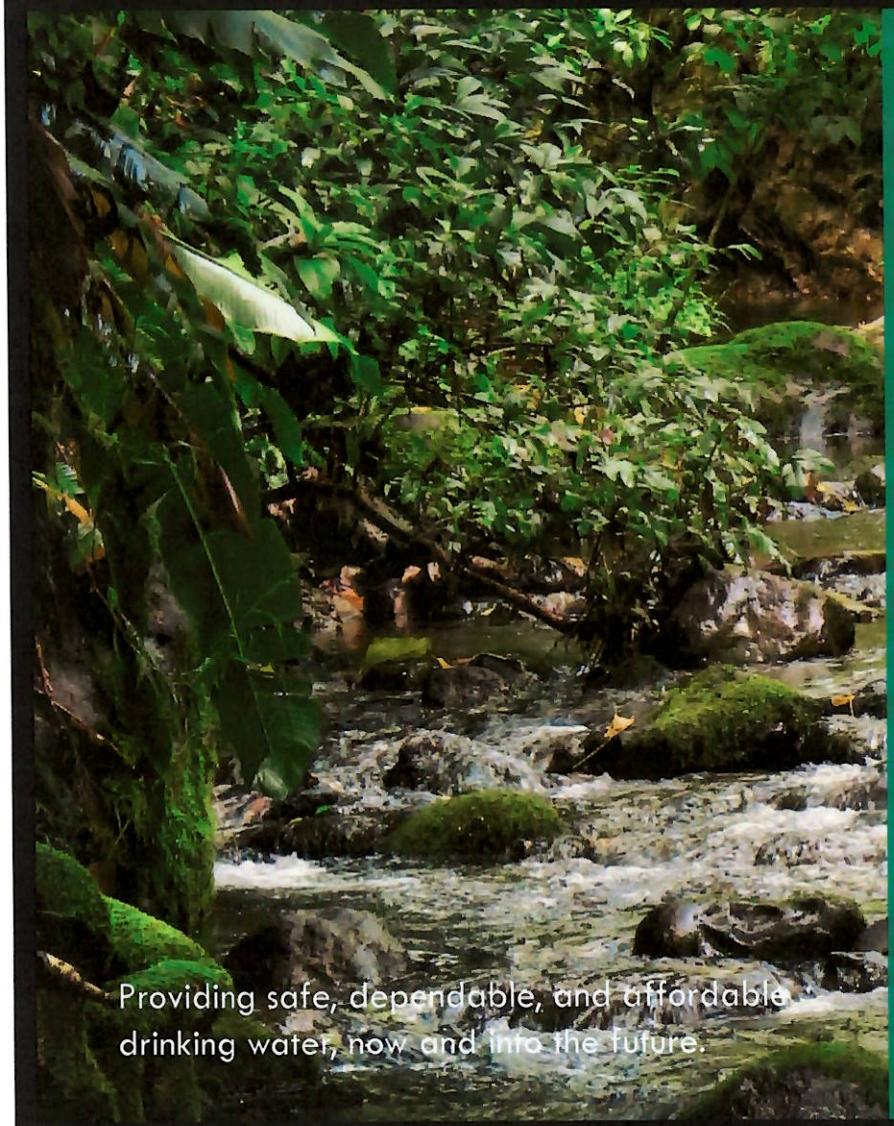
	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Amendment No. 5 Amended Totals:	50,296,000	15,730,000	20,600,000	93,350,000	179,976,000
Amendment No. 6					
#48 Honouliuli WWTP Expansion 16-Inch Main		-4,300,000			
#48 Honouliuli WWTP Expansion 16-Inch Main	4,300,000				
Amended Totals:	54,596,000	11,430,000	20,600,000	93,350,000	179,976,000

Justification(s):

Project # 48 - The project is not SRF eligible.

FINAL SUMMARY BY CATEGORY

	Operating	Op. SRF Eligible	Spec. Ex.	Improvement	Total
Research and Development	**6,900,000**				**6,900,000**
Amendment No. 2	2,000,000				2,000,000
Amendment No. 3	-400,000				-400,000
Amendment No. 4	-350,000				-350,000
	8,150,000				**8,150,000**
Renewal and Replacement	**25,375,000**	**10,000,000**		**86,100,000**	**121,475,000**
Amendment No. 1	-1,000,000				-1,000,000
Amendment No. 2	-2,000,000				-2,000,000
Amendment No. 4	350,000			-11,500,000	-11,150,000
Amendment No. 5	260,000				
Amendment No. 5	-260,000				-260,000
	22,725,000	**10,000,000**	**0**	**74,600,000**	**107,325,000**
Capacity Expansion		**4,300,000**	**18,900,000**		**23,200,000**
Amendment No. 6	4,300,000	-4,300,000			0
	4,300,000	**0**	**18,900,000**	**0**	**23,200,000**
Construction Cost Index	**2,421,000**	**1,430,000**	**1,700,000**	**7,250,000**	**12,801,000**
Contract Adjustment Account	**15,600,000**				**15,600,000**
Amendment No. 1	1,000,000				1,000,000
Amendment No. 3	400,000				400,000
Amendment No. 4				11,500,000	11,500,000
	17,000,000			**11,500,000**	**28,500,000**
	54,596,000	**11,430,000**	**20,600,000**	**93,350,000**	**179,976,000**



Mahalo!

BOARD OF WATER SUPPLY

Revisions to the FY2022 CIP

Raelynn Nakabayashi
(808) 748-5177, rnakabayashi@hbws.org

boardofwatersupply.com for more information

October 24, 2022

ITEM FOR INFORMATION NO. 5

"October 24, 2022

RECRUITMENT STATUS

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843
Chair and Members:

Subject: Recruitment Status

Michele L. Thomas, Executive Assistant, Human Resources Office, will be presenting an update on the Recruitment Status for the period of July 2022 to September 2022.

Respectfully Submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

The foregoing was for information only.

DISCUSSION:

Michele Thomas, Executive Assistant I, Human Resources Office, gave the report.

Board Member Sword asked if the BWS participates in job fairs.

Ms. Michele Thomas responded that the BWS participates in various career and/or job fairs that are relevant, such as the UH School of Engineering, the City, the American Water Works Association (AWWA), and the Association of Metropolitan Water (AMWA) Job Fair. She also mentioned that the BWS participates in virtual job fairs.

Positions Filled
September 1, 2021 through September 30, 2022

For the Period Jul22 – Sep22 Actions: 18 New hires, 9 Promotions, 3 Transfers, 15 Separations

BOARD OF WATER SUPPLY

City and County of Honolulu

RECRUITMENT AND SEPARATION STATUS

For Period July 31, 2022 to September 30, 2022

Status of Positions Under Recruitment

	as of		
	7/31/2022	8/31/2022	9/30/2022
Pending DHR Open List (external recruitment)	42	20	25
Pending Internal recruitments	7	0	3
Pending Final Interview Questions	9	15	10
Pending Interviews with Division	28	52	31
Anticipated Starts (pre-employment clearances)	19	14	25
Cancelled Requests	0	3	5
Total Positions Under Recruitment	105	104	99

Filled Positions

Month	Jul-22	Aug-22	Sep-22
Open list	4	7	8
Internal Promotions	2	2	4
Internal Demotions/Transfers	0	3	0
Reallocations	6	17	6

Separations

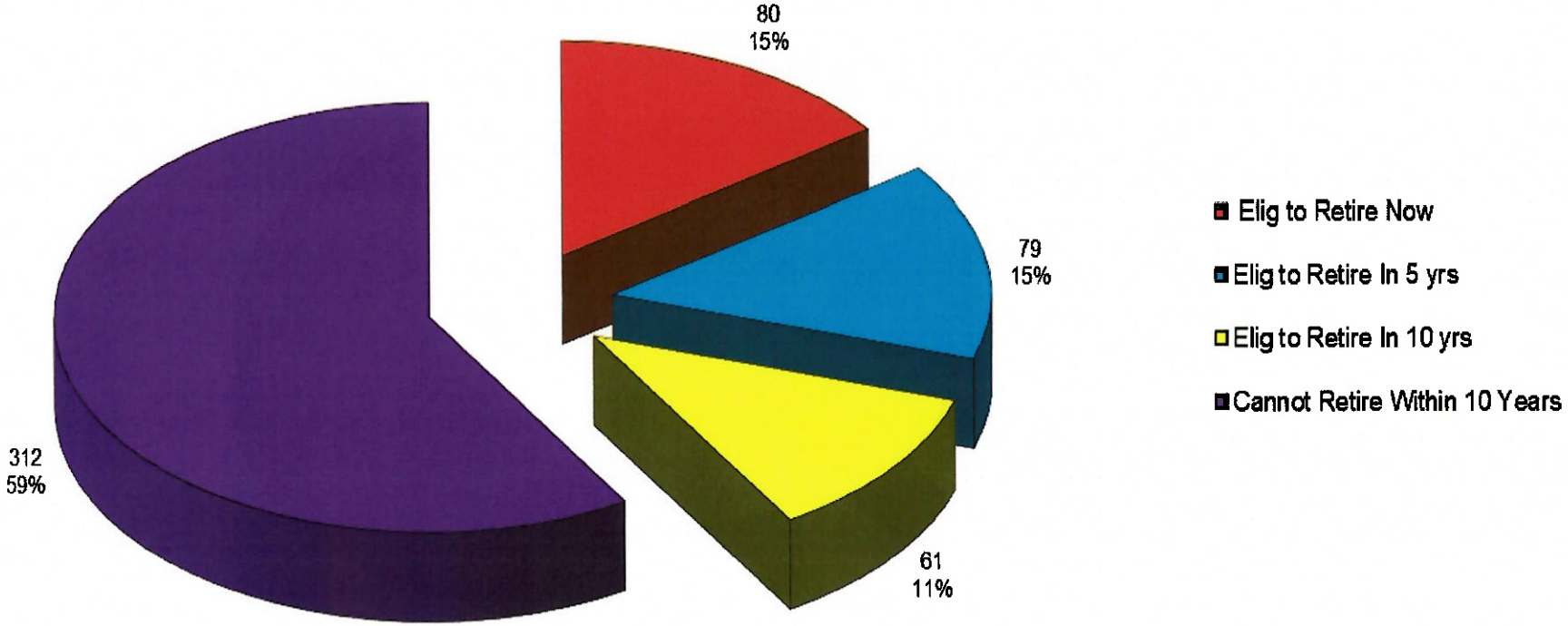
Month	Jul-22	Aug-22	Sep-22
Retire	1	1	2
Resign/Termination/Other	4	5	2

Legend:

DHR = Department of Human Resources City and County of Honolulu

Reallocation = Employee has demonstrated compentency in higher level position and position was adjusted

BWS Retirement Projections
As of September 30, 2022



ITEM FOR INFORMATION NO. 6

"October 24, 2022

STATUS UPDATE OF GROUNDWATER LEVELS AT ALL INDEX STATIONS

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chair and Members:

Subject: Status Update of Groundwater Levels at All Index Stations

Six aquifer index stations were in low groundwater condition for the production month of September 2022. Beretania, Pearl City, Kaluanui and Waialua are in Caution Status. Kaimuki and Punaluu are in Alert Status. The monthly production average for September 2022 was 143.59 million gallons per day.

The Board of Water Supply rainfall index for the month of September 2022 was 94 percent of normal, with a 5-month moving average of 74 percent. As of October 4, 2022, the Hawaii Drought Monitor shows zero drought to severe drought conditions moving southwest across Oahu. The National Weather Service is forecasting enhanced probabilities for above-normal precipitation between roughly November 2022 through January 2023.

Most monitoring wells exhibited decreasing head levels for the month of September, likely due to the relatively higher overall groundwater production, and the significantly decreased rainfall from the prior month. Average monthly production for September 2022 was approximately the same as the previous year and the 5-year monthly average.

Respectfully Submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

The foregoing was for information only.

DISCUSSION: Barry Usagawa, Program Administrator, Water Resources Division, gave the report. There were no comments or discussion.

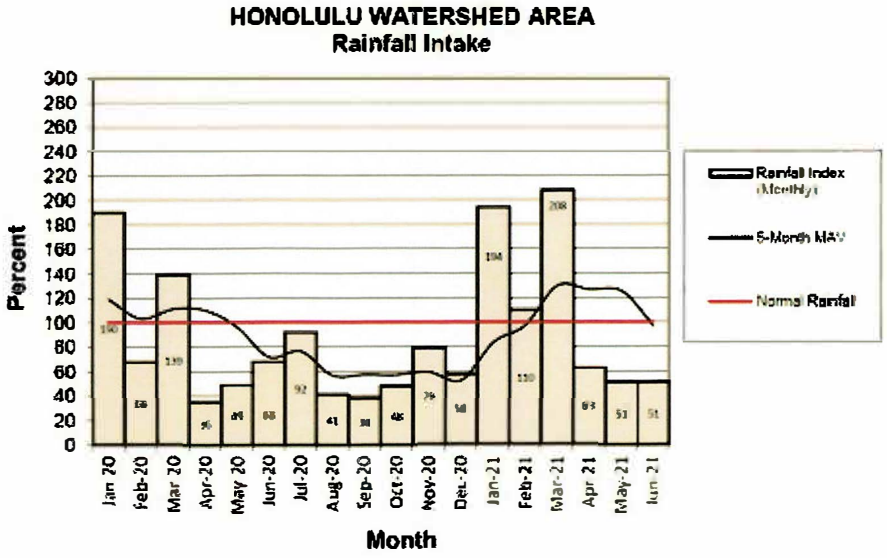
Board Member Kaneshiro commented that he was curious about the 2022 National Weather Service (NWS) forecasts for a wet winter since the same conditions were forecasted in 2021.

Mr. Usagawa shared that the BWS meets with Mr. Kevin Kodama, NWS periodically throughout the year. Mr. Kodama is forecasting the third year of La Nina conditions, which should result in a wet winter. Mr. Usagawa

explained that in December 2021 there was a lot of rain. However, throughout January and the remaining of winter, was dry which is contrary to a typical La Nina condition. He explained the difference between La Nina and El Nino. El Nino typically results in dry winters, with more possibilities of hurricane activity and storm disturbance, whereas La Nina is wetter winters and cooler weather conditions.

Board Member Sword asked if the winter of December 2020 to January 2021, had the same dry condition as January 2022.

Mr. Usagawa responded that the winter months were wet because the 5-month moving average (MAV) was above normal in the spring of 2021. He mentioned that during the winter of 2020 it was also wet.



PRODUCTION, HEAD AND RAINFALL REPORT
MONTH OF SEPTEMBER 2022

POTABLE

STATION	MGD
HONOLULU (1)	
KULIOUOU	0.00
WAILUPE	0.14
AINA KOA	0.00
AINA KOA II	0.72
MANOA II	0.94
PALOLO	1.12
KAIMUKI HIGH	1.92
KAIMUKI LOW	1.14
WILDER	9.11
BERETANIA HIGH	3.87
BERETANIA LOW	2.97
KALIHI HIGH	0.00
KALIHI LOW	5.04
KAPALAMA	1.09
KALIHI SHAFT	8.33
MOANALUA	0.86
HALAWA SHAFT	0.00
KAAMILO	0.60
KALAUAO	9.01
PUNANANI	12.07
KAAHUMANU	0.24
HECO WAIAU	2.36
MANANA	0.22
WAIALAE IKI	0.00
WELLS SUBTOTAL:	61.74
MANOA TUNNEL	0.17
PALOLO TUNNEL	0.00
GRAVITY SUBTOTAL:	0.17
HONO. SUBTOTAL:	61.91

STATION	MGD
WINDWARD (2)	
WAIMANALO II	0.97
WAIMANALO III	0.00
KUOU I	0.98
KUOU II	0.66
KUOU III	0.70
LULUKU	0.82
HAIKU	0.35
IOLEKAA	0.00
KAHALUU	0.67
KAHANA	0.99
PUNALUU I	0.00
PUNALUU II	4.65
PUNALUU III	0.00
KALUANUI	1.48
MAAKUA	0.27
HAUULA	0.26
WELLS SUBTOTAL:	12.81
WAIM. TUNNELS I & II	0.00
WAIM. TUNNELS III&IV	0.19
WAIHEE INCL. WELLS	0.29
WAIHEE TUNNEL	3.59
LULUKU TUNNEL	0.19
HAIKU TUNNEL	0.29
KAHALUU TUNNEL	1.06
GRAVITY SUBTOTAL:	5.61
WIND. SUBTOTAL:	18.42

STATION	MGD
NORTH SHORE (3)	
KAHUKU	0.39
OPANA	0.98
WAIALEE I	0.43
WAIALEE II	0.21
HALEIWA	0.00
WAIALUA	2.00
N.SHORE SUBTOTAL:	4.00

MILILANI (4)	
MILILANI I	1.44
MILILANI II	0.00
MILILANI III	0.69
MILILANI IV	2.45
MILILANI SUBTOTAL:	4.58

WAHIAWA (5)	
WAHIAWA	1.44
WAHIAWA II	1.53
WAHIAWA SUBTOTAL:	2.97

PEARL CITY-HALAWA (6)	
HALAWA 277	0.00
HALAWA 550	0.00
AIEA	0.00
AIEA GULCH 497	0.01
AIEA GULCH 550	0.30
KAONOHI I	1.85
WAIMALU I	0.00
NEWTOWN	1.86
WAIAU	1.94
PEARL CITY I	0.84
PEARL CITY II	1.12
PEARL CITY III	0.20
PEARL CITY SHAFT	0.93
PEARL CITY-HALAWA SUBTOTAL:	9.03

STATION	MGD
WAIPAHU-EWA (7)	
WAIPIO HTS.	1.75
WAIPIO HTS. I	0.00
WAIPIO HTS. II	0.37
WAIPIO HTS. III	1.18
WAIPAHU	6.73
WAIPAHU II	1.89
WAIPAHU III	4.06
WAIPAHU IV	2.06
KUNIA I	4.08
KUNIA II	2.03
KUNIA III	1.36
HOAEAE	4.83
HONOULIULI I	0.00
HONOULIULI II	8.40
MAKAKILO	0.15
WAIPAHU-EWA SUBTOTAL:	38.88

WAIANAE (8)	
MAKAHA I	0.47
MAKAHA II	0.00
MAKAHA III	0.12
MAKAHA V	0.16
MAKAHA VI	0.00
MAKAHA SHAFT	0.00
KAMAILE	0.07
WAIANAE I	0.29
WAIANAE II	0.35
WAIANAE III	0.78
WELLS SUBTOTAL:	2.25
WAIA. C&C TUNNEL	1.40
WAIA. PLANT. TUNNELS	0.14
GRAVITY SUBTOTAL:	1.54
WAIANAE SUBTOTAL:	3.79

NONPOTABLE

NONPOTABLE	MGD
KALAUAO SPRINGS	0.59
BARBERS POINT WELL	1.15
GLOVER TUNNEL NP	0.29
NONPOTABLE TOTAL:	2.03

RECYCLED WATER (AUGUST 2022)

RECYCLED WATER	MGD
HONOULIULI WRF R-1	6.19
HONOULIULI WRF RO	1.42
RECYCLED TOTAL:	7.61

PRODUCTION, HEAD AND RAINFALL REPORT
MONTH OF SEPTEMBER 2022

PRODUCTION SUMMARIES

TOTAL WATER	MGD
PUMPAGE	136.27
GRAVITY	7.32
POTABLE TOTAL:	143.59
NONPOTABLE	2.03
RECYCLED WATER	7.61
TOTAL WATER:	153.24

CWRM PERMITTED USE AND BWS ASSESSED YIELDS FOR BWS POTABLE SOURCES

	WATER USE DISTRICTS	A PERMITTED USE/ BWS YLDS	B SEP 2022	C DIFF. A-B
1	HONOLULU	83.32	61.74	21.58
2	WINDWARD	25.02	18.42	6.60
3	NORTH SHORE	4.70	4.00	0.70
4	MILILANI	7.53	4.58	2.95
5	WAHIAWA	4.27	2.97	1.30
6	PEARL CITY-HALAWA	12.25	9.03	3.22
7	WAIPAHU-EWA	50.63	38.88	11.75
8	WAIANAE	4.34	3.79	0.55
	TOTAL:	192.06	143.42	48.63

CWRM PERMITTED USE FOR BWS NONPOTABLE SOURCES

	WATER USE DISTRICTS	A PERMITTED USE	B SEP 2022	C DIFF. A-B
7	WAIPAHU-EWA (BARBERS POINT WELL)	1.00	1.15	-0.15
	TOTAL:	1.00	1.15	-0.15

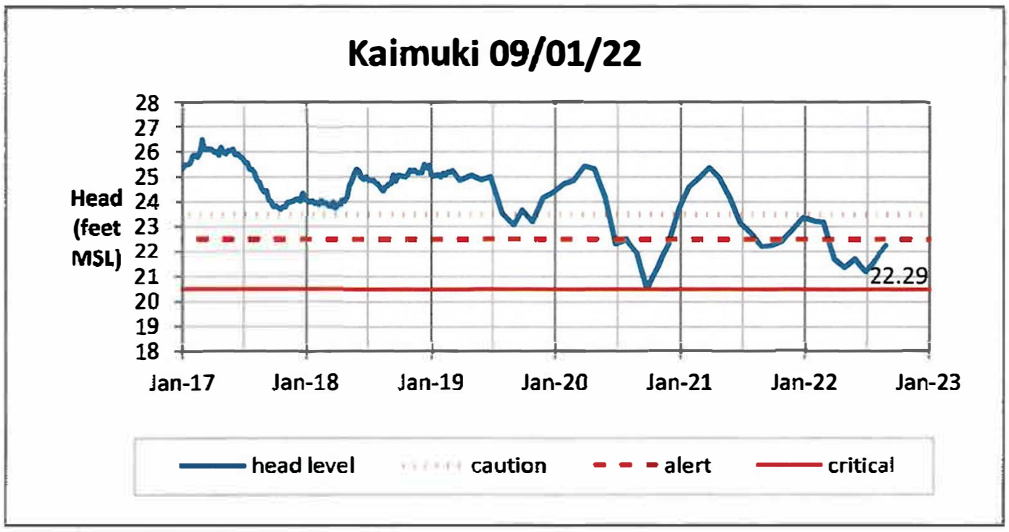
EFFECTIVE WATER DEMAND PER DISTRICT

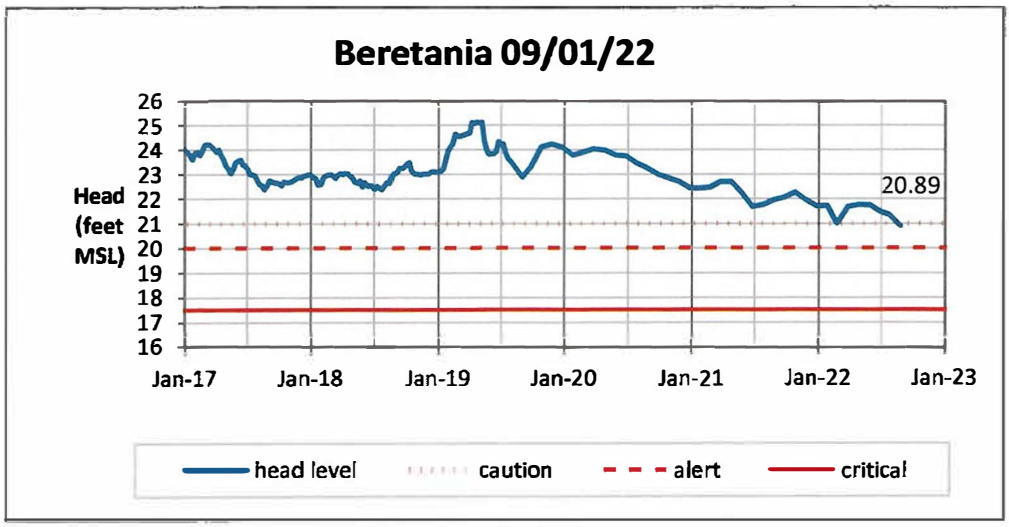
IMPORT/EXPORT BETWEEN WATER USE DISTRICTS

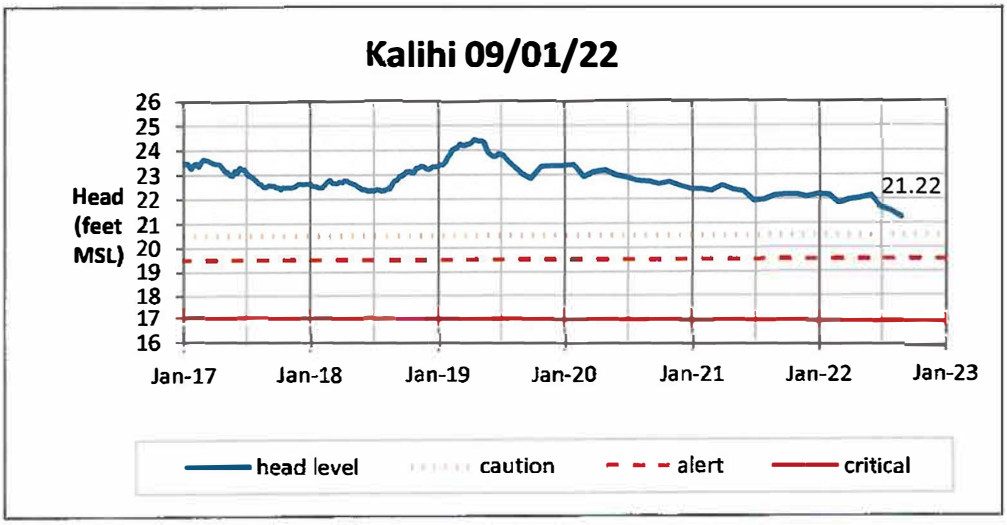
FROM	TO		MGD
2	1	WINDWARD EXPORT	1.07
7	8	BARBERS PT LB	5.47

	WATER USE DISTRICTS	SUBTOTAL	IMPORT	EXPORT	EFFECTIVE WATER DEMAND
1	HONOLULU	61.91	1.07	-	62.98
2	WINDWARD	18.42	-	1.07	17.35
3	NORTH SHORE	4.00	-	-	4.00
4	MILILANI	4.58	-	-	4.58
5	WAHIAWA	2.97	-	-	2.97
6	PEARL CITY-HALAWA	9.03	-	-	9.03
7	WAIPAHU-EWA	38.88	-	5.47	33.41
8	WAIANAE	3.79	5.47	-	9.26
	TOTAL:	143.59	6.54	6.54	143.59

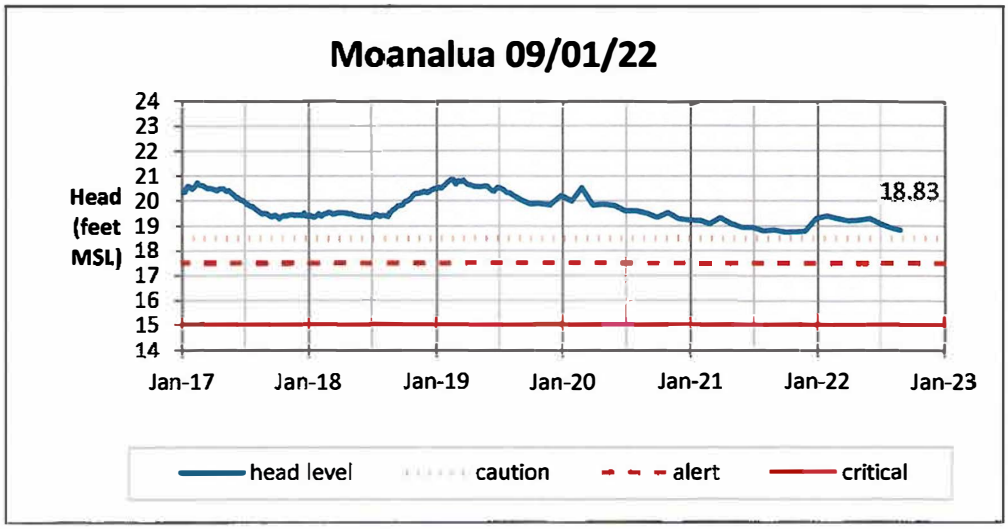
Head Report

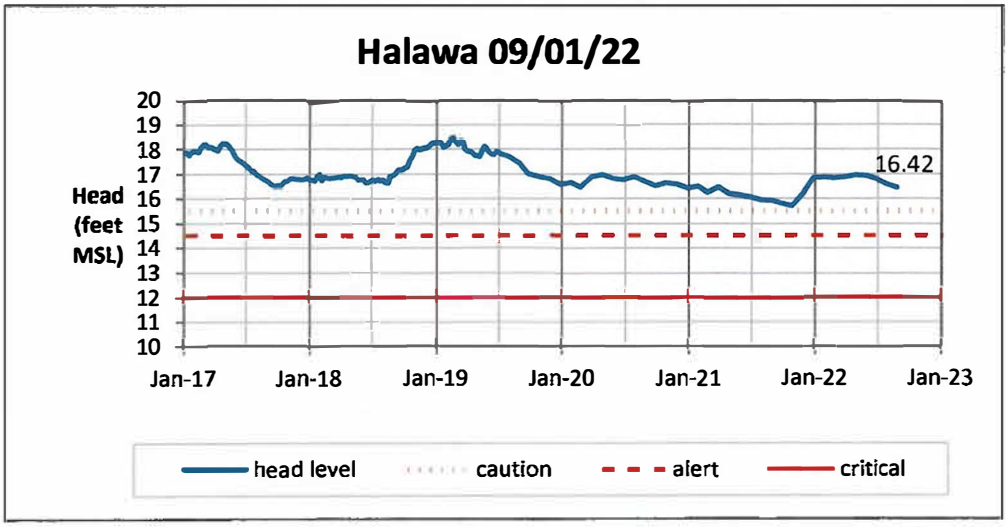

Kaimuki 09/01/22
Head (feet MSL)
28
27
26
25
24
23
22
21
20
19
18
22.29
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

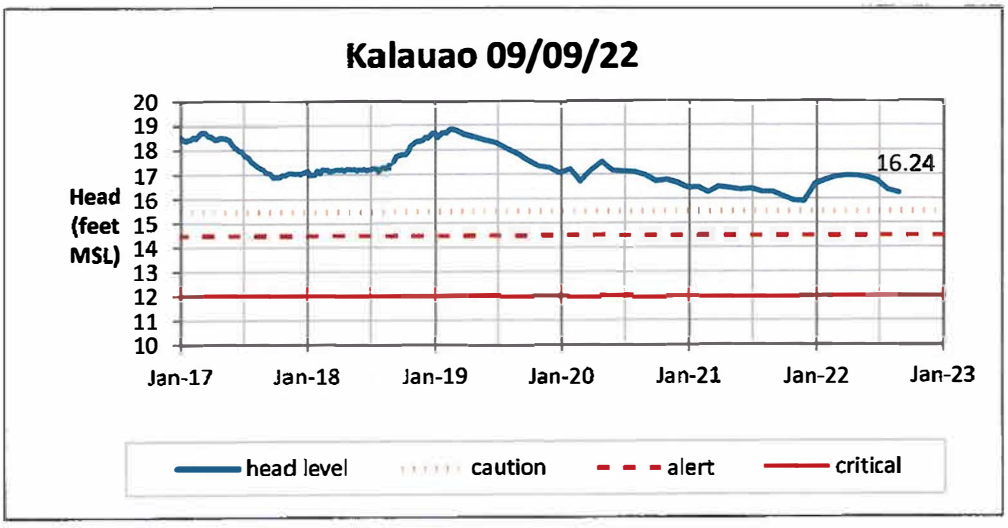

Beretania 09/01/22
Head (feet MSL)
26
25
24
23
22
21
20
19
18
17
16
20.89
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical


Kalihi 09/01/22
Head (feet MSL)
26
25
24
23
22
21
20
19
18
17
16
21.22
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

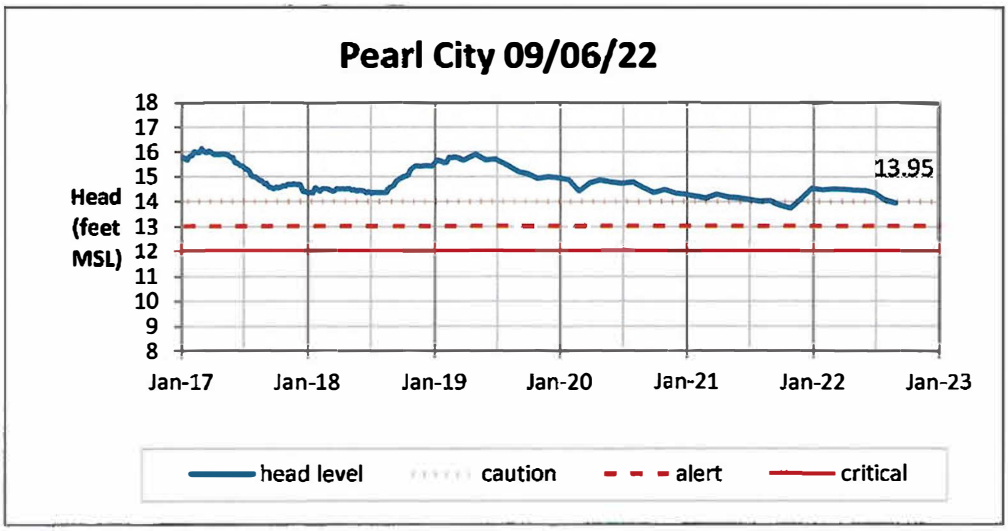
Head Report

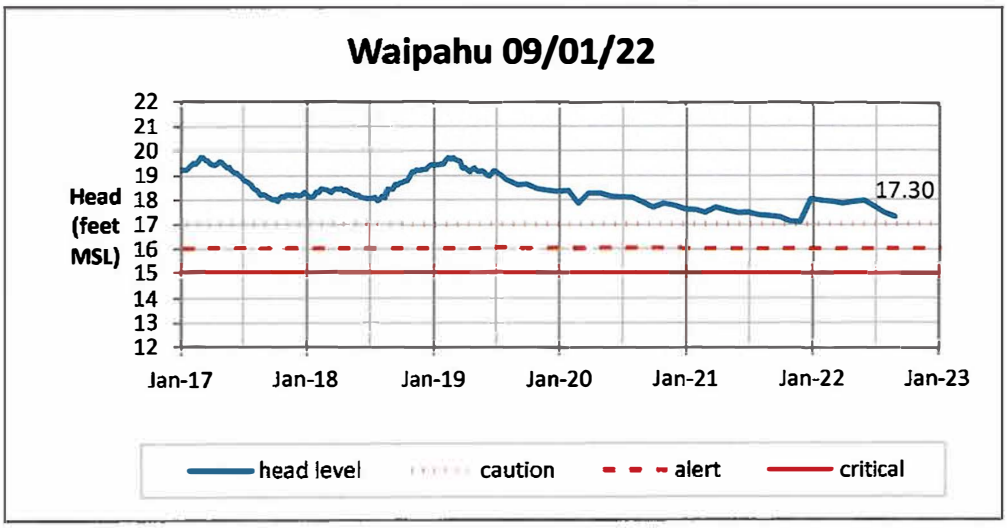

Moanalua 09/01/22
Head (feet MSL)
24
23
22
21
20
19
18
17
16
15
14
18.83
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

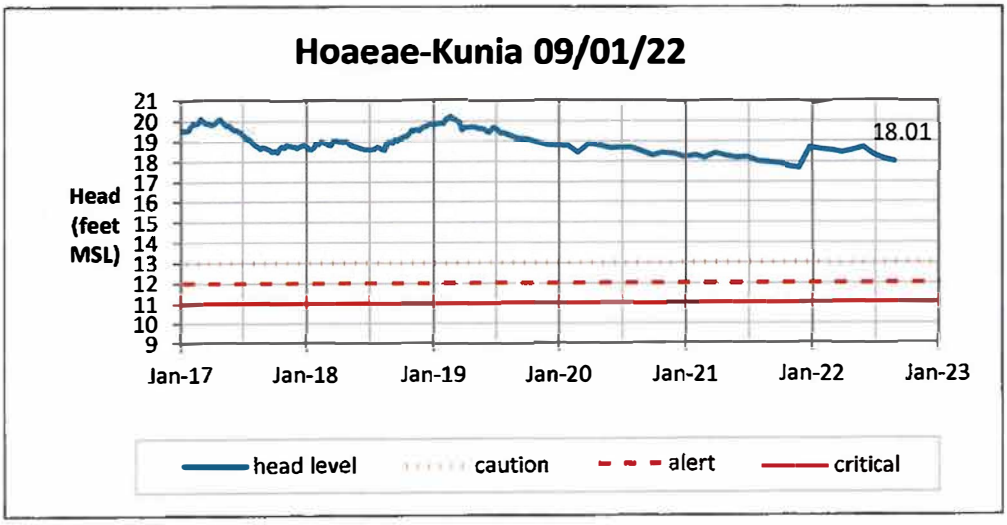

Halawa 09/01/22
Head (feet MSL)
20
19
18
17
16
15
14
13
12
11
10
16.42
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical


Kalauao 09/09/22
Head (feet MSL)
20
19
18
17
16
15
14
13
12
11
10
16.24
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

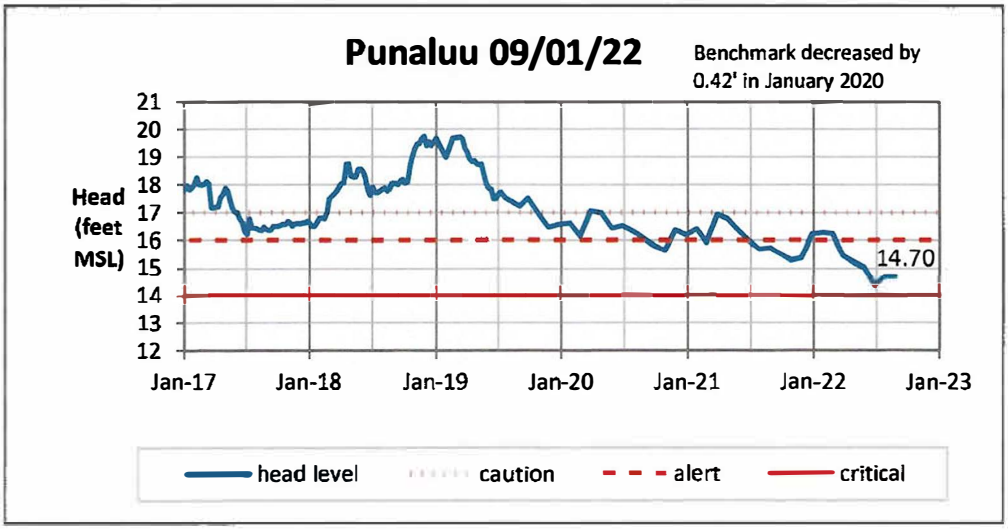
Head Report

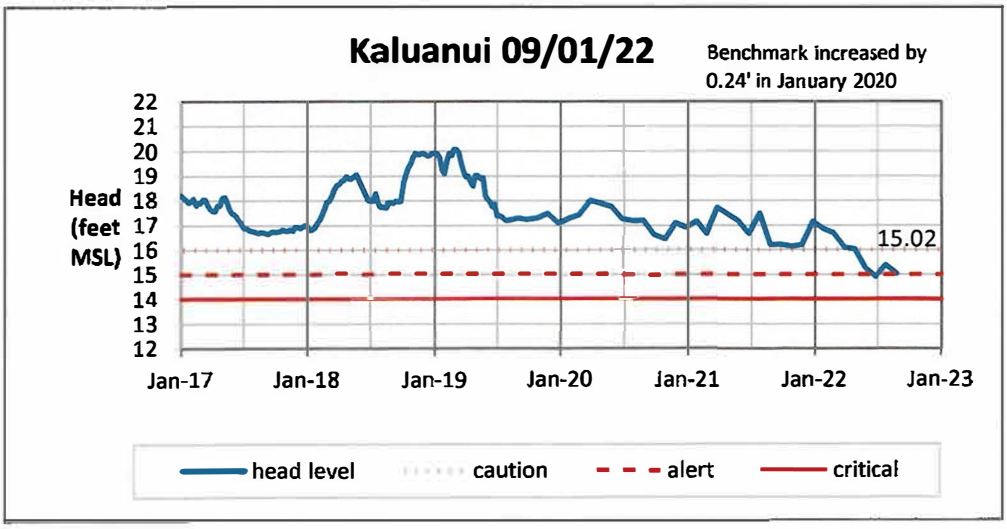

Pearl City 09/06/22
Head (feet MSL)
18
17
16
15
14
13
12
11
10
9
8
13.95
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

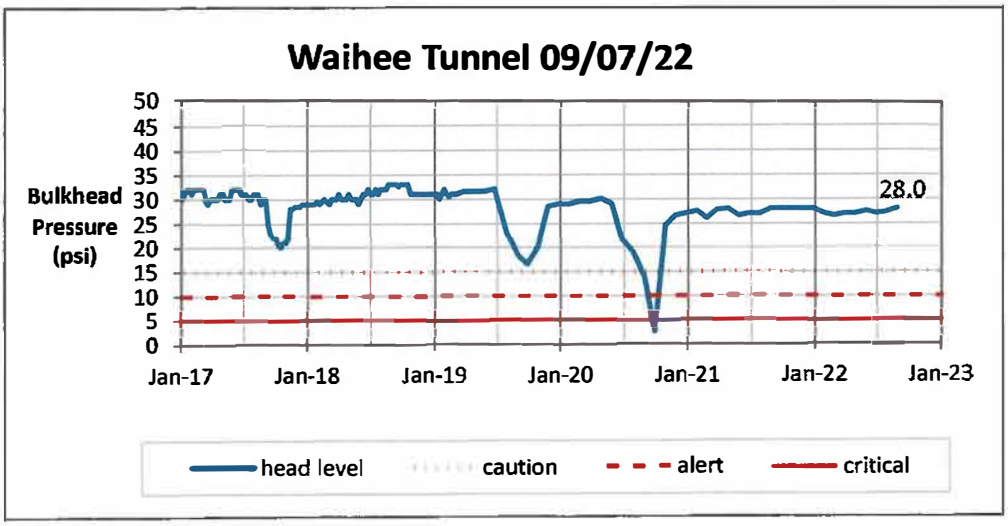

Waipahu 09/01/22
Head (feet MSL)
22
21
20
19
18
17
16
15
14
13
12
17.30
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical


Hoaeae-Kunia 09/01/22
Head (feet MSL)
21
20
19
18
17
16
15
14
13
12
11
10
9
18.01
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

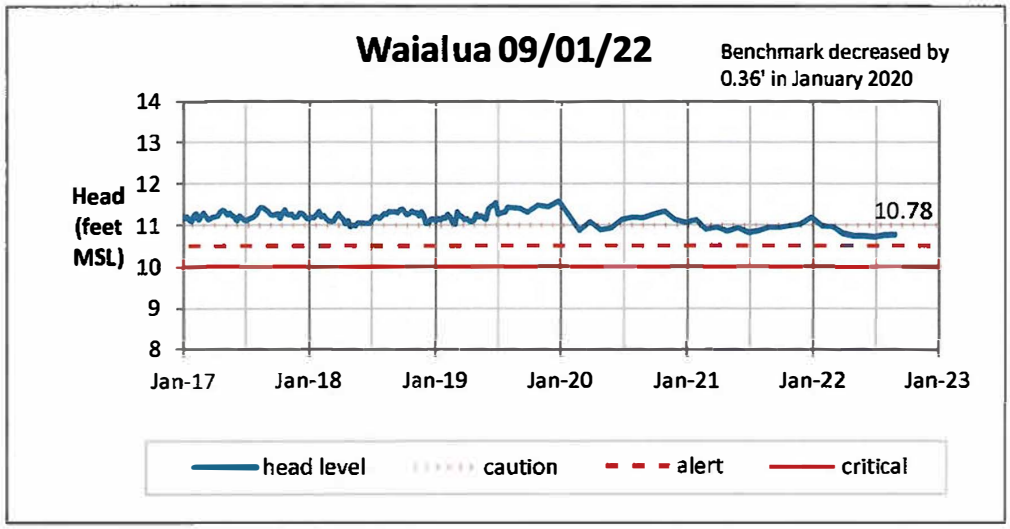
Head Report

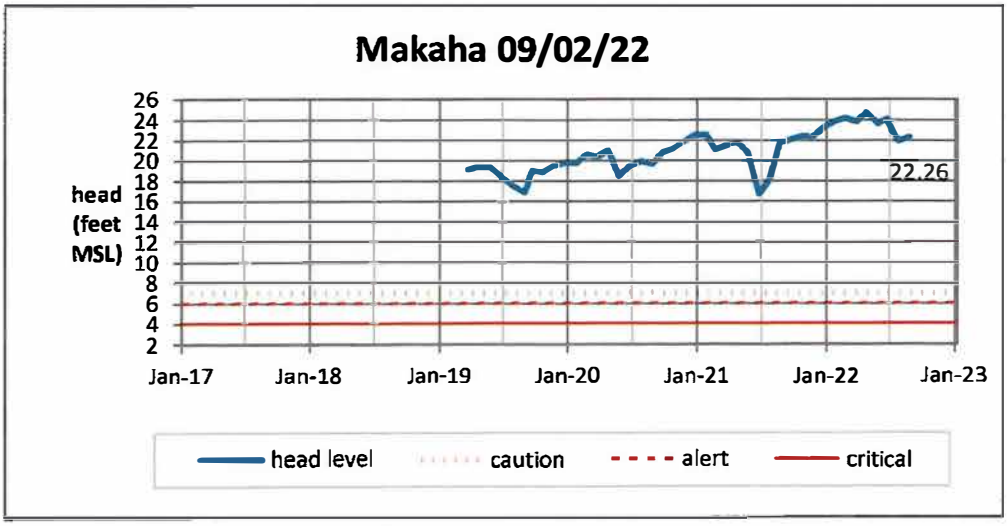

Punaluu 09/01/22
Benchmark decreased by 0.42' in January 2020
Head (feet MSL)
21
20
19
18
17
16
15
14
13
12
14.70
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

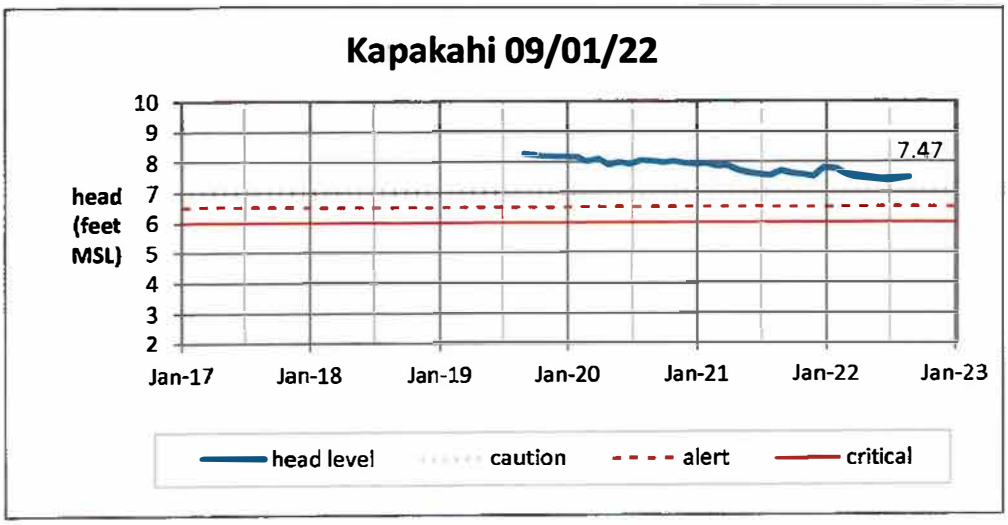

Kaluanui 09/01/22
Benchmark increased by 0.24' in January 2020
Head (feet MSL)
22
21
20
19
18
17
16
15
14
13
12
15.02
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

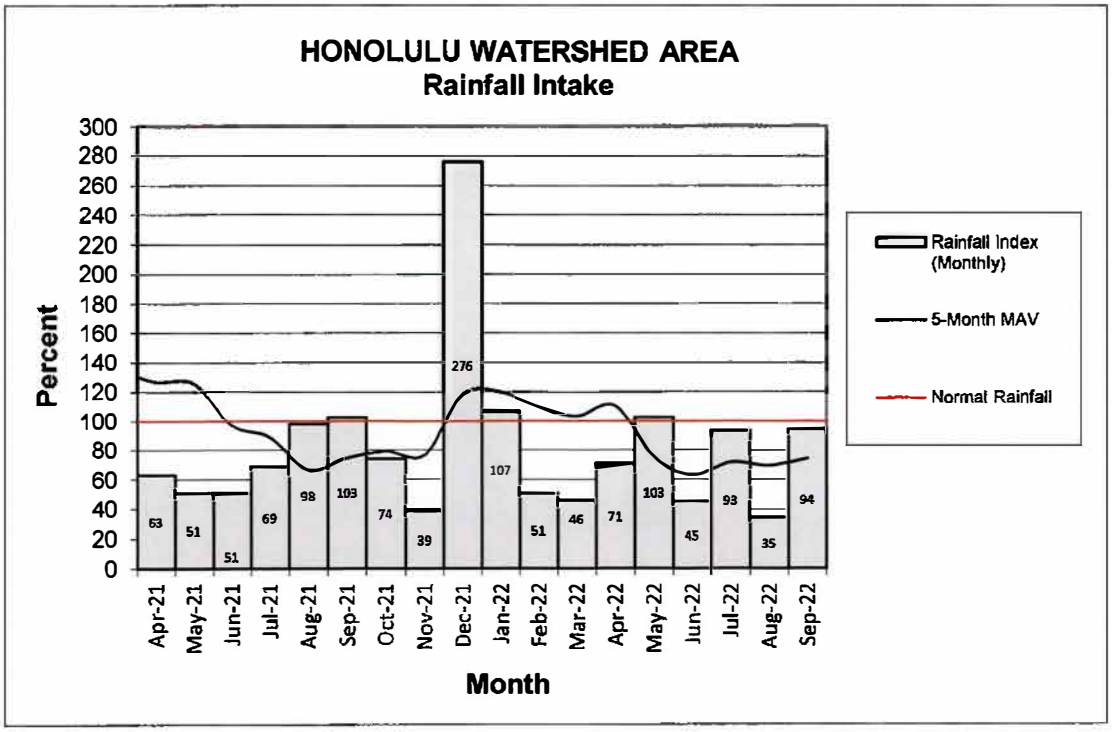

Waihee Tunnel 09/07/22
Bulkhead Pressure (psi)
50
45
40
35
30
25
20
15
10
5
0
28.0
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical

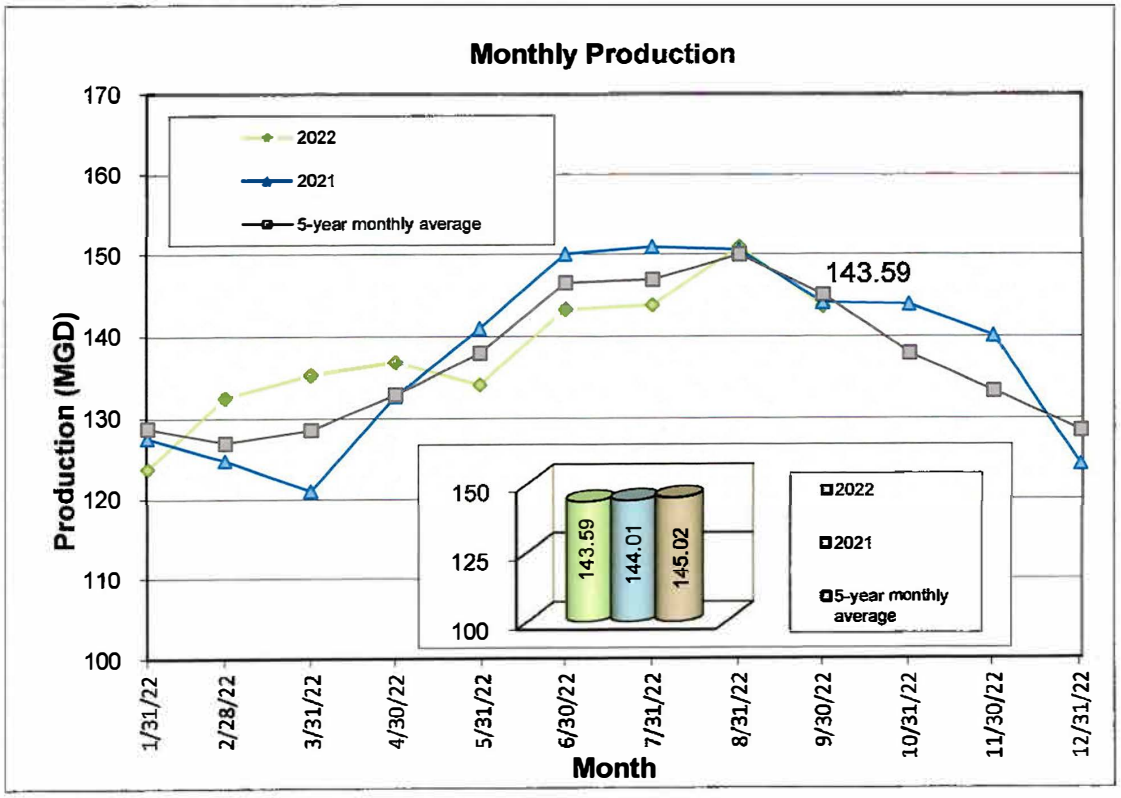
Head Report


Waialua 09/01/22
Benchmark decreased by 0.36' in January 2020
Head (feet MSL)
14
13
12
11
10
9
8
10.78
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical


Makaha 09/02/22
head (feet MSL)
26
24
22
20
18
16
14
12
10
8
6
4
2
22.26
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical


Kapakahi 09/01/22
head (feet MSL)
10
9
8
7
6
5
4
3
2
7.47
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
head level
caution
alert
critical


HONOLULU WATERSHED AREA
Rainfall Intake
Percent
300
280
260
240
220
200
180
160
140
120
100
80
60
40
20
0
63
51
51
69
98
103
74
39
276
107
51
46
71
103
45
93
35
94
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Month
Rainfall Index (Monthly)
5-Month MAV
Normal Rainfall


Monthly Production
Production (MGD)
170
160
150
140
130
120
110
100
2022
2021
5-year monthly average
143.59
1/31/22
2/28/22
3/31/22
4/30/22
5/31/22
6/30/22
7/31/22
8/31/22
9/30/22
10/31/22
11/30/22
12/31/22
Month
150
125
100
143.59
144.01
145.02
2022
2021
5-year monthly average

ITEM FOR INFORMATION NO. 7

"October 24, 2022

WATER MAIN REPAIR REPORT FOR SEPTEMBER 2022

Chair and Members
Board of Water Supply
City and County of Honolulu
Honolulu, Hawaii 96843

Chair and Members:

Subject: Water Main Repair Report for September 2022

Jason Nikaido, Program Administrator, Field Operations Division, will report on water main repair work for the month of September 2022.

Respectfully submitted,

/s/ ERNEST Y. W. LAU, P.E
Manager and Chief Engineer

Attachment"

The foregoing was for information only.

DISCUSSION:

Jason Nikaido, Program Administrator, Field Operations Division, gave the report.

Manager Lau asked Mr. Jason Nikaido to explain the satellite leak detection program.

Mr. Nikaido shared that the BWS has a contract with a third-party vendor that provides satellite imagery or satellite analysis of the BWS's entire 2100-mile system with points of interest (POI). The approximate accuracy is about 600 feet of any location provided. He stated since using the satellite leak detection program the BWS has investigated approximately 1000 POIs and increased the accuracy and efficiency of the leak detection team. Before the use of the program, the leak detection team would travel from neighborhood to neighborhood.

Manager Lau mentioned that satellite imagery can detect chlorinated water on the surface of the ground and up six feet below ground.

Board Member Kaneshiro inquired if the satellite leak detection program uses visible or infrared lighting.

Mr. Nikaido replied that the satellite capabilities are black-boxed.

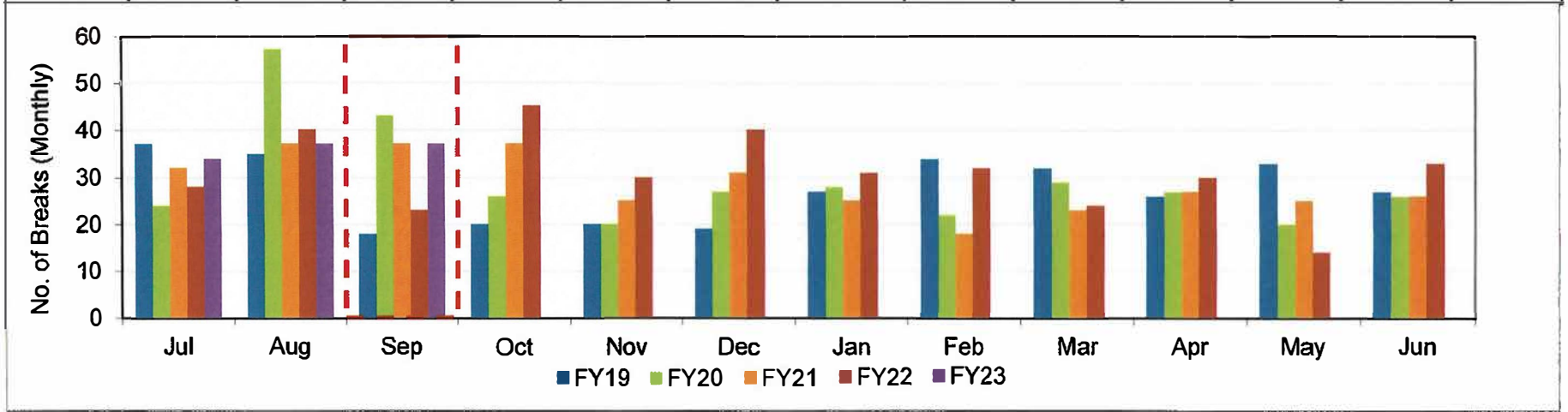
Board Member Jade Butay asked if the BWS will be billing the contractor that damaged the 36 inch pipeline on Old Kalanianaole Road.

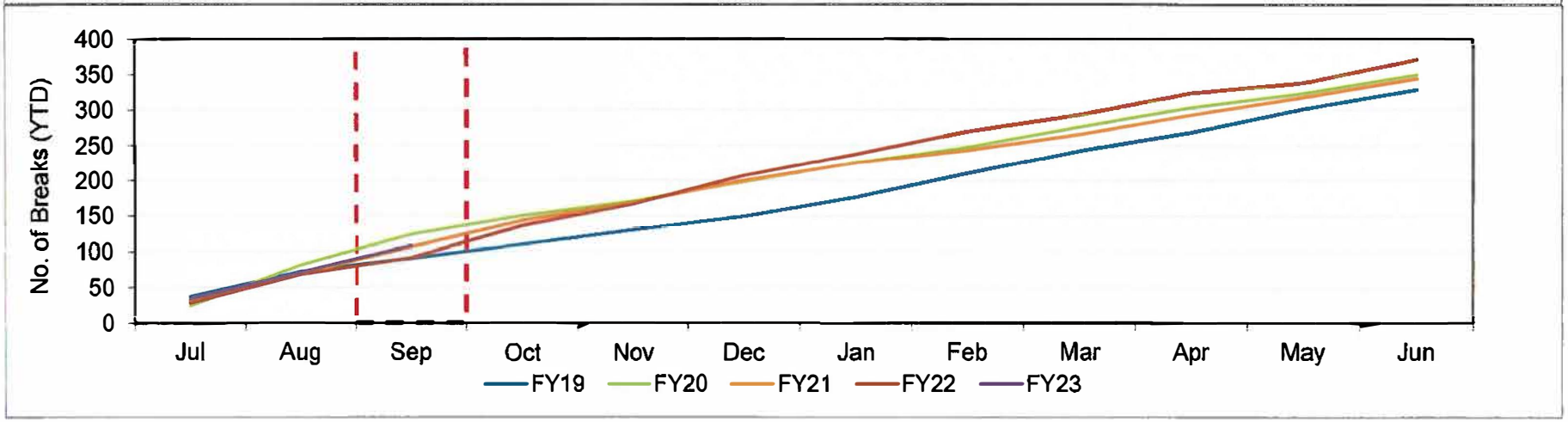
Mr. Nikaido responded that the BWS will be billing the contractor.

WATER MAIN REPAIR REPORT
for September 2022

Monthly Main Breaks

FY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
2023	34	37	**37**										**108**
2022	28	40	23	45	30	40	31	32	24	30	14	33	**370**
2021	32	37	37	37	25	31	25	18	23	27	25	26	**343**
2020	24	57	43	26	20	27	28	22	29	27	20	26	**349**
2019	37	35	18	20	20	19	27	34	32	26	33	27	**328**



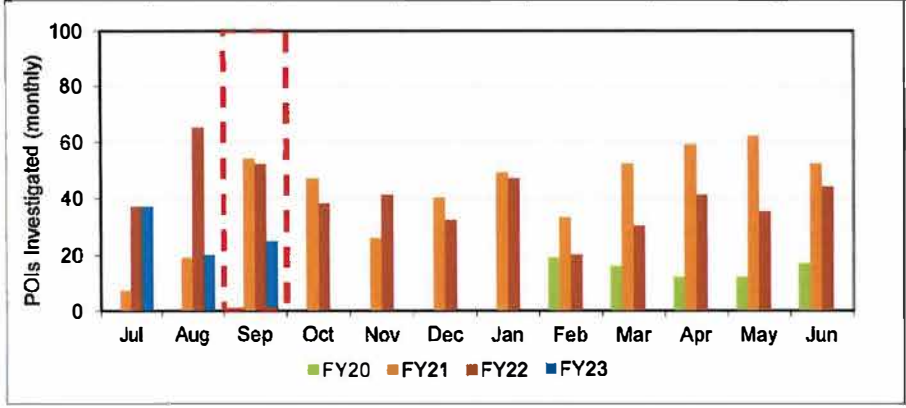


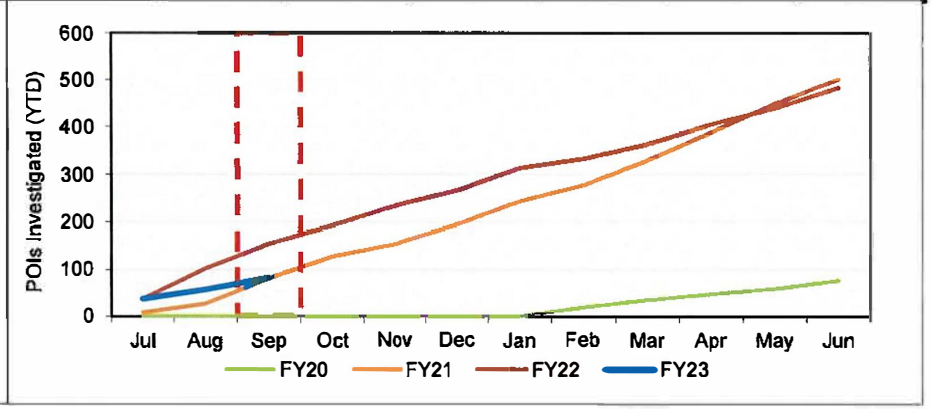
Date	Address	Size (In)	Pipe Type
9/1/2022	4328 Halupa St, Honolulu	12	PVC
9/1/2022	94-208 Huewai Pl, Waipahu	4	PVC
9/2/2022	99-1779 Hoapono Pl, Aiea	6	CI
9/2/2022	758 Halekauwila St, Honolulu	8	DI
9/2/2022	1446 Alewa Dr, Honolulu	4	CI
9/3/2022	432 Ena Rd, Honolulu	8	CI
9/3/2022	1344 Kukana Pl, Kailua	8	CI
9/4/2022	1800 Ala Moana Blvd, Honolulu	8	CI
9/5/2022	44-14 Nohokai Pl, Kaneohe	6	CI
9/6/2022	1831 Sereno St, Honolulu	8	DI
9/6/2022	42-265 Old Kalanianaole Rd, Kailua	36	CC
9/7/2022	5172 Kilauea Ave, Honolulu	12	CI
9/8/2022	5278 Makalena St, Honolulu	8	CI
9/8/2022	199 Waikalani Dr, Mililani Town	8	CI
9/9/2022	3340 Kalihi St, Honolulu	8	CI
9/10/2022	616 8th Ave, Honolulu	6	CI
9/11/2022	830 Punchbowl St, Honolulu	8	CI
9/13/2022	5289 Makalena St, Honolulul	4	CI
9/13/2022	1310 Akele St, Kailua	8	CI
9/15/2022	41 Dowsett Ave, Honolulu	8	PVC
9/16/2022	2621 Kalihi St, Honolulu	4	CI
9/16/2022	3462 Pakui St, Honolulu	8	PVC
9/16/2022	1134 Waikui Pl, Honolulu,	4	CI
9/17/2022	91-504 Huleia Pl, Ewa Beach	8	CI
9/17/2022	91-515 Huleia Pl, Ewa Beach	6	CI
9/19/2022	91-508 Pupu St, Ewa Beach	6	CI
9/20/2022	91-868 Wailewa Pl, Ewa Beach	8	CI
9/20/2022	1015 Wilder Ave, Honolulu	4	CI
9/21/2022	176 Rose St, Wahiawa	6	CI
9/22/2022	94-967 Kahuailani St, Waipahu,	8	CI
9/24/2022	92-685 Anipeahi St, Kapolei	8	CI
9/25/2022	92-605 Mehani St, Kapolei	8	CI
9/26/2022	3439 Harding Ave, Honolulu	6	CI
9/27/2022	99-855 Aiea Heights Dr, Aiea,	4	CI
9/29/2022	98-1020 Kaonohi St, Aiea,	8	CI
9/29/2022	4815 Kahala Ave, Honolulu	8	CI
9/30/2022	1431 Haku St, Honolulu	8	CI

LEAK DETECTION
for September 2022

POIs Investigated

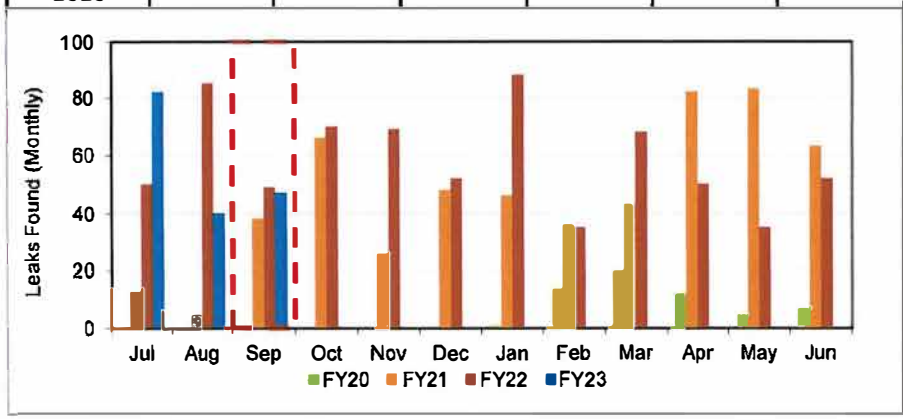
FY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
2023	37	20	**25**										82
2022	37	65	52	38	41	32	47	20	30	41	35	44	482
2021	7	19	54	47	26	40	49	33	52	59	62	52	500
2020							0	19	16	12	12	17	76

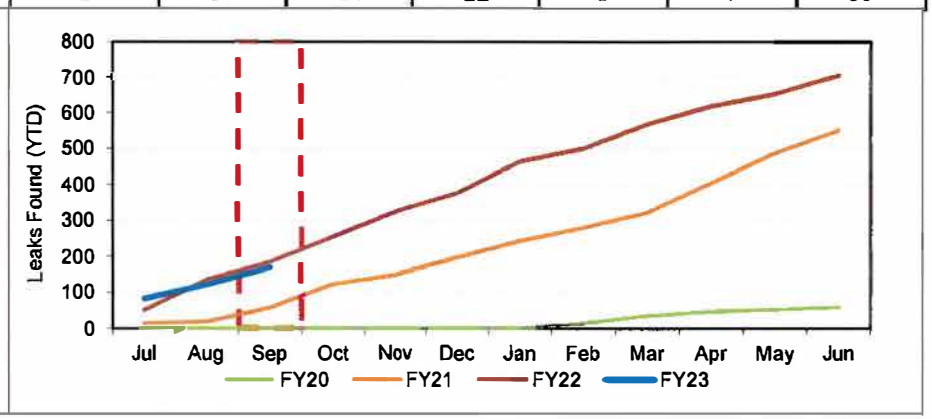




Leaks Found

FY	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
2023	82	40	**47**										**169**
2022	50	85	49	70	69	52	88	35	68	50	35	52	703
2021	13	5	38	66	26	48	46	36	43	82	83	63	549
2020							1	14	20	12	5	7	59





MOTION TO RECESS INTO EXECUTIVE SESSION

There being no further business Chair Andaya at 4:18 PM called for a motion to adjourn the Open Session. Max Sword so moved; seconded by Jonathan Kaneshiro and unanimously carried.

Upon unanimous approved motion, the Board recessed into Executive Session Pursuant to [HRS § 92-5 (a)(4)] at 4:19 PM to Consider Issues Pertaining to Matters Posted for Discussion at an Executive Session.

OPEN SESSION

The Board reconvened in Open Session at 5:41 PM.

MOTION TO ADJOURN

There being no further business Chair Andaya at 5:42 PM called for a motion to adjourn the Regular Session. Max Sword so moved; seconded by Jade Buty and unanimously carried.

The minutes of the Regular Meeting held on October 24, 2022, are respectfully submitted,

JOY CRUZ-ACHIU

APPROVED:

BRYAN P. ANDAYA
Chair of the Board
NOV 2 8 2022
Date

THE MINUTES OF THE REGULAR MEETING HELD ON OCTOBER 24, 2022, WERE APPROVED AT THE NOVEMBER 28, 2022, BOARD MEETING			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT	X		
MAX J. SWORD			ABSENT
NA'ALEHU ANTHONY	X		
JONATHAN KANESHIRO	X		
JADE T. BUTAY	X		
DAWN B. SZEWCZYK	X		