BOARD OF WATER SUPPLY

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

June 22, 2021

NOTICE

The Board of Water Supply, City and County of Honolulu, will hold a Regular Meeting on Monday, June 28, 2021, at 2:00 p.m. in the Boardroom, Public Service Building, 630 South Beretania Street, Honolulu, Hawaii.

Pursuant to the Twenty-First Proclamation issued by Governor David Y. Ige on June 7, 2021, related to the COVID-19 emergency, in order to allow public participation in a manner consistent with social distancing practices, the following procedures are in effect for the meeting.

Some Board members may be participating in the meeting by interactive conference technology from remote locations.

TESTIMONY

Testimony can be submitted as follows:

- Written testimony may be emailed to board@hbws.org or faxed to (808) 748-5079. Testimony is due by Monday, June 28, 2021, at noon. Written testimonies should include the submitter's address, email address, and phone number. Written testimony will be posted to the BWS website at boardofwatersupply.com.
- Mail written testimony to Board of Water Supply, 630 S. Beretania St., Honolulu, HI 96843. Testimony is due by Monday, June 28, 2021, at noon.
- On-line testimony will be accepted at boardofwatersupply.com/testimony Fill out the testimony form. Due by Monday, June 28, 2021, at noon.
- Telephone testimony will be accepted during the meeting at (808) 748-6040. Callers will be placed in a queue and brought up to testify one at a time.
- In-person testimony will not be accepted.

Testimony is limited to two (2) minutes and shall be presented by the registered speaker only.

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 748-5172 or email your request to board@hbws.org **at least three business days prior to the meeting date**.

The agenda for the June 28, 2021, Regular Meeting of the Board of Water Supply is as follows:

ITEMS REQUIRING BOARD ACTION

1. Approval of the Minutes of the Public Hearing and Regular Meeting Held on May 24, 2021

2. Adoption of Resolution No. 925, 2021, Reimbursement of Capital Expenditures from the Proceeds of Indebtedness

3. Adoption of Resolution No. 926, 2021, Authorizing Up to $50,000,000 Principal Amount of Series 2021 State Revolving Fund Water System Revenue Loans

4. Approval to Seek Public Input on Draft Changes to Water System Facilities Charges

ITEMS FOR INFORMATION

1. Water Systems Revenue Bonds – Compliance with Rate Covenant

2. Update of Commission on Water Resource Management Action Regarding Board of Water Supply Ha'ikū Tunnel

3. My Account ePortal Project Update

4. Status Update of Groundwater Levels at All Index Stations

5. Water Main Repair Report for May 2021

6. Correspondence to the Board in Reference to Executive Session Item No. 3, Proposed Settlement of Claim #21-007, Relating to Property Damages at 1242 10th Avenue, Honolulu, Hawaii following a 12" pvc main break between 3496 10th Avenue and Keanu Street, Honolulu, Hawaii, on August 2, 2020

EXECUTIVE SESSION

1. Approval of the Minutes of the Executive Session Held on April 26, 2021

2. Approval of the Minutes of the Executive Session Held on May 24, 2021

3. To Consult with the Board's Attorney on Questions and Issues Pertaining to the Board of Water Supply's Proposed Settlement of Claim #21-007, Relating to Property Damages at 1242 10th Avenue, Honolulu, Hawaii following a 12" pvc main break between 3496 10th Avenue and Keanu Street, Honolulu, Hawaii, on August 2, 2020 [HRS §92-5(a)(4)]

MINUTES

THE REGULAR MEETING OF THE BOARD OF WATER SUPPLY

June 28, 2021

At 2:07 PM on June 28, 2021, 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
Max J. Sword, Board Member
Ray C. Soon, Board Member via WebEx
Na'alehu Anthony, Board Member via WebEx
Jade T. Butay, Board Member, Ex-Officio via WebEx
Roger Babcock, Jr., Board Member, Ex-Officio via WebEx

Also Present:
Ernest Lau, Manager and Chief Engineer
Ellen Kitamura, Deputy Manager and Chief Engineer via WebEx
Jason Takaki, Program Administrator, Capital Projects Division via WebEx
Jennifer Elflein, Program Administrator, Customer Care Division
Garon Hamasaki, Civil Engineer IV, Customer Care Division via Vimeo
Kathleen Elliott-Pahinui, Information Officer, Communications Office via WebEx
Raelynn Nakabayashi, Executive Assistant I, Executive Support Office via WebEx
Michael Fuke, Program Administrator, Field Operations Division
Joseph Cooper, Waterworks Controller, Finance Division
Leanne Matsumoto, Assistant Waterworks Controller, via WebEx
Teriann Akana, Human Resources Specialist VI, Human Resources Office via WebEx
Henderson Nuuhiwa, Program Administrator, Information Technology Division via WebEx
Michael Matsuo, Land Administrator, Land Division Via WebEx
Erwin Kawata, Program Administrator, Water Quality Division via WebEx
Barry Usagawa, Program Administrator, Water Resources Division

Kevin Ihu, Program Administrator,
Water System Operations Division
via WebEx
David Ebersold, Vice-President of CDM Smith via
WebEx
Kathy Mitchell, Administrative Services Officer
via Vimeo
Kimberly Kuwaye, Deputy Secretary via WebEx
Joy Cruz-Achiu, Board Secretary
Steven Norstrom, Information Specialist II,
Communications Office
Stella Bernardo, Information Specialist II,
Communications Office
Blaine Fergerstrom, Information Specialist II,
Communications Office

Others Present: Jeff Lau, Deputy Corporation Counsel
via Conference Call
Jessica Wong, Deputy Corporation Counsel
via WebEx

Absent: Kapua Sproat, Vice Chair

REGULAR MEETING

Chair Bryan Andaya requested a roll call for the Regular Meeting. Chair Andaya asked each Board Member to respond verbally when their names were called. Board Member Max Sword, aye; Board Member Jade Butay, aye; and Board Member Roger Babcock, aye.

Chair Andaya stated he would acknowledge other Board Members as they joined the meeting.

Chair Andaya introduced those present in the Boardroom, Manager Ernest Lau, Board Secretary Joy Cruz-Achiu, and Information Specialist Steven Norstrom. Joining from the City and County Corporation Counsel were Deputy Jeff Lau and Deputy Jessica Wong via WebEx Call.

Chair Andaya requested 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 stated that the Board of Water Supply (BWS) is dedicated to providing safe, dependable, and affordable water now and into the future.

Chair Andaya stated under the Twenty-first Proclamation issued by Governor David Ige on June 7, 2021, to follow public participation in a matter consistent with COVID-19 practices. The following procedures are in effect for the meeting:

Board Members are participating from remote locations via WebEx.

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, June 28, 2021, at noon. However, late testimony will be accepted by email, fax, or mail. Telephone testimony is accepted by calling (808)748-6040, where you will be put in the queue and allowed to testify one at a time. Unfortunately, due to the pandemic, in-person testimony is suspended. 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.

APPROVAL OF MEETING	Approval of the Minutes of the Regular Meeting Held on May 24, 2021.
MOTION TO APPROVE	Max Sword and Roger Babcock motioned and seconded, respectively, to approve the Minutes of the Regular Meeting of May 24, 2021.

THE MINUTES OF THE REGULAR MEETING HELD ON MAY 24, 2021, WERE APPROVED AT THE JUNE 28, 2021 BOARD MEETING			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT			ABSENT
RAY C. SOON			ABSENT
MAX J. SWORD	X		
NA'ALEHU ANTHONY			ABSENT
JADE T. BUTAY	X		
ROGER BABCOCK, JR.	X		

"June 28, 2021

ADOPTION OF RESOLUTION NO. 925, 2021, REIMBURSEMENT OF CAPITAL EXPENDITURES FROM THE PROCEEDS OF INDEBTEDNESS

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

Chair and Members:

Subject: Adoption of Resolution No. 925, 2021, Reimbursement of Capital Expenditures from the Proceeds of Indebtedness

We recommend adoption of Resolution No. 925, 2021, Declaring the Official Intent of the Board of Water Supply of the City and County of Honolulu to Reimburse Itself for Certain Capital Expenditures from the Proceeds of Indebtedess.

The Resolution establishes the time limit for reimbursement of capital expenditures at eighteen months. This brings the Board of Water Supply into compliance with Section 1.150 of the U. S. Treasury Regulations and does not bind the Board to make any expenditure, incur any indebtedness, or proceed with the Project.

The Resolution establishes a limit of $179,976,000 and attaches the FY 2022 Capital Improvement Program.

Respectfully Submitted,

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

Attachment"

DISCUSSION: Joseph Cooper, Waterworks Controller, Finance Division, gave the report. There were no comments or discussions.

MOTION TO ADOPT Max Sword and Roger Babcock motioned and seconded, respectively, the Adoption of Resolution No. 925, 2021, Reimbursement of Capital Expenditures from the Proceeds on Indebtedness.

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. 925, 2021, REIMBURSEMENT OF CAPITAL EXPENDITURES FROM THE PROCEEDS OF INDEBTEDNESS, ADOPTED ON JUNE 28, 2021			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT			ABSENT
RAY C. SOON			ABSENT
MAX J. SWORD	X		
NA'ALEHU ANTHONY			ABSENT
JADE T. BUTAY	X		
ROGER BABCOCK JR.	X		

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

RESOLUTION NO. 925, 2021

A RESOLUTION DECLARING THE OFFICIAL INTENT OF THE BOARD OF WATER SUPPLY OF THE CITY AND COUNTY OF HONOLULU TO REIMBURSE ITSELF FOR CERTAIN CAPITAL EXPENDITURES FROM THE PROCEEDS OF INDEBTEDNESS

WHEREAS, the Board intends to provide for the acquisition, construction, rehabilitation and/or equipping of certain capital facilities for the Board constituting water system facilities and other capital improvements for the use and benefit of the Board comprising improvements related to the FY 2022 Capital Improvement Program and other related facilities (the "Project"); and

WHEREAS, the Board expects to pay certain expenditures (the "Reimbursement Expenditures") in connection with the Project prior to the issuance of indebtedness for the purpose of financing costs associated with the Project on a long-term basis; and

WHEREAS, the Board reasonably expects that debt obligations for the Project in an amount not expected to exceed $179,976,000 will be issued and that certain of the proceeds of such debt obligations will be used to reimburse the Reimbursement Expenditures; and

WHEREAS, proceeds of such debt obligations will be allocated to Reimbursement Expenditures no later than 18 months after the later of (i) the date the cost is paid, or (ii) the date the Project is placed in service or abandoned (but in no event more than three years after the cost is paid); and

WHEREAS, the Board may issue debt obligations for the Project in connection with obligations for other projects;

BE IT RESOLVED by the Board of Water Supply of the City and County of Honolulu, Hawaii, as follows:

1. It is hereby found and determined that it is the intent of the Board that bonds be authorized and issued by the Board to provide monies to carry out one or more purposes of the Board, including the acquisition and construction of improvements to the water system of the Board as specified in Schedule I attached hereto.

2. This declaration is made solely for purposes of establishing compliance with the requirements of Section 1.150 2 of the Treasury Regulations, and this declaration does not bind the Board to make any expenditure, incur any indebtedness, or proceed with the Project.

3. The Board hereby declares its official intent to use proceeds of the indebtedness to reimburse itself for the Reimbursement Expenditures after adoption of this resolution.

4. This resolution shall take effect upon the adoption thereof.

WHEREAS, the Board may issue debt obligations for the Project in connection with obligations for other projects;

BE IT RESOLVED by the Board of Water Supply of the City and County of Honolulu, Hawaii, as follows:

1. It is hereby found and determined that it is the intent of the Board that bonds be authorized and issued by the Board to provide monies to carry out one or more purposes of the Board, including the acquisition and construction of improvements to the water system of the Board as specified in Schedule I attached hereto.

2. This declaration is made solely for purposes of establishing compliance with the requirements of Section 1.150 2 of the Treasury Regulations, and this declaration does not bind the Board to make any expenditure, incur any indebtedness, or proceed with the Project.

3. The Board hereby declares its official intent to use proceeds of the indebtedness to reimburse itself for the Reimbursement Expenditures after adoption of this resolution.

4. This resolution shall take effect upon the adoption thereof.

ADOPTED:

BRYAN ANDAYA

Chair

Honolulu, Hawaii
June 28, 2021

ADOPTION OF RESOLUTION NO. 925, 2021, REIMBURSEMENT OF CAPITAL EXPENDITURES FROM THE PROCEEDS OF INDEBTEDNESS, ADOPTED ON JUNE 28, 2021			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT			ABSENT
RAY C. SOON			ABSENT
MAX J. SWORD	X		
NA'ALEHU ANTHONY			ABSENT
JADE T. BUTAY	X		
ROGER BABCOCK JR.	X		

"June 28, 2021

ADOPTION OF RESOLUTION NO. 926, 2021, AUTHORIZING UP TO $50,000,000 PRINCIPAL AMOUNT OF SERIES 2021 STATE REVOLVING FUND WATER SYSTEM REVENUE LOANS

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

Chair and Members:

Subject: Adoption of Resolution No. 926, 2021, Authorizing Up to $50,000,000 Principal Amount of Series 2021 State Revolving Fund Water System Revenue Loans

The State Revolving Fund (SRF) is a program funded by the U.S. Environmental Protection Agency under the Clean Water and Safe Drinking Water Acts. The Board of Water Supply (BWS) has been participating in this program since 2004.

Resolution 900, authorizing $50,000,000 of SRF loans, was approved in July 2019. BWS negotiated four loans with interest rates between 0.75% and 1.15% and loan fees of 1% for a total cost of capital of 1.75% to 2.15%.

That resolution was used to support the following 22 infrastructure improvements: (1) Kapiolani Boulevard 12" Main; (2) Keanu Line Booster/Maunawili/Mariner's Ridge/Aina Haina Pump Renewal and Replacement; (3) Kaluanui Line Booster/Diamond Head Line Booster/Kaonohi No. 1 Pump Renewal and Replacement; (4) Kalihi Pump Station Low & High Service Renovation; (5) Kamehameha Hwy. 16" & 8" Mains (Heeia); (6) Waialae Iki Well Renovation; (7) Mililani Wells II Improvements; (8) Punanani Wells MCC Replacement; (9) Pearl City Wells II Isolation Valves; (10) Makiki/Waialae Iki 180 Renovation/Replacement of Altitude Valves; (11) Keanu Line Booster Pump Replacement; (12) Kalihi Pump Station Renovation; (13) Anoi Road Water System Improvements; (14) Waialae Iki Well Renovation; (15) Diamond Head Line Booster Pump Replacement; (16) Pearl City Wells I Renovation; (17) Halawa Wells & Halawa Booster No. 2; (18) Punaluu Wells II Renovation; (19) Pearl City Wells II System Improvements; (20) Moanalua Wells Pump Replacement; (21) Lunalilo Home Road Water System Improvements; and (22) Makapuu Tunnel Rehabilitation.

In order to continue participating in the SRF program, the Board will need to authorize additional borrowing.

We recommend adoption of Resolution No. 926, 2021, authorizing up to $50,000,000 aggregate principal amount of the BWS SRF Water System Revenue Loans, Series 2021 (Series 2021 Loans).

The Series 2021 Loans provide moneys to pay the costs of improvements to the Water System authorized in the capital budget of the BWS, to make a deposit to an SRF Series Reserve Account if applicable, and to pay costs of issuance of the Series 2021 Loans. The Series 2021 Loans are the sixth series of SRF Loans to be obtained by the BWS from the State Department of Health under and pursuant to the SRF General Resolution.

Resolution No. 926, 2021 further authorizes any Authorized Officer of the BWS, subject to limitations, the power to determine and carry out certain actions in connection with the issuance and execution of the Series 2021 Loans.

Respectfully Submitted,

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

Attachment"

DISCUSSION: Joseph Cooper, Waterworks Controller, Finance Division, gave the report.

Chair Andaya commented the State Revolving Fund (SRF) Loan Program has proven to be very using useful to the Board of Water Supply (BWS). It has assisted in 22 different infrastructure improvement projects by providing funds to pay the cost of improvements to the water system which was authorized in our Capital Improvement Programs (CIP) budget and allows the BWS to deposit into the SRF series reserve account and to pay costs for the issuance of series 2021 loans.

Board Member Max Sword inquired if the Board's authorization of $50,000,000 was included in the CIP budget.

Mr. Cooper replied the $50,000,000 was included in the CIP budget. He explained that the rate structure of the loans is very low. The loans are forecasted at $11.5 million which the BWS can apply to expenditures that have already been completed. Each year the BWS allocates CIP projects to be covered by the SRF loan program.

Manager Lau stated the SRF loan funds portion of the CIP.

Chair Andaya asked if there was any further discussion on Resolution 926, 2021 from the Board Members. There were no further comments or discussions.

MOTION TO ADOPT Max Sword and Roger Babcock motioned and seconded, respectively, the Adoption of Resolution No. 926, 2021, Authorizing Up to $50,000,000 Principal Amount of Series 2021 State Revolving Fund Water System Revenue Loans.

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. 926, 2021, AUTHORIZING UP TO $50,000,000 PRINCIPAL AMOUNT OF SERIES 2021 STATE REVOLVING FUND WATER SYSTEM REVENUE LOANS, ADOPTED ON JUNE 28, 2021			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT			ABSENT
RAY C. SOON			ABSENT
MAX J. SWORD	X		
NA'ALEHU ANTHONY			ABSENT
JADE T. BUTAY	X		
ROGER BABCOCK JR.	X		

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU, HAWAII

STATE REVOLVING FUND
WATER SYSTEM REVENUE LOAN
SERIES 2021 RESOLUTION NO. 926, 2021

AUTHORIZING UP TO
$50,000,000 PRINCIPAL AMOUNT OF SERIES 2021 LOANS

ADOPTED JUNE 28, 2021

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STATE REVOLVING FUND
WATER SYSTEM REVENUE LOAN
SERIES 2021 RESOLUTION NO. 926, 2021

AUTHORIZING UP TO
$50,000,000 PRINCIPAL AMOUNT OF SERIES 2021 LOANS

BE IT RESOLVED by the Board of Water Supply of the City and County of Honolulu, Hawaii (the "Board"), as follows:

ARTICLE I

DEFINITIONS AND STATUTORY AUTHORITY

Section 1.01. Series 2021 Resolution; Findings and Determination. (1) This State Revolving Fund Water System Revenue Loan Series 2021 Resolution authorizing up to $50,000,000 principal amount of Series 2021 Loans is supplemental to, and constitutes a Series Resolution within the meaning of and is adopted in accordance with Article IX of, the Resolution, as hereinafter defined.

(2) It is hereby found and determined by the Board that it is necessary and desirable that the Board obtain from the Department of Health at this time one or more Loans to be designated as provided herein to provide monies to carry out one or more purposes of the Board.

Section 1.02. Definitions. (1) All terms which are defined in Section 1.01 of the Resolution shall have the same meanings, respectively, in this Series 2021 Resolution as such terms are given in said Section 1.01 of the Resolution.

(2) In addition, as used in this Series 2021 Resolution, unless the context shall otherwise require, the following terms shall have the following respective meanings:

"*Resolution*" means that certain resolution adopted by the Board on February 23, 2004 entitled "A Resolution Authorizing and Providing for State Revolving Fund Loans to be Obtained from time to time from the State of Hawaii Department of Health by the Board of Water Supply of the City and County of Honolulu, Hawaii, for the Purposes of the Water System of the City and County; Covenanting as to Establishment, Maintenance, Revision and Collection of Charges and Rates for the Use and Services of the Water System and the Collection and Disbursement of Revenues Derived therefrom; Pledging on a Junior and Subordinate Basis the Net Revenues Derived from the Water System to the Payment of the Principal of and Interest on such Loans as the same Fall Due; Creating and Establishing Certain Funds and Accounts; Setting Forth the Limitations or Conditions upon the Obtaining of Additional Loans Payable from such Revenues and Making Other Covenants and Agreements in connection with the Foregoing" as amended and supplemented.

"*Series 2021 Loans*" mean the Loans authorized by Article II of this Series 2021 Resolution.

"*Series 2021 Project*" means the Improvements authorized in the capital budget of the Board and identified in one or more SRF Series 2021 Loan Agreements to be financed.

"*Series 2021 Resolution*" means this State Revolving Fund Water System Revenue Loan Series 2021 Resolution authorizing up to $50,000,000 principal amount of the Series 2021 Loans.

"*SRF Series 2021 Loan Agreements*" means one or more interim and final Loan Agreements to be entered into between the Department of Health and the Board pursuant to which the Department of Health is to make one or more loans to the Board and the Board is to obtain one or more of such loans from the Department of Health to finance the Improvements identified therein constituting a part of the Series 2021 Project.

(3) Words of any gender shall be deemed and construed to include correlative words of the other genders. Unless the context shall otherwise indicate, words importing the singular number shall include the plural number and vice versa, and words importing persons shall include firms, associations and corporations, including public bodies, as well as natural persons.

(4) The terms "hereby", "hereof", "hereto", "herein", "hereunder", and any similar terms, as used in this Series 2021 Resolution, refer to this Series 2021 Resolution.

Section 1.03. Authority for the Series 2021 Resolution. This Series 2021 Resolution is adopted pursuant to the provisions of the Act and the Resolution.

ARTICLE II

AUTHORIZATION, TERMS AND OBTAINING OF SERIES 2021 LOANS

Section 2.01. Authorization of Series 2021 Loans, Principal Amount, Designation and Title. One or more Loans (collectively, the "Series 2021 Loans") entitled to the benefit, protection and security of the Resolution is hereby authorized to be obtained from the Department of Health in an aggregate principal amount not to exceed $50,000,000. The Series 2021 Loans may be initially obtained on different dates; provided that no Series 2021 Loan shall be obtained later than six years from the date of adoption of this Series 2021 Resolution. For purposes of this Series 2021 Resolution, a Series 2021 Loan is obtained when the Board receives money from the Department of Health and the amount of the Series 2021 Loan is the actual amount that the Board receives.

Section 2.02. Purposes. The purposes for which the Series 2021 Loans are being issued are (1) to pay the Costs of Improvements constituting the Series 2021 Project; (2) to make such deposit to the SRF Series Reserve Account in the SRF Revenue Fund as may be necessary in connection with obtaining the Series 2021 Loans; and (3) to pay the costs of obtaining of the Series 2021 Loans.

Section 2.03. Delegation of Authority. (1) There is hereby delegated to any Authorized Officer of the Board, subject to the limitations contained herein and in the Resolution

and the Act, the power with respect to the Series 2021 Loans to determine and carry out the following:

(a) The terms and provisions of each Series 2021 Loan to be obtained from the Department of Health to finance the cost of one or more Improvements; *provided, however,* that all terms and provisions shall be in the best interest of the Board and shall carry out the purposes of the Board;

(b) The principal amount and designation and title of each Series 2021 Loan to be obtained; *provided however,* that the principal amount of all Series 2021 Loans shall not exceed $50,000,000 or, together with other bonds and loans of the Board, any applicable limit approved by the City Council to be issued or obtained by the Board;

(c) The specific Improvements constituting the Series 2021 Project to be financed from the proceeds of the Series 2021 Loans;

(d) The date or dates, maturity date or dates and principal amount of each maturity of each 2013 Loan;

(e) The interest rate or rates of each Series 2021 Loan, the date from which interest on such Series 2021 Loan shall accrue, the dates on which interest on such Series 2021 Loan shall be payable, if any; *provided, however,* that the true interest cost (as determined by an Authorized Officer of the Board, which determination shall be conclusive) on the Series 2021 Loans shall not exceed eight percent (8%) per annum;

(f) The Paying Agent or Paying Agents for the Series 2021 Loans and the place or places of payments of the principal, Sinking Fund Installments, if any, prepayment price of and interest on the Series 2021 Loans, if other than the Board;

(g) The prepayment prices, if any, and the prepayment terms, if any, for the Series 2021 Loans, *provided, however,* that the prepayment price of Series 2021 Loans at the election or direction of the Board shall not be greater than one hundred three percent (103%) of the principal amount of the Series 2021 Loans to be prepaid, plus accrued interest thereof to the prepayment date;

(h) Any provisions with respect to funds and accounts and subaccounts therein, if applicable, and the Revenues and application thereof, as provided in Article V of the Resolution;

(i) Whether a SRF Series Reserve Account shall be established for the Series 2021 Loans, and if so determined to be established, the amount of the SRF Series Reserve Account Requirement and the method of funding or providing for such SRF Series Reserve Account Requirement, and any provisions with respect to subaccounts therein, if applicable, and the Revenues and application thereof, as provided in Article V of the Resolution;

(j) Directions for the application of the proceeds of each Series 2021 Loan, including the interest on the Series 2021 Loans to be capitalized from the proceeds thereof, if any, and the date or dates to which such capitalized interest shall accrue; and

(k) Any other provisions deemed advisable by an Authorized Officer of the Board, not in conflict with the provisions hereof or of the Resolution.

(2) Such Authorized Officer shall set forth in the Series 2021 Loan Agreements the determinations or other actions taken pursuant to the authority granted herein or in the Resolution and any such Series 2021 Loan Agreements shall be conclusive evidence of the action or determination of such Authorized Officer as to the matters stated therein.

Section 2.04. Authority to Enter into Series 2021 Loan Agreements. Any Authorized Officer of the Board is hereby authorized to execute, and acknowledge and agree to, one or more Series 2021 Loan Agreements in the name and on behalf of the Board in substantially the form as presented at the meeting at which this Series 2021 Resolution is adopted, which form is hereby approved, with such changes, insertions and omissions as may be approved by such Authorized Officers, such execution and acknowledgement and agreement being conclusive evidence of such approval; provided that no Series 2021 Loan Agreement shall be entered into later than four years from the date of adoption of this Series 2021 Resolution

Section 2.05. Execution of Documents. Any Authorized Officer of the Board is hereby authorized to execute and deliver, in the name and on behalf of the Board, any and all documents and instruments, and to do and cause to be done any and all acts and things, such Authorized Officer deems necessary or advisable in connection with obtaining the Series 2021 Loans from the Department of Health and to carry out the transactions contemplated by this Series 2021 Resolution.

ARTICLE III

APPLICATION OF PROCEEDS

Section 3.01. Application of Proceeds. On the date each Series 2021 Loan is obtained, the proceeds of such Series 2021 Loan shall be applied in accordance with the written direction of any Authorized Officer given pursuant to Section 2.03(1)(j) of this Series 2021 Resolution.

ARTICLE IV

MISCELLANEOUS

Section 4.01. Effectiveness. The Series 2021 Resolution shall become effective immediately upon its adoption.

INTRODUCED BY:

Bryan P. Andaya, Chair

Date of Introduction: June 28, 2021

ADOPTION OF RESOLUTION NO. 926, 2021, AUTHORIZING UP TO $50,000,000 PRINCIPAL AMOUNT OF SERIES 2021 STATE REVOLVING FUND WATER SYSTEM REVENUE LOANS, ADOPTED ON JUNE 28, 2021			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT			ABSENT
RAY C. SOON			ABSENT
MAX J. SWORD	X		
NA'ALEHU ANTHONY			ABSENT
JADE T. BUTAY	X		
ROGER BABCOCK JR.	X		

Date of Introduction: June 28, 2021

The above and foregoing resolution is hereby approved as to form and legality this June 28, 2021.

Deputy Corporation Counsel
City and County of Honolulu
JESSICA Y. WONG

4150-5861-4831.2

"June 28, 2021

APPROVAL TO SEEK PUBLIC INPUT ON DRAFT CHANGES TO WATER SYSTEM FACILITIES CHARGES

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

Chair and Members:

Subject: Approval to Seek Public Input on Draft Changes to Water System Facilities Charges

We have completed an evaluation of the BWS's current Water System Facilities Charges, which have not been updated since 1993. Revenues from these charges do not currently cover the cost of our growth-related projects. We have provided periodic updates of this evaluation to the Board, held a series of meetings with our Stakeholder Advisory Group to seek community input, and held focused outreach meetings with both development and agricultural interest groups. Additionally, meetings have been held with the BWS's Permitted Interaction Group for Water Rates to seek additional input into the development of this draft proposal. The draft proposal was prepared based on technical analyses performed by CDM Smith (currently in draft form) and is awaiting public input and then Board approval prior to finalization. The draft proposal for changes to the Water System Facilities Charges would only affect customers who are either 1) connecting to BWS's water system for the first time, or 2) require additional capacity through an existing connection. Careful consideration has been given to phasing in proposed changes over a number of years in order to minimize affordability impacts. After careful review and consideration of the public input, including by the Small Business Regulatory Review Board, we will be able to prepare a final proposal of changes to the Water System Facilities Charges for the Board's consideration.

We recommend that the Board approve the Board of Water Supply request to seek public input on these draft changes to the Water System Facilities Charges.

Respectfully submitted,

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

Attachments

DISCUSSION: Manager Lau stated that the purpose of this action item was to get the Board's approval to seek public input on the draft changes to the Water System Facilities Charges (WSFC). The WSFC was last updated in 1993 and Mr. Ebersold and Mr. Barry Usagawa, Program Administrator for the Water Resources Division have been working on a update to the WSFC.

The WSFC are basically the impact fees that BWS charges for customers applying for new water service. The WSFC pays for capacity expansion of our water system to meet the new demands.

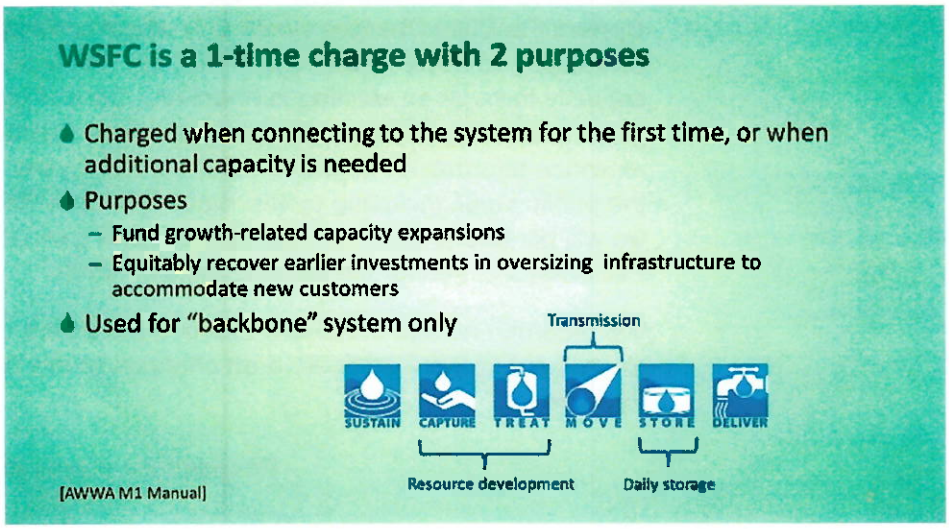
Mr. Usagawa added that the WSFC would be applicable for new developments or expansion of existing water service. The WSFC pays for water source, transmission and storage for growth related projects and helps to offset the costs of bonds and funds collected by water rates to pay for water system infrastructure improvements.

Manager Lau indicated BWS is seeking public and stakeholder input on the draft proposal. BWS is not asking the Board at this time to take action on the proposed WSFC, but for authorization to proceed with the community engagement and information process on the draft proposal.

Manager Lau introduced Mr. David Ebersold, Vice President of CDM Smith. Mr. Ebersold and Mr. Usagawa who gave the report.

At 2:34 PM, Chair Andaya acknowledged Board Member Ray Soon joining the Board Meeting via WebEx.

Board Member Sword requested that Mr. Ebersold explain the "backbone" system noted on slide #2.



Mr. Ebersold explained the purpose of the Water System Facilities Charge (WSFC) is for the BWS to be able to provide the same level of service, in both reliability, and water quality to all customers across the island. The "backbone" system consists of all sources of supply, treatment systems, transmission mains, large pipes, and storage tanks that are located in the system that help provide a consistent flow and pressure throughout the system. The WSFC pays for the "backbone" system.

Board Member Sword inquired if the proposed WSFC increase supports the whole "backbone" system.

Mr. Ebersold replied that the WSFC increase would support the growth of that system.

Mr. Usagawa stated that the growth forecast is supplied by the Department of Planning and Permitting (DPP) which is based on their land-use model of proposed subdivisions.

Board Member Sword asked if the increase in WSFC for nonresidential projects would affect affordable housing.

Mr. Exbersold responded the WSFC increase shouldn't affect affordable housing and low-income housing since both are considered residential which would fall under the single-family or low rise or high rise residential.

Board Member Sword inquired would the affordable housing units located in multi-unit high rises be affected by WSFC increase.

Mr. Ebersold replied that the BWS currently waives the WSFC for affordable housing and low-income housing up to a maximum of 500 units per year. The Stakeholder Advisory Group recommended that the BWS consider waiving more than 500 units.

Manager Lau stated in 2018 the Board adopted the revised water rates which included an authorization for the BWS to waive the WSFC charges for 500 units or more at the Manager's discretion for affordable housing (owner owned or rentals), and homeless housing projects, which for the first time this year exceeded 500 units.

Manager Lau mentioned that when the new fiscal year begins on July 1, 2021, the BWS will start a new rate study. He explained the rate study is not related to the WSFC and impact fees, however, related to the water rates, which the Board can decide whether to extend the waivers for affordable units for an additional five years.

Board Member Sword asked what is considered a large resort that would have 3,500 fixtures.

Mr. Ebersold responded something in comparison to a Sheraton.

Manager Lau mentioned smaller businesses such as fast food or small market with 50 fixtures or less would see a decrease in charges.

Chair Andaya stated he was part of the Permitted Interaction Group (PIG) to discuss the changes to the WSFC. The discussion in the PIG consisted of updating the charges to be able to recover the BWS's cost and to also avoid any rate shock.

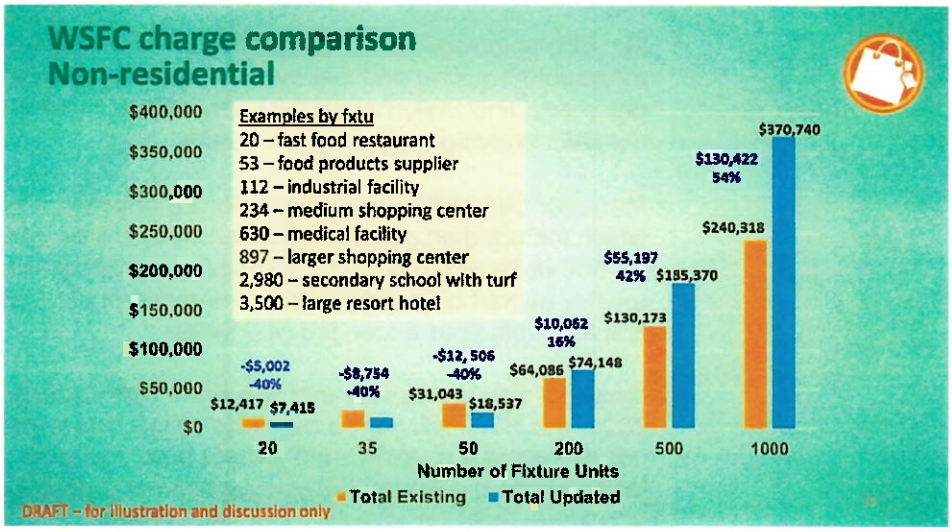
Board Member Sword inquired about the WSFC process timeline that indicated continuous customer outreach.

Manager Lau responded that the BWS is requesting the Board's authorization to seek customer input regarding the WSFC. However, customer outreach would continue to educate customers once the Board adopts the new WSFC.

Board Member Sword asked if the BWS is only seeking customer input.

Manager Lau replied that the reason for the outreach is to get the customers involved. A draft of options would be presented to customers which customers would be able to provide their feedback, input, and suggestions. If the Board adopts a resolution, customer outreach would continue.

Board Member Soon asked for clarification of slide #15 that showed a decrease then an increase in the WSFC.



Board Member Soon asked for Mr. Ebersold to explain why there's a decrease in the WSFC charge.

Mr. Ebersold explained that the current WSFC structure assumed that the water use efficiency in the first 50 fixture units is low. Therefore, the charge to pay for each of the 50 fixture units is high.

Board Member Soon asked if the target WSFC is to reach $130,422 or an increase of 54%.

Mr. Ebersold responded that the target is not the percentage. He explained that the charges per fixture unit right now are very different. For the first fifty fixture units, the charges are high, but thereafter the charges are lower. The updated WSFC indicates that regardless of the number of fixture units the charge should all be the same since new analyses show there isn't a difference in the efficiency of water use either above or below

50 fixture units. The goal is to have everyone paying the same amount per fixture unit.

At 3:04 PM, Chair Andaya acknowledged Board Member Na'alehu Anthony joined the Board Meeting via WebEx.

Board Member Roger Babcock inquired if some of the Stakeholders Advisory Group (SAG) recommendations would be part of the draft options that would be presented during the customer outreach.

Mr. Ebersold replied that he didn't have any slides to present regarding the stakeholder recommendations but that information is available for discussion and consideration for the public outreach. If there were no phase-in for single-family residential the increase would be an immediate 18.4% and multi-unit residential low or high rise would be an increase between 6.5% to 7.8%. For agricultural and non-residential customers with more than 50 fixture units, the increase would be higher. For agricultural customers, the stakeholder advisory group recommendation was to not raise the WSFC more than 10% per year. For the non-residential customer, their recommendation was to implement the changes without any phase-in.

Board Member Babcock commented he agreed with the recommendations from the stakeholders. Since the last increase of the WSFC was in 1993 the proposed WSFC is based on recovering expenses. He suggested in the future the BWS should consider updating the WSFC every five years to avoid having to catch up and falling behind.

Mr. Ebersold agreed with Board Member Babcock's suggestion of updating the WSFC more frequently similar to the BWS updates on the water rates.

Manager Lau explained to Board Member Babcock that the BWS is timing the WSFC customer outreach to align with the updates to the Water Master Plan (WMP), and infrastructure plans so the BWS can provide a good basis for the charges. He agreed with Board Member Babcock that it has been a long time since the last updated WSFC. The Board adopted WMP allowed the BWS to determine the proposed WSFC based on the long-term capital infrastructure and financial plan.

Manager Lau agreed with Chair Andaya.

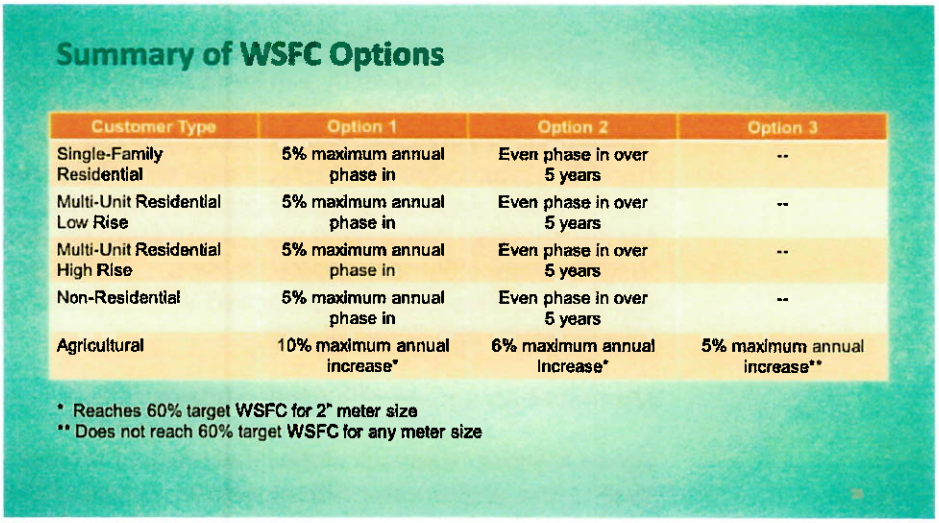
Board Member Babcock stated there would be rate shock for the proposed WSFC, but unlike water rate increases, not all of the customers would be affected. The customers that would be affected most would be the ones building a new home or structure. In instances where a new structure is being built an 18% increase in this one-time charge would be minimal for a meter that is required for a new home.

Board Member Soon agreed with Board Member Babcock's statement except for agriculture rates.

Manager Lau shared that the BWS has reached out to stakeholders in the various affected groups, the developers, the development community, and the farming community. He agreed with Board Member Soon's concerns as the agricultural community were surprised by the proposed increase in the WSFC. The farming community didn't realize the amount of water that was being used for their operations. In 1993 when the WSFC was introduced farmers were treated similarly to residential users. However, as Mr. Ebersold shared that on average, agricultural customers use an equivalent of 6,000 gallons of water per day in comparison to a single-family residential customer who uses that same amount in a month. The BWS is open to suggestions on how to proceed.

Chair Andaya expressed that he understood wanting to increase charges immediately if the BWS was a private business, however, the BWS is an agency that serves the public who is made up of a diverse population. The PIG was most concerned about the double-digit increase of 18%. Although, the 18% may be minimal in terms of the actual dollar amount and may only affect developers, the double digit increase could be concerning for the customers. He stated if the Board could continue discussion on the proposed WSFC, however, the BWS would like to seek the public's input soon.

Manager Lau suggested adding another column to the summary of options to include a no phase-in option for comparison to phase-in over multiple years. Then, return to the Board to present the feedback gathered from the public.



Summary of WSFC Options

Customer Type	Option 1	Option 2	Option 3
Single-Family Residential	5% maximum annual phase in	Even phase in over 5 years	--
Multi-Unit Residential Low Rise	5% maximum annual phase in	Even phase in over 5 years	--
Multi-Unit Residential High Rise	5% maximum annual phase in	Even phase in over 5 years	--
Non-Residential	5% maximum annual phase in	Even phase in over 5 years	--
Agricultural	10% maximum annual increase*	6% maximum annual increase*	5% maximum annual increase**

* Reaches 60% target WSFC for 2" meter size
** Does not reach 60% target WSFC for any meter size

Board Member Soon expressed that there may be a lot of opposition against the option of paying the 18% in full when compared to the phase-in scenario.

Manager Lau commented that with the current economic situation, the BWS is trying to be sensitive to the affordability for its customers.

Mr. Ebersold summarized the recommendations from the Stakeholder Advisory Group which would make up a revised option 3. Single-family residential would be a 3-year phase-in. Multi-unit residential low rise and high rise would have no phase-in since the increase should range between 6.5% to 7.5%. Non-residential would also have no phase-in. Agricultural customers would have a 10% maximum increase.

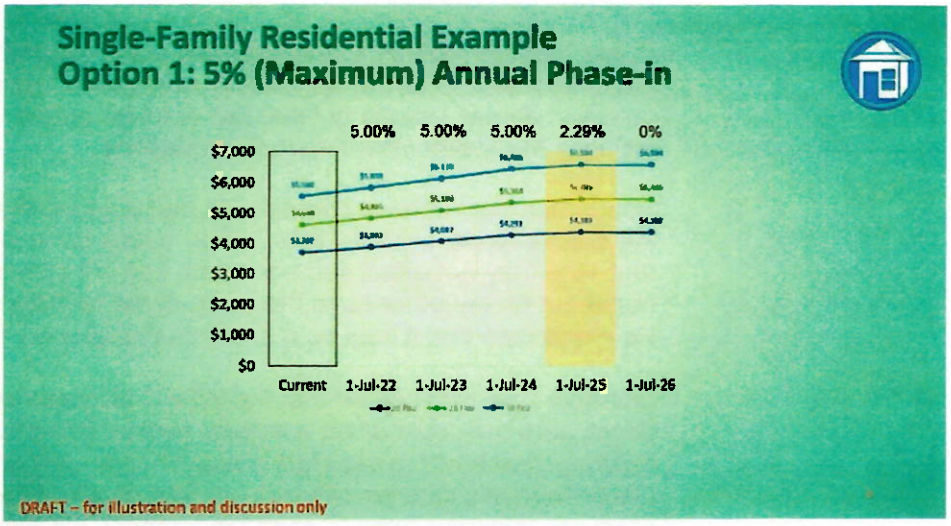
Board Member Babcock inquired if the Stakeholders Advisory Group's recommendation for a single-family residential is the same as option 1.

Mr. Ebersold replied it would be close.

Chair Andaya commented if the BWS seeks the public's input with options 1, 2, and 3, the public would choose the option that would be most affordable and beneficial which is option 1 or 2. However, if the BWS could choose to provide option 3 which would be a shorter phase in to reach the 18% target for a single-family residential customers quicker.

Board Member Na'alehu Anthony inquired if the dollar amount for single-family residential, option 1 has been calculated.

Chair Andaya replied that the dollar amount has been determined.



Chair Andaya explained Board Member Babcock's view regarding who would be most affected by the WSFC increase. The increase would not be an ongoing expense but a one-time fee at the beginning of a build.

Manager Lau added another way there would be an increase would be if a customer requested a new meter with a larger size.

Mr. Ebersold explained for a typical 3-bedroom, 2-bath home in 2021 the WSFC would cost $3,700 which would be a one-time fee paid concurrent with the issuance of the permit and would reach a maximum of $4,389.

Manager Lau commented that would be a $600 to $700 increase in the WSFC that would happen all at once if the Board and BWS choose to implement no phase-in.

Board Member Soon asked if the BWS chose to go full implementation in the first year would the cost increase from $3,700 to $4,389.

Mr. Ebersold confirmed the cost at full implementation would be $4,389.

Board Member Soon inquired about the money that is lost within the next four years before reaching the target.

Mr. Ebersold replied that the costs of a BWS's capacity expansion projects to accommodate growth would be spread across the entire rate base. He explained if money is not being collected through the WSFC program it would be collected through the general water rates.

Board Member Soon commented that's important information.

Manager Lau shared that the BWS recovers the cost of the affordable/homeless housing project waivers through water rate revenue and through the WSFC. This year is the first year the BWS is above the 500 unit waiver allocation.

Board Member Babcock commented it is important that the WSFC is presented as a one-time fee paid by new users. He suggested that the outreach should include at least two options: option 1 and an option that includes the stakeholders' recommendations.

Board Member Anthony commented that anytime there is an increase in the double digits, such as 18%, it may cause controversy. He understands that 18% may not affect someone who can afford to build a million-dollar home but on the other hand there are some families struggling to get by. He expressed that it may be a shock to many at an 18% increase.

Manager Lau commented that the WSFC increase will not only affect the developers but could affect a regular person trying to build additional dwelling space with a separate meter on their property. He agreed with Chair Andaya's concern regarding a rate shock. How does the BWS gradually increase rates to ease the impact? He expressed his appreciation to the Board for acknowledging the importance and willingness to review updates to the WSFC. The WSFC draft process is to present the different proposals and allow the public to comment and react.

Board Member Soon asked if the BWS can provide information that will explain how the 18% was calculated to support WSFC.

Manager Lau responded the BWS can provide the information requested. Understanding how the BWS arrived at a specific number and why the increase is important to the BWS's water system could help answer a lot of questions the public may have. He stated that it will be included in the outreach materials.

Board Member Soon suggested including what increased in cost and what is necessary to cover the cost of growth-related projects.

Chair Andaya asked if the Board agreed to seek the public's input with option 1 and the Stakeholder Advisory Group's recommendation.

Board Member Babcock agreed that multiple options would work. He suggested also sharing the equivalence of percentage to the dollar amount.

Mr. Usagawa asked Mr. Ebersold to confirm that the BWS currently collects about $8 million towards WSFC annually.

Mr. Ebersold replied to he recollects between $8 million and $10 million a year on average goes towards the WSFC.

Board Member Soon commented that is good information to know.

Chair Andaya asked the Board if there was a motion to allow the BWS to seek public input with three options on the draft changes to the WSFC.

Board Member Sword inquired which option included the recommendation from the PIG.

Chair Andaya replied option 2 is the recommendation from the PIG which is a 5-year phase-in.

Mr. Ebersold confirmed that option 2 is reflective of the PIG recommendations. The Stakeholder Advisory Group recommended a 3-year phase-in on a single-family residential which is a little above 5%, no phase-in for multi-unit and non-residential, and a 10% maximum increase for agriculture. This will be shown on the summary table as the revised option 3 for public input.

Board Member Sword asked Mr. Ebersold if any of the Stakeholder Advisory Group's recommendations are included in option 1 or option 2.

Mr. Ebersold responded that the closest option to the Stakeholder Advisory Group's recommendation would be option 1 because this option reached the target WSFC quicker than option 2.

Board Member Sword inquired if the Board will be incorporating the Stakeholder Advisory Group's recommendation into the revised option 3.

Chair Andaya confirmed that the SAG recommendations will be the revised option 3.

MOTION TO ADOPT

Max Sword and Roger Babcock motioned and seconded, respectively, the Approval to Seek Public Input on Draft Changes to Water System Facilities Charges.

Chair Andaya asked if there was any further discussion. There were no further comments or discussion.

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

Ms. Cruz-Achiu conducted a roll call vote: Board Member Ray Soon, aye; Board Member Max Sword, aye; Board Member Na'alehu Anthony, aye: Board Member Jade Butay, aye; Board Member Roger Babcock, aye; and Chair Bryan Andaya, aye.

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

APPROVAL TO SEEK PUBLIC INPUT ON DRAFT CHANGES TO WATER SYSTEM FACILITIES CHARGES WAS APPROVED ON JUNE 28, 2021			
	AYE	NO	COMMENT
BRYAN P. ANDAYA	X		
KAPUA SPROAT			ABSENT
RAY C. SOON	X		
MAX J. SWORD	X		
NA'ALEHU ANTHONY	X		
JADE T. BUTAY	X		
ROGER BABCOCK JR.	X		

WATER FOR LIFE

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

Board of Water Supply
City and County of Honolulu

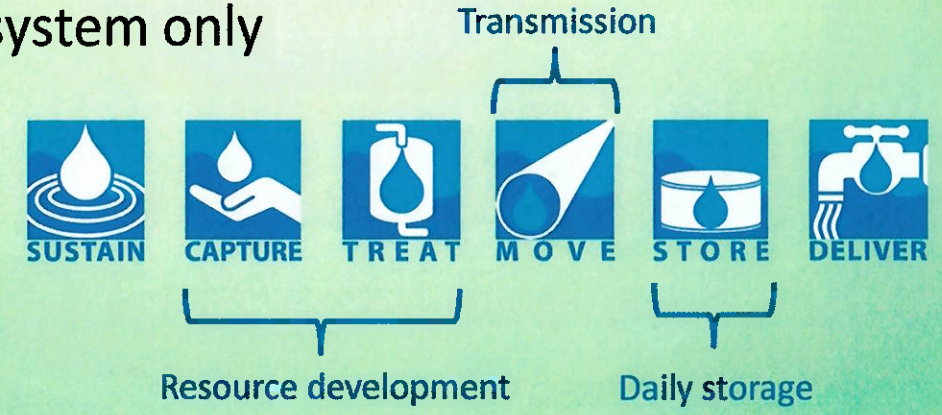
Proposed Update of the Board of Water Supply Water System Facilities Charges

June 28, 2021

2:00 pm

WSFC is a 1-time charge with 2 purposes

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



[AWWA M1 Manual]

Why update the WSFC?

- Current charges adopted in 1993
- Water use patterns have changed
- Growth needs have changed
- Available capacities in existing system have changed
- Costs have increased
- WSFC revenues do not cover costs of growth-related projects

Five basic steps to updating the WSFC

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

WSFC (Impact Fee) Design Principles

1. May only be imposed for capital improvements specifically identified in a facility needs assessment study (e.g. Water Master Plan)
2. Shall be substantially related to the needs arising from the development
3. Shall not exceed a proportionate share of the costs arising from the development
4. Collection and expenditure of fees shall be reasonably related to the benefits accruing to the development
5. Collection of the impact fee shall be a condition precedent to issuance of a permit and shall be collected in full
6. Promote efficiency and conservation

HRS §46-141:148

Water System Facilities Charges
Summary of Changes

- Analyses completed for all customer classes

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

fxu: fixture unit

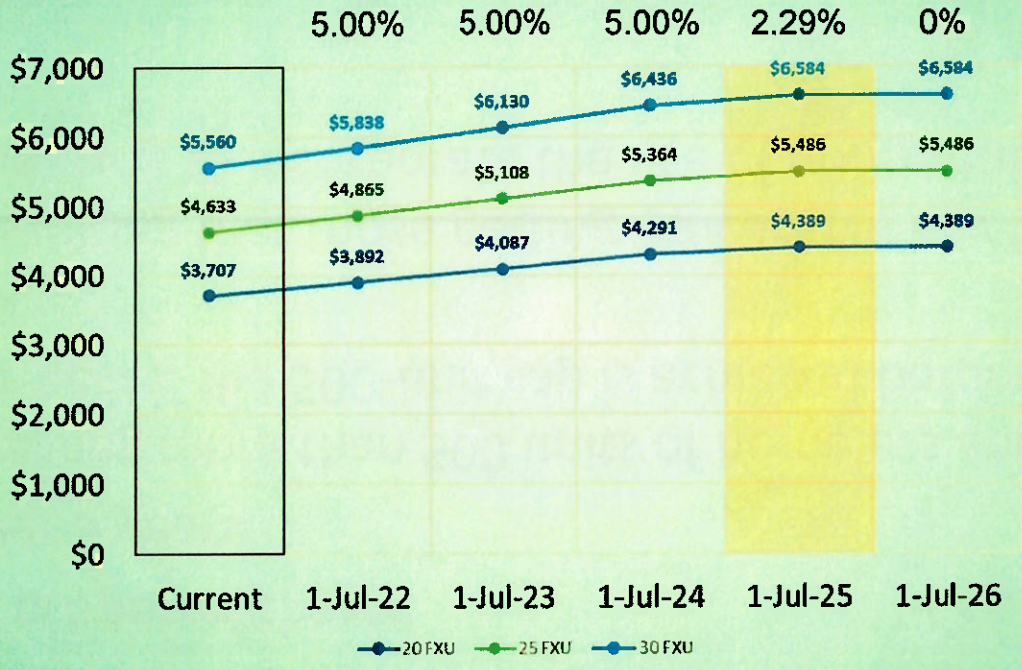
Stakeholder Advisory Group
Single Family Recommendation

- Implement proposed charge
- Phase in over 3 years
- Consider waiving more than 500 units of homeless and low-income housing per year if the 500-unit cap is achieved before the end of the Fiscal Year
- Consider requiring that those getting waivers for low income and homeless housing to incorporate the use of non-potable water if possible

Permitted Interaction Group Input:

- **Consider limiting to 5%/year**
- **Consider phase in evenly over 5 years**

Single-Family Residential Example
Option 1: 5% (Maximum) Annual Phase-in



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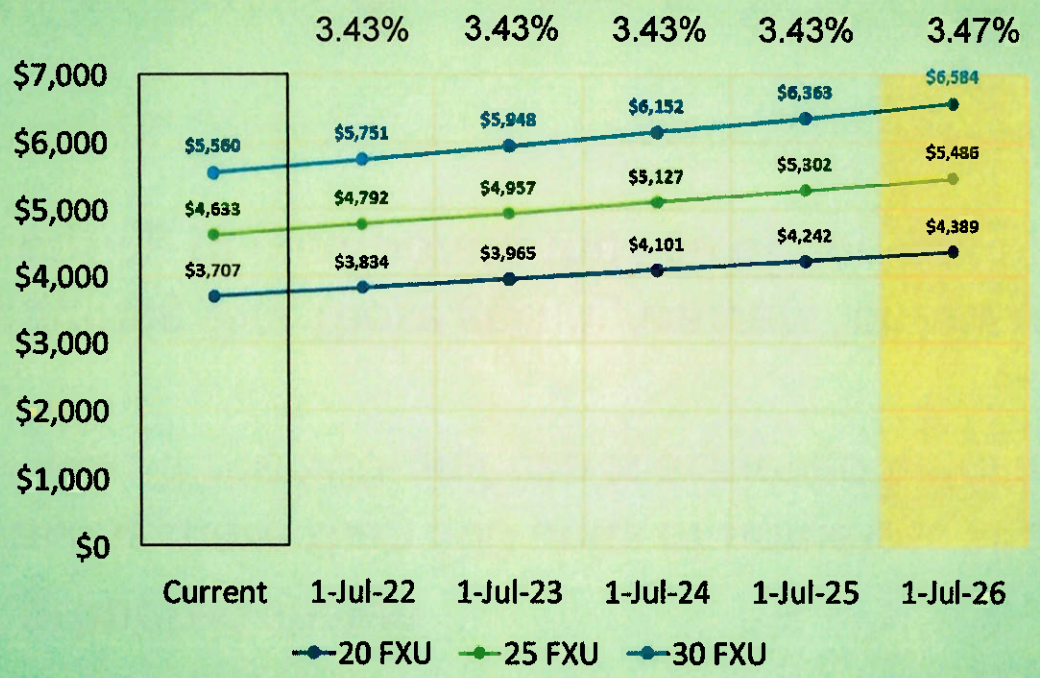
Single-Family Residential Example
Option 2: 5-Year Phase-in



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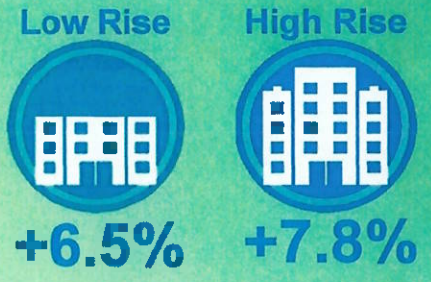
Stakeholder Advisory Group Multi-Unit Recommendation

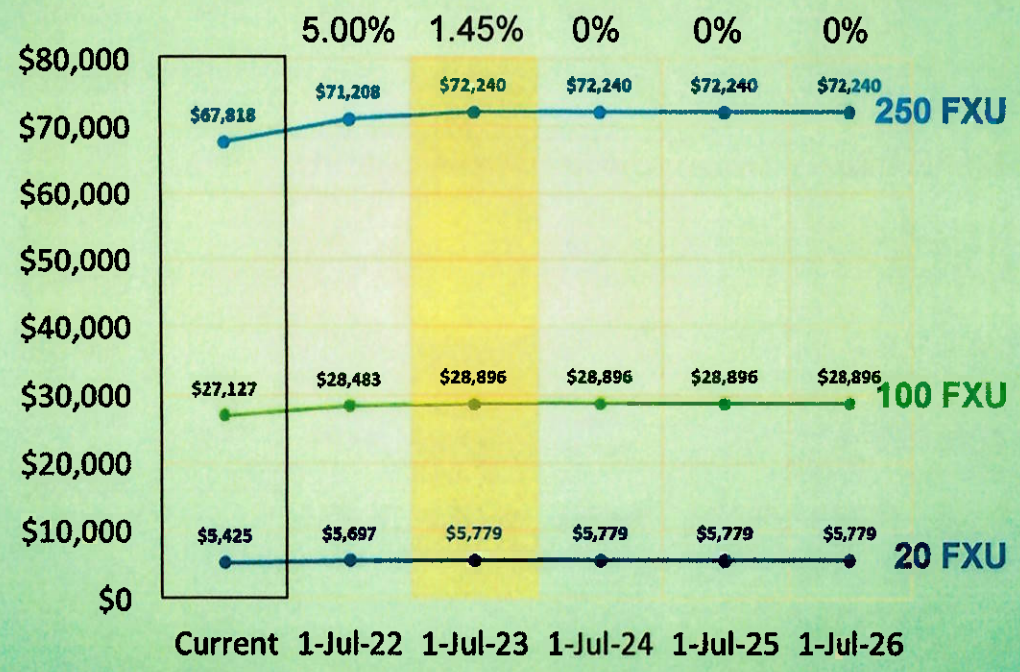


- Implement proposed charge
- Consider waiving more than 500 units of homeless and low-income housing per year if the 500-unit cap is achieved before the end of the Fiscal Year.
- Consider requiring that those getting waivers for low income and homeless housing to incorporate the use of non-potable water if possible.

Permitted Interaction Group Input:

- **Consider limiting to 5%/year**
- **Consider phase in evenly over 5 years**

Multi Unit Residential – Low Rise (3 Stories or Under)
Option 1: 5% (Maximum) Annual Phase-in



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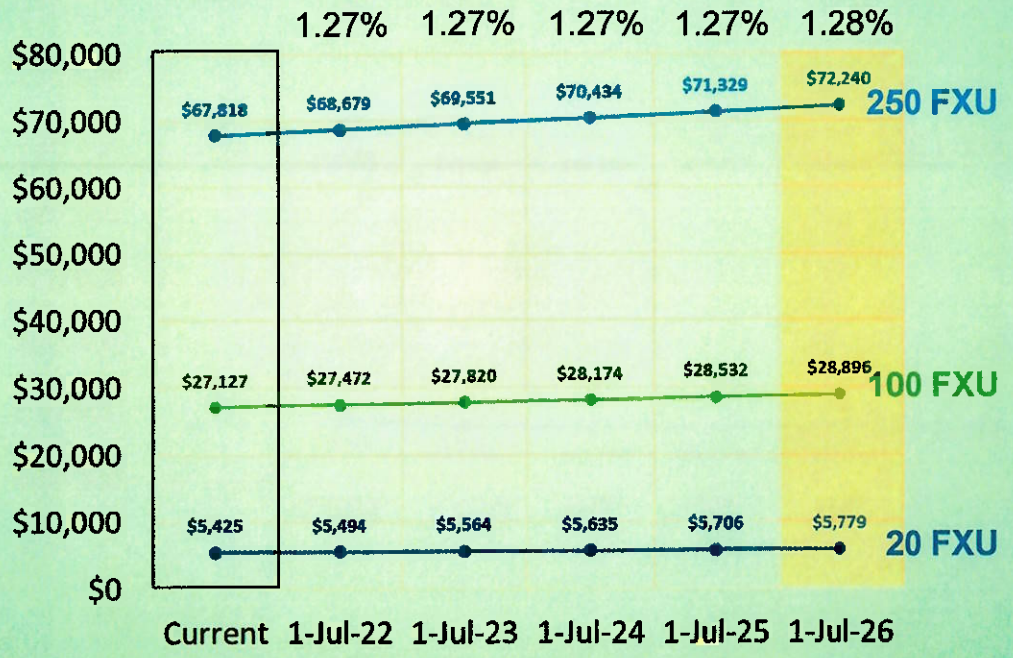
Multi Unit Residential – Low Rise (3 Stories or Under)
Option 2: 5-Year Phase-in



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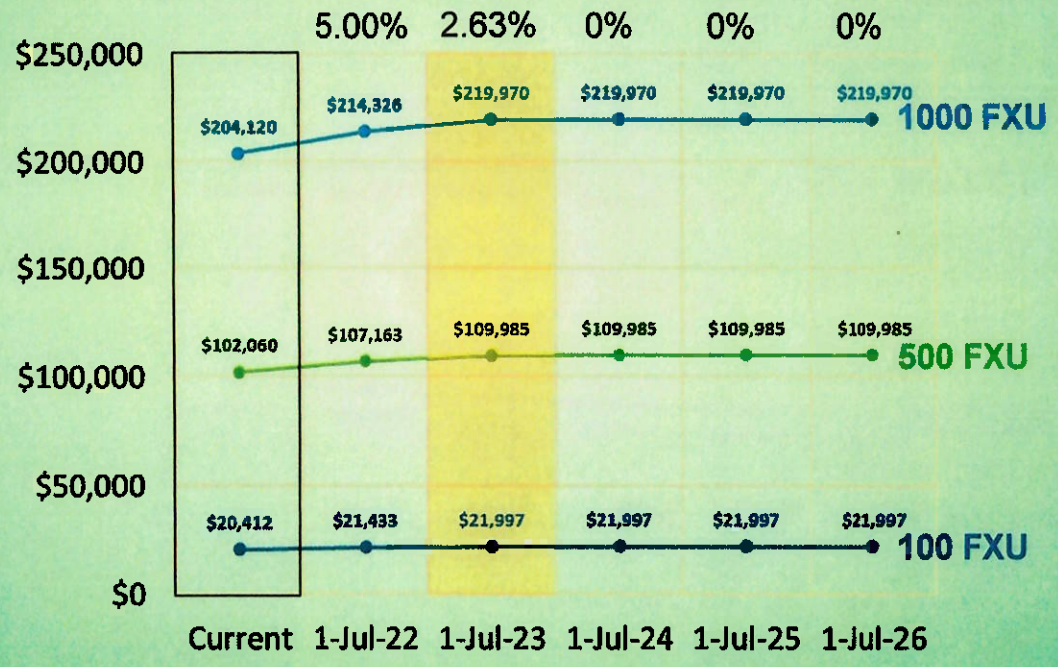
Multi Unit Residential – High Rise (Over 3 Stories)
Option 1: 5% (Maximum) Annual Phase-in



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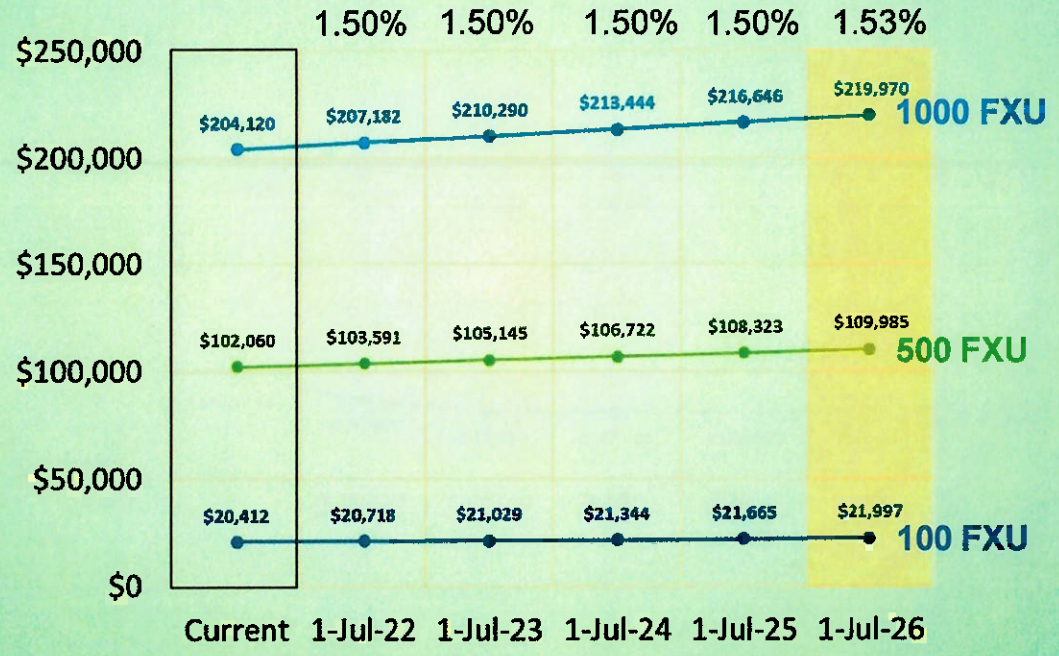
Multi Unit Residential – High Rise (Over 3 Stories)
Option 2: 5-Year Phase-in



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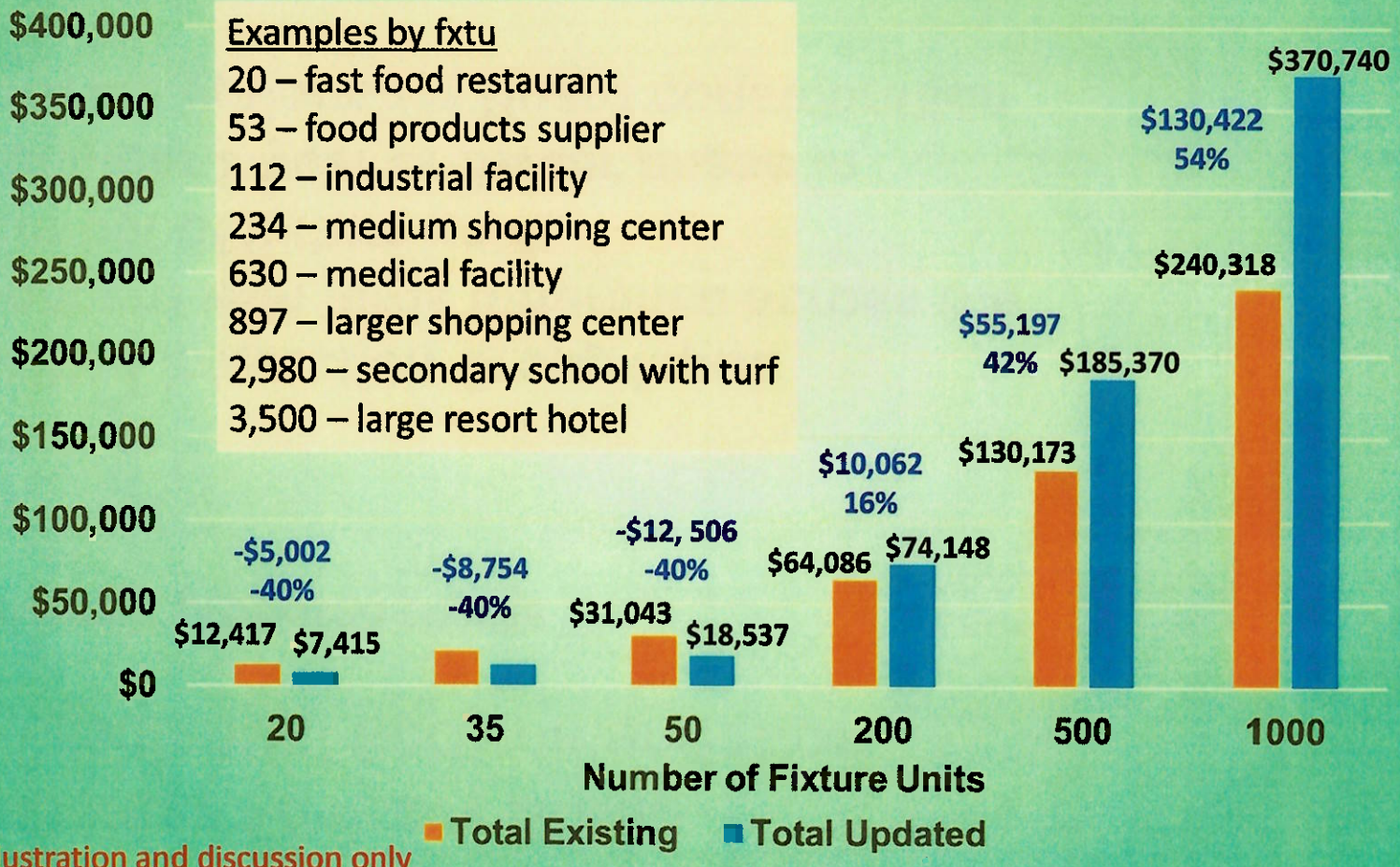
WSFC charge comparison
Non-residential



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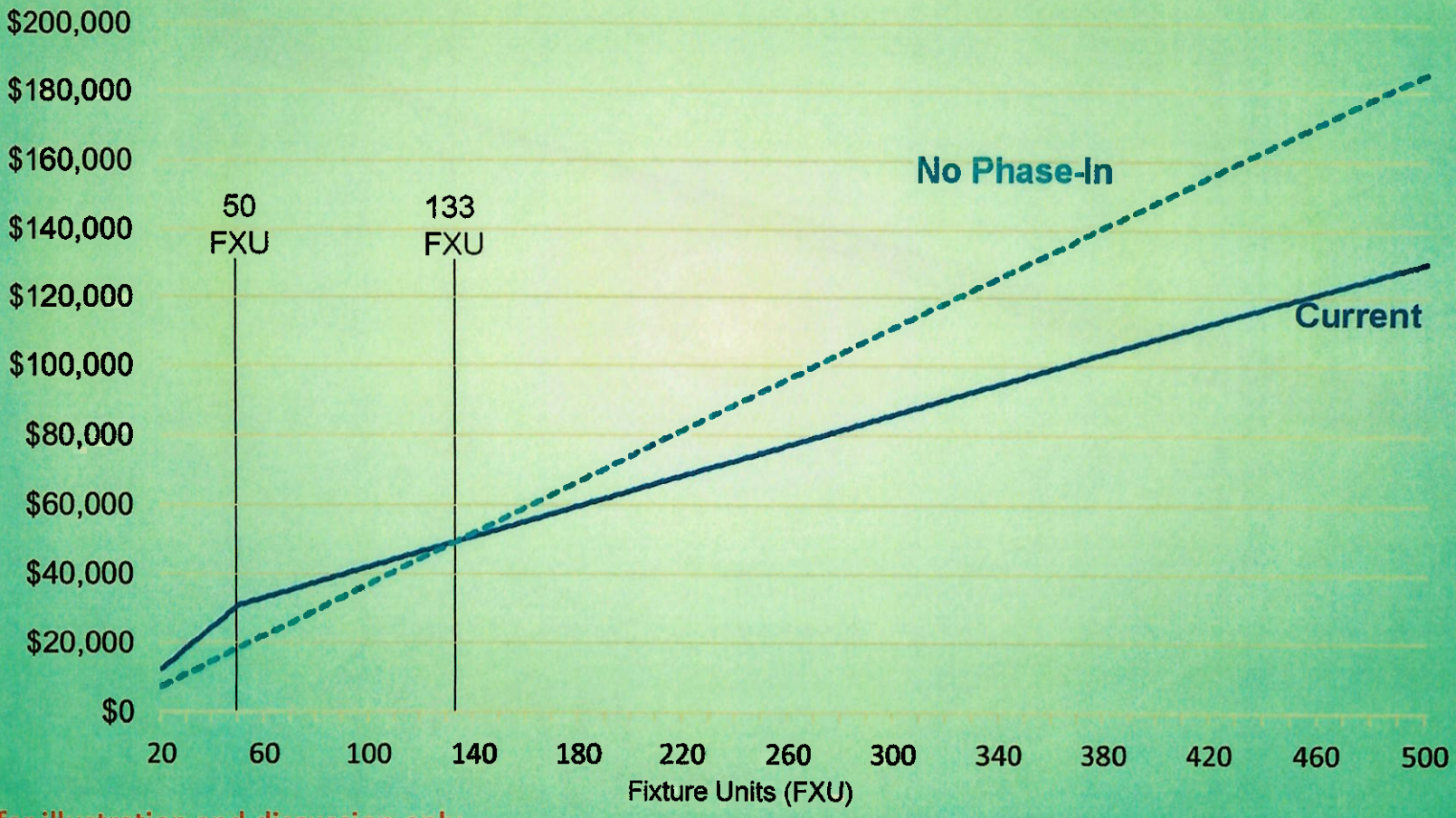
Stakeholder Advisory Group
Non-Residential Recommendation

- Implement proposed charge

Permitted Interaction Group Input:

- **Concern with large difference across the number of fixture units**
- **Consider 3-year or 5-year phase in**
- **Provide options for Board consideration**

Non-Residential WSFC Change Lowers Fee Up To 133 FXU



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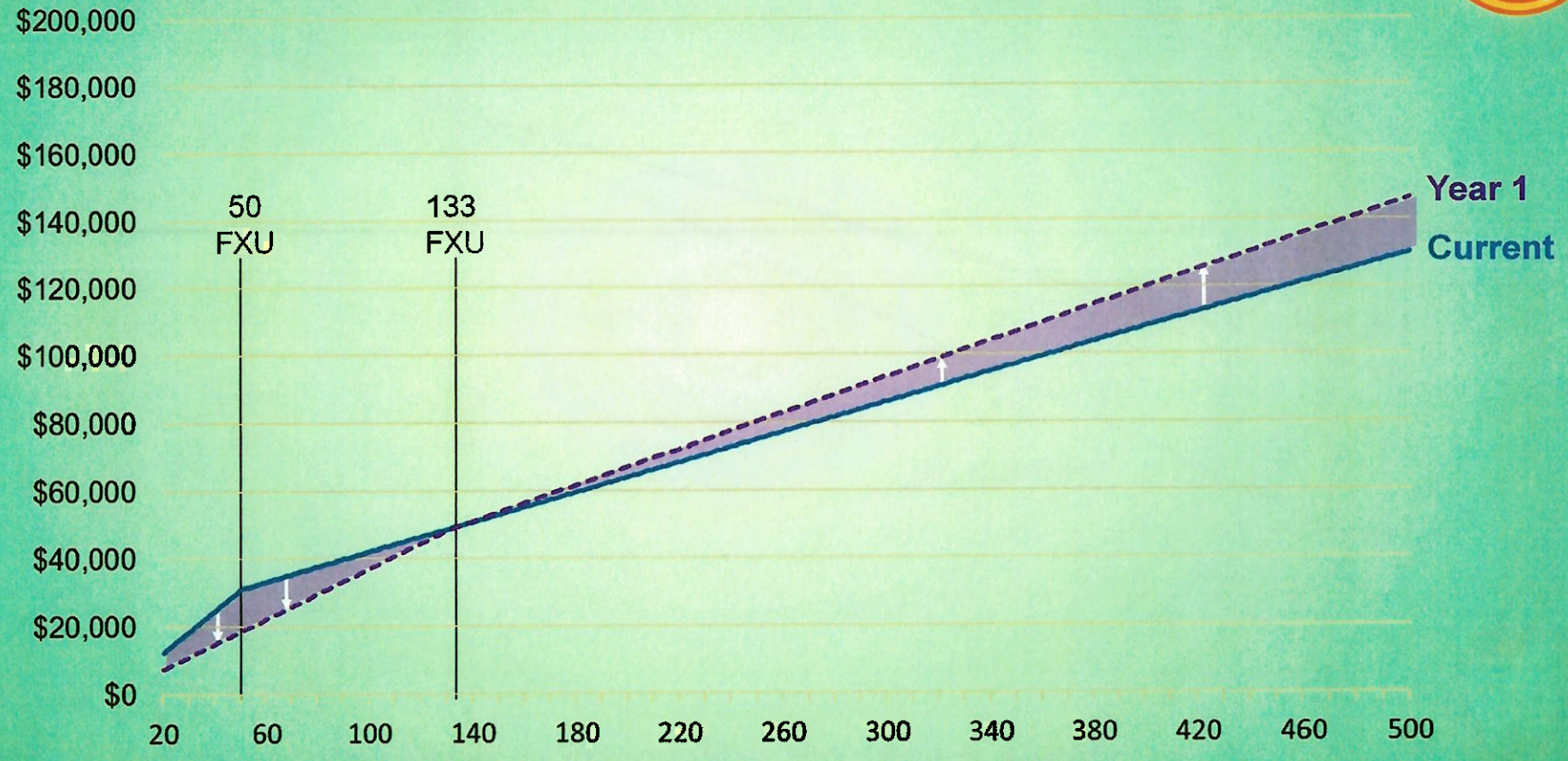
Non-Residential WSFC Charge
Option 1: 3-Year Phase In



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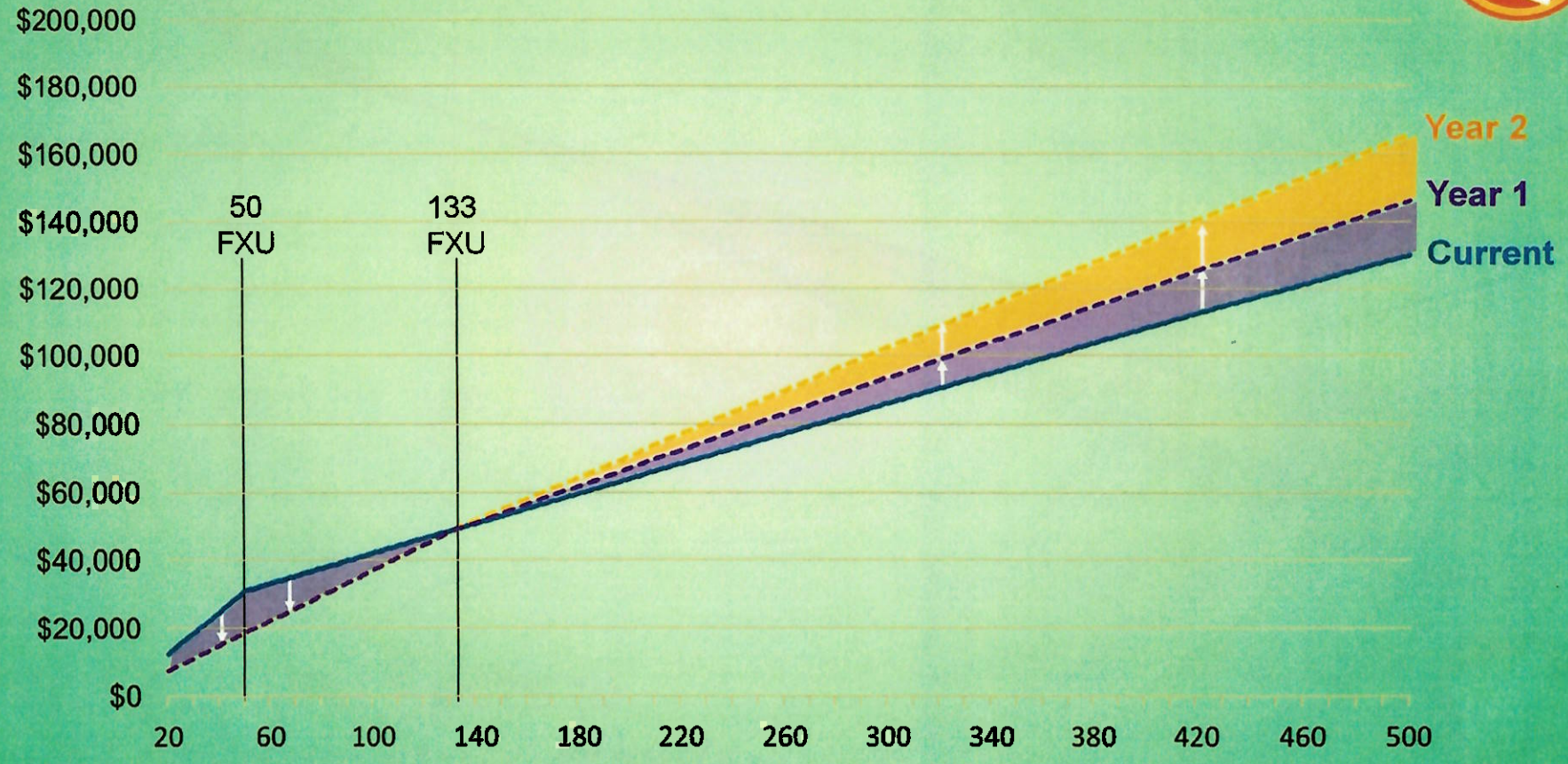
Non-Residential WSFC Charge
Option 1: 3-Year Phase In



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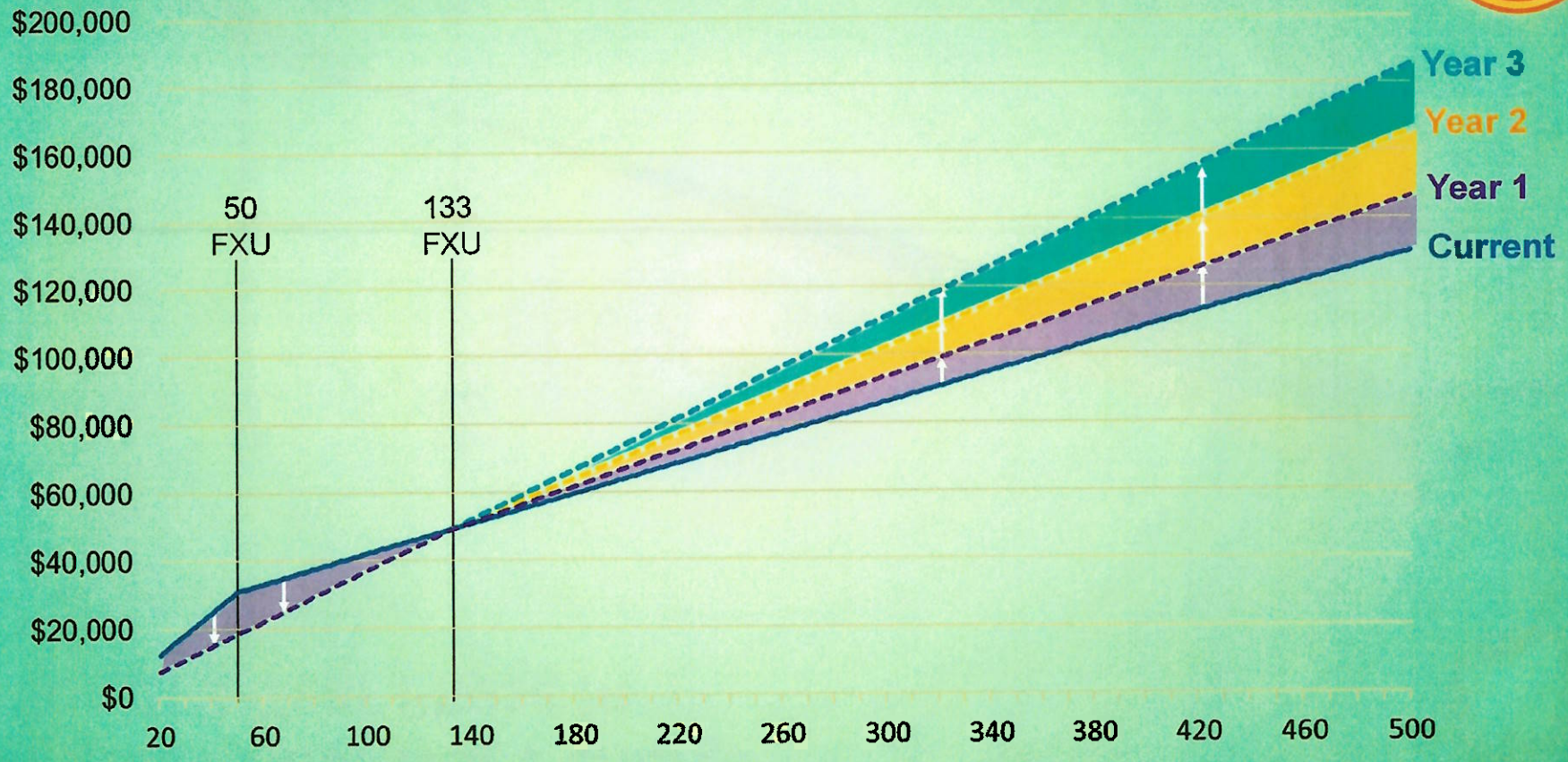
Non-Residential WSFC Charge
Option 1: 3-Year Phase In



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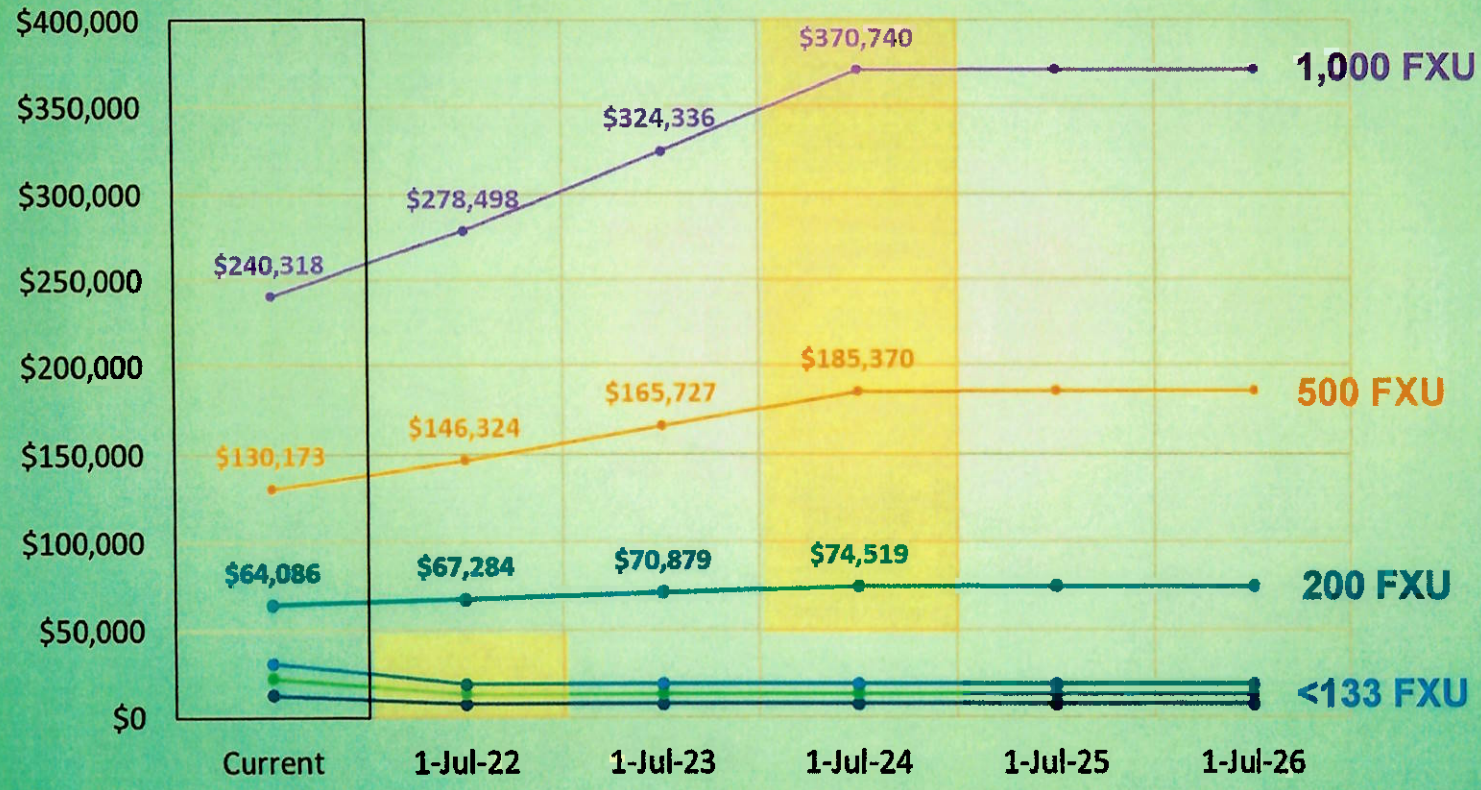
Non-Residential WSFC
Option 1: 3-Year Phase In



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Non-Residential WSFC
Option 2: 5-Year Phase In

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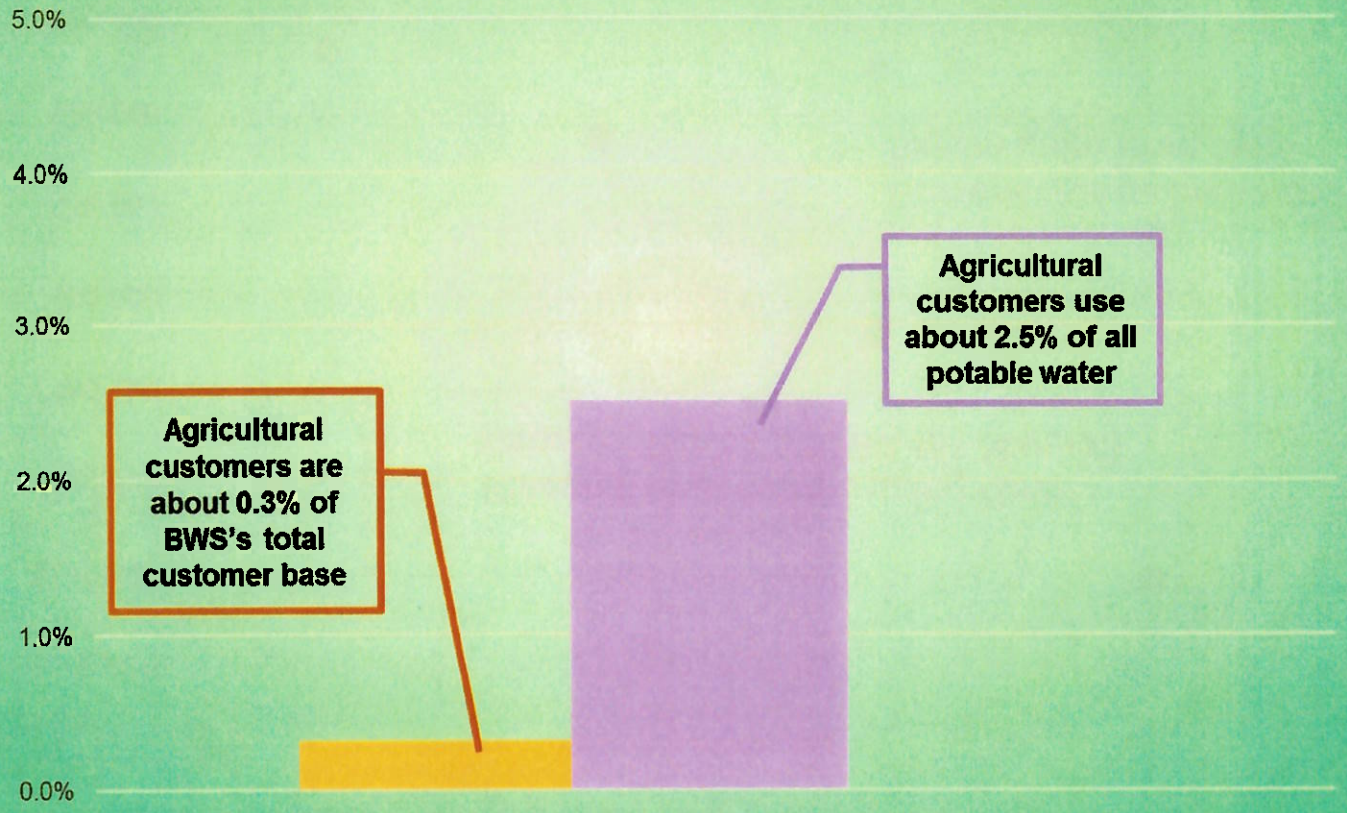
Agricultural WSFC currently based on single family residential (SFR) usage

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

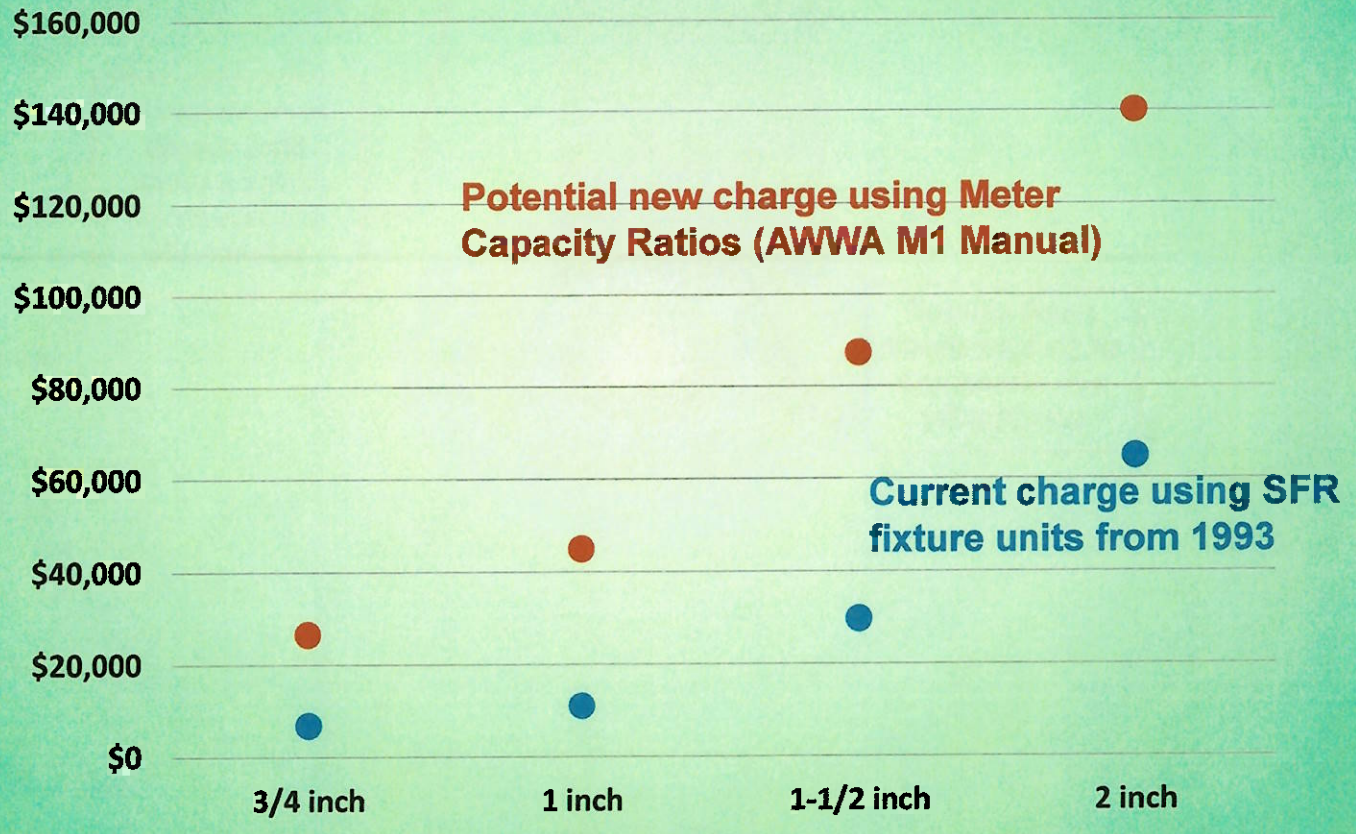
Meter size	1993 fxu for SFR	Updated fxu for SFR
3/4"	36	20.0
1"	59	34.8
1 1/2"	160	63.5
2"	350	147.4

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

Agricultural customers are large water users



New WSFC Methodology for Ag Based on Meter Capacity



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Stakeholder Advisory Group Agricultural Recommendation

- Implement proposed charge
- Phase in and limit increases to 10% per year
- Include requirement for Water Use Plan to help new farmers right-size their meters
- Provide sufficient outreach and education to the agriculture community and involving other agencies (e.g. DOA, NRCS, CTAHR)

Permitted Interaction Group Input:

- **Would like to see options in the 5-8% range**

1. Establish Uniform Cost Recovery to Match Ag Water Rate Subsidy

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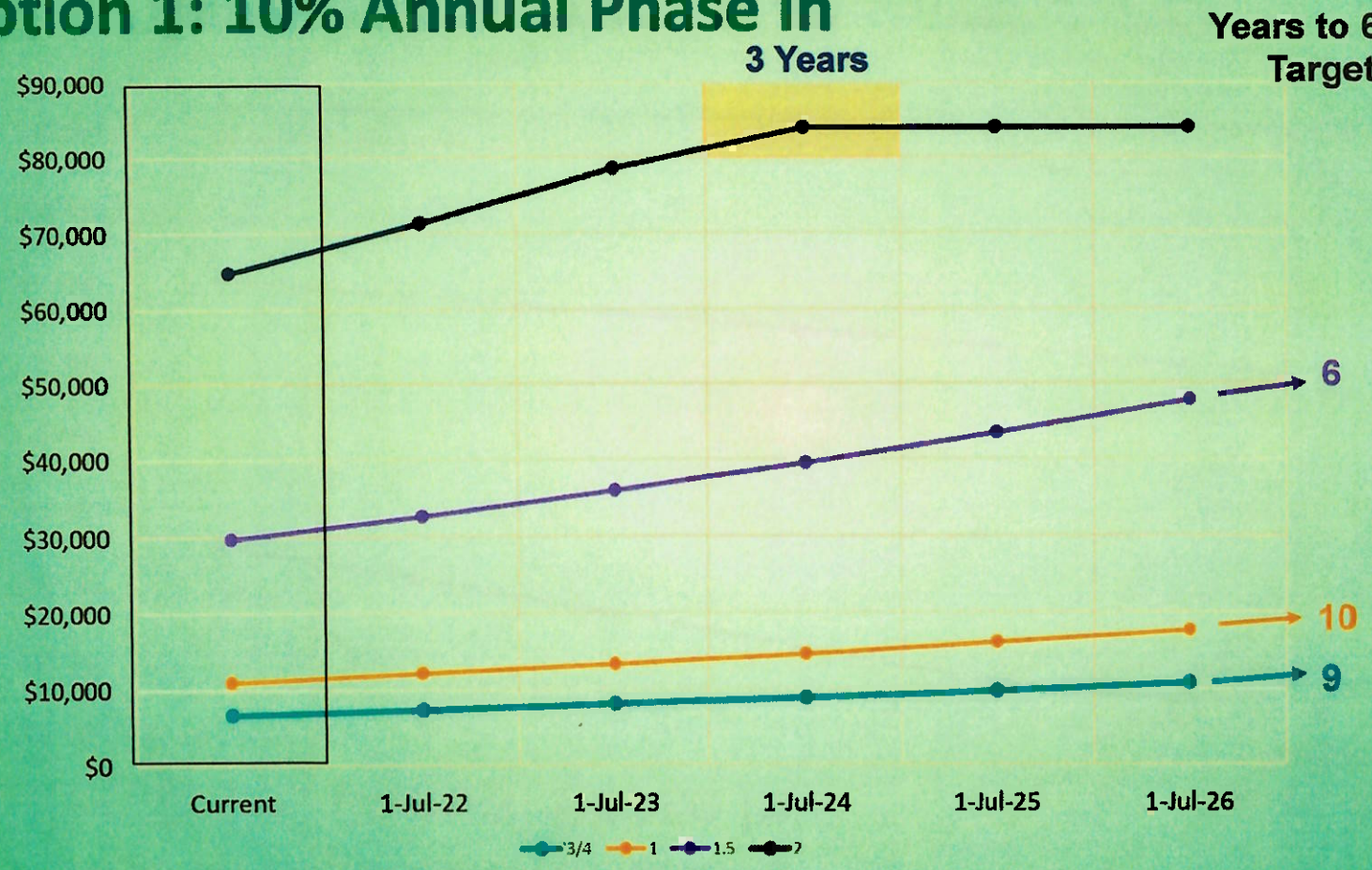
2. Phase In Agricultural WSFC
Option 1: 10% Annual Phase In



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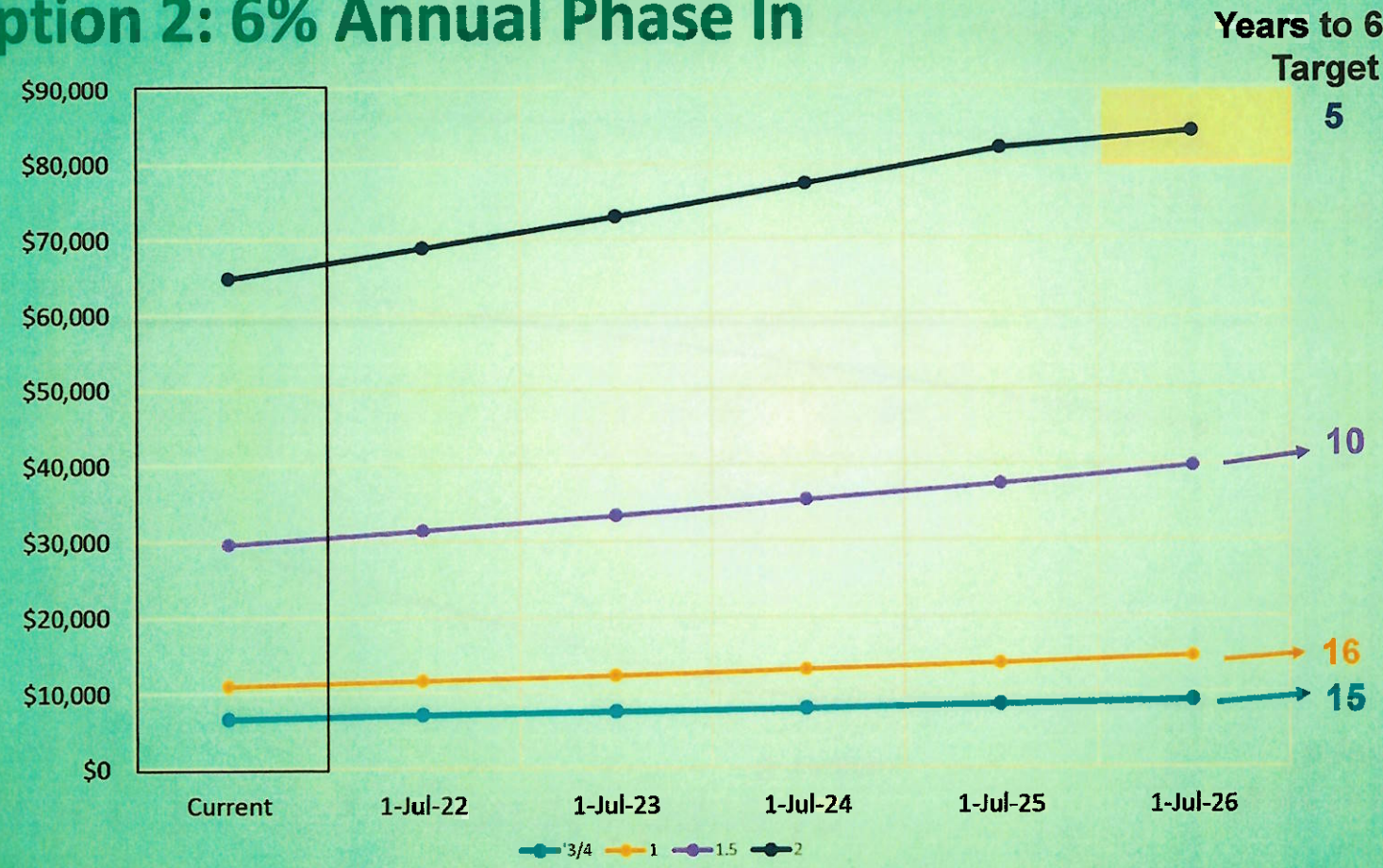
2. Phase In Agricultural WSFC
Option 2: 6% Annual Phase In



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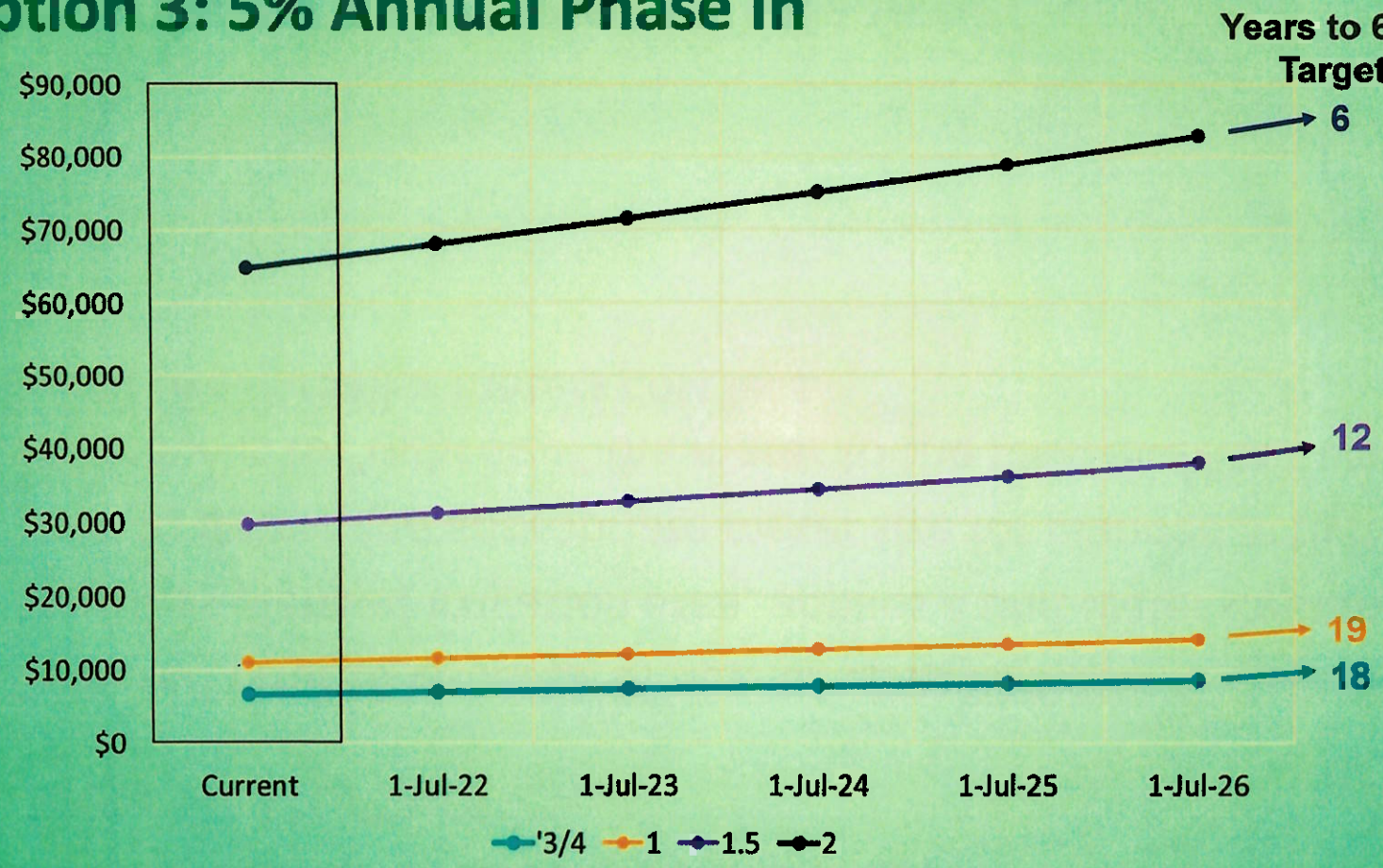
2. Phase In Agricultural WSFC
Option 3: 5% Annual Phase In



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3. Agricultural Water Use Plan for New Customers

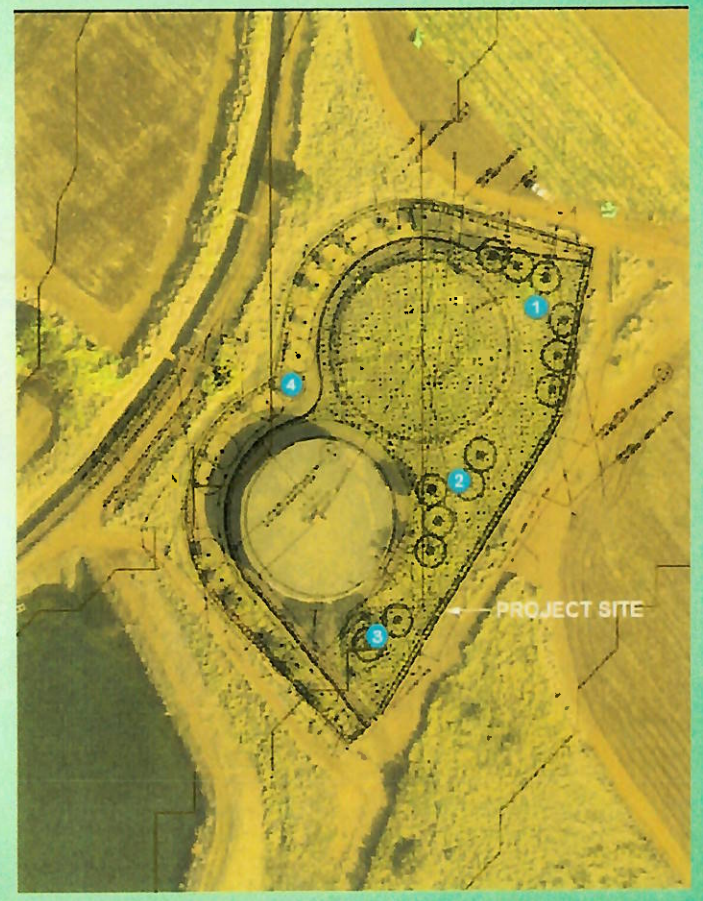
- Required prior to issuance of new or upsized meter
- Identifies planned irrigation area, applies a unit water demand/acre,
- Used to determine appropriate meter size for planned activities
- Objective is to "right size" the meter to the farm and limit wasteful water use. Smaller meters cost less.

4. Encourage conservation for all BWS ag customers

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

5. Pursue/Utilize supplemental funding from State to offset revenue impacts

- In 2019, Act 40 was passed to provide $1 million to offset costs for 1 exploratory well in upper Kunia
- Well station is mauka of proposed State Kunia Agriculture Park and could provide potable water for crop washing
- BWS will apply State contribution to "buy down" WSFC for new farmers on BWS islandwide water system
- Release of funds is pending approval by Governor



6. Reevaluate program effectiveness in 5 years

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

Summary of WSFC Options

Customer Type	Option 1	Option 2	Option 3
Single-Family Residential	5% maximum annual phase in	Even phase in over 5 years	--
Multi-Unit Residential Low Rise	5% maximum annual phase in	Even phase in over 5 years	--
Multi-Unit Residential High Rise	5% maximum annual phase in	Even phase in over 5 years	--
Non-Residential	5% maximum annual phase in	Even phase in over 5 years	--
Agricultural	10% maximum annual increase*	6% maximum annual increase*	5% maximum annual increase**

* Reaches 60% target WSFC for 2" meter size

** Does not reach 60% target WSFC for any meter size

Water System Facilities Charge (WSFC) Process Timeline

WSFC Approval Process Schedule	2021									2022						
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Permitted Interaction Group Input	■															
BWS Board Update and Outreach Authorization			■													
Final draft WSFC report to BWS			■													
Customer Outreach			■	■	■	■	■	■	■	■	■	■	■	■	■	■
SBRRB Meeting					■											
BWS Public Hearing/Board Consideration						■										
Submit Post-Hearing Small Business Impact Statement							■									
Submit final WSFC Report to BWS							■									
Staff training to implement with customers													■	■	■	
New WSFC Effective																◆

New WSFC charges effective July 1, 2022

ITEM FOR INFORMATION NO. 1

"June 28, 2021

WATER SYSTEMS REVENUE BONDS-COMPLIANCE AND RATE COVENANT

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

Chair and Members:

Subject: Water System Revenue Bonds – Compliance with Rate Covenant

In accordance with Article VIII, Section 8.02, Rates and Charges, of the Water System Revenue Bonds, Resolution No. 717, 2001, we have completed a review of the financial condition of the Board of Water Supply for the purpose of estimating whether the Net Revenues for the current fiscal year and the next succeeding fiscal year will be sufficient to comply with the rate covenant in Section 8.02.

Our review included an examination of the financial and accounting records which we considered necessary to express an opinion on the adequacy of the department's rates and other charges such that Net Revenues shall not be less than the Net Revenue Requirement in each fiscal year.

In our opinion, Net Revenues for fiscal years 2021 and 2022 will not be less than the Net Revenue Requirement for such fiscal years.

The attached schedules present the actual and estimated revenues and expenditures in compliance with the above rate covenant.

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

Attachment"

The foregoing was for information only.

DISCUSSION: Joseph Cooper, Waterworks Controller, Finance Division, gave the report. There were no comments or discussion.

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
SUPPLEMENTAL SCHEDULE OF NET REVENUE REQUIREMENT
PROJECTED AS OF JUNE 30, 2021

		Amount
REVENUES		
Water sales	$	235,163,000
Interest		6,816,000
Other		5,839,000
Total revenues		247,818,000
DEDUCTIONS		
Operating expenses		196,791,000
Less depreciation expense		(46,132,000)
Total deductions		150,659,000
Net revenues	$	97,159,000
NET REVENUE REQUIREMENT		
Greater of:		
1) Aggregate debt service	$	18,874,086
Required deposits - subordinate obligation fund		
		18,874,086
2) Aggregate debt service		18,874,086
	x	1.20
Net revenue requirement	$	22,648,903
Target New Requirement of 1.7		30,185,946
Current ratio		5.15

Note: Subject to change after year end adjustments

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
CALCULATIONS OF NET REVENUES AND NET REVENUE REQIREMENT
FISCAL YEAR ENDING JUNE 30, 2022

	PROJECTED FY 2022
REVENUES	
Water sales	$ 239,708,000
Other charges & services	3,640,000
Interest revenue	5,500,000
Total revenues	$ 248,848,000
DEDUCTIONS	
Operating expenses	$ 185,552,500
Net revenues	$ 63,295,500
NET REVENUE REQUIREMENT	
Greater of:	
1) Aggregate debt service for FY 19	$ 20,661,000
Required deposits - subordinate obligation fund	
	$ 20,661,000
2) Aggregate debt service for FY 19	$ 20,661,000
	x 1.20
Net revenue requirement	$ 24,793,200
Target Net Requirement of 1.7	$ 35,123,700
Current Ratio	3.06

ITEM FOR INFORMATION NO. 2

"June 28, 2021

UPDATE OF COMMISSION ON WATER RESOURCE MANAGEMENT ACTION REGARDING BOARD OF WATER SUPPLY HA'IKŪ TUNNEL

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

Chair and Members:

Subject: Update of Commission on Water Resource Management Action Regarding BWS Ha'ikū Tunnel

On June 15, 2021, the State Commission on Water Resource Management (CWRM) issued an order requiring BWS to reduce Ha'ikū Tunnel production from 1.0 mgd to 0.3 mgd and evaluate the feasibility of installing another bulkhead in Ha'ikū Tunnel.

CWRM indicated the substantial ecological and cultural values supported by He'eia Stream, including habitat for native amphidromous species, restored native riparian environment, a healthy estuarine and near-shore ecosystem, recreational and aesthetic values, as well as the productivity of the He'eia fishpond and wetland to support a biocultural food production systems, merits restoration of He'eia Stream to pre-tunnel baseflow.

As an interim measure, until the Ha'ikū tunnel is fully bulkheaded, BWS is required to reduce withdrawal from the Ha'ikū tunnel to 0.3 mgd by August 15, 2021. When the bulkheading process commences, the Ha'ikū tunnel will not be a viable source for BWS, and therefore the entirety of the tunnel flow will be discharged into the stream.

IMPLEMENTATION

- Within two years, BWS will complete their feasibility study and preliminary engineering design for the proposed bulkhead.
- BWS will communicate with the Commission and continue to coordinate with Kamehameha Schools, Department of Hawaiian Home Lands (DHHL), Papahana Kuaola, Hawaii Community Development Authority (HCDA), He`eia National Estuarine Research Reserve (NERR), Kāko'o 'Ōiwi and Papae O' He`eia water users on a quarterly basis.
- Upon completion of the feasibility study and engineering design, BWS will have three years to complete the final design and construction of the bulkhead.
- Following the installation of the bulkhead, CWRM staff will work with BWS, Kamehameha Schools, DHHL, Papahana Kuaola, HCDA, NERR, and Kāko'o 'Ōiwi to evaluate the implications for baseflow in Ha'ikū Stream and determine the feasibility of establishing a numeric instream flow standard.
- If BWS determines that bulkheading is not a feasible solution upon completion of the feasibility study, staff will recommend an amendment

to the interim Instream Flow Standard (IFS) or amend the BWS water use permit as needed.

MONITORING

- Streamflow monitoring shall be maintained by BWS coordinating with US Geological Survey (USGS).
- At monthly intervals, BWS will provide monitoring of daily flow withdrawn from the Ha'ikū Tunnel, Ha'ikū well, and Ioleka'a well.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota by all interested parties.

REPORTING

CWRM staff will report progress at their September 21, 2021 meeting on the following:

- BWS reduction of 0.3 mgd from Haiku Tunnel;
- BWS' reduction from Haiku Tunnel and its impact on flow in He`eia stream;
- The bulkhead feasibility and preliminary engineering report; and
- Potential development of alternative water sources, including the State Hospital Well."

Following the bulkheading of the tunnel, staff will evaluate the resultant effects on stream baseflow and may amend the interim IFS or amend the BWS water use permit as needed.

BWS is entering into a cooperative study with the USGS to conduct a 3 year 3 Phase Heeia watershed study. The total study cost is $875,000. USGS share is $350,000 and BWS share is $525,000 from the FY 2022 Water Resources budget. The study has the following scope:

- Determine whether the effect of a reduction of withdrawals on groundwater discharge to streams can be detected in streamflow measurements and stream-gage records
- Estimate how much of the water withdrawn from the tunnel and wells in the He'eia watershed comes from outside the watershed
- Identify gaining and losing reaches of He'eia Stream, and quantify current seepage
- Quantify current water uses to the extent possible from existing data or short-term measurements
- Installation of a new stream gage below the confluence of He'eia and 'Ioleka'a Streams and operating it over a multi-year period.

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.

Board Member Sword asked what areas does Ha'iku Tunnel serves.

Mr. Usagawa replied Ha'iku Tunnel serves the higher elevation areas of Kaneohe area. He explained that Ha'iku Tunnel is producing 0.5 million gallons per day (mgd) and serves Ha'iku Valley, Ha'iku Plantation, and Ha'iku Village. Ha'iku Tunnel also serves areas along Keaahala Road such as Windward Community College, the Hawaii State Hospital, and two parks, Kaneohe District and Hokulele. If the mgd is lowered to 0.3 mgd, Ha'iku tunnel will only be able to serve the areas above Kahekili Highway, but during the summer high demand, there will be sufficient supply. We'll have to evaluate it more closely.

Board Member Sword asked if there's a proposal to reactivate the well near the Hawaii State Hospital.

Mr. Usagawa responded the Department of Land and Natural Resources (DLNR) drilled a well in 2000 beside the water tank above the Hawaii State Hospital which was renovated into a modern secure mental health hospital. The BWS requested CWRM to require the DLNR to install a pump to serve the State hospital water system and get off the BWS system to help BWS reduce Haiku Tunnel water use. The existing water meters can be used for backup supply should the well pump fail. The Hospital is directly off the Haiku Tunnel transmission main and according to the Hospital expansion FEIS will increase use from 23,000 gallons per day (gpd) to 100,000 gpd with full build-out reaching 200,000 gpd. The renovated hospital will reopen in August 2021. The Hawaii State Hospital is the largest water user in the BWS Haiku 500-foot water system. If the hospital uses their well, it would help reduce the valley's water demand to potentially meet the 0.3 mgd requirement.

Board Member Sword inquired if residents in the area would be affected by the reduction.

Mr. Usagawa replied that if the demand approaches and exceeds the fixed source input of 0.3 mgd or exceeds 0.3 mgd reservoir levels will start to drop and residents near the 400-foot elevations of the system will experience low and fluctuating water pressures, probably in the summer when water demand is high.

Board Member Sword asked what is the BWS currently withdrawing from the Ha'iku Tunnel.
Manager Lau replied the amount coming out of Ha'iku Tunnel is 0.5 mgd.

Board Member Sword inquired if lowers water pressures are with or without the use of the State Hospital well.

Mr. Usagawa responded that without the use of the State Hospital well, higher elevation areas would experience low water pressures.

Manager Lau mentioned that the BWS has been working to get Ha'iku Well back online and able to pump again. He stated Ha'iku Well feeds into the system.

Mr. Usagawa stated it has not been determined whether the 0.3 mgd is for only Ha'iku Tunnel or all three sources, Ha'iku Tunnel, Ha'iku Well, and Iolekaa Well.

Mr. Usagawa added to what Manager Lau mentioned regarding Ha'iku Well. The BWS informed the Commission of Water Resource Management (CWRM) that Ha'iku Well may need to begin pumping once the well is back online on August 15, 2021.

Board Member Soon asked Mr. Usagawa if there is a long-term plan or anything that the Board Members be concerned about.

Mr. Usagawa replied that the CWRM will be setting Interim Instream Flow Standards (IIFS) for several streams where BWS has sources. Heeia Stream is the first and BWS is required to lower the Haiku Tunnel production from 1.0 mgd to 0.3 mgd. In September, the BWS will update the CWRM on our progress to reduce production to 0.3 mgd and investigate the feasibility of adding another bulkhead in Haiku Tunnel. During September and October, the BWS should begin to see effects and determine if there are any pressure issues and operate Haiku Well to compensate. The evaluation will take time indicating that the summer months would be the hardest.

Board Member Soon commented his understanding was an interim of 0.3 with the goal of zero.

Manager Lau responded that the CWRM didn't indicate that the BWS would need to reduce the mgd to zero from Ha'iku Tunnel. The CWRM understands that there are customers such as Kamakau Charter School that is located on Hawaiian homelands and at the highest elevation in the system, that uses water directly from Ha'iku Tunnel for drinking and fire protection. In January 2021 the CWRM's proposed an IIFS measured by the United States Geological Survey (USGS) gage at He'eia Stream is to maintain a flow of 1.77 mgd, up from approximately 1.0 mgd.

Mr. Usagawa stated the BWS is dropping water from the 500 system for the lower 272 system. The Water Resources Division is working with operations to reduce the drop and leave more water in the upper system.

With the reduction in Haiku, the majority of the water supply will have to come from Luluku Tunnel and Well. The way the distribution system is configured, Luluku water does not readily move back to Ha'iku. The BWS needs more time to be able to assess the system and present an accurate evaluation.

Manager Lau mentioned that in the previous meeting, CWRM contracted with the USGS to do similar watershed studies on Kahaluu and Waihe'e streams to amend the IIFS there. The Waihe'e Tunnel is the largest tunnel source in Koolaupoko that produces about 5 mgd for BWS customers. A combined reduction in IIFS from Ha'iku, Waihe'e, and Kahaluu could cause significant consequences to the Koolaupoko system from Kaneohe to Waimanalo.

Chair Andaya asked if there were any further questions or comments. Hearing none, Chair Andaya asked Mr. Usagawa to keep the Board updated with any new developments.

At 3:58 PM Board Member Ray Soon announced that he was leaving the meeting.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

June 18, 2021

Ref: PAIFS.5666.3

Ernest Y.W. Lau, P.E.
Manager and Chief Engineer
Honolulu Board of Water Supply
630 S. Beretania Street
Honolulu, HI 96843-0001

Aloha Mr. Lau:

NOTICE OF COMMISSION ACTION
Order to Honolulu Board of Water Supply to Bulkhead
Ha'ikū Tunnel (Well No. 2450-001) at the 10-foot Thick Dike 1,200 feet
From the Portal Entrance and Reduce Their Withdrawal to 0.3 million gallons per day
He'eia Hydrologic Unit, Ko'olaupoko, O'ahu

This letter serves as your notice of action taken by the Commission on Water Resource Management (Commission) on the subject matter. On June 15, 2021, by a 7-0 vote (1 vote for approval with reservations), the Commission approved the following Order:

He'eia Stream supported one of the most agriculturally productive areas on O'ahu. The Ha'ikū Tunnel, dug at an elevation of 550 feet, depleted the groundwater storage of high-elevation dike compartments which supplied baseflow to He'eia Stream. In 1971, the USGS recommended that bulkheading at a 10-foot thick dike compartment at approximately 1,200 feet from the tunnel entrance is the preferred method to restore the storage function of the aquifer. Tunnels with high recession constants (*b*), such as the Ha'ikū Tunnel, drain faster than tunnels with lower recession constants, and would therefore benefit more from bulkheading. An existing bulkhead installed and valved at 600 feet from the portal provides some small storage. The substantial ecological and cultural values supported by He'eia Stream, including habitat for native amphidromous species, restored native riparian environment, a healthy estuarine and near-shore ecosystem, recreational and aesthetic values, as well as the productivity of the He'eia fishpond and wetland to support a biocultural food production system, merits restoration of He'eia Stream to pre-tunnel baseflow. In order to protect these instream uses staff recommends that Honolulu Board of Water Supply (HBWS) bulkhead the 10-foot thick dike compartment at approximately 1,200 feet from the tunnel entrance and valve separately from the bulkhead at 600 feet from the tunnel entrance. Such action would increase spring flow in Ha'ikū while providing a more reliable source of water supply for HBWS. This solution is expected to increase the natural capacity of

the high-elevation groundwater system to store and discharge water to streams and springs in the moku of Ko'olaupoko.

As an interim measure, until the Ha'ikū tunnel is fully bulkheaded, Commission staff recommends that HBWS reduce their withdrawal from the Ha'ikū tunnel to 0.3 million gallons per day (mgd) by August 15, 2021. When the bulkheading process commences, the Ha'ikū tunnel will not be a viable source for HBWS, and therefore the entirety of the tunnel flow will be discharged into the stream.

In order to improve transparency among stakeholders, staff recommends that HBWS provides the daily amount of water withdrawn from each well source (Ha'ikū Tunnel, Ha'ikū well, and Ioleka'a well) at monthly intervals.

Following the bulkheading of the tunnel, staff will evaluate the resultant effects on stream baseflow and may amend the interim IFS or amend the HBWS water use permit as needed.

IMPLEMENTATION

- Within two years, HBWS will complete their feasibility study and preliminary engineering design for the proposed bulkhead.
- HBWS will communicate with the Commission and continue to coordinate with Kamehameha Schools, Department of Hawaiian Home Lands (DHHL), Papahana Kuaola, Hawai'i Community Development Authority (HCDA), National Estuarine Research Reserve (NERR), and Kāko'o 'Ōiwi water users on a quarterly basis.
- Upon completion of the feasibility study and engineering design, HBWS will have three years to complete the final design and construction of the bulkhead.
- Following the installation of the bulkhead, staff will work with HBWS, Kamehameha Schools, DHHL, Papahana Kuaola, HCDA, NERR, and Kāko'o 'Ōiwi to evaluate the implications for baseflow in Ha'ikū Stream and determine the feasibility of establishing a numeric instream flow standard.
- If HBWS determines that bulkheading is not a feasible solution upon completion of the feasibility study, staff will recommend an amendment to the interim IFS or amend the HBWS water use permit as needed.

MONITORING

- Streamflow monitoring shall be maintained by HBWS coordinating with USGS.
- At monthly intervals, HBWS will provide monitoring of daily flow withdrawn from the Ha'ikū Tunnel, Ha'ikū well, and Ioleka'a well.
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota by all interested parties.
- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

EVALUATION

- One to two years following the completion of the bulkheading, staff shall report to the Commission on an evaluation of baseflow conditions in He'eia and nearby streams and make recommendations to amend instream flow standards at that time.

Staff will report to the Commission, at its September 2021 meeting, on the progress of:

1. HBWS reduction to 0.3 mgd from Ha'ikū Tunnel;
2. HBWS reduction from Ha'ikū Tunnel to flow in He'eia Stream;
3. Assessment of bulkhead feasibility and preliminary engineering report; and
4. Potential development of alternative water sources, including the State Hospital Well.

If you have any questions, please contact Ayron Strauch at (808) 587-0265, or ayron.m.strauch@hawaii.gov.

Ola i ka wai,

M. KALEO MANUEL
Deputy Director

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

STAFF SUBMITTAL

COMMISSION ON WATER RESOURCE MANAGEMENT

June 15, 2021
Honolulu, Hawai'i

Approve Order to Honolulu Board of Water Supply to Bulkhead Ha'ikū Tunnel (Well No. 2450-001) at the 10-foot Thick Dike 1,200 feet From the Portal Entrance and Reduce Their Withdrawal to 0.3 million gallons per day
He'eia Hydrologic Unit, Ko'olaupoko, O'ahu

SUMMARY OF REQUEST

Staff is requesting the Commission on Water Resource Management (Commission) consider the recommendations for improving high-elevation aquifer storage in the Ko'olaupoko Aquifer System for protecting instream uses in He'eia Stream affected by groundwater withdrawals from Ha'ikū Tunnel by bulkheading Ha'ikū Tunnel (Well No. 2450-001) at the 10-foot thick dike 1,200 feet from the portal entrance. As an interim solution, until the bulkheading is installed, Honolulu Board of Water Supply (HBWS) will reduce their withdrawal from 1.0 million gallons per day to 0.3 million gallons per day, with the resulting difference supporting streamflow.

LOCATION MAP: See Figure 1

LEGAL AUTHORITY

Under the Code, the Commission has the responsibility of establishing IFS on a stream-by-stream basis whenever necessary to protect the public interest in the waters of the State. In the 2000 appellate ruling on the first Waiāhole Ditch Contested Case Decision and Order ("*Waiāhole* I"), the Hawai'i Supreme Court emphasized that "instream flow standards serve as the primary mechanism by which the Commission is to discharge its duty to protect and promote the entire range of public trust purposes dependent upon instream flows." 94 Hawai'i 97, 148, 9 P.3d 409, 460 (2000). The Code defines an instream flow standard as a "quantity or flow of water or depth of water which is required to be present at a specific location in a stream system at certain specified times of the year to protect fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses." *See* HRS § 174C-3 ("Definitions"). In considering a petition to amend an interim instream flow standard, the Code directs the Commission to "weigh the

importance of the present or potential instream values with the importance of the present or potential uses of water for noninstream purposes, including the economic impact of restricting such uses." HRS § 174C-71(2)(D).

"Instream use" means beneficial uses of stream water for significant purposes which are located in the stream and which are achieved by leaving the water in the stream. Instream uses include, but are not limited to:

1) Maintenance of fish and wildlife habitats;
2) Outdoor recreational activities;
3) Maintenance of ecosystems such as estuaries, wetlands, and stream vegetation;
4) Aesthetic values such as waterfalls and scenic waterways;
5) Navigation;
6) Instream hydropower generation;
7) Maintenance of water quality;
8) The conveyance of irrigation and domestic water supplies to downstream points of diversion; and
9) The protection of traditional and customary Hawaiian rights.

"Noninstream use" means the use of stream water that is diverted or removed from its stream channel and includes the use of stream water outside of the channel for domestic, agricultural, and industrial purposes.

The analysis for protecting instream uses incorporates a balancing of the public trust uses with reasonable and beneficial uses. In the He'eia hydrologic unit, a number of community organizations, public groups, and private individuals who engage in cultural practices, including the growing of kalo, the gathering of medicinal plants and aquatic animals, and engaging in hula, have expressed their concern regarding the diminished flow in He'eia Stream. Reductions in streamflow have also limited: (1) the productivity of the He'eia fishpond, which has three mākāhā; (2) the vitality of the wetland, which historically supported hundreds of acres of lo'i; (3) habitat for native endemic wildlife, and habitat for native aquatic biota; and (4) recreational value of He'eia Stream. In *McBryde Sugar Co v. Robinson*, the Hawai'i Supreme Court identified riparian rights as "the right to use water flowing without prejudicing the riparian rights of others and the right to the natural flow of the stream without substantial diminution in the shape and size given it by nature". 54 Haw. at 198, 504 P.2d at 1344. 54 Haw. 174, 504 P.2d 1330. Further, the Hawai'i Supreme Court affirmed the unity of the hydrological cycle such that surface and groundwater represent an integrated source of water, and "where surface and groundwater can be demonstrated to be interrelated as parts of a single system, established surface water rights may be protected against diversions that injure those rights whether the diversion is of surface water or groundwater." *Reppun v. Board of Water Supply,* 65 Haw. at 531, 656 P.2d 57 at 79.

The public trust is a state constitutional doctrine which "continues to inform the Code's interpretation, define its permissible 'outer limits,' and justify its existence…(T)he Code does not supplant the protections of the public trust doctrine." *Waiāhole I*, 94 Hawai'i at 133, 9 P.3d

at 445. The Hawai'i Supreme Court has described "the public trust relating to water resources as the authority and duty 'to maintain the purity and flow of our waters for future generations and to assure that the waters of our land are put to reasonable and beneficial uses (*emphases in original).*" *Waiāhole I*, 94 Hawai'i at 138, 9 P.3d at 450. "'Reasonable-beneficial use' means the use of water in such a quantity as is necessary for economic and efficient utilization, for a purpose, and in a manner which is both reasonable and consistent with the state and county land use plans and the public interest." HRS § 174C-3.

The Hawai`i Constitution requires the Commission both to protect natural resources and to promote their use and development. "The state water resources trust thus embodies a dual mandate of 1) protection and 2) maximum reasonable and beneficial use." *Waiāhole I*, 94 Hawai'i at 139, 9 P.3d at 451. The purposes or protected uses of the water resources trust are: 1) maintenance of waters in their natural state, 2) domestic water use of the general public, in particular, protecting an adequate supply of drinking water, 3) the use of water in the exercise of Native Hawaiian traditional and customary rights, and 4) the reservation of water enumerated by the State Water Code. *Waiāhole I*, 94 Hawai'i at 136-37, 9 P.3d at 448-58; *In re Wai`ola o Moloka`i, Inc.* ("*Wai`ola*"), 103 Hawai'i 401, 431, 83 P.3d 664, 694 (2004).

"In this jurisdiction, the water resources trust also encompasses a duty to promote the reasonable and beneficial use of water resources in order to maximize their social and economic benefits to the people of the state…(We) have indicated a preference for accommodating both instream and offstream uses where feasible..(and) reason and necessity dictate that the public trust may have to accommodate offstream diversions inconsistent with the mandate of protection, to the unavoidable impairment of public instream uses and values." *Waiāhole I*, 94 Hawai'i at 139, 141-42, 9 P.3d at 451, 453-54.

There are no absolute priorities under the Public Trust Doctrine. "Given the diverse and not necessarily complementary range of water uses, even among public trust uses alone, (the Court) consider(s) it neither feasible nor prudent to designate absolute priorities between broad categories of uses under the water resources trust. There are no absolute priorities between uses under the water resources trust…(and) the Commission inevitably must weigh competing public and private water uses on a case-by-case basis, according to any appropriate standards provided by law (emphasis added)." *Waiāhole I*, 94 Hawai'i at 142, 9 P.3d at 454. The public trust creates an affirmative duty of the Commission "to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses whenever feasible[1] (emphasis added)." *Waiāhole I*, 94 Hawai'i at 141, 9 P.3d at 453.

The water code does not place a burden of proof on any particular party; instead, the water code and case law interpreting the code have affirmed the Commission's duty to 'protect instream values to the extent practicable' and 'protect the public interest.'" *In re `Īao Ground Water Management Area High-Level Surface Water Use Permit Applications and Petition to Amend Interim Instream Flow Standards of Waihe`e River and Waiehu, `Īao, and Waikapu Streams*

[1] The Court refers to the term "feasible" as a balancing of benefits and costs and not to mean "capable of achievement." (*Waiāhole I*, 94 Hawai'i, at 141 n. 39; 9 P.3d, at 453 n. 39.)

Contested Case Hearing ("*Nā Wai `Ehā*"), 128 Hawai'i 228, 258, 287 P.3d 129, 159 (2012)), *citing In re Water Use Permit Applications* ("*Waiāhole II*"), 105 Hawai'i 1, 11, 93 P.3d 643, 653 ((2004)); and HRS §174C-71((2))((A)).

Further, Article 12, §7 of the Hawai`i Constitution states that: "The State reaffirms and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua`a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights."

Where scientific evidence is preliminary and not yet conclusive regarding the management of fresh water resources, it is prudent to adopt "precautionary principles" in protecting the resource[2]. That is, where there are present or potential threats of serious damage, lack of full scientific certainty should not be a basis for postponing effective measures to prevent environmental degradation…In addition, where uncertainty exists, a trustee's duty to protect the resource mitigates in favor of choosing presumptions that also protect the resource.[3] The "precautionary principle" appears in diverse forms throughout the field of environmental law… The Hawaii Supreme Court confirmed that the principle, in its quintessential form, states: at minimum, the absence of firm scientific proof should not tie the Commission's hands in adopting reasonable measures designed to further the public interest. "*Waiāhole I*", 94 Hawai'i at 155 n. 60 p.13.

In developing the recommendations, staff has attempted to remain consistent in weighing all the instream and noninstream uses of each stream based upon the best available information presented in the Instream Flow Stream Assessment Report (IFSAR), along with the oral and written comments received through the public review process. This process is challenging due to the unique nature of each stream, the various instream and noninstream uses of water, and the logistical challenges of instituting any decision. Whether attempting to compare stream characteristics across multiple hydrologic units or within one unit, no single principal or equation determines the rate of flow restoration. However, the principals established by the State Constitution, the laws dictating the Hawai'i State Water Code (HRS chapter 174C), and the statutes which are used to implement these laws (HRS) are applied equally.

The assessment of instream uses for windward O'ahu began with the Waiāhole Ditch Combined Contested Case Hearing (CCH-OA95-1), which concluded with the 2006 Decision and Order by the Commission and with its final appeal to the Intermediate Court of Appeals concluded in 2010. In this submittal, the Commission will address the interim IFS for one stream in windward O'ahu in the He'eia (3028) hydrologic unit (Figure 1). This submittal is based on the best available information provided by the IFSAR, the information in the draft recommendations presented to and discussed by the Commission at the regularly scheduled Commission meeting on January 19, 2021, and subsequent data provided by the HBWS to the Commission.

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[2] Commission on Water Resource Management. 1997. In the Matter of Water Use Permit Applications, Petitions for Interim Instream Flow Standard Amendments, and Petitions for Water Reservations for the Waiāhole Ditch Combined Contested Case Hearing. Final Decision & Order. CCH-OA-95-01.
[3] Commission on Water Resource Management. 1997. CCH-OA-95-01.

HISTORIC CONTEXT

The lands of the He'eia Ahupua'a were some of the most agriculturally productive lands on the island of O'ahu. Frequent rainfall and favorable geology provided sufficient baseflow to support extensive lo'i complexes across the broad fertile valleys with spring flow providing further support to many complexes around the large inland wetland. The productivity was also attributed to the extensive water system that distributed surface water throughout the ahupua'a. Further, coastal geology provided the perfect setting to support a large fishpond at the stream mouth. The abundant agriculture supported a large population center which developed a unique and rich cultural heritage.

Following the Great Māhele, changes in the socio-political environment led to a transition from predominantly kalo production managed by Hawaiian communities to the cultivation of sugarcane, pineapple, rice, and then cattle grazing managed by immigrant communities. Produce (i.e., truck crops) were grown for the growing urban population in Honolulu.

In 1940, the suburban water utility for windward O'ahu built the Ha'ikū Development Tunnel ("Ha'ikū Tunnel"; well 2450-001) in Ha'ikū Valley as a municipal water supply for the growing urban population of the Kāne'ohe area. Tunnel construction decreased the baseflow in He'eia Stream[4] as well as Kahalu'u Stream in the neighboring valley[5]. Following the consolidation of all suburban water utilities in 1959, the Honolulu Board of Water Supply (HBWS) assumed operation of the Ha'ikū Tunnel. The tunnel is bulkheaded 600 feet from the portal, restoring a small part of the original storage. However, in 1971, USGS recommended an additional bulkhead installed at the 10-foot dike 1,200 feet from the portal to more fully restore the storage capacity of the high elevation aquifer[6].

In 1981, the HBWS built the Ha'ikū Well (well 2450-002) to supplement the water supply of the area with an installed pump capacity of 1.008 mgd.

In 1987, with the passage of the State Water Code (HRS 174C), all wells and stream diversions had to be registered with the Commission on Water Resource Management (Commission) by May 31, 1989. While no registrations were received by the Commission in the He'eia hydrologic unit by this deadline, in 1992, the Hawai'i Community Development Authority (HCDA) provided documentation to register a diversion and 'auwai that had been historically used for taro farming (Table 1). Additional fieldwork has verified the use of a second diversion and 'auwai (Hop Tuk).

In 2011, Act 210 established the He'eia Community Development District (HCDD), a district under HCDA, consisting of 409 acres of land. Of the total 409 acres, 46 were acquired by the

[4] Hirashima, G.T. 1971. Tunnels and dikes of the Koolau Range, Oahu, Hawaii, and their effect on storage depletion and movement of ground water. U.S. Geological Survey Water-Supply Paper 1999-M.
[5] Hirashima, G.T. 1962. Effect of the Haiku Tunnel on Kahaluu Stream, Oahu. U.S. Geological Survey Professional Paper 450-C.
[6] Hirashima, G.T. 1971.

HCDA through a land exchange with Bishop Estate (now known as Kamehameha Schools, KS). HRS § 206E-201. The act established HCDD as the redevelopment authority to facilitate culturally appropriate agriculture, education, and natural-resource restoration and management of the He'eia wetlands[7]. This arrangement was in alignment with the HBWS' Ko'olaupoko Watershed Management Plan and the City and County of Honolulu's Ko'olaupoko Sustainable Communities Plan. However, a lack of streamflow has continued to affect instream uses, including traditional and customary gathering practices, the cultivation of taro, estuarine ecosystem services, and the productivity of the fishpond.

Table 1. Registrant, diversion ID, diversion name, stream, and additional information in the He'eia hydrologic unit, Windward Oahu.

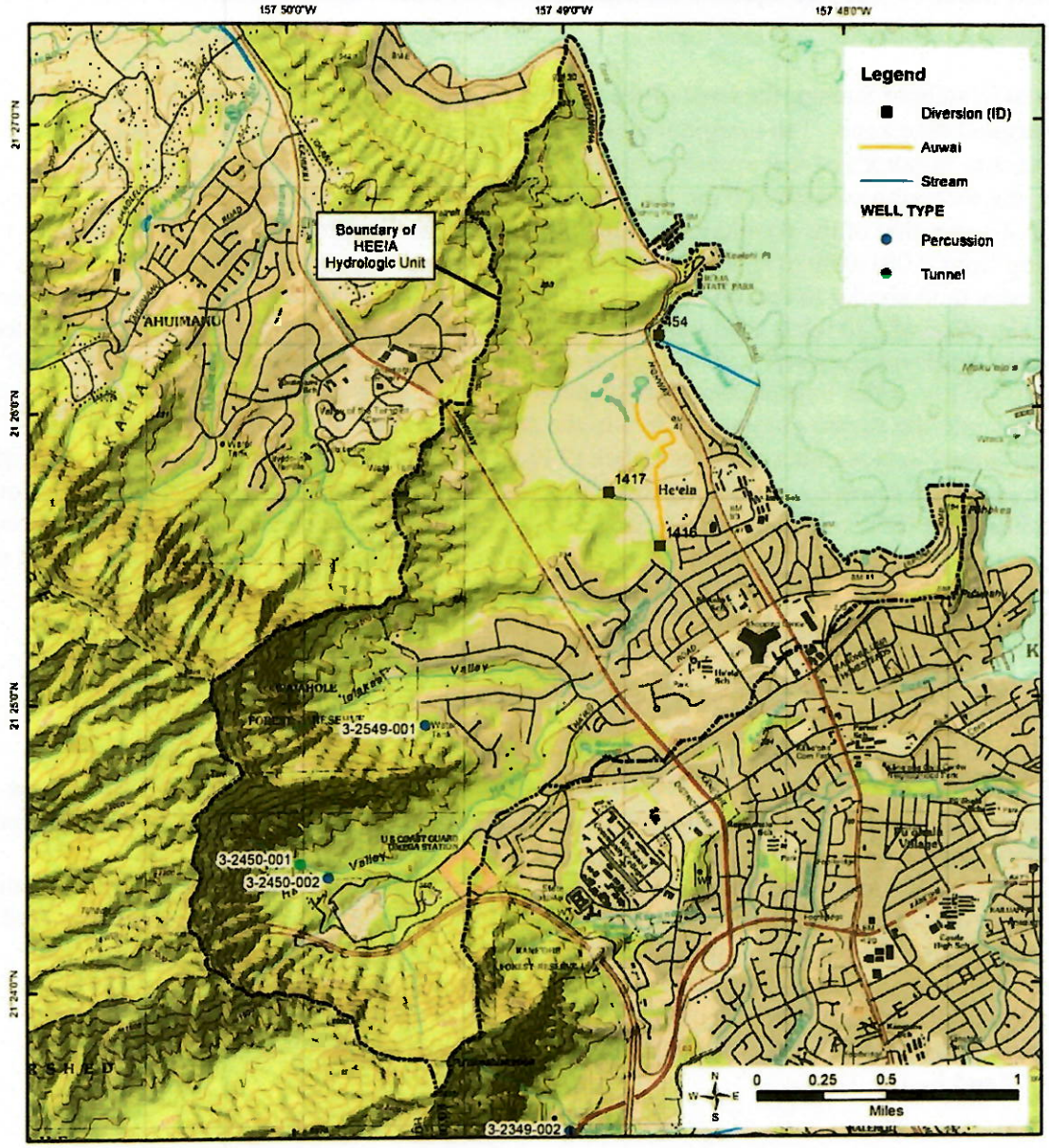
registrant	diversion ID	diversion name	stream name	additional information
HCDA	1416	Wing Wo Tai Intake	He'eia	'auwai also captures spring flow
HCDA	1417	Hop Tuk Intake	He'eia	original 'auwai restored in 2019
HAW ISLE SEA	454	Fishpond Intakes (x3)	He'eia	Single registration but three intakes to regulate inflow into He'eia fishpond

HYDROGEOLOGIC CONTEXT

The surface water hydrologic unit of He'eia is in the Ko'olaupoko aquifer system as part of the Windward Aquifer Sector. He'eia is composed of two valleys: Ha'ikū and 'Ioleka'a. The geology of Ha'ikū Valley is a heterogeneous composition of rocks from various volcanic events. The basement geology is composed of Ko'olau Basalt of high permeability, interlaced with low permeable interconnected dikes. On top of this is older alluvium of low permeability, followed by a massive lava flow of the Honolulu Volcanic Series with low permeability, pyroclastics of the Honolulu Volcanic Series of high permeability, and then deposits of younger alluvium, colluvium, and lava flows with higher permeability[8]. The low permeability of certain layers generates substantial lateral movement of groundwater in the valley, particularly at the interface of the Honolulu Volcanics and older alluvium layers, discharging into streams as spring flow (Figure 2). The water accumulated in dike compartments commonly discharges into the stream or as spring flow where incision has exposed the compartment. In the Ha'ikū Tunnel, a bulkhead was placed at the site of a dike 600 feet from the portal, restoring a small amount of the original storage[9]. Hirashima (1971) suggested that to increase storage, an additional bulkhead should be installed and valved separately at the site of the 10-foot dike approximately 1,200 feet from the portal.

[7] He'eia Community Development District Plan & Rules. Draft Report. October, 2018. Prepared by Townscape, Inc.
[8] Stearns, H.T. Vaksvik, K.N. 1935. Geology and ground-water resources of the island of Oahu, Hawaii. U.S. Geological Survey Division of Hydrography. Bulletin 1.
[9] Hirashima, G.T. 1971.

Figure 1. The He'eia hydrologic unit, stream, wells, registered diversions and 'auwai system, windward O'ahu.



Large quantities of water have been drained from storage by the construction of horizontal tunnels and the current rate of discharge is a fraction of the rate at full storage[10]. In addition to the basal aquifer, Ha'ikū Valley has two higher elevation aquifers: one with a potentiometric surface above ground level in the alluvium or pyroclastics of the Honolulu Volcanics; and a second at 170 feet below ground level (i.e., 155 feet a.m.s.l.) in the dike compartment of the

[10] Hirashima, G.T. 1971.

Ko'olau Basalt[11]. The two aquifers are separated by the thick basalt lava flow of the Honolulu Volcanics.

South of Waiāhole Stream, the crest of the Ko'olau Range is southwest of the rift zone, within the marginal dike zone. The marginal dike zone is characterized by more widely spaced dikes (e.g., tens to hundreds of feet apart) compared to the rift zone (e.g., inches to feet apart). As a result, the recession constant for the Ha'ikū Tunnel located in the marginal dike zone (0.00436) is 2- to 4-times that of the development tunnels built for the Waiāhole Ditch Irrigation System (ranging from 0.001-0.00203), indicating that water recharge and withdrawal occurs at much faster rates (and similar to the Waihe'e Tunnel). As the Ha'ikū Tunnel was under construction (at an elevation of 550 feet), a flow of 11.3 mgd was discharged under pressure behind a 10 foot thick dike, indicating a water level of approximately 700 feet in elevation in the compartment[12]. The dewatering of the Tunnel disrupted the natural balance of groundwater storage, lowering the discharge into the stream at higher points in the stream channel. During construction of the Ha'ikū Tunnel in November and December 1940 and continuing for several months in 1941, the large quantity of storage was depleted from the high-elevation aquifers. Springs ceased to flow and subsequent flow in He'eia Stream decreased. Continued drainage even decreased the flow of Kahalu'u Stream 2.5 miles north of Ha'ikū Valley by 26 percent[13]. A detailed description of the groundwater occurrence, movement, and interactions with surface water in this area is described by Nichols et al. (1996)[14].

SURFACE FLOW

Streamflow conditions have been monitored in the He'eia hydrologic unit at USGS station 16275000 from 1911-1919, from 1939-1977, and from 1982-present. The Ha'ikū Tunnel was constructed in 1940 and 1941 for municipal water supply, draining high-elevation aquifers that supported groundwater discharge to He'eia Stream. Prior to tunnel development in October 1940, the groundwater system equilibrium discharged approximately 3.28 cfs (2.11 mgd) to the stream above 272 feet in elevation at USGS 16275000 (Table 2). Hirashima (1971) estimated the average base flow in He'eia stream as 2.0 mgd. The artificial reduction in groundwater storage following tunnel construction and groundwater withdrawal reduced the groundwater discharge to the stream by approximately 50%. The mean daily flow and low-flow duration discharge characteristics before and after tunnel construction reflect this decline in baseflow (Table 2 and Figure 3).

[11] Izuka, S.K., Hill, B.R., Shade, P.J., Tribble, G.W. 1993. Geohydrology and possible transport routes of polychlorinated biphenyls in Haiku Valley, Oahu, Hawaii. U.S. Geological Survey Water-Resources Investigations Report 92-4168.
[12] Takahashi, K.J., Mink, J.F. 1985. Evaluation of major dike-impounded ground-water reservoirs, island of Oahu. U.S. Geological Survey Water-Supply Paper 2217.
[13] Hirashima, G.T. 1962.
[14] Nichols, W.D., Shade, P.J., Hunt Jr., C.D. 1996. Summary of the Oahu, Hawaii, regional aquifer-system analysis. U.S. Geological Survey Professional Paper 1412-A.

Figure 2. Cross-section depiction of the geology of Ha'ikū Valley with marginal dike zone and dike complex areas identified providing context for the groundwater-surface water interactions, Windward O'ahu. (Source: Izuka et al. 1993)

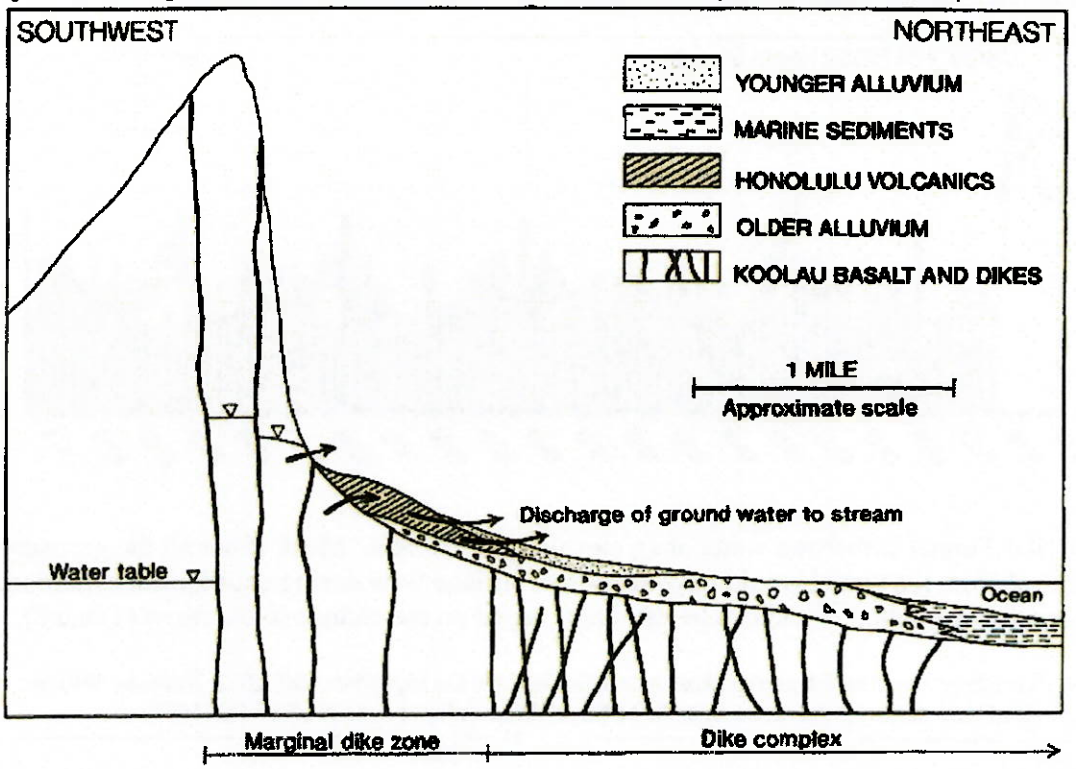


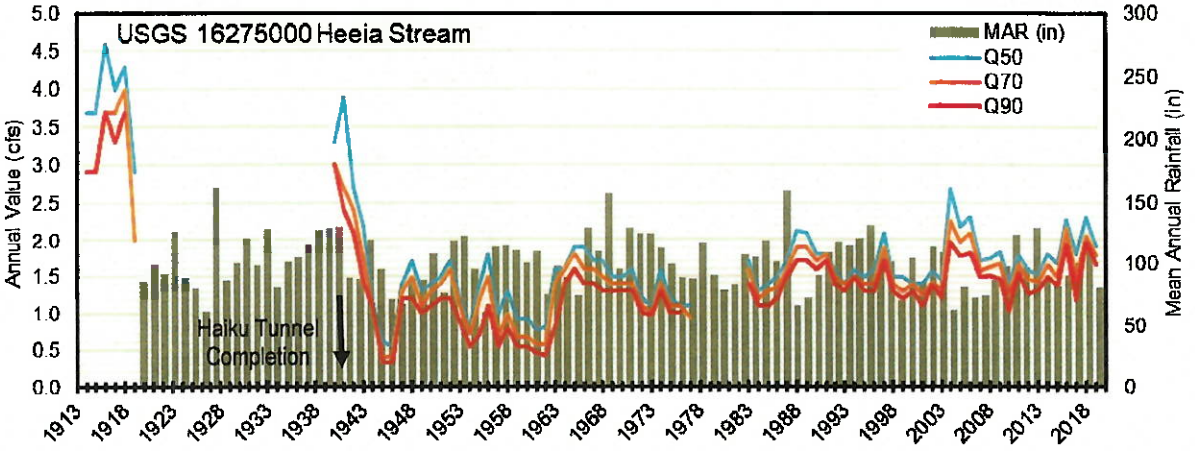
Table 2. Estimated mean daily flow, median (Q_{50}) and low flow (Q_{60} to Q_{95}) values for He'eia stream at USGS 16275000 before (1911-1940) and after (1941-present) Ha'ikū Development Tunnel (well 2450-001) construction in the He'eia hydrologic unit on Windward Oahu. [cfs = cubic feet per second; mgd = million gallons per day]

time period	median baseflow	mean daily flow	discharge (Q) for a selected percentage ($_{xx}$) discharge was equaled or exceeded			
			Q_{50}	Q_{70}	Q_{90}	Q_{95}
1914-1940	3.28 (2.11)	4.5 (2.94)	3.7 (2.39)	3.3 (2.13)	2.9 (1.87)	2.9 (1.87)
1941-present	1.23 (0.79)	2.6 (1.68)	1.5 (0.97)	1.2 (0.78)	0.43 (0.28)	0.36 (0.23)
1989-2019	1.48 (0.96)	2.4 (1.58)	1.7 (1.12)	1.5 (0.98)	1.3 (0.84)	1.26 (0.81)

OTHER HYDROLOGIC CONSIDERATIONS

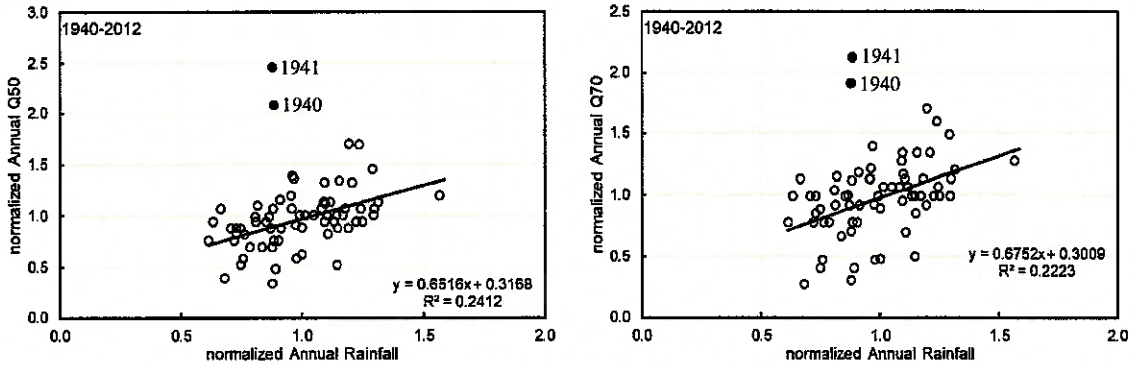
Groundwater-surface water interactions influence the extent of gaining and losing stream reaches. A gaining reach is where the streambed intersects the underlying water table and groundwater contributes to streamflow as seepage or springs. A losing reach is where the streambed is above the water table and surface water infiltrates the streambed recharging the aquifer. The extent of groundwater contributions to streamflow influence median and low-flow statistics. While overlapping rainfall and streamflow data are sparse prior to tunnel development, the years 1940 and 1941 are obvious outliers when normalized annual rainfall is compared to normalized annual Q_{50} or Q_{70}, indicating an anomalous amount of baseflow relative to rainfall compared to data from the post-tunnel construction time period (Figure 4).

Figure 3. Annual Q_{50}, Q_{70}, and Q_{90} values (in cubic feet per second, cfs) for He'eia stream at USGS 16275000 and mean annual rainfall from 1920-2012 (from Frazier and Giambelluca, 2012). Ha'ikū Tunnel was constructed from October 1940 to March 1941



The Ha'ikū Tunnel withdraws water at an elevation of 550 feet. Most, if not all the groundwater withdrawal from the tunnel would have supported surface flow during equilibrium conditions (pre-tunnel construction)[15] and can be estimated based on the change in baseflow (Table 2).

Figure 4. Normalized annual rainfall vs normalized annual Q_{50} (left) and Q_{70} (right) from 1940-2012. Points for 1940 and 1941 identified in filled black circles. [note: rainfall is for the portion of Ha'ikū Valley upslope of USGS 16275000]



He'eia Stream gains streamflow via groundwater seepage as it flows from mauka to makai. During selected periods of time, the USGS made synoptic measurements (simultaneous point measurements) at locations during low-flow conditions. These "seepage" measurements are used to quantify the gains and losses of streamflow due to interactions with the groundwater system. Many measurements were made in the early 1940s and early 1960s, and again in the late 1980s. Using the upstream and downstream measurements, and the length of stream channel between the measurements, estimates of gains and losses of streamflow can be calculated. Overall, He'eia Stream is gaining flow below the Ha'ikū Tunnel to its confluence with the 'Ioleka'a Stream at an elevation of 140 feet, corresponding to the stream channel incising the Honolulu Volcanics in Ha'ikū Valley.

[15] Hirashima, G.T. 1962.

Gains in streamflow ranged from 10.0 to 13.2 cfs per mile of channel (6.64 to 8.53 mgd per mile) at higher elevations and between 6.0 to 0.23 cfs per mile (4.0 to 0.16 mgd per mile) of channel at middle elevations. Total net gain in seepage from 570 feet in elevation to the marsh at 95 feet in elevation is approximately 7.0 cfs (4.5 mgd). This is further supported by the 8.34 cfs (5.39 mgd) measured on 9/20/2018 and 10.33 cfs (6.68 mgd) measured on 11/16/2018 above the Hop Tuck Intake in He'eia Marsh when mean daily flow was measured as 2.17 cfs (1.40 mgd), and 2.51 cfs (1.62 mgd) at USGS station 16275000; resulting in stream gains of 6.17 cfs (3.99 mgd) and 7.82 cfs (5.05 mgd), respectively, including surface water inflow from 'Ioleka'a Stream.

CLIMATE CHANGE

Long-term (1920-2012) and recent (1983-2012) trends in rainfall indicate significant declines in rainfall across certain areas of windward O'ahu (Figure 5), particularly during the dry season. However, there has been minimal change in rainfall within the He'eia hydrologic unit[16]. Total annual and seasonal rainfall trends indicate no significant ($p > 0.1$) trend in dry season, wet season, or total annual rainfall[17] (Figure 6). Dynamical[18] and statistical[19] downscaled rainfall estimates for the mauka portion of He'eia watershed (i.e., above USGS 1627500) for current and future projected changes in rainfall are provided in Table 5. Overall, end-of-century annual and seasonal rainfall is projected to increase in He'eia based on the dynamical downscaled data and projected to decrease based on the statistical downscaled data.

ISSUES/ANALYSIS

The next step to developing an IFS is to weigh often-competing instream and noninstream uses of water against the amount of water available to accommodate the needs of these uses. Again, the quantity and quality of information varies from stream to stream. This step is further complicated by the tremendous variability of instream and noninstream uses across and within surface water hydrologic units. For example, one stream may support extensive kalo cultivation while another may primarily support domestic uses. The potential of the stream and hydrologic unit to support additional water use in the future has also been considered, as has the four public trust purposes of water. The process is to be based upon best available information when weighing the present or potential, instream and noninstream uses in order to provide balance.

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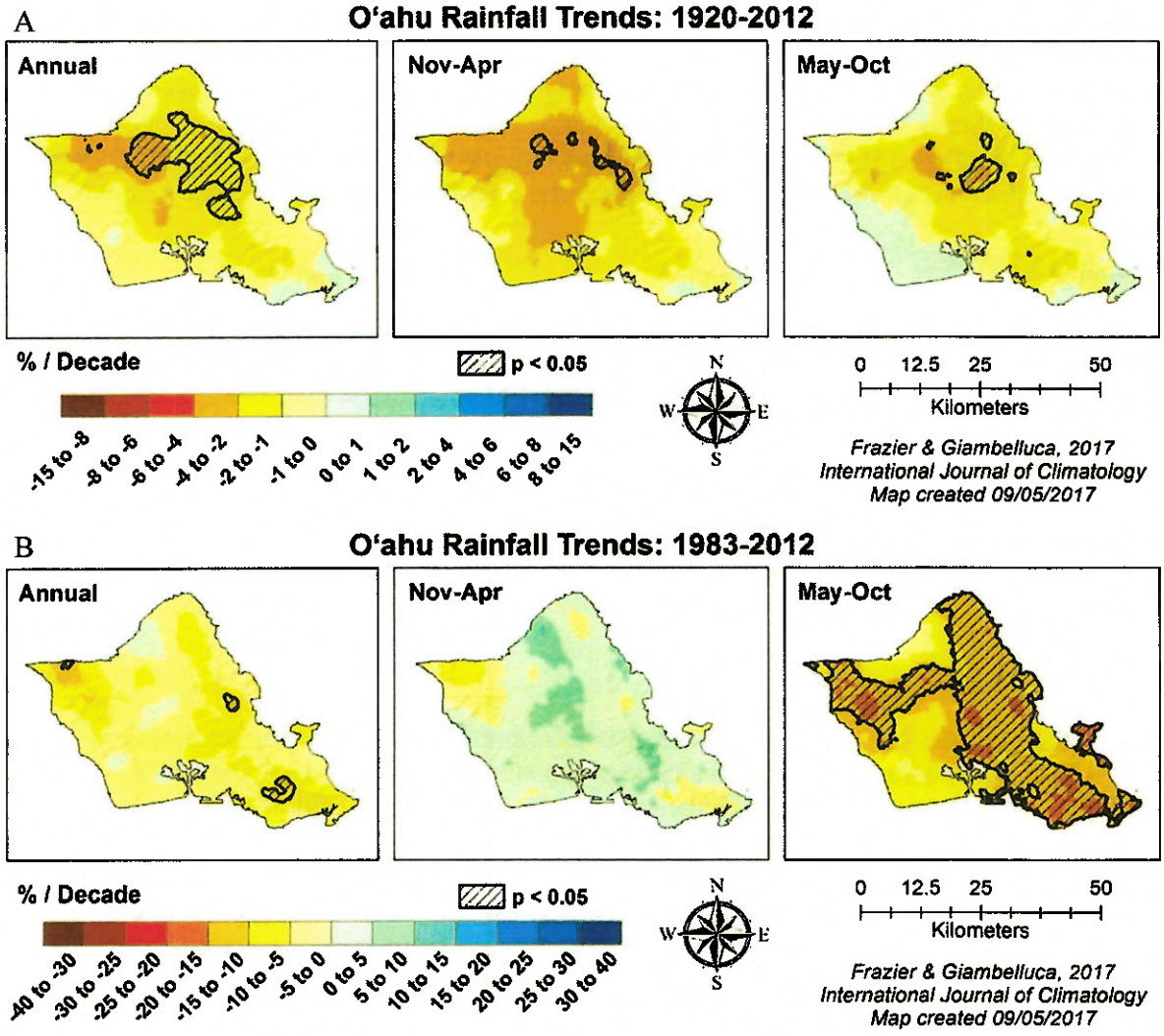
[16] Frazier, A.G. Giambelluca, T.W. 2017. Spatial trend analysis of Hawaiian rainfall from 1920 to 2012. International Journal of Climatology, 37(5): 2522-2531.

[17] Non-parametric Mann-Kendall trend test for hydrologic time-series with Sen's slope estimate: dry season rainfall (Z_{90} = -0.63; Sen's slope Q = -0.019, 95% CI = -0.097, 0.045); wet season rainfall (Z_{90} = -0.47; Sen's slope Q = -0.037, 95% CI = -0.196, 0.117); total annual rainfall (Z_{90} = -0.64; Sen's slope Q = -0.054, 95% CI = -0.238, 0.126)

[18] Zang, C., Wang, Y., Hamilton, K, Lauer, A. 2016. Dynamical downscaling of the climate for the Hawaiian Islands. Part II: Projection for the Late Twenty-first Century. Journal of Climate, 29:8333-8354.

[19] Elison Timm, O., Giambelluca, T.W., Diaz, H.F. 2015. Statistical downscaling of rainfall changes in Hawaii based on the CMIO5 global model projections. Journal of Geophysical Research: Atmospheres, 120:92-112.

Figure 5. Annual, wet season (Nov-Apr) and dry season (May-Oct) rainfall trends for the 1920-2012 (A) and 1983-2012 (B) periods, Oahu. Hashed line areas represent significant trend over the period. (with permission from Frazier and Giambelluca, 2017)



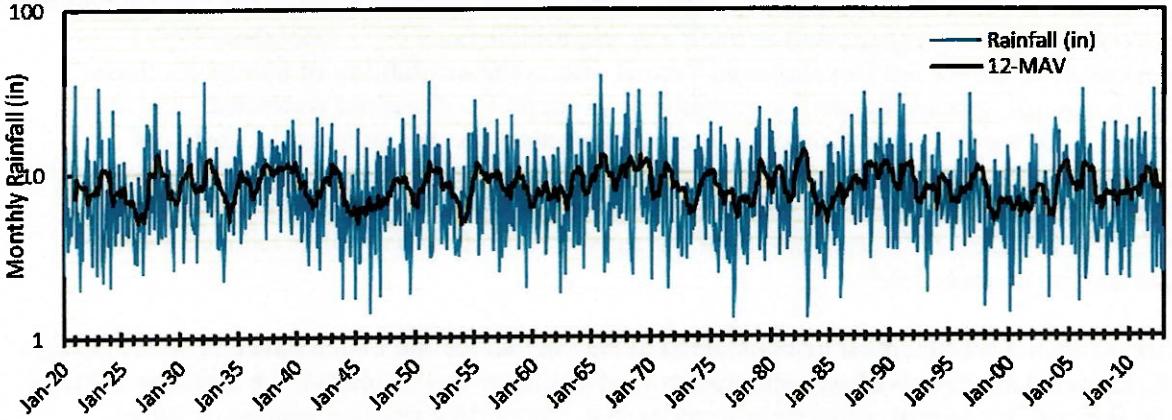
Instream Use Considerations:

The Hawaiian ahupua'a concept is focused on mauka-to-makai streamflow, with many cultural representations of the stream, including ceremonial and religious traditions tied to flowing water that are severed when connectivity is lost. The resurgence of traditional Hawaiian culture, local food productivity, and the protection of freshwater, wetland, and estuarine habitat for native and endemic species have amplified the need to incorporate a biocultural landscape perspective. Additionally, community awareness of the interconnectivity of the land ('āina), freshwater (wai) and ocean (kai) resources within an ahupua'a is pushing resource managers to re-imagine the landscape as an ecologically, economically, and culturally sustainable place.

Table 5. Present day observed rainfall, future mean rainfall, future percent change in rainfall, and future absolute change in rainfall for annual, dry season, and wet season time periods for the 4.5 RCP and 8.5 RCP climate projections in the mauka portion of the He'eia watershed based on dynamical and statistical downscaling. note: values affected by rounding; RCP = Representative Concentration Pathway (Source: A. Frazier, pers. comm)

	Annual		Dry Season		Wet Season	
Present Day Mean (1990-2009) (in)	97.5		39.6		57.2	
Dynamical Downscaling	**RCP 4.5**	**RCP 8.5**	**RCP 4.5**	**RCP 8.5**	**RCP 4.5**	**RCP 8.5**
Future (2080-2100) Mean (in)	100.0	111.8	43.2	51.2	59.6	66.4
Future Percent Change	+8.7%	+14.8%	+8.7%	+29.5%	+4.2%	+16.1%
Present Day Mean (1978-2007) (in)	104.7		43.0		61.7	
Statistical Downscaling	**RCP 4.5**	**RCP 8.5**	**RCP 4.5**	**RCP 8.5**	**RCP 4.5**	**RCP 8.5**
Future (2071-2099) Mean (in)	100.7	99.8	39.3	36.7	61.4	63.1
Future Percent Change	-3.9%	-4.7%	-8.7%	-14.8%	-0.5%	+2.3%

Figure 6. Monthly rainfall for the portion of the watershed that contributes to streamflow measured at USGS 16275000 on He'eia Stream from 1920-2012, He'eia hydrologic unit Oahu. Bold line indicates 12-month moving average (with permission from A. Frazier).



In He'eia, restoration of upland and lowland stream, riparian, and cultural resources by community organizations and non-profit groups has expanded the cultivation of lo'i kalo, the production of aquaculture, and the amount of usable habitat for native biota. Based on historic data and current land ownership, it is likely that 0.014 square miles (9 acres) of wetland lo'i can be grown in Ha'ikū Valley and 0.347 square miles (222 acres) of wetland lo'i could be developed in the He'eia wetland. This would require at least 1.80 mgd of flow through water (1.92 mgd total) based on 0.200 mgd per acre per day in the upland region, much of it supplied by spring flow.

The He'eia ahupua'a serves as a living laboratory and center for educational opportunities at all levels and ages. The non-profit organization Papahana Kua'ola leases 63 acres of land from Kamehameha Schools to create an innovative and culturally-minded program of education, land restoration, food production, and environmental sustainability in Ha'ikū Valley. Their programs focus on cultural stewardship of the land and water resources, native species restoration, and education.

Kāko'o 'Ōiwi leases 38 acres of land within the 405 acre He'eia wetland owned by HCDA to cultivate lo'i kalo and other culturally important food crops. There is currently one 'auwai from an unregistered diversion (Hop Tuck Intake) and one 'auwai from a registered diversion (Wing Wo Tai Intake) supplying sufficient water for three lo'i complexes (approximately 3.5 acres), which is anticipated to grow to 11 acres in the near-term (<5 years) and to as much as 80 acres (<20 years). Kāko'o 'Ōiwi is experimenting with kalo varieties that require less water to reduce their water demand. Using a consumptive demand of 13,540 gallons per acre per day (gpad) and a flow-through demand of 200,000 gpad, the current instream lo'i kalo water demand is 0.75 mgd, with an anticipated water demand at full implementation of their long-term plan much more. Additional water would be needed to irrigate other food crops grown on site.

The maintenance and restoration of stream and wetland habitat in He'eia will benefit from increased streamflow. Historic biota surveys documented by the Division of Aquatic Resources (DAR) has identified numerous endemic species including *Atyoida bisulcata* ('ōpae kala'ole), *Eleotris sandwicensis* ('o'opu akupa), *Kuhlia xenura* (āholehole), *Eleotris sandwicensis* ('o'opu nōpili), *Macrobrachium grandimanus* ('ōpae 'oeha'a), *Stenogobius hawaiiensis* ('o'opu naniha) and *Neritina vespertina* (hapawai) in the lower and middle reaches[20]. Decreased flow downstream of the Ha'ikū Development Tunnel affects the availability of habitat for these endemic aquatic species, the ability of wetlands to support endangered waterbirds, and the functioning of the nearshore fishpond. Increased streamflow will support the upstream recruitment of post-larvae juveniles of aquatic amphidromous species. Streamflow also benefits the operation of the He'eia fishpond at the mouth of the stream by supplying freshwater and nutrients that increase the productivity of the aquatic food chain as well as reduced salinity important for juvenile fish[21].

Other instream uses that must be considered in He'eia include the maintenance of water quality (e.g., temperature, dissolved oxygen, transport of sediment and turbidity), the aesthetic value of water flowing in a stream, ecosystem services (e.g., supporting riparian species of value, streambank stability, biogeochemical cycling), and the recreational value to the community.

Noninstream Use Considerations and Availability of Alternative Sources:
The He'eia hydrologic unit is part of the Ko'olaupoko aquifer system within the Windward Aquifer Sector. The HBWS water distribution system sources water from across the aquifer

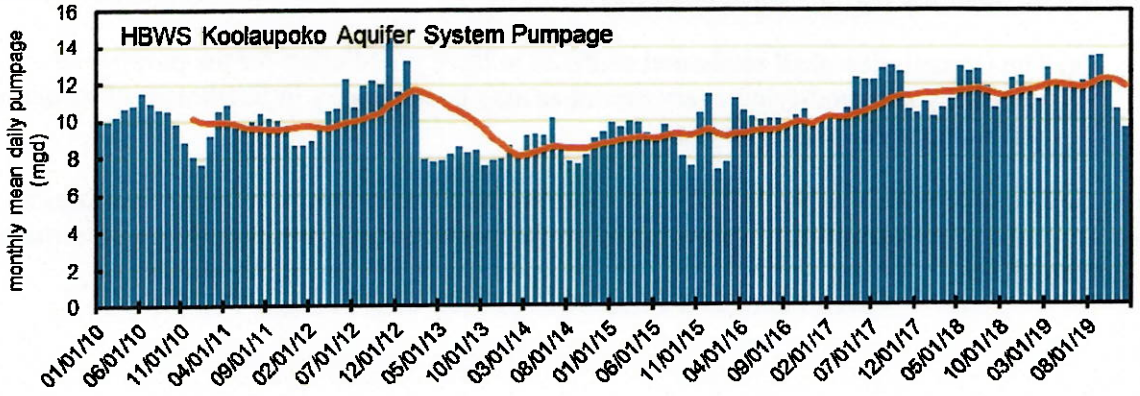
[20] Parham, J.E., Higashi, G.R., Lapp, E.K., Kuamoo, D.G.K., Nishimoto, R.T., Hau, S., Fitzsimons, J.M., Polhemus, D.A., Devick, W.S. 2008. He'eia, O'ahu (Watershed Code 32008). In: Atlas of Hawaiian Watersheds and Their Aquatic Resources. Division of Aquatic Resources, State of Hawaii Department of Land and Natural Resources.
[21] Keala, G., Hollyer, J.R., Castro, L. 2007. Loko i'a: A Manuel on Hawaiian Fishpond Restoration and Management. College of Tropical Agriculture and Human Resources, University of Hawai'i at Mānoa.

system and can deliver water to urban areas within and outside of the hydrologic unit (e.g., Kāne'ohe, Kailua). In 2000, the HWBS potable water system delivered 19.840 mgd to the Ko'olaupoko District, which includes the aquifer systems of Ko'olaupoko, and Waimānalo, and the surface water hydrologic units from Kualoa to Makapu'u. Based on a slight (4%) decline in the population, the low-, mid-, and high-projected municipal water demand in 2030 for the district is 17.575 mgd, 17.944 mgd, and 18.313 mgd, respectively, from 18.060 mgd in 2000[22]. In 2000, the HBWS system imported 8.838 mgd of groundwater from the Ko'olauloa District into the Ko'olaupoko District, but this is projected to decline to 6.600 mgd by 2030 through conservation. The total installed pump capacity in the aquifer system is 14.55 mgd, with 86 wells. Total monthly pumpage from the aquifer system by the HBWS is provided in Figure 7 and summarized in Table 6. From 2010 to 2019, the HBWS mean pumpage from the aquifer system was 10.27 mgd, with a median of 10.20 mgd, and a maximum of 14.44 mgd. The HBWS can offset reductions in withdrawal from any single source with water sourced from other wells. HBWS frequently ceases withdrawals from the Ha'ikū Tunnel for extended periods of time (Figure 8). From 2013 to 2019, HBWS withdrew water from the Ha'ikū Tunnel only 42 out of 84 months, with an average of 1.019 mgd and a maximum of 2.064 mgd.

The 2019 update to the Water Resources Protection Plan[23] revised the sustainable yield of the Ko'olaupoko Aquifer System based on updated information from 30 mgd to 28 mgd. The largest metered water consumers (CY 2009) in the Ko'olaupoko District for HBWS are identified in Table 7, most of which is for non-potable uses.

Figure 8 depicts the mean daily tunnel withdrawal and groundwater pumpage for the three HBWS wells in the He'eia hydrologic unit. It is also possible that withdrawal of groundwater from Ha'ikū well and 'Ioleka'a well affects stream flow.

Figure 7. Total monthly mean daily pumpage by the Honolulu Board of Water Supply (HBWS) from the Ko'olaupoko Aquifer System and 12-month moving average.



[22] Ko'olau Poko Watershed Management Plan. 2012. Honolulu Board of Water Supply. Prepared by Townscape, Inc.
[23] Water Resource Protection Plan 2019 Update. State of Hawaii Commission on Water Resource Management. Prepared by Townscape, Inc.

As stated in the "*Waiāhole I*" Decision and Order, the Commission believes that an integrated water resource plan must be developed in order to prepare for O'ahu's water future[24]. This plan must address how we will meet water demand given our dwindling supply and must prioritize competing demands. An integrated water resource plan encompasses the concept of least-cost planning and considers all types of resources equally: new supply, conservation, reclaimed water, alternative rate structures, as well as other demand management methods. The planning process would assess and balance competing needs such as urban, agricultural, appurtenant rights, traditional and customary gathering rights, Hawaiian Home Lands rights, and stream protection, and set priorities for allocation decisions. An interim IFS that balances competing public trust uses can support the City & County of Honolulu's Ko'olau Poko Sustainable Communities Plan[25], which identifies the protection of He'eia, including it's high-quality perennial stream, wetland habitat, and ancient Hawaiian fishpond.

ALTERNATIVE SOURCES

Most of the largest metered water consumers identified in Table 7 are non-potable uses. The Kaneohe Klipper Golf Course (KKGC) is located on the Kane'ohe Marine Corps Base Hawai'i (MCBH) in the HBWS Ko'olaupoko District.

In 1966, KKGC was the first golf course in Hawai'i to utilize recycled water, using 0.6 to 1.0 mgd of R-2 water produced on site. Because of issues related to inconsistent disinfection and sprinkler clogging, the KKGC switched to irrigating with potable water from HBWS. KKGC is now the largest consumer of potable water in the HBWS Ko'olaupoko District. As a practical policy of the Commission, water use should be matched with the level of quality; with high quality potable water reserved for domestic consumption, and non-potable needs met with lower quality recycled water. The long history of documented R-2 on site use suggests that this is a practicable alternative to using potable water. Considering that HAR §13-169-22 provides for the review of water use permits when necessary:

> (a) The Commission shall retain and continue to have jurisdiction for the purpose of reviewing and modifying every permit as may be necessary in fulfillment of its duties and obligations under this code

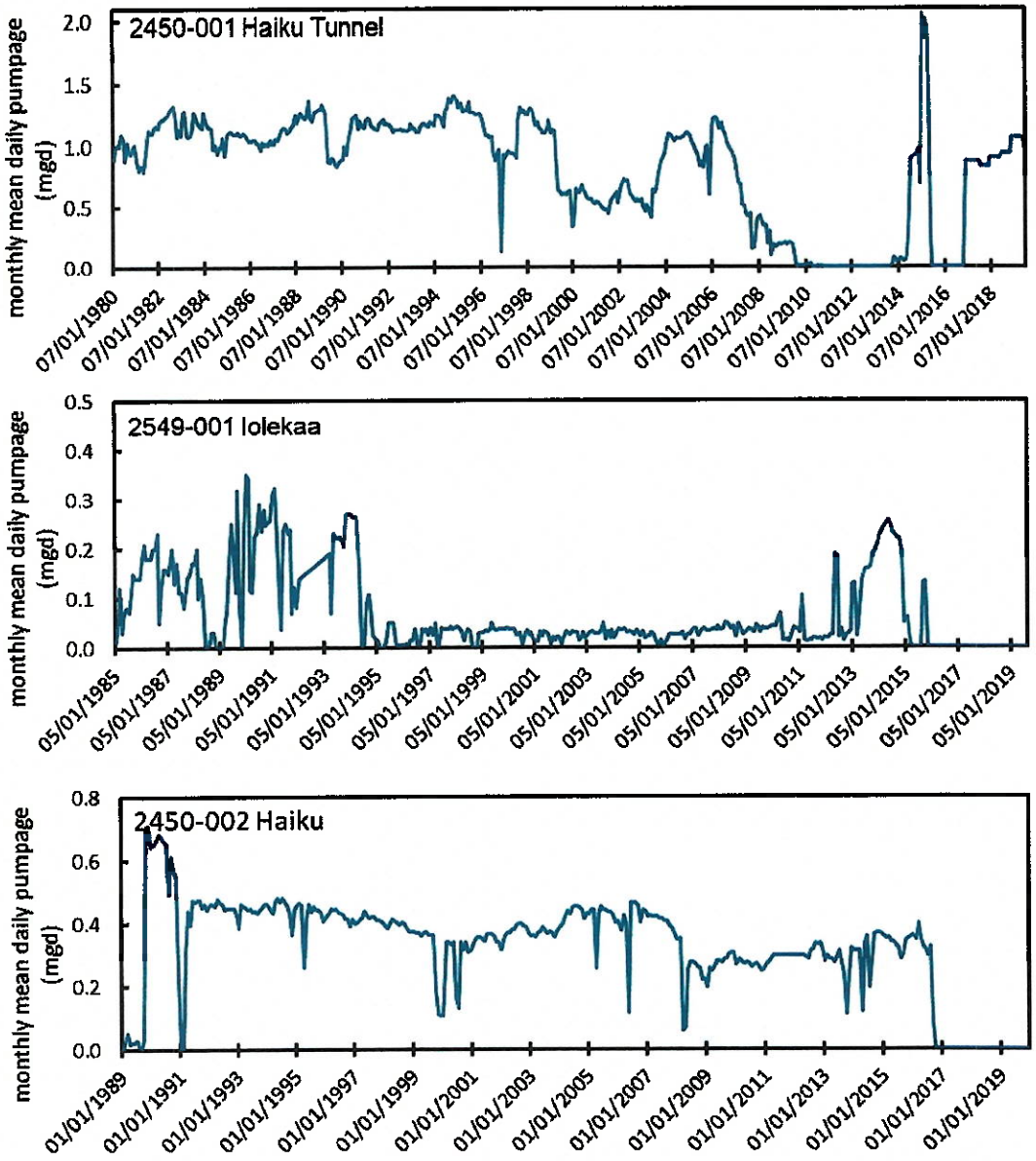
It is possible that in review of the HBWS Ko'olaupoko water use permits, a future Commission action may reduce the permitted amounts based on the availability of non-potable water to meet non-potable needs.

[24] Commission on Water Resource Management. 1997. p. 217. CCH-OA-15-001.
[25] Ko'olau Poko Sustainable Communities Plan. 2017. City and County of Honolulu. https://luc.hawaii.gov/wp-content/uploads/2019/12/A17-804-DPP-Exhibit.pdf

Table 6. Groundwater pumpage from source wells for the Honolulu Board of Water Supply from the Ko'olaupoko Aquifer System from 2013-2020. Note: values include months with zero withdrawal and the statistical distribution of pumpage thus has positive skew [Flows in million gallons per day, mgd]

well ID	well name	year drilled	pump capacity (mgd)	average monthly pumpage (mgd)	median monthly pumpage (mgd)	maximum monthly pumpage (mgd)
2247-001	Kamooalii II	1985	n/a	n/a	n/a	n/a
2248-001	Kamooalii I	1985	n/a	n/a	n/a	n/a
2348-002	Kuou I-1	1955	--	0.670	0.578	1.720
2348-003	Kuou I-2	1955	3.024	0.000	0.000	0.000
2549-001	Iolekaa	1966	0.302	0.057	0.000	0.257
2651-001	Kahaluu Tunnel	1947	n/a	1.846	1.842	2.575
2651-002	Waihee Tunnel	1955	n/a	3.770	4.260	7.721
2651-003	Kahaluu	1980	1.008	0.716	0.787	1.831
2652-002	Waihee Incline 1	1976	n/a	0.000	0.000	0.000
2652-003	Waihee Incline 2	1976	n/a	0.000	0.000	0.000
2652-001	Waihee Incline 3	1971	n/a	0.854	0.955	2.160
2652-004	Waihee Incline 4	1976	n/a	0.000	0.000	0.000
2751-002	Waihee I-1	1972	1.008	0.000	0.000	0.000
2751-003	Waihee I-2	1972	1.008	0.000	0.000	0.000
2348-005	Kuou II	1986	1.008	0.095	0.083	0.636
2348-006	Kuou III	1995	0.720	0.447	0.462	0.811
2349-001	Luluku Tunnel	1948	n/a	0.104	0.093	0.307
2349-002	Luluku	1984	1.008	1.001	1.006	1.180
2450-001	Haiku Tunnel	1940	n/a	0.525	0.594	2.064
2450-002	Haiku	1981	1.008	0.163	0.159	0.399
		Total =		10.248	10.819	

Figure 8. Monthly mean daily reported pumpage from Ha'ikū Tunnel (well 2450-001), 'Ioleka'a Well (well 2549-001) and Ha'ikū Well (well 2450-002). Note: period of record differs between graphs.



In 2021, HBWS experimented with reducing their water withdrawal from Ha'ikū Tunnel to examine if stream baseflow responded. While the reduction in withdrawal from an average of 1.0 mgd in 2020 to approximately 0.5 mgd did not occur until the beginning of April 2021, some increase in stream baseflow is observed in May 2021. An existing bulkhead installed and valved at 600 feet from the portal provides some small storage.

Table 7. Honolulu Board of Water Supply (HBWS) largest metered water consumers (CY 2009). (Source: Ko'olau Poko Watershed Management Plan, 2012)

	HBWS Customer	Average daily consumption (mgd)		HBWS Customer	Average daily consumption (mgd)
1	Kāne'ohe Marine Corps Base	1.698	6	Hawaii State Hospital	0.070
2	Mid Pacific Country Club	0.128	7	Hawaiian Memorial Park Cemetery	0.052
3	Kailua Regional WWTP	0.128	8	Pali Golf Course	0.044
4	Sea Life Park	0.104	9	Blue Stone Apartment Complex, Kailua	0.045
5	Olomana Golf Links	0.064	10	Pu'u Ali'i Community Association, Kāne'ohe	0.047

ASSESSMENT SUMMARY: HE'EIA STREAM

Maintenance of Fish and Wildlife Habitat. The 1990 Hawaii Stream Assessment ranks He'eia's aquatic resources as "moderate" (2 out of 4). Many native freshwater species have been found in the He'eia hydrologic unit, including 'o'opu nōpili, āholehole, 'o'opu naniha, and 'ōpae kala'ole, 'ōpae 'oeha'a and hapawai. Several native damselfly species (e.g., *Megalagrion sp., Megalagrion nigrohamatum nigrolineatum*) have also been identified in He'eia, meeting the criteria as a biotic stream of importance for native macrofauna diversity (>5 spp.) established by DAR. Many native and endangered wetland birds of cultural importance live, breed, nest, and forage in the He'eia wetland, including the Hawaiian Stilt (*Himantopus mexicanus knudseni*), Hawaiian coot (*Fulica alai*), and Hawaiian moorhen (*Gallinule chloropus sandvicensis*).

Outdoor Recreational Activities. He'eia has "substantial" (3 out of 4) outdoor recreational opportunities based on the Hawaii Stream Assessment, including hiking trails, fishing, swimming, and hunting.

Maintenance of Ecosystems. The riparian resources of He'eia were classified as "outstanding" (4 out of 4) by the Hawaii Stream Assessment. Non-native trees and shrubs can have a negative impact on the ecosystem, but are largely being managed by control measures. Streamflow returning to the ocean supports a diversity of nearshore and intertidal species, improving the fisheries, the muliwai, and the functioning of the fishpond.

Aesthetic. He'eia Stream supports continual mauka to makai flow with much aesthetic value and many opportunities for the public to access views of the stream.

Maintenance of Water Quality. He'eia Stream is classified by the Department of Health as Class 1b inland waters in the upper elevations and Class 2 inland waters in the lower elevations based on land use. It does not appear on the 2018 List of Impaired Waters in Hawai'i, Clean Water Act §303(d), although there was insufficient data to support any conclusions. Sufficient

water is needed to keep stream temperatures low enough to support lo'i kalo cultivation across a large number of lo'i complexes.

Conveyance of Irrigation and Domestic Water Supplies. He'eia Stream is not used for the conveyance of irrigation or domestic water supplies.

Protection of Traditional and Customary Hawaiian Rights. Both in Ha'ikū Valley and in the He'eia wetland, He'eia stream supports the cultivation of lo'i kalo. Fishing and gathering of aquatic biota is common in the muliwai and coastal areas. Additional water would benefit the needs of the nearshore fishpond. The return of native freshwater fish following increased flow restoration would support traditional gathering of these species.

The mauka to makai flow of He'eia Stream is of central importance to the community's cultural and spiritual sense of place. Various hula groups, educational groups, and community organizations reconnect with the Hawaiian culture through participation in activities centered around the flow of He'eia Stream

Paepae o He'eia manages the Heeia fishpond as a functioning Hawaiian aquaculture facility, supporting local food production while reinforcing the ancestral knowledge that supported large pre-contact Hawaiian populations.

The entire ahupua'a offers a natural laboratory for educational opportunities for all ages. In 2017, Heeia was added to the National Estuarine Research Reserve System (NERR), further solidifying its role in the educational landscape.

Noninstream Uses. From 1989 to 2019, during periods when the wells were in use, there was a mean, median, and maximum withdrawal of 0.869 mgd, 0.941 mgd, and 2.064 mgd of water from Ha'ikū Tunnel used for potable water supply, respectively. Similarly, from Ha'ikū Well there was a mean, median, and maximum withdrawal of 0.361 mgd, 0.370 mgd, and 0.708 mgd, respectively. From 'Ioleka'a well there was a mean, median, and maximum withdrawal of 0.072 mgd, 0.035 mgd, and 0.350 mgd, respectively.

RECOMMENDATION

He'eia Stream supported one of the most agriculturally productive areas on O'ahu. The Ha'ikū Tunnel, dug at an elevation of 550 feet, depleted the groundwater storage of high-elevation dike compartments which supplied baseflow to He'eia Stream. In 1971, the USGS recommended that bulkheading at a 10-foot thick dike compartment at approximately 1,200 feet from the tunnel entrance is the preferred method to restore the storage function of the aquifer. Tunnels with high recession constants (*b*), such as the Ha'ikū Tunnel, drain faster than tunnels with lower recession constants, and would therefore benefit more from bulkheading[26]. An existing bulkhead installed and valved at 600 feet from the portal provides some small storage. The substantial ecological

[26] Hirashima, G.T. 1971.

and cultural values supported by He'eia Stream, including habitat for native amphidromous species, restored native riparian environment, a healthy estuarine and near-shore ecosystem, recreational and aesthetic values, as well as the productivity of the He'eia fishpond and wetland to support a biocultural food production system, merits restoration of He'eia Stream to pre-tunnel baseflow. In order to protect these instream uses staff recommends that HBWS bulkhead the 10-foot thick dike compartment at approximately 1,200 feet from the tunnel entrance and valve separately from the bulkhead at 600 feet from the tunnel entrance. Such action would increase spring flow in Ha'ikū while providing a more reliable source of water supply for HBWS. This solution is expected to increase the natural capacity of the high-elevation groundwater system to store and discharge water to streams and springs in the moku of Ko'olaupoko.

As an interim measure, until the Ha'ikū tunnel is fully bulkheaded, Commission staff recommends that HBWS reduce their withdrawal from the Ha'ikū tunnel to 0.3 mgd. When the bulkheading process commences, the Ha'ikū tunnel will not be a viable source for HBWS, and therefore the entirety of the tunnel flow will be discharged into the stream.

In order to improve transparency among stakeholders, staff recommends that HBWS provides the daily amount of water withdrawn from each well source (Ha'ikū Tunnel, Ha'ikū well, and Ioleka'a well) at monthly intervals.

Following the bulkheading of the tunnel, staff will evaluate the resultant effects on stream baseflow and may amend the interim IFS or amend the HBWS water use permit as needed.

IMPLEMENTATION

- Within two years, HBWS will complete their feasibility study and preliminary engineering design for the proposed bulkhead.
- HBWS will communicate with the Commission and continue to coordinate with Kamehameha Schools, DHHL, Papahana Kuaola, HCDA, NERR, and Kāko'o 'Ōiwi water users.
- Upon completion of the feasibility study and engineering design, HBWS will have three years to complete the final design and construction of the bulkhead. .
- Following the installation of the bulkhead, staff will work with HBWS, Kamehameha Schools, DHHL, Papahana Kuaola, HCDA, NERR, and Kāko'o 'Ōiwi to evaluate the implications for baseflow in Ha'ikū Stream and determine the feasibility of establishing a numeric instream flow standard.
- If HBWS determines that bulkheading is not a feasible solution upon completion of the feasibility study, staff will recommend an amendment to the interim IFS or amend the HBWS water use permit as needed.

MONITORING

- Streamflow monitoring shall be maintained by HBWS coordinating with USGS.
- At monthly intervals, HBWS will provide monitoring of daily flow withdrawn from the Ha'ikū Tunnel, Ha'ikū well, and Ioleka'a well..
- Periodic biological surveys shall be conducted, subject to available funding, to monitor the response of stream biota.

- All claimants shall cooperate with staff in conducting appropriate investigations and studies, particularly with regard to granting access to stream channels and private property related to such investigations, subject to the provisions of the State Water Code, Chapter 174C, HRS.

EVALUATION

- One to two years following the completion of the bulkheading, staff shall report to the Commission on an evaluation of baseflow conditions in He'eia and nearby streams and make recommendations to amend instream flow standards at that time.

Ola i ka wai,

M. KALEO MANUEL
Deputy Director

Note: Exhibits 1 and 2 are available from the Commission website at:
http://dlnr.hawaii.gov/cwrm/surfacewater/ifs/oahu/3028-heeia/

Exhibit 1 Instream Flow Standard Assessment Report for He'eia Hydrologic Unit 3028, PR-2020-02
Exhibit 2 Compilation of Public Review Comments for He'eia (3028), Island of O'ahu, PR-2020-15

APPROVED FOR SUBMITTAL:

SUZANNE D. CASE
Chairperson

BOARD OF WATER SUPPLY

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

June 15, 2021

Ms. Suzanne D. Case, Chairperson
and Members
State Department of Land and Natural Resources
Commission on Water Resource Management
1151 Punchbowl Street, Board Room 132
Honolulu, Hawaii 96813

Dear Chairperson Case and Members:

Subject: Action Item B2 - Approve Order to Honolulu Board of Water Supply to Bulkhead Ha'ikū Tunnel (well 2450- 001) at the 10-foot Thick Dike 1,200 feet From the Portal Entrance and Reduce Their Withdrawal to 0.3 million gallons per day He'eia Hydrologic Unit, Ko'olaupoko.

The Board of Water Supply (BWS) recognizes the importance of setting an Amended Interim Instream Flow Standard (IIFS) for He`eia Stream. We appreciate the Commission's willingness to embrace a holistic watershed perspective and seek innovative solutions toward setting a reasonable IIFS for He`eia Stream. We are committed to partnering with the Commission staff and the US Geological Survey (USGS) in elevating scientific understanding of the hydro-geologic resources in He`eia and adjacent watersheds, evaluating workable forms of watershed restoration balancing public trust instream and public trust noninstream uses of He`eia water and implementing innovative and tested solutions. Although there may be different perspectives on the scale of restoration, we are working toward the same objective and we appreciate this opportunity.

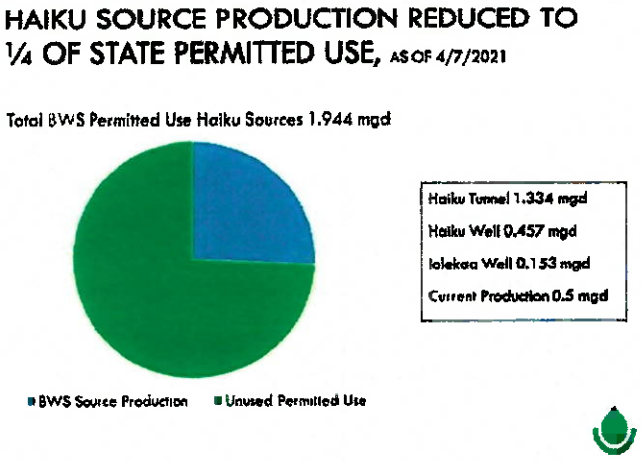
BWS agrees to fund the preliminary hydrogeology and engineering evaluation of an additional bulkhead in the BWS Haiku Tunnel in Fiscal Year 2021-2022, as a means to increase dike storage and water level elevation. We agree that increasing dike storage will have mutual watershed wide benefits to increasing stream and spring flow and provide a reduced but sustainable withdrawal for domestic use and water for Department of Hawaiian Homelands in mauka Ha'ikū Valley within the BWS municipal Ha'ikū-Luluku 500' water system.

As a follow-up to our testimony and discussion at the CWRM meeting of January 19, 2021, we are pleased to report the following progress:

1. BWS Board has approved funding in the BWS FY 2022 budget for the cooperative USGS study on the He`eia watershed and we are reviewing the agreement. The study scope was shared with CWRM staff and comments were incorporated. Execution of the cooperative agreement is anticipated in a month. USGS is conducting a site reconnaissance of the He`eia and Iolekaa Streams in the next week in preparation of their stream seepage runs later this summer. Stream seepage runs will determine which

stream segments are gaining or losing. We note that the USGS study will take 3 years to complete and this ability to have more scientific certainty of how water is stored and moves in the watershed, will be very important in it would be difficult in determining a reasonable IIFS.

2. BWS has throttled down production levels at Ha'ikū Tunnel from 1.0 mgd in January to 0.68 mgd on February 16 and to 0.5 mgd on April 7, 2021. BWS source production is now ¼ of our permitted use of Ha'ikū sources.

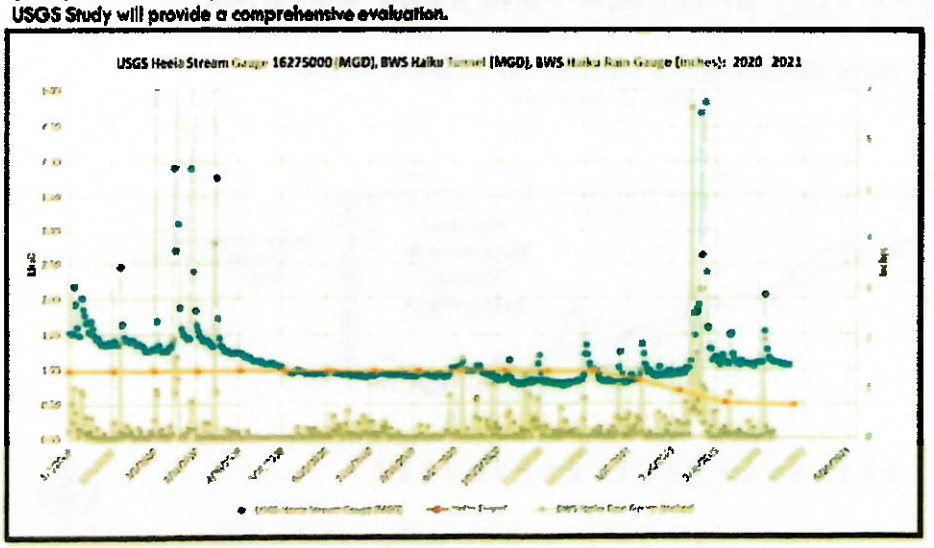


3. While the USGS study is being developed, BWS will keep withdrawals to a minimum, currently at 0.5 mgd. The Ha'ikū-Luluku 500' system is sensitive to system adjustments when demand approaches gravity input. To continue to adequately serve our existing customers, we need to ensure reservoir levels do not drop drastically and that water pressures are maintained especially for highest elevation users like Kamakau School in mauka Ha'ikū Valley and the Hawaii State Hospital. Our operations staff has expressed caution about water hammer surges in water pressures that could cause water main breaks in lower Maunawili when source input is reduced down. High summer water demand and low rainfall could trigger these system impact indicators. It is for these reasons that throttling Ha'ikū Tunnel withdrawals even lower to 0.3 mgd will require methodical trial and testing and greater reliance on our Luluku sources. It is a complex hydraulic challenge. When Ha'ikū Well is fully operational, we may have to pump well water into the water system to keep Ha'ikū Tunnel production at 0.3 mgd and still meet system demand.

4. As a result of the reduction in Ha'ikū Tunnel withdrawal, our hydrogeology staff has seen some increases in stream flow at the USGS He`eia Stream gage although they note that rainfall after March has been below normal. The national weather service is forecasting below normal rainfall through the summer.

Heeia Stream Gage, Rainfall and Haiku Tunnel Production

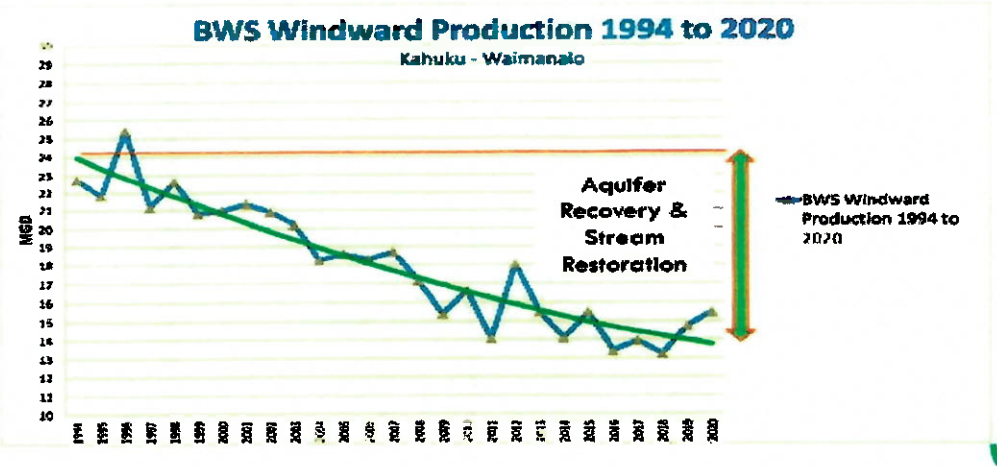
Haiku Tunnel production reduced from 1.0 mgd to 0.5 mgd on 4/7/21. Stream is recovering but not yet to the same extent of tunnel flow reduction. Possible factors: Recovery time & low rainfall post drought, Stream gaining above & below gage location, Flowing to loiekaa Stream and springs along streams. USGS Study will provide a comprehensive evaluation.



5. BWS is evaluating alternatives to assist Kāko'o 'Ōiwi through a re-envisioned watershed partnership agreement to promote water conveyance efficiencies, diversion measuring gages and supplemental agricultural water meters to accommodate their irrigation demands especially during droughts.

6. We note that from early 1990's when the BWS water conservation program was initiated, BWS windward production has decreased approximately 37% which results in aquifer recovery and stream restoration. We note that chlorides are still at elevated levels in select Ko`olauloa basal wells and Ko'olaupoko dike sources are more sensitive to pumping. Water conservation, sustainable watersheds and limits on water transfer policies and stream restoration projects including He`eia as a catalyst project were included in the adopted 2012 Ko'olaupoko Watershed Management Plan.

BWS CONSERVATION EFFORTS REDUCED WINDWARD POTABLE DEMAND BY 37%



Given the many competing needs for limited water resources in this watershed, BWS is appreciative of CWRM's holistic watershed approach in He`eia to ensure that the foregoing issues and alternative solutions are adequately considered and addressed before this Commission issues an IIFS decision.

If you have any questions, please contact me at 748-5061.

Very truly yours,

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

ITEM FOR INFORMATION NO. 3

"June 28, 2021

MY ACCOUNT
EPORTAL
PROJECT
UPDATE

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

Chair and Members:

Subject: My Account ePortal Project Update

Jennifer Elflein, Program Administrator, Customer Care Division will provide an update on the ePortal enhancement project.

Respectfully submitted,

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

Attachment"

The foregoing was for information only.

DISCUSSION: Jennifer Elflein, Program Administrator, Customer Care Division gave the report.

Board Member Sword inquired if login is not required to make payment on someone's bill how would payment be applied to the correct account.

Ms. Jennifer Elflein replied that login credentials are not required, however, if someone other than the account holder makes a payment it would require billing information and credit card information to be entered.

Manager Lau acknowledged the Communications Office who put together the instructional video and Mr. Steven Nordstrom who was the speaker in the video.

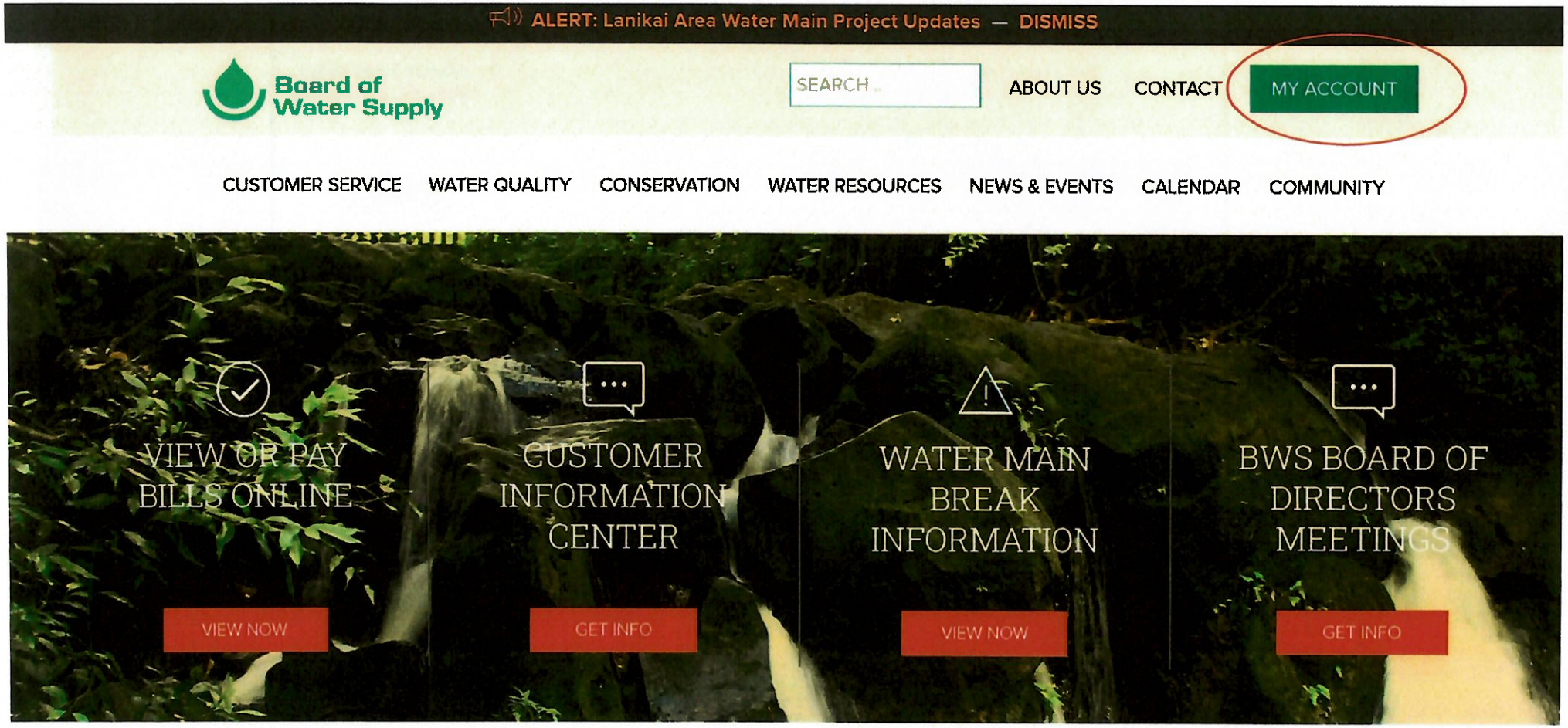
Chair Andaya asked if there were any further questions. There were no further questions.

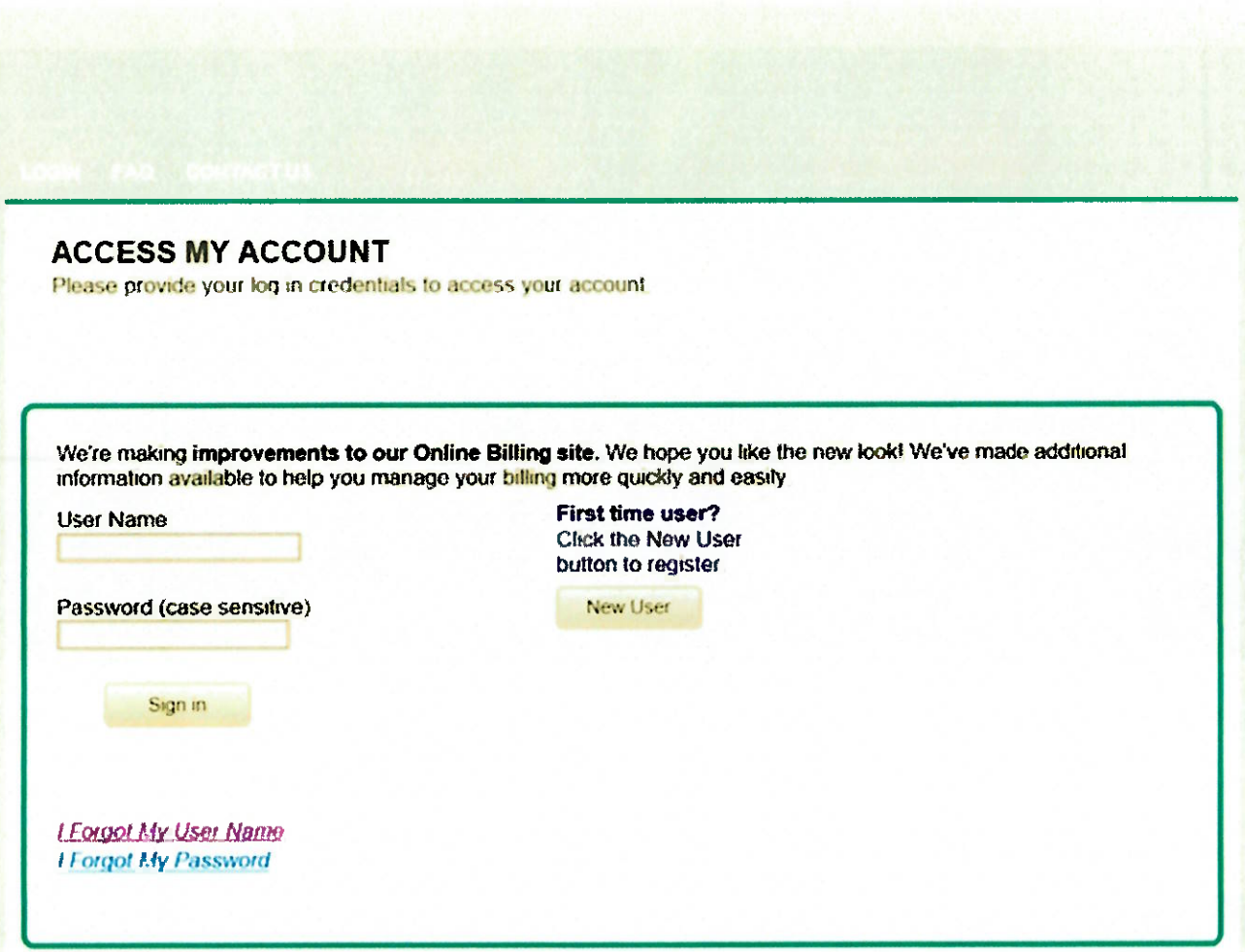
'MY ACCOUNT' EPORTAL PROJECT

Jennifer Elflein

June 28, 2021

www.boardofwatersupply.com


ALERT: Lanikai Area Water Main Project Updates — DISMISS
Board of Water Supply
SEARCH
ABOUT US
CONTACT
MY ACCOUNT
CUSTOMER SERVICE
WATER QUALITY
CONSERVATION
WATER RESOURCES
NEWS & EVENTS
CALENDAR
COMMUNITY
VIEW OR PAY BILLS ONLINE
VIEW NOW
CUSTOMER INFORMATION CENTER
GET INFO
WATER MAIN BREAK INFORMATION
VIEW NOW
BWS BOARD OF DIRECTORS MEETINGS
GET INFO


ACCESS MY ACCOUNT
Please provide your log in credentials to access your account
We're making improvements to our Online Billing site. We hope you like the new look! We've made additional information available to help you manage your billing more quickly and easily
User Name
Password (case sensitive)
Sign in
First time user?
Click the New User button to register
New User
I Forgot My User Name
I Forgot My Password

Welcome Jennifer!

Last Visit: Thu, Jun 10 2021 12:30am
Email: bills@gmail.com edit

- Payment Options
- Sign Up for Automatic Bill Payment
- How to Read Your Bill
- News & Updates
- Water Matters Newsletter
- How to Check for Leaks

Contact Us
Phone: 748-5000
Email: customerservice@hbws.org
Hours: 7 45am - 4 30pm
Monday - Friday, except holidays

Account Past Due or Water Service Disconnected? Do not pay your bill online. Please call us at (808) 748-5030 for assistance.

For further details, click the plus sign to the left of your account number.

Export to Excel

Account Number	Service Address	Account Balance	Payment must reach us by	Current Bill	Pay My Bill	Paperless Billing
+ 123456789	1234 Street	($161 95)	6/17/2021	View	Pay Now	Go Green!

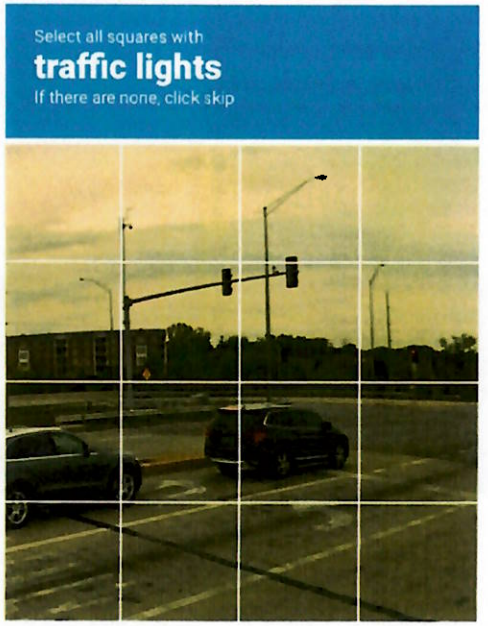
Add an Account

Your bill reflects the status of your account at the time it was issued. Any new activity (e g payments, adjustments, etc) will appear on your next bill.

QUICK FACTS ABOUT EPORTAL

- 27,000+ accountholders use the service to pay their bills each month
- 19% of BWS payments were made through the ePortal so far this year
- BWS does not assess a transaction or service fee for credit /debit card payments.
- Single-family residential rate payers only

ENHANCEMENTS COMING SEPTEMBER 1, 2021



- Branded to match the BWS corporate website
- Improved viewing and navigation across all devices
- Increased security - CAPTCHA
- Additional information and functionality
  - Make payment without registering or logging in
  - Send messaging/requests securely
  - View billing and payment history at-a-glance, and export the information

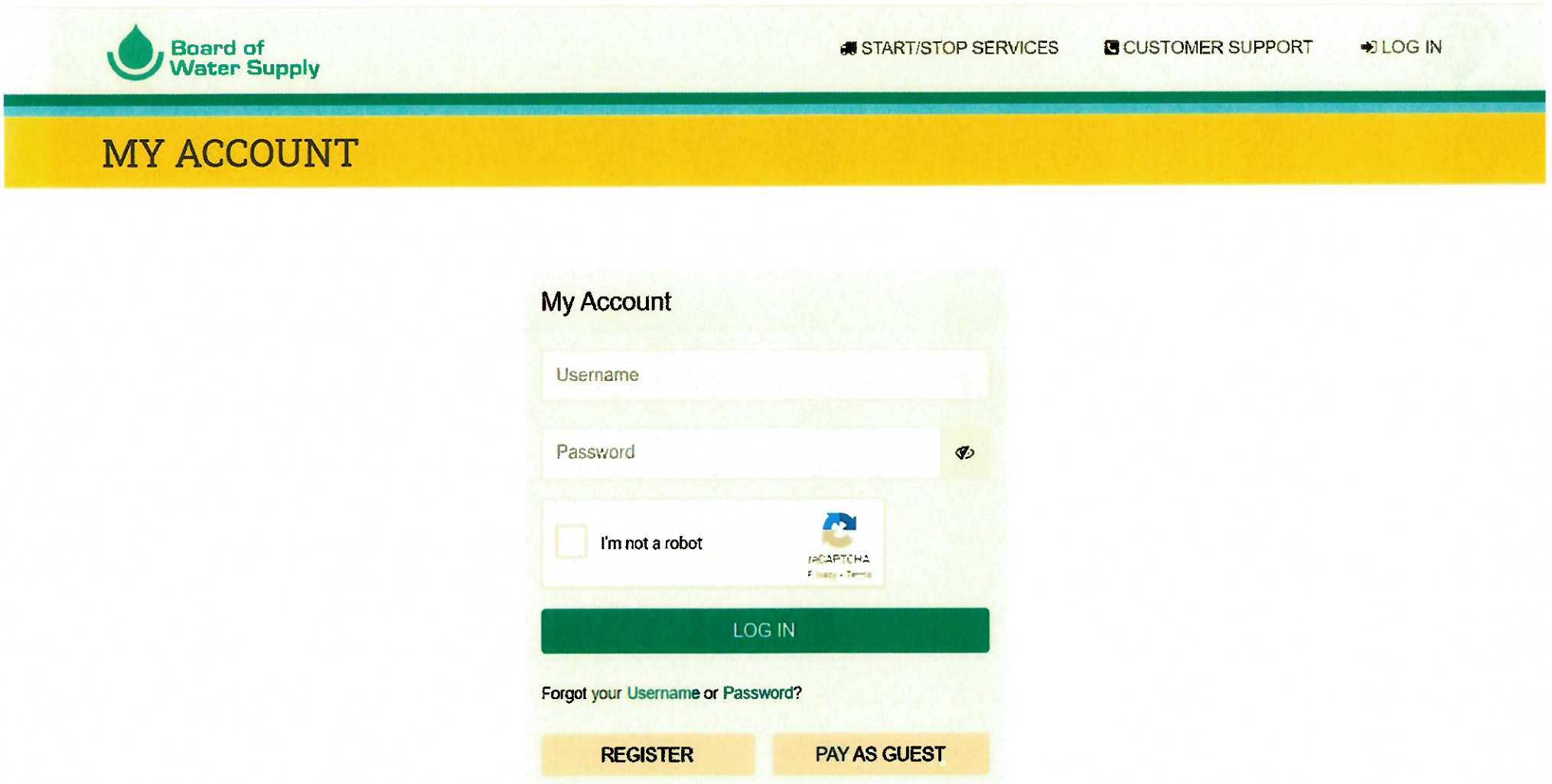
TIMELINE

- Employee Rollout – July
- Customer outreach – August + On-Going
- Go Live – September 1

Existing Users: 2 Steps

1. **Register**
2. **Re-enroll in eBills**

EXAMPLE: HOW TO PAY


Board of Water Supply
START/STOP SERVICES
CUSTOMER SUPPORT
LOG IN
MY ACCOUNT
My Account
Username
Password
I'm not a robot
reCAPTCHA
LOG IN
Forgot your Username or Password?
REGISTER
PAY AS GUEST

ACCOUNT OVERVIEW

Account # 123456789 Address 1234 Street HONOLULU, HI, 96816-3905

Welcome, Guest User of Jennifer Elflein !

Account Balance

$0.00

Due Date : **May 10, 2021**

MAKE PAYMENT

Balance Details

Past Due: **$0.00**

Current Bill: **$128.49**

Total Due: **$0.00**

Last Payment Details

Pending Payment Amount: **$0.00**

Last Payment: **$128.49**

Last Payment Date: **Apr 27, 2021**

LOOKUP ACCOUNT

LOG IN

Board of Water Supply

START/STOP SERVICES | CUSTOMER SUPPORT | LOG IN

MAKE A PAYMENT

Account # 123456789 | Address 1234 Street **HONOLULU, HI, 96816-3905**

Payment Method

- (●) Debit or Credit Card

Payment Amount

- (●) Current Charges **$128.49**
- ( ) Past Due Balance **$0.00**
- ( ) Total Amount Due **$0.00**
- ( ) Other Amount

Email Address

Email Address

[ ] **Board of Water Supply accepts debit and credit card payments through a third-party provider, Authorize.net.**

Debit/Credit Card Payment Terms of Use: By clicking **"Continue"** you authorize Board of Water Supply to use the amount you enter into the Authorize.net system as payment for your bill. In the event your debit/credit card issuer refuses the transaction for any reason, any credit for the payment made to your Board of Water Supply account will be reversed and a returned payment charge will be applied. By clicking "Continue" you acknowledge that your account will be updated to reflect the returned payment and, if the account is delinquent, collection actions may be initiated, including collection notices, fees, and suspension of water services.

CANCEL

CONTINUE

MAKE A PAYMENT

Verify Payment Information

Account # 123456789 Address 1234 Street **HONOLULU, HI, 96816-3905**

Payment Method	**Payment Amount**	$128.49	**Payment Date**
New Payment	**Transaction Fee**	$0.00	06/17/2021
	Total Amount	$128.49	

CANCEL EDIT PAYMENT CONTINUE

Board of Water Supply

START/STOP SERVICES | CUSTOMER SUPPORT | LOG IN

MAKE A PAYMENT

Payment Information

Account # 123456789 Address 1234 Street , **HONOLULU, HI, 96816-3905**

Please allow 2 business days for the payment to be posted to your account.

Order Summary

Total $ 128.49

Card Number * | Exp. Date * | Card Code

Billing Address

First Name | Last Name

Billing Country
USA | Zip

Street Address | City

State | Phone Number

Pay | Cancel

Payment Information

Account # 123456789 Address 1234 Street, Honolulu

Please allow 2 business days for the payment to be posted to your account.

HBWSTEST

Thu Jun 17 2021 5:19:09 PM

Continue

Thank you for your payment.

$ 162.58

Hide Details

Total $ 162.58

Billing Information

1234 Street, Honolulu
808-123-1234

Paid By MasterCard XXXX0015

Authorization Code: 34FTRU

Transaction ID: 40067602219

PO Number: 1174

Board of Water Supply

PROFILE CUSTOMER SUPPORT LOG OUT

ACCOUNT SUMMARY | BILLING | PAYMENTS | START/STOP SERVICES | CUSTOMER CENTER

PAYMENT HISTORY

Account # **9055938302** | Address **45-329 MAKALANI ST, KANEOHE, HI, 96744-2827**

123456789 1234 Street, Honolulu

Export

Payment Date	Total Paid	Payment Status
2021-06-17	$162.58	Pending
2021-04-08	$172.41	Processed
2021-03-08	$147.55	Processed
2021-02-09	$128.49	Processed

Mahalo!

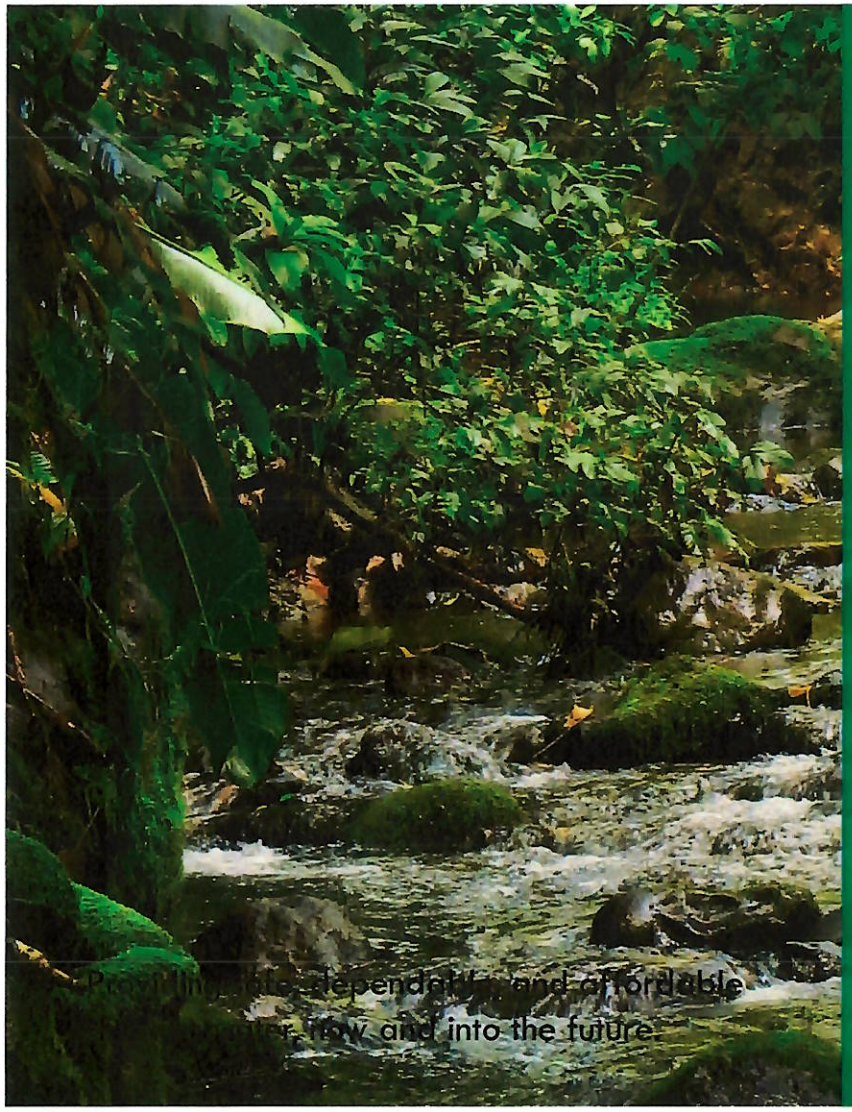
BOARD OF WATER SUPPLY

'MY ACCOUNT' EPORTAL PROJECT

JENNIFER ELFLEIN

JUNE 28, 2021

WWW.BOARDOFWATERSUPPLY.COM



Provide the safest, dependable and affordable
water now and into the future.

Mahalo!

BOARD OF WATER SUPPLY

ITEM FOR INFORMATION NO. 4

"June 28, 2021

STATUS UPDATE OF GROUNDWATER LEVELS AT ALL INDEX LEVELS

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

There were two aquifer index stations in low groundwater condition for the production month of May 2021. Punaluu and Waialua are in Caution Status. The monthly production average for May 2021 was 140.91 million gallons per day.

The Board of Water Supply rainfall index for the month of May 2021 was 51 percent of normal, with a 5-month moving average of 125 percent. As of June1, 2021, the Hawaii Drought Monitor showed abnormally dry conditions on most of the island of Oahu, except for portions of the windward side; and moderate drought conditions from Pearl Harbor to Kapolei. The National Weather Service is forecasting below normal precipitation for the summer months.

Most monitoring wells exhibited decreased head levels for the month, likely due to increased pumping during the summer dry season. Average monthly Production for May 2021 was slightly higher compared to 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.

PRODUCTION, HEAD AND RAINFALL REPORT
MONTH OF MAY 2021

POTABLE

STATION	MGD
HONOLULU (1)	
KULIOUOU	0.00
WAILUPE	0.13
AINA KOA	0.02
AINA KOA II	0.74
MANOA II	0.92
PALOLO	1.11
KAIMUKI HIGH	1.24
KAIMUKI LOW	2.30
WILDER	7.17
BERETANIA HIGH	4.83
BERETANIA LOW	1.28
KALIHI HIGH	0.00
KALIHI LOW	0.00
KAPALAMA	2.51
KALIHI SHAFT	7.48
MOANALUA	1.41
HALAWA SHAFT	10.47
KAAMILO	0.86
KALAUAO	6.06
PUNANANI	11.18
KAAHUMANU	0.27
HECO WAIAU	2.56
MANANA	0.36
WELLS SUBTOTAL:	62.89
MANOA TUNNEL	0.17
PALOLO TUNNEL	0.00
GRAVITY SUBTOTAL:	0.17
HONO. SUBTOTAL:	63.06

STATION	MGD
WINDWARD (2)	
WAIMANALO II	0.29
WAIMANALO III	0.00
KUOU I	0.97
KUOU II	0.06
KUOU III	0.76
LULUKU	0.90
HAIKU	0.00
IOLEKAA	0.00
KAHALUU	0.71
KAHANA	1.01
PUNALUU I	0.00
PUNALUU II	2.83
PUNALUU III	0.50
KALUANUI	1.21
MAAKUA	0.27
HAUULA	0.26
WELLS SUBTOTAL:	9.77
WAIM. TUNNELS I & II	0.00
WAIM. TUNNELS III&IV	0.19
WAIHEE INCL. WELLS	0.19
WAIHEE TUNNEL	4.33
LULUKU TUNNEL	0.20
HAIKU TUNNEL	0.48
KAHALUU TUNNEL	1.60
GRAVITY SUBTOTAL:	6.98
WIND. SUBTOTAL:	16.75

STATION	MGD
NORTH SHORE (3)	
KAHUKU	0.41
OPANA	0.22
WAIALEE I	0.42
WAIALEE II	0.64
HALEIWA	0.00
WAIALUA	2.05
N.SHORE SUBTOTAL:	3.74

MILILANI (4)	
MILILANI I	1.67
MILILANI II	0.00
MILILANI III	0.74
MILILANI IV	2.19
MILILANI SUBTOTAL:	4.60

WAHIAWA (5)	
WAHIAWA	0.97
WAHIAWA II	2.31
WAHIAWA SUBTOTAL:	3.28

PEARL CITY-HALAWA (6)	
HALAWA 277	0.67
HALAWA 550	0.00
AIEA	1.20
AIEA GULCH 497	0.16
AIEA GULCH 550	0.23
KAONOHI I	1.20
WAIMALU I	0.00
NEWTOWN	1.06
WAIAU	0.84
PEARL CITY I	0.83
PEARL CITY II	1.19
PEARL CITY III	0.25
PEARL CITY SHAFT	0.93
PEARL CITY-HALAWA SUBTOTAL:	8.56

STATION	MGD
WAIPAHU-EWA (7)	
WAIPIO HTS.	1.91
WAIPIO HTS. I	1.00
WAIPIO HTS. II	0.36
WAIPIO HTS. III	1.19
WAIPAHU	5.54
WAIPAHU II	2.34
WAIPAHU III	3.21
WAIPAHU IV	3.06
KUNIA I	0.04
KUNIA II	2.20
KUNIA III	2.92
HOAEAE	8.23
HONOULIULI I	0.00
HONOULIULI II	4.14
MAKAKILO	0.21
WAIPAHU-EWA SUBTOTAL:	36.35

WAIANAE (8)	
MAKAHA I	0.00
MAKAHA II	0.27
MAKAHA III	0.83
MAKAHA V	0.37
MAKAHA VI	0.00
MAKAHA SHAFT	0.00
KAMAILE	0.08
WAIANAE I	0.08
WAIANAE II	0.62
WAIANAE III	0.70
WELLS SUBTOTAL:	2.96
WAIA. C&C TUNNEL	1.40
WAIA. PLANT. TUNNELS	0.21
GRAVITY SUBTOTAL:	1.61
WAIANAE SUBTOTAL:	4.57

NONPOTABLE

NONPOTABLE	MGD
KALAUAO SPRINGS	0.43
BARBERS POINT WELL	1.23
GLOVER TUNNEL NP	0.31
NONPOTABLE TOTAL:	1.97

RECYCLED WATER (APRIL 2021)

RECYCLED WATER	MGD
HONOULIULI WRF R-1	7.20
HONOULIULI WRF RO	1.26
RECYCLED WATER TOTAL:	8.46

PRODUCTION, HEAD AND RAINFALL REPORT
MONTH OF MAY 2021

PRODUCTION SUMMARIES

TOTAL WATER	MGD
PUMPAGE	132.15
GRAVITY	8.76
POTABLE TOTAL:	140.91
NONPOTABLE	1.97
RECYCLED WATER	8.46
TOTAL WATER:	151.34

CWRM PERMITTED USE AND BWS ASSESSED YIELDS FOR BWS POTABLE SOURCES

	WATER USE DISTRICTS	A PERMITTED USE/ BWS YLDS	B MAY 2021	C DIFF. A-B
1	HONOLULU	82.93	62.89	20.04
2	WINDWARD	25.02	12.23	12.79
3	NORTH SHORE	4.70	3.74	0.96
4	MILILANI	7.53	4.60	2.93
5	WAHIAWA	4.27	3.28	0.99
6	PEARL CITY-HALAWA	12.25	8.56	3.69
7	WAIPAHU-EWA	50.63	36.35	14.28
8	WAIANAE	4.34	2.96	1.38
	TOTAL:	191.67	134.61	57.06

CWRM PERMITTED USE FOR BWS NONPOTABLE SOURCES

	WATER USE DISTRICTS	A PERMITTED USE	B MAY 2021	C DIFF. A-B
7	WAIPAHU-EWA (BARBERS POINT WELL)	1.00	1.23	-0.23
	TOTAL:	1.00	1.23	-0.23

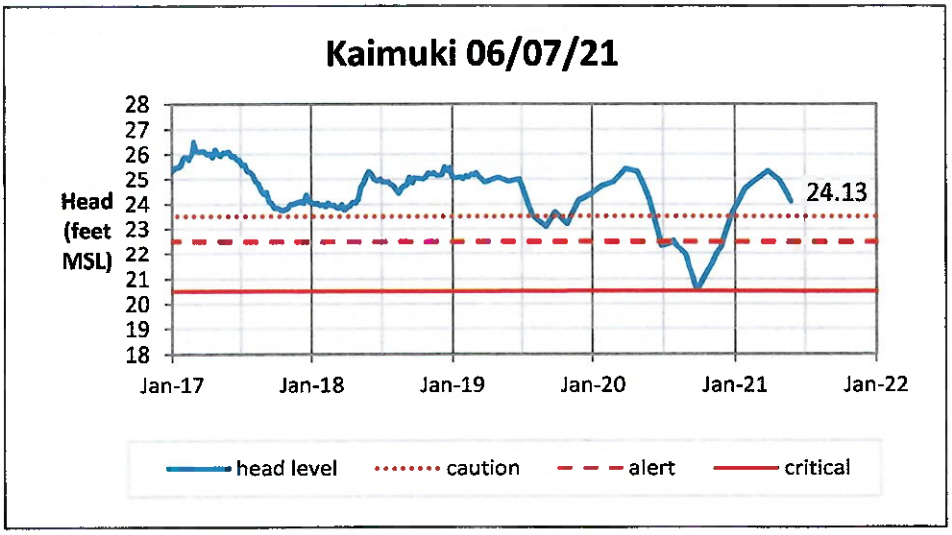
EFFECTIVE WATER DEMAND PER DISTRICT

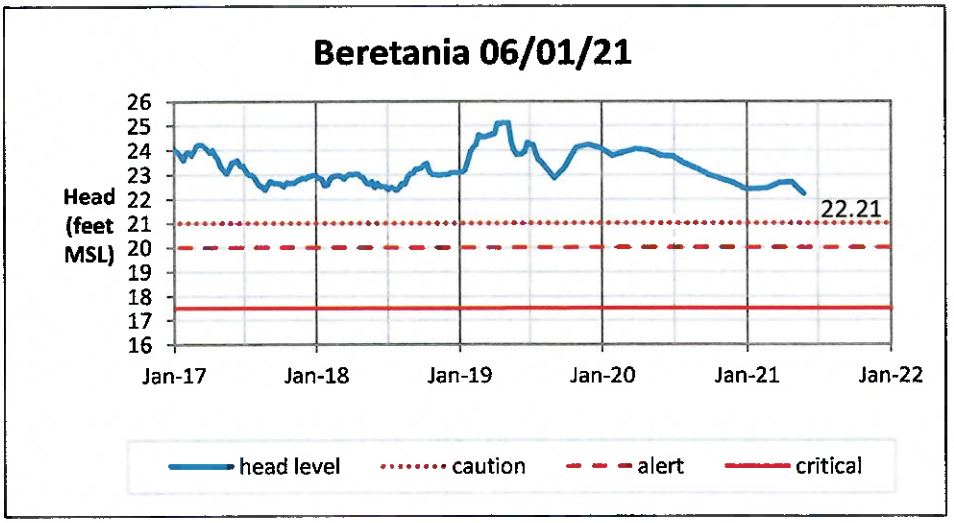
IMPORT/EXPORT BETWEEN WATER USE DISTRICTS

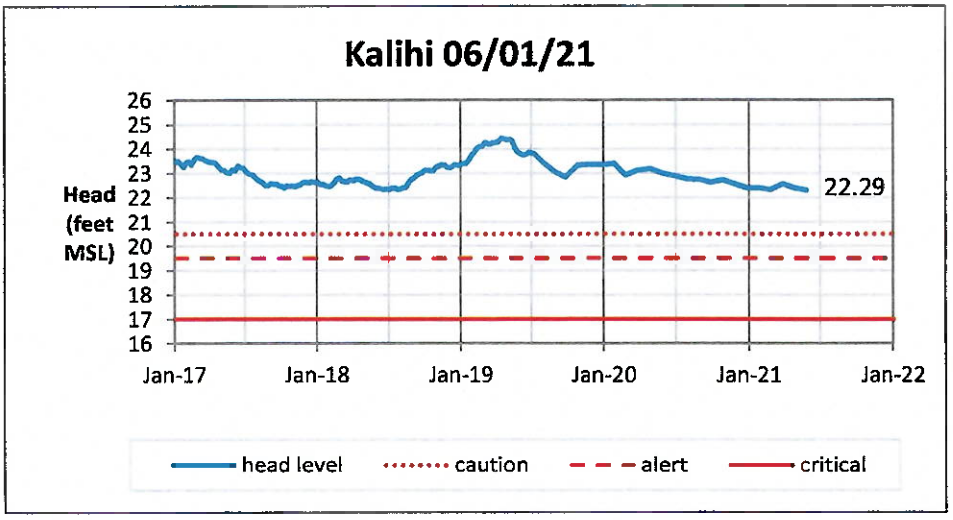
FROM	TO		MGD
2	1	WINDWARD EXPORT	0.58
7	8	BARBERS PT LB	6.44

	WATER USE DISTRICTS	SUBTOTAL	IMPORT	EXPORT	EFFECTIVE WATER DEMAND
1	HONOLULU	62.89	0.58	-	63.47
2	WINDWARD	12.23	-	0.58	11.65
3	NORTH SHORE	3.74	-	-	3.74
4	MILILANI	4.60	-	-	4.60
5	WAHIAWA	3.28	-	-	3.28
6	PEARL CITY-HALAWA	8.56	-	-	8.56
7	WAIPAHU-EWA	36.35	-	6.44	29.91
8	WAIANAE	2.96	6.44	-	9.40
	TOTAL:	134.61	7.02	7.02	134.61

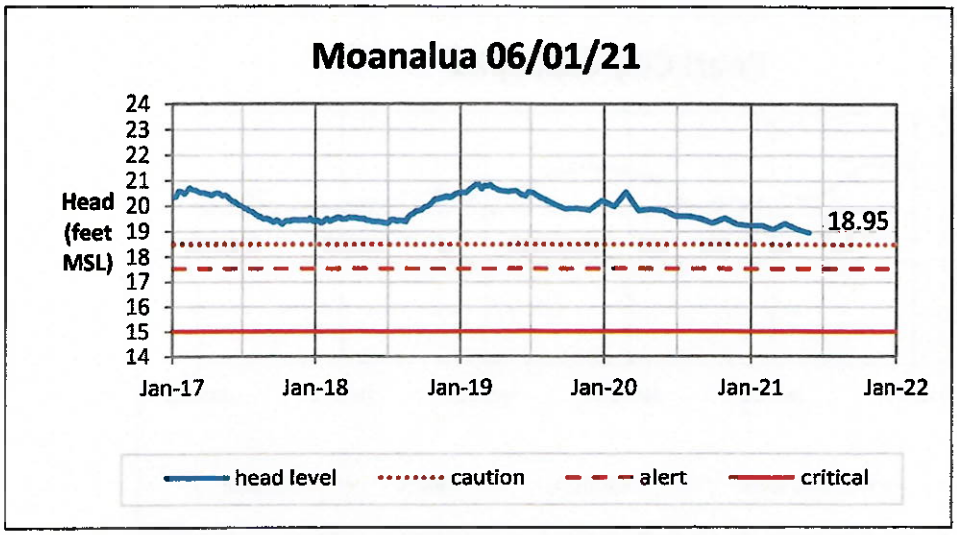
Head Report

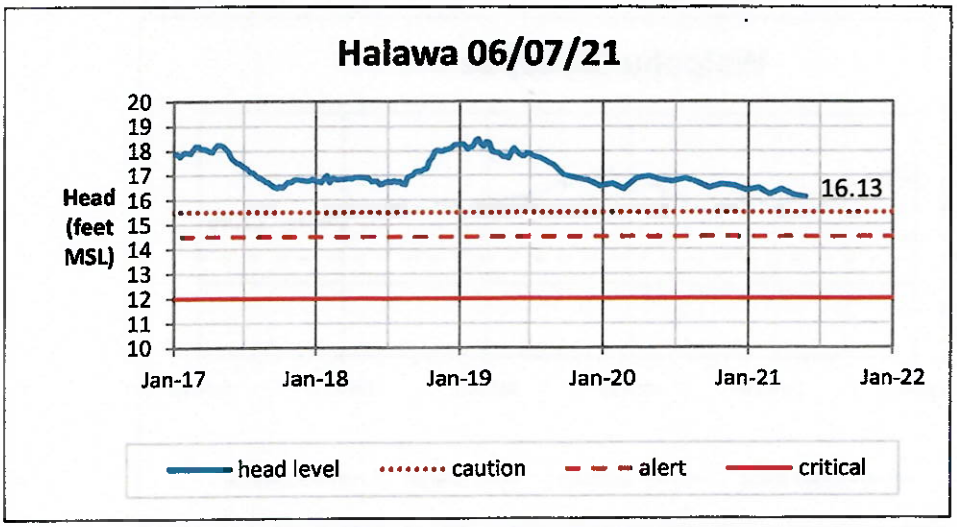

Kaimuki 06/07/21
Head (feet MSL)
28
27
26
25
24
23
22
21
20
19
18
24.13
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

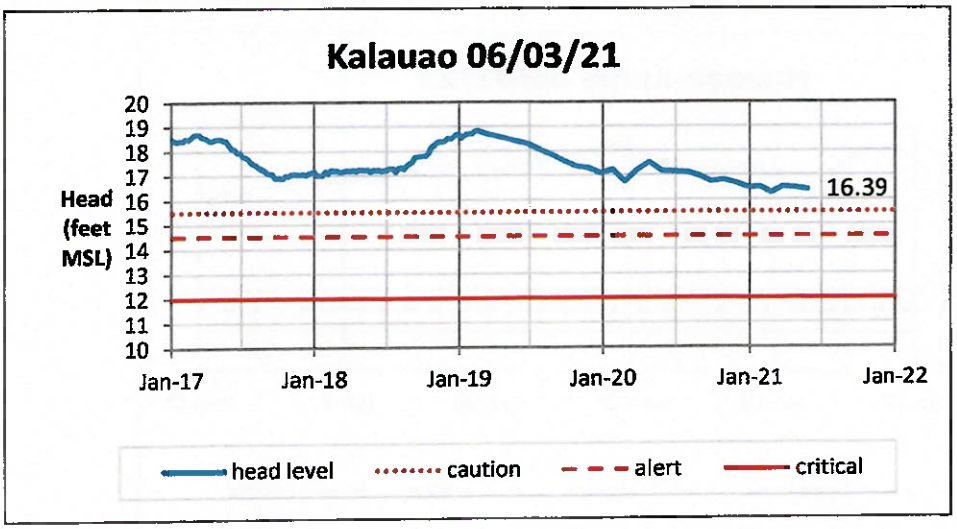

Beretania 06/01/21
Head (feet MSL)
26
25
24
23
22
21
20
19
18
17
16
22.21
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical


Kalihi 06/01/21
Head (feet MSL)
26
25
24
23
22
21
20
19
18
17
16
22.29
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

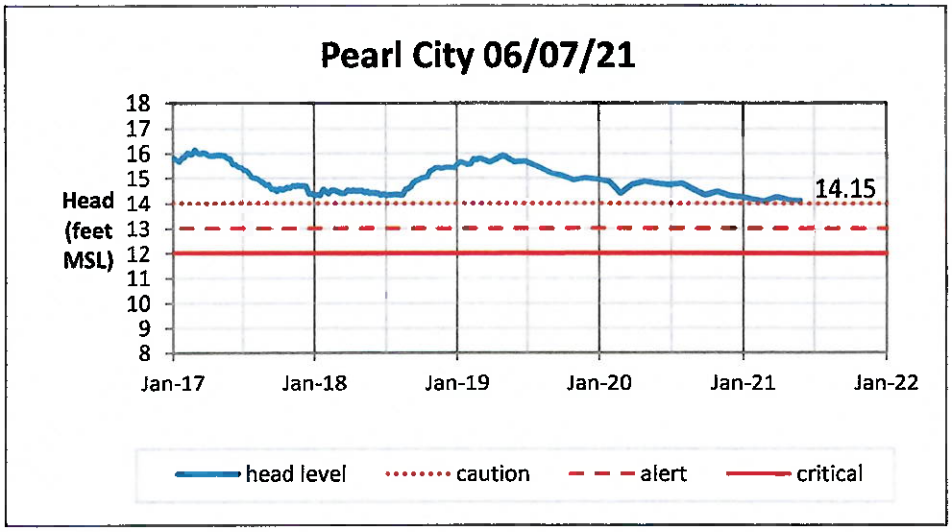
Head Report

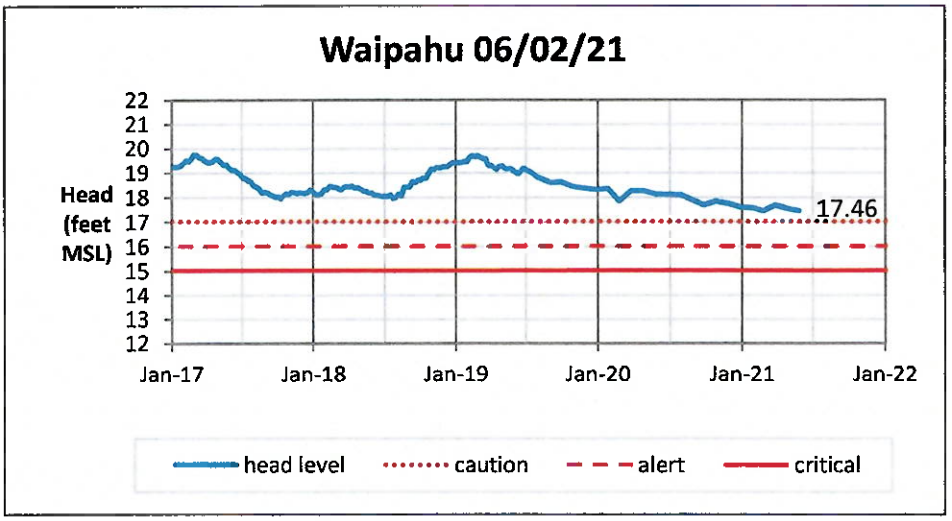

Moanalua 06/01/21
Head (feet MSL)
24
23
22
21
20
19
18
17
16
15
14
18.95
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

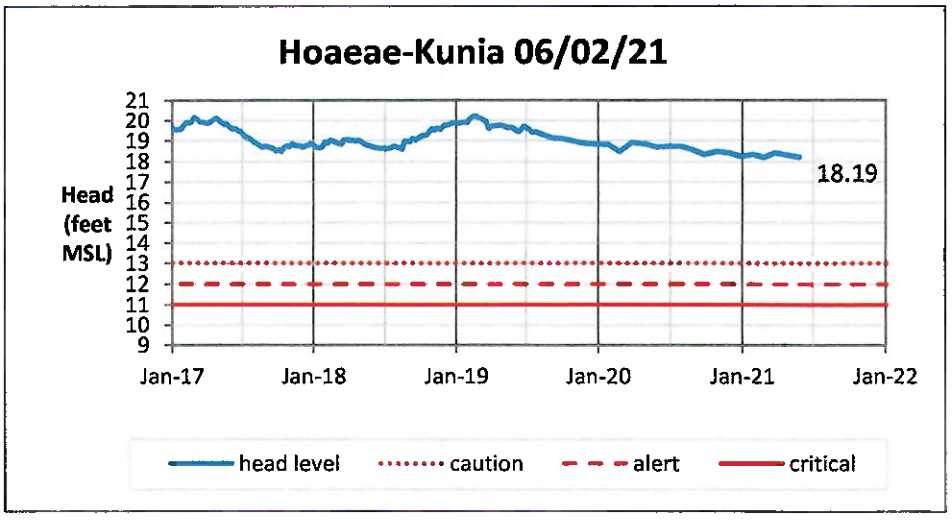

Halawa 06/07/21
Head (feet MSL)
20
19
18
17
16
15
14
13
12
11
10
16.13
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical


Kalauao 06/03/21
Head (feet MSL)
20
19
18
17
16
15
14
13
12
11
10
16.39
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

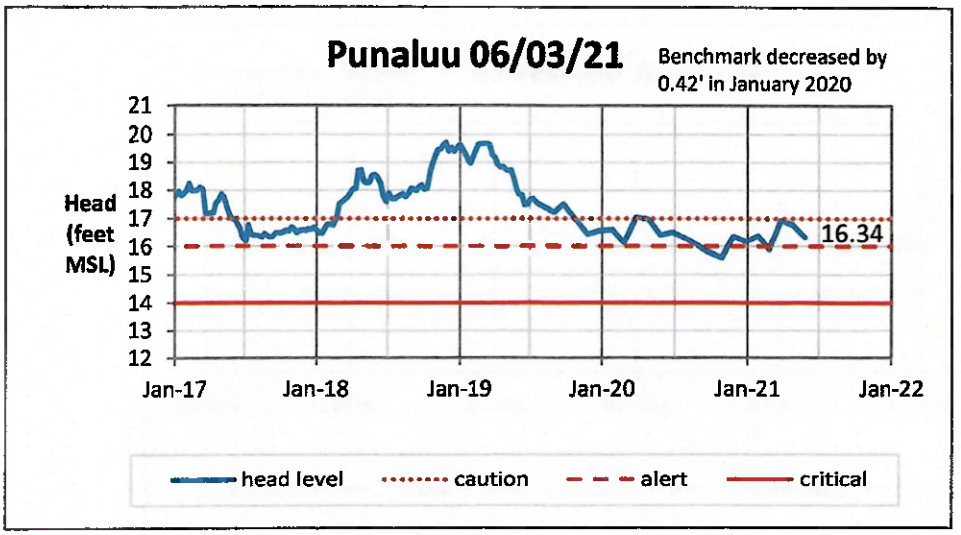
Head Report

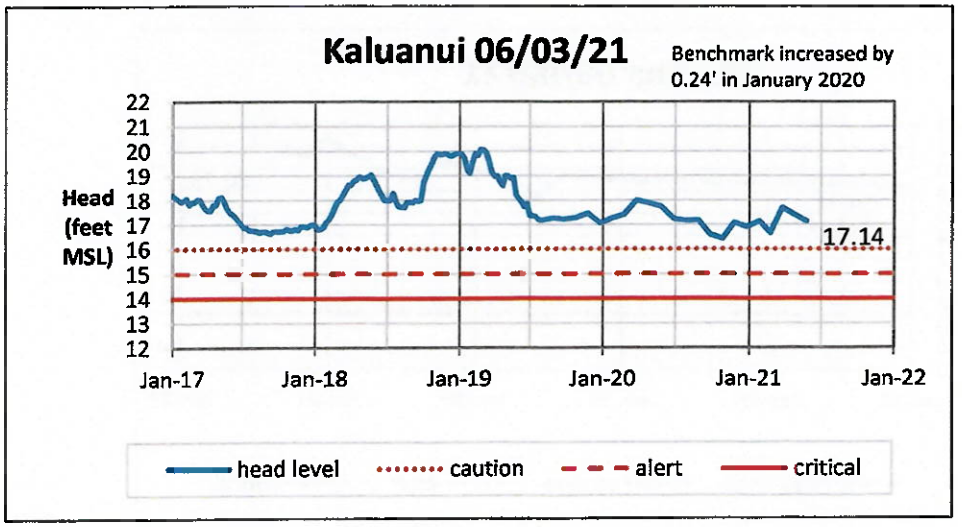

Pearl City 06/07/21
Head (feet MSL)
18
17
16
15
14
13
12
11
10
9
8
14.15
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

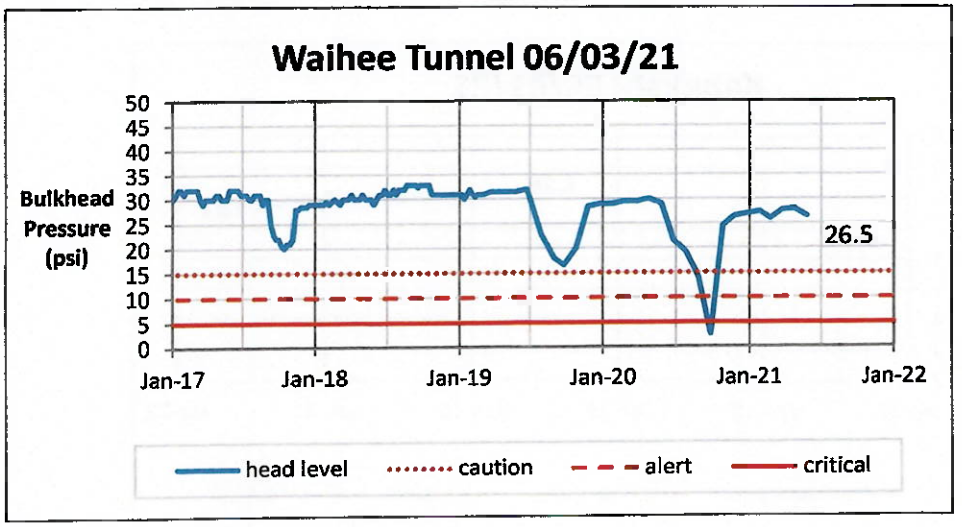

Waipahu 06/02/21
Head (feet MSL)
22
21
20
19
18
17
16
15
14
13
12
17.46
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical


Hoaeae-Kunia 06/02/21
Head (feet MSL)
21
20
19
18
17
16
15
14
13
12
11
10
9
18.19
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

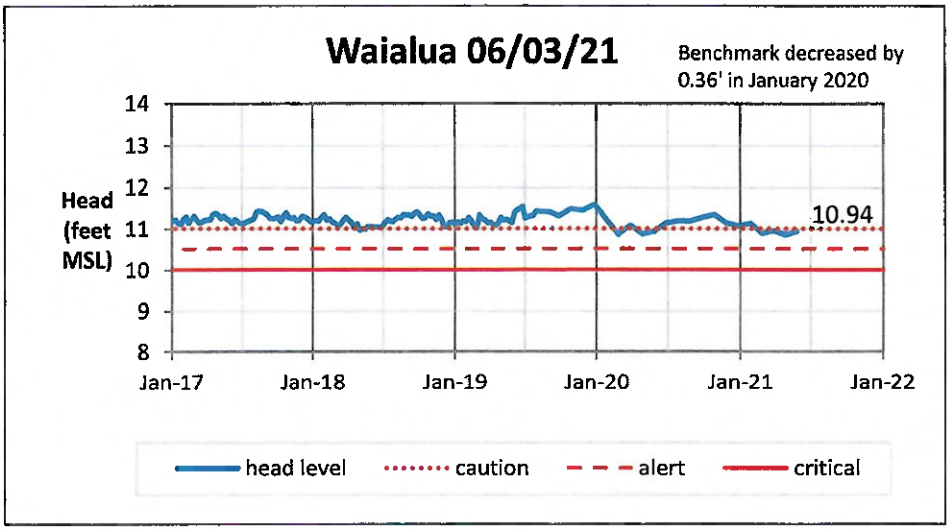
Head Report

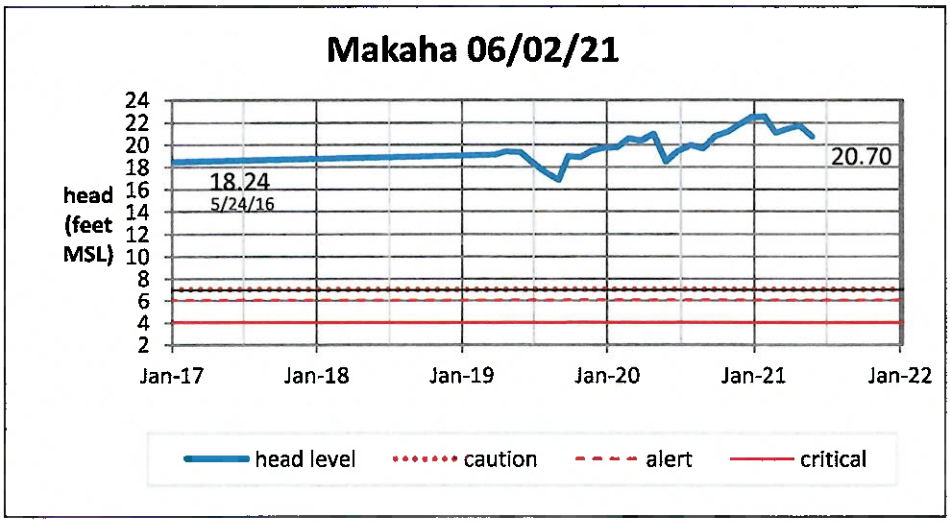

Punaluu 06/03/21
Benchmark decreased by 0.42' in January 2020
Head (feet MSL)
21
20
19
18
17
16
15
14
13
12
16.34
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

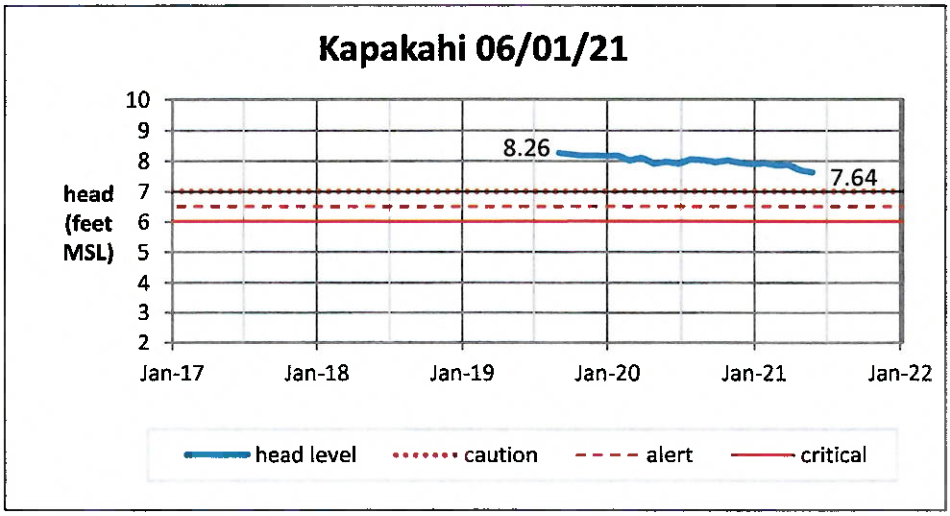

Kaluanui 06/03/21
Benchmark increased by 0.24' in January 2020
Head (feet MSL)
22
21
20
19
18
17
16
15
14
13
12
17.14
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

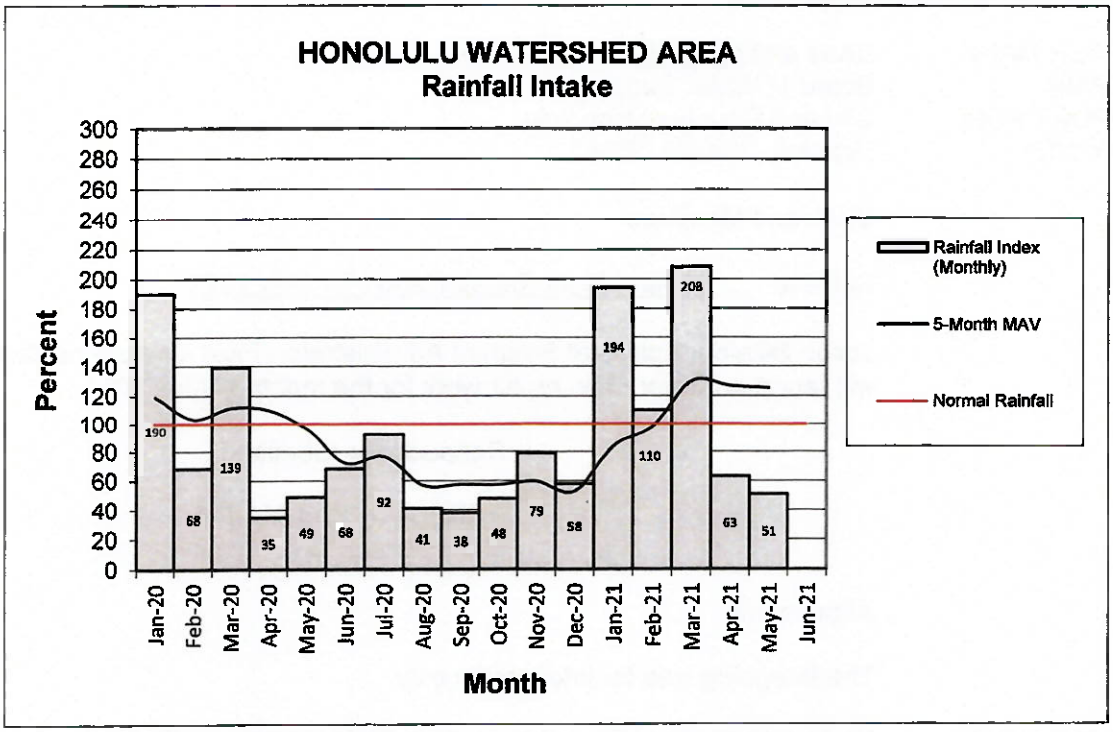

Waihee Tunnel 06/03/21
Bulkhead Pressure (psi)
50
45
40
35
30
25
20
15
10
5
0
26.5
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical

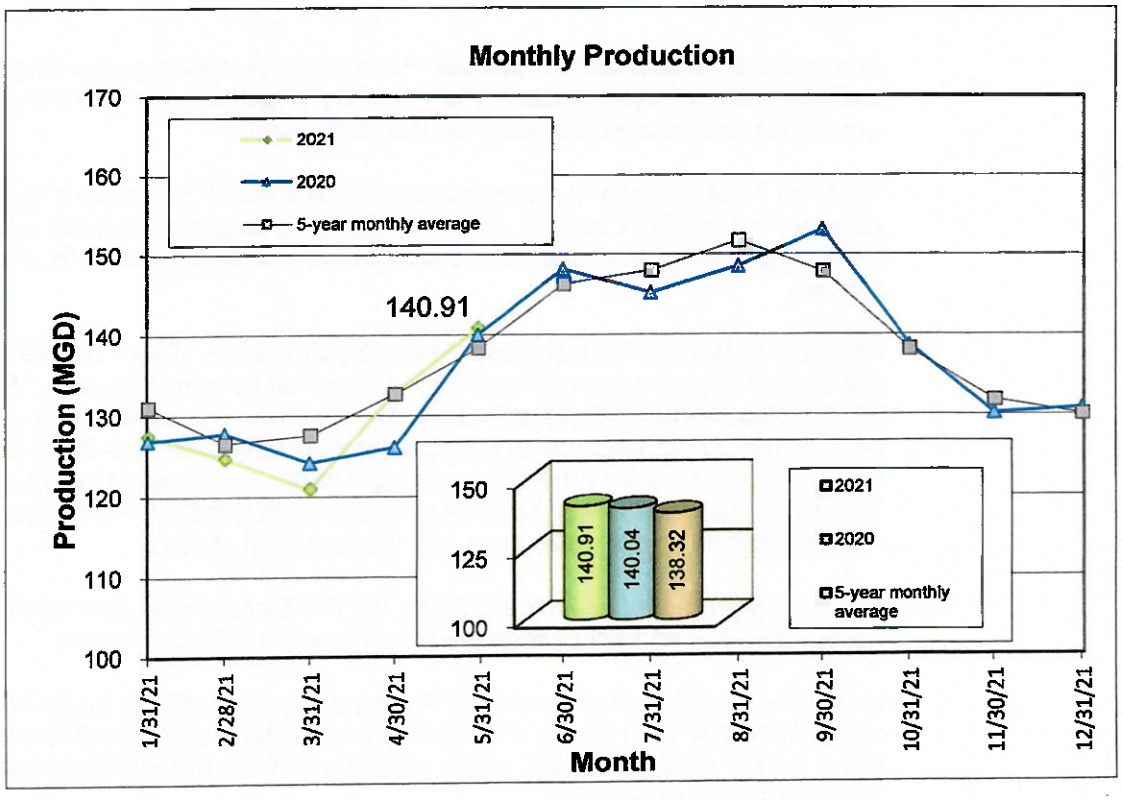
Head Report


Waialua 06/03/21
Benchmark decreased by 0.36' in January 2020
Head (feet MSL)
14
13
12
11
10
9
8
10.94
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical


Makaha 06/02/21
head (feet MSL)
24
22
20
18
16
14
12
10
8
6
4
2
18.24
5/24/16
20.70
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical


Kapakahi 06/01/21
head (feet MSL)
10
9
8
7
6
5
4
3
2
8.26
7.64
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
head level
caution
alert
critical


HONOLULU WATERSHED AREA
Rainfall Intake
Percent
Month
Rainfall Index (Monthly)
5-Month MAV
Normal Rainfall
190
68
139
35
49
68
92
41
38
48
79
58
194
110
208
63
51
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21


Monthly Production
Production (MGD)
Month
2021
2020
5-year monthly average
140.91
140.04
138.32
1/31/21
2/28/21
3/31/21
4/30/21
5/31/21
6/30/21
7/31/21
8/31/21
9/30/21
10/31/21
11/30/21
12/31/21

ITEM FOR INFORMATION NO. 5

"June 28, 2021

WATER MAIN REPAIR REPORT FOR MAY 2021

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

Chair and Members:

Subject: Water Main Repair Report for May 2021

Jason Nikaido, Assistant Program Administrator, Field Operations Division, will report on water main repair work for the month of May 2021.

Respectfully submitted,

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

Attachment"

The foregoing was for information only.

DISCUSSION:

Michael Fuke, Program Administrator, Field Operations Division, gave the report.

Chair Andaya presented Mr. Michael Fuke with a lei before presenting his last Water Main Repair Report. He stated it's people like Mr. Fuke in public service that make agencies such as the BWS great.

Mr. Mike Fuke expressed his appreciation and stated it has been a quick 45 years but hard to imagine. He shared that he began his journey with the BWS 50 years ago and has served with all the managers except for the first two.

Mr. Fuke presented his last Water Main Repair Report. Then, shared information regarding the 42-inch main break that occurred on June 18, 2021, going westbound at the Fort Shafter on ramp. He explained that while a military contractor was drilling for a new sewer line, the BWS 42-inch main was struck by the drill, creating a water main break that was 25-feet deep. The water main break required hiring a contractor to perform welding repairs on the water main in a wet confined space.

Mr. Fuke reported as of June 28, 2021, the BWS has since repaired the water main leak and water lines are in the process of being flushed.

Board Member Sword commended Manager Lau for notifying the public about the water main break. He recommended that a press conference being held to notify the public of the positive progress the BWS has made on repairing the main break.

Manager Lau replied that the BWS can plan on notifying the public once the test results are back.

Mr. Fuke commented that the area still needs to be restored.

Manager Lau thanked Board Member Sword's suggestion. He expressed his appreciation to the news media and Star Advertiser who attended the press conference. He praised the Field Operations Division, lead by Mr. Fuke and Jason Nikaido, Assistant Program Administrator, Field Operations Division, for working diligently to get the repairs done on the 42-inch water main break.

Mr. Fuke appreciated the gratitude but gave credit to Mr. Nikaido who was on site overseeing the repair of the 42-inch water main.

Chair Andaya and Manager Lau wished Mr. Fuke well in his retirement.

Board Member Babcock inquired if the BWS is documenting the damages and cost, then seeking reimbursement from the contractor.

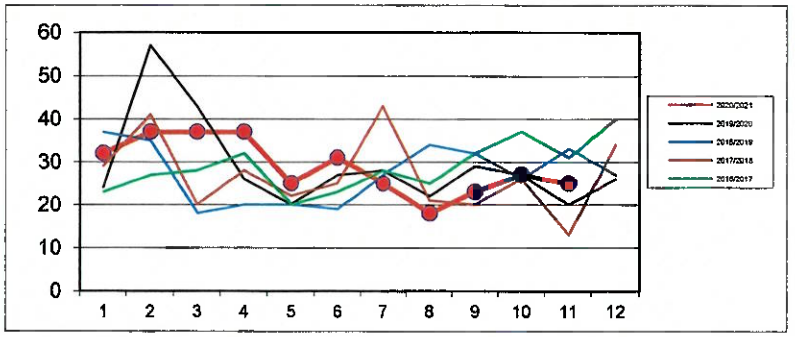
Manager Lau stated the standard process since the contractor caused the damages, the BWS would be to seek reimbursement for all the work and damages.

WATER MAIN REPAIR REPORT

for May 2021

	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	Total
2020/2021	32	37	37	37	25	31	25	18	23	27	**25**		**317**
2019/2020	24	57	43	26	20	27	28	22	29	27	20	26	349
2018/2019	37	35	18	20	20	19	27	34	32	26	33	27	328
2017/2018	29	41	20	28	22	25	43	21	20	26	13	34	322
2016/2017	23	27	28	32	20	23	28	25	32	37	31	40	346

Date	Address	Size (In)	Pipe Type
5/1/2021	2415 Kini Pl, Honolulu	6	CI
5/3/2021	1362 Akiahala Pl, Kailua	4	CI
5/3/2021	3901 Kaimuki Ave, Honolulu	4	GALV
5/4/2021	85-282 McArthur St, Waianae	8	PVC
5/5/2021	91-102 Unahipipi Pl, Ewa Beach	4	DI
5/8/2021	86-257 Kawili St, Waianae	8	PVC
5/8/2021	45-702 Paepuu St, Kaneohe	4	DI
5/10/2021	226 Lehua St, Wahiawa	6	CI
5/11/2021	249 Kuliouou Rd, Honolulu	12	CI
5/11/2021	45-885 Keneke St, Kaneohe	8	CI
5/12/2021	2150 Aulii St, Honolulu	6	CI
5/13/2021	2262 Aupaka St, Pearl City	8	CI
5/13/2021	47-506 Nenehiwa Pl, Kaneohe	4	CI
5/13/2021	98-1020 Kaonohi St, Aiea	8	CI
5/15/2021	1020 Kaili St, Honolulu	6	CI
5/18/2021	141 Puiwa Rd, Honolulu	8	CI
5/19/2021	1056 Kahului St, Honolulu	8	CI
5/19/2021	1044 Malua Dr, Honolulu	6	CI
5/23/2021	347 Elelupe Rd, Honolulu	8	CI
5/24/2021	6106 Kawekiu Pl, Honolulu	6	CI
5/25/2021	45-688 Kapunahala Rd, Kaneohe	8	CI
5/24/2021	137 Meleana Pl, Honolulu	4	CI
5/25/2021	85-908 Lihue St, Waianae	4	GALV
5/26/2021	1032 Malua Dr, Honolulu	6	CI
5/26/2021	2427 Waiomao Rd, Honolulu	8	CI



18 miles of pipeline were surveyed by the Leak Detection Team in the month of May.

ITEM FOR INFORMATION NO. 6

"June 28, 2021

CORRES-PONDENCE TO THE BOARD IN REFERENCE TO EXECUTIVE SESSION ITEM NO. 3, PROPOSED SETTLEMENT OF CLAIM #21-007, RELATING TO PROPERTY DAMAGES AT 1242 10TH AVENUE, HONOLULU, HAWAII FOLLOWING 12" PVC MAIN BREAK BETWEEN 3496 10TH AVENUE AND KEANU STREET, HONOLULU, HAWAII ON AUGUST 2, 2020

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

Chair and Members:

Subject: Correspndence to the Board in Reference to Executive Session Item No. 3, Proposed Settlement of Claim #21-007, Relating to Property Damages at 1242 10th Avenue, Honolulu, Hawaii following 12" pvc main break between 3496 10th Avenue and Keanu Street, Honolulu, Hawaii, on August 2, 2020

Respectfully submitted,

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

Attachment"

The foregoing was for information only.

DISCUSSION: Chair Andaya explained that the BWS received a written testimony relating to a proposed settlement for property damages claim that is being discussed in executive session.

June 28, 2021

Bryan P. Andaya, Chair
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, HI 96814

RE: Flood Damages to 1242 10th Avenue, Honolulu
Board of Water Supply Water Main Break on August 2, 2020
Claim No. 21-007

Aloha Chair Andaya and Members of the Board of Water Supply

Thank you for this opportunity to give you some personal background information related to this Claim No. 21-007.

I am a disabled widow, 69 years old, retired and with limited income. I have lived with my support companion dog at 1242 10th Avenue, Honolulu, for over 30 years, with major health issues. I have severe osteoarthritis primarily in my knees, and suffer from asthma. I don't drive; I use the Handivan. Since last year, 2020, I developed kidney problems and am being treated by a kidney specialist. Experiencing extreme stress due to the August 2, 2020 flooding situation, I lost a huge amount of weight within a short period of time and my blood pressure plummeted. The downstairs bathroom is not usable since the August 2nd flooding so I climb the stairs with much pain frequently to use the second floor bathroom due to kidney problems.

I vividly recall last August 2, 2020, around 8:30 a.m. on Sunday, I was watching television when a heavy stream of water appeared flowing toward me in the family room from the bathroom. The water came from waterspouts from the screws securing the toilet to the floor, from water overflowing from the toilet and from the bathroom tub. The flow proceeded to the family room, the living room, the bedroom next to the living room, the closet in the family room, the kitchen, and the laundry area. The water rose about 3 inches or more saturating and damaging whatever was on the floors.

I went outside to see where the water originated from and to my complete horror, I saw a flood on 10th Avenue that started from a water main break across my home of 1242 10th Avenue. The water was gushing from the water main break, which pushed the roadway into rolling mounds of asphalt. It pushed the manhole cover near my home up and I believe from the extreme overflowing water under my property pushed into my sewage line and my bathroom plumbing. The overflow pushed dirt and grass from the sidewalk areas on both sides of 10th Avenue. The Board of Water Supply was called but no crew member came until hours later to turn off the water, after massive damage was done to my property. As my plumber informed me, there was no sewage or water line breakage on my property but the sole cause was the Board of Water Supply's water main break on 10th Avenue. My home insurance denied coverage.

I strongly feel the Board of Water Supply should reimburse me for the damages incurred under their responsibility. The floors need to be stripped, the water damaged walls cut, and bathroom flooring and fixtures removed, cleaned, and restored, salvageable furniture and items need to be packed and stored before the flooring and walls can be repaired. All furniture and items need to be placed back after restoration.

The Board of Water Supply should also reimburse me for the necessary storage and packing related to water main break and floor restoration. The only damaged furniture items for replacement were a couch, loveseat, and TV stand. I had to pay for cleaning services as itemized below with other reimbursements I am seeking. My son assisted me over several months to help de-clutter, store items, and bag enormous amounts of damaged property, for which we relied on our neighbors' refuse bins. However, my son was unable to help any longer with his own health issues, and I cannot continue with cleanup with my physical limitations. My support companion dog has also developed eating problems and allergies and has lost weight. These personal hardships I am enduring without compensation; however, a fair remuneration is requested for your approval.

I request reimbursement in the amount of $82,070.33:

$3,886.47	cleaning and sanitizing the sewage and water
17,399.56	mitigation
41,243.23	reconstruction
10,201.64	storage and packing
139.43	HECO bill on August 2 - about one week for humidifiers (actual bill $265.43)
3,000.00	3 throw rugs at $1,000 each
3,000.00	large couch
2,000.00	loveseat
1,200.00	1,200.00 - tv stand - glass doors for storage of videotapes
$82,070.33	

Respectfully submitted

Janice H. Higa

Janice H. Higa
1242 10th Avenue
Honolulu, HI 96816

MOTION TO RECESS INTO EXECUTIVE SESSION	There being no further business Chair Andaya at 4:23 PM called for a motion to adjourn the Open Session. Max Sword so moved; seconded by Jade Butay and unanimously carried. Upon unanimous approved motion, the Board recessed into Executive Session Pursuant to [HRS § 92-5 (a)(4)] and [HRS § 92-5 (a)(2)] at 4:24 PM to Consider Issues Pertaining to Matters Posted for Discussion at an Executive Session.
OPEN SESSION	The Board reconvened in Open Session at 4:59 PM.
MOTION TO ADJOURN	There being no further business Chair Andaya at 5:00 PM called for a motion to adjourn the Regular Session. Max Sword so moved; seconded by Roger Babcock and unanimously carried.

The minutes of the Regular Meeting held on June 28, 2021 are respectfully submitted,

JOY CRUZ-ACHIU

APPROVED:

BRYAN P. ANDAYA
Chair of the Board

JUL 2 6 2021
Date

THE MINUTES OF THE REGULAR SESSION BOARD MEETING ON JUNE 28, 2021 WERE APPROVED AT THE JULY 26, 2021 BOARD MEETING			
	AYE	NO	COMMENT
BRYAN P. ANDAYA			ABSENT
KAPUA SPROAT	X		
RAY C. SOON	X		
MAX J. SWORD			ABSENT
NA'ALEHU ANTHONY	X		
JADE T. BUTAY	X		
ROGER BABCOCK JR.	X		