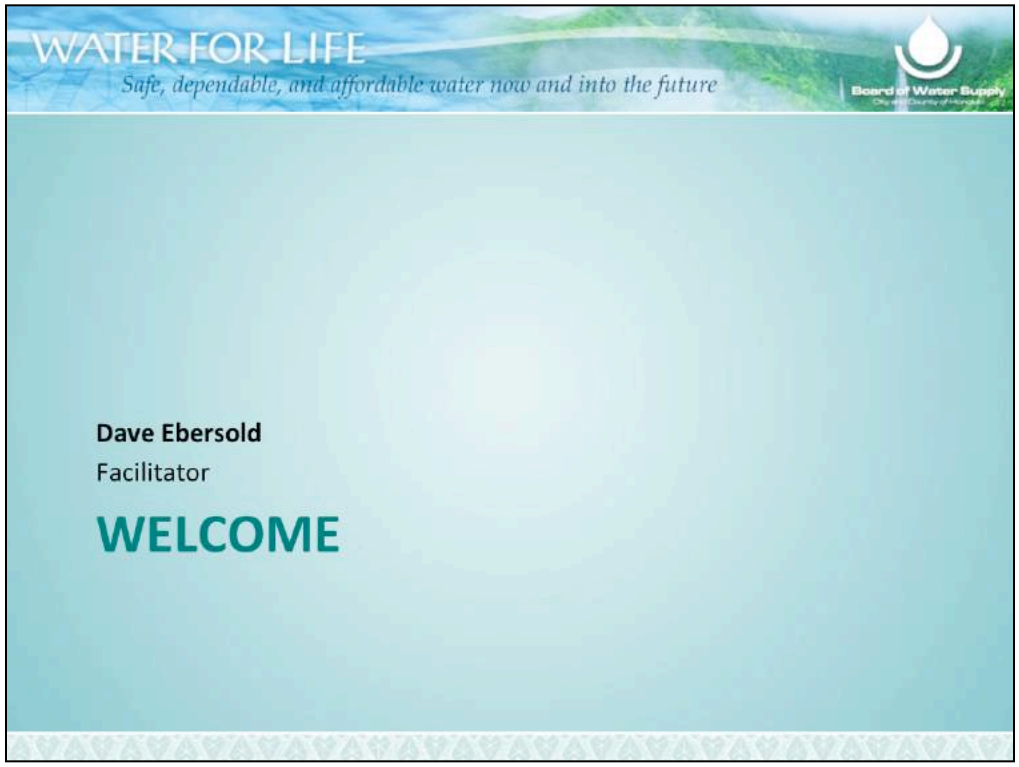

WATER FOR LIFE
Safe, dependable, and affordable water now and into the future
Board of Water Supply
Stakeholder Advisory Group
Board of Water Supply
City & County of Honolulu
Tuesday October 16, 2018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Board of Water Supply
Dave Ebersold
Facilitator
WELCOME


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Public Comments on Agenda Items

## Meeting Objectives

- Receive updates regarding the BWS
- Prioritization of Stakeholder Advisory Group 2019 Meeting Topics and Issues
- Get your input on Water System Facilities Charge policy issues
- Water Master Plan Scorecard Update – How are we doing?


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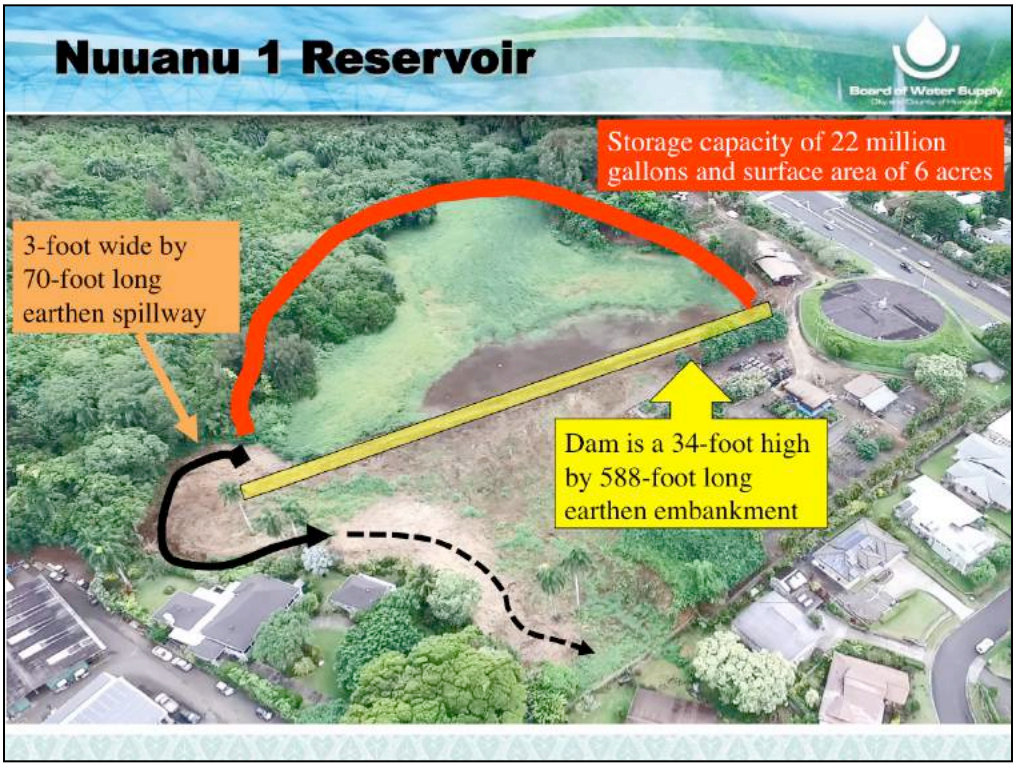
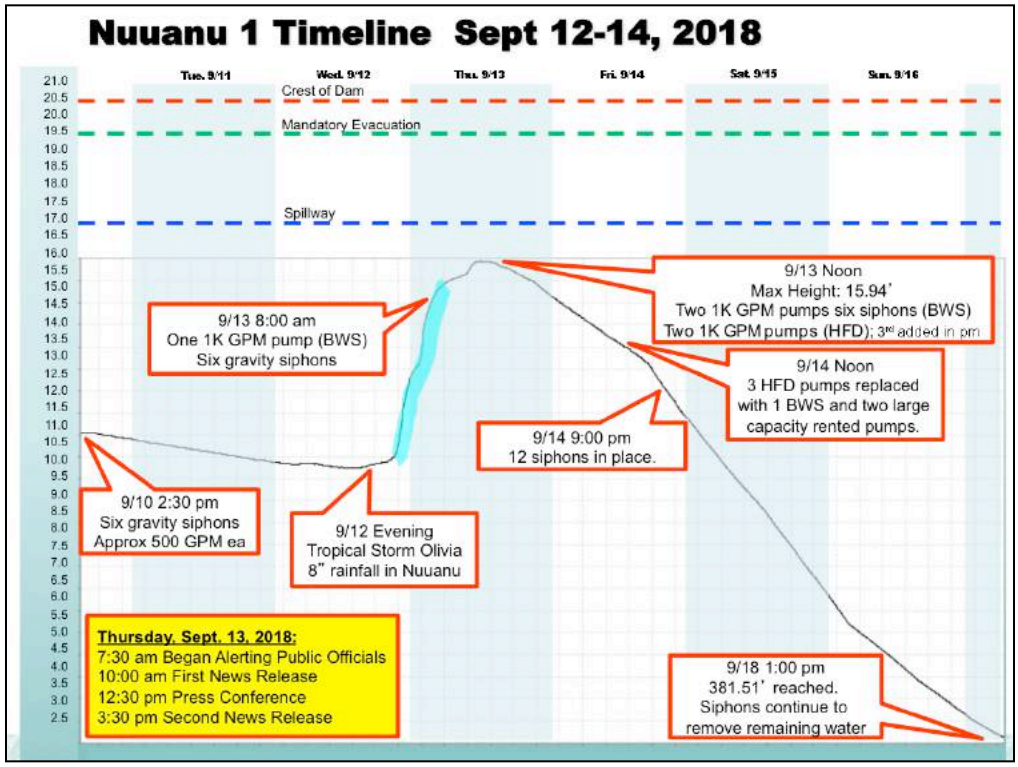
Ellen Kitamura.
BWS Deputy Manager and Chief Engineer
BWS UPDATES


Board of Water Supply
Nuuanu Reservoir No. 1
Pali Hwy
Country Club Rd
Nichiren Mission of Hawaii
Hinalo Pl

## History of Reservoir

- Constructed in 1889
- Original purpose was to provide water supply and hydroelectric power for Honolulu
- Reservoir no longer needed for water supply due to development of artesian wells
- The hydroelectric plant decommissioned in 1930
- Current function is as a debris and storm water detention basin
- State designated Nuuanu 1 as regulated dam in 2014
- Dam improvements design scheduled for fiscal year 2019 ($1 million)

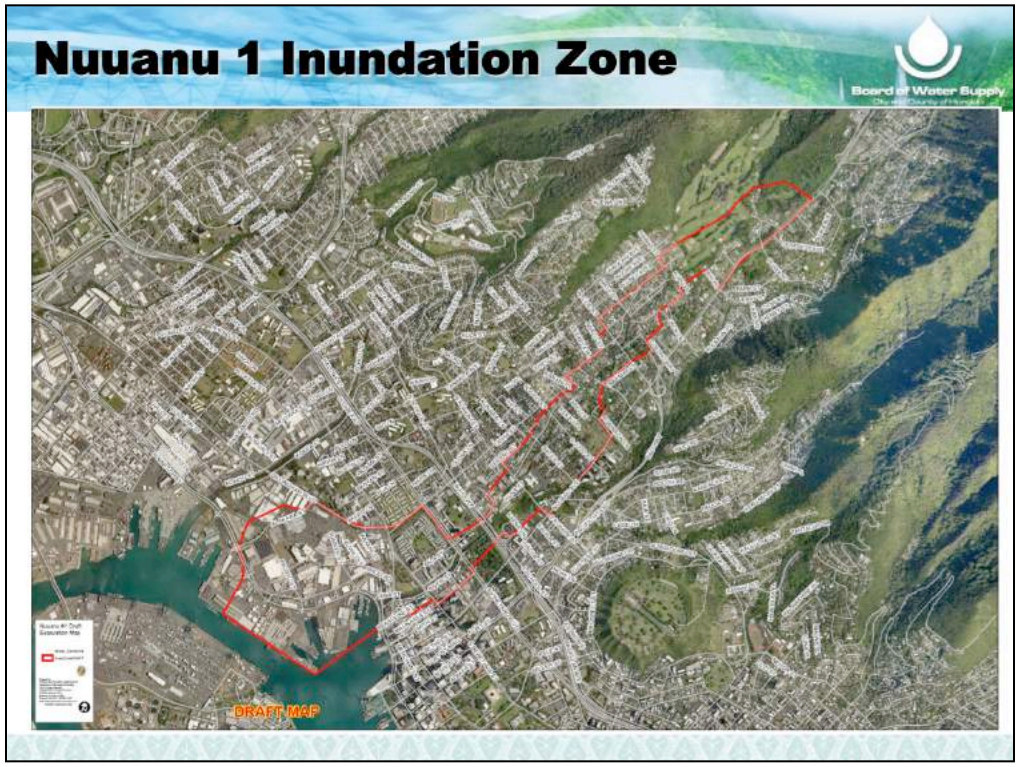

Nuuanu 1 Reservoir
Board of Water Supply
Storage capacity of 22 million gallons and surface area of 6 acres
3-foot wide by 70-foot long earthen spillway
Dam is a 34-foot high by 588-foot long earthen embankment


Nuuanu 1 Timeline Sept 12-14, 2018
Tue. 9/11
Wed. 9/12
Thu. 9/13
Fri. 9/14
Sat. 9/15
Sun. 9/16
Crest of Dam
Mandatory Evacuation
Spillway
9/13 8:00 am
One 1K GPM pump (BWS)
Six gravity siphons
9/13 Noon
Max Height: 15.94'
Two 1K GPM pumps six siphons (BWS)
Two 1K GPM pumps (HFD); 3rd added in pm
9/14 Noon
3 HFD pumps replaced
with 1 BWS and two large
capacity rented pumps.
9/14 9:00 pm
12 siphons in place.
9/10 2:30 pm
Six gravity siphons
Approx 500 GPM ea
9/12 Evening
Tropical Storm Olivia
8" rainfall in Nuuanu
Thursday, Sept. 13, 2018:
7:30 am Began Alerting Public Officials
10:00 am First News Release
12:30 pm Press Conference
3:30 pm Second News Release
9/18 1:00 pm
381.51' reached.
Siphons continue to
remove remaining water

# Before and After Olivia

Board of Water Supply

# Nuuanu 1 Inundation Zone



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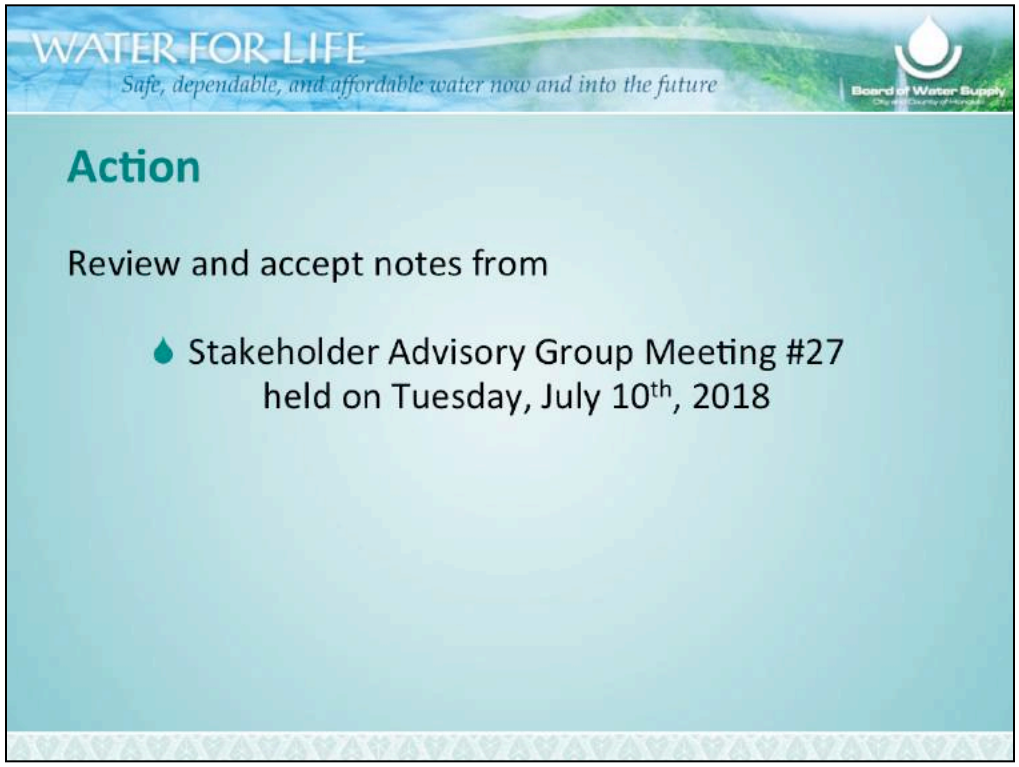
## Mahalo!

## Questions & Answers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Action
Review and accept notes from
Stakeholder Advisory Group Meeting #27 held on Tuesday, July 10th, 2018


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Board of Water Supply
Dave Ebersold
Facilitator
PRIORITIZATION OF STAKEHOLDER ADVISORY GROUP 2019 MEETING TOPICS AND ISSUES


Thank you!
Insightful
21 Interviews
Informative
Inspiring

## Thinking back about the meetings and other activities of the Stakeholder Advisory Group, what was the best part of the process?

- Diversity of group and sharing different points of view
- Leadership and passion of BWS
- Facilitation
- Activities during meeting, e.g. Zero Sum Game
- Field trips
- The environment to speak freely

## What could have been done better?

- Nothing
- Too much detail, too technical
- Meetings: too long, too short, same day of week

## On a scale of 1 being terrible and 5 being excellent:

| Item | How would you rate? | How important? |
|---|---|---|
| Notification and reminders of upcoming meetings | 4.9 | 4.9 |
| The pace of the meetings and worthwhile use of your time | 4.7 | 4.9 |
| Interesting information shared | 4.9 | 4.9 |
| Complex concepts clearly explained | 4.6 | 5.0 |
| Demonstration of being heard by BWS leadership | 4.9 | 4.9 |
| Contributing to BWS Board decisions | 4.8 | 4.9 |

## Do you have suggestions for how could we do any of these better?

- 21+ Great ideas!
- The amount of detail
- More field trips

## During the coming year, what should be the 3 most important priorities for the Stakeholder Advisory Group to work on?

- Check progress on WMP implementation
- Developing/ensuring alternative water sources
- Climate change
- Watershed programs and sustainability
- Conservation
- Continue public education
- Water quality monitoring and assurance
- Get sewer off of the water bill
- Emergency preparedness
- Water/Energy nexus

## Members of the group have suggested forming working groups to tackle key water issues between quarterly meetings. What's do you think about this approach? (If positive: what topic or topics would be important to work on in this format?)

- It depends
- Not strong support

## What will success of the Stakeholder Advisory Group look like to you?

- Have been successful so far. Make sure the group has a purpose going forward

## Making an Impact

- How do you envision helping ensure implementation of the WMP?
- What do you want to know about climate change as it relates to BWS?
- How can the Stakeholder Advisory Group help ensure BWS meets its sustainability and water conservation goals?
- Do you really want to tackle separating the sewer bill?

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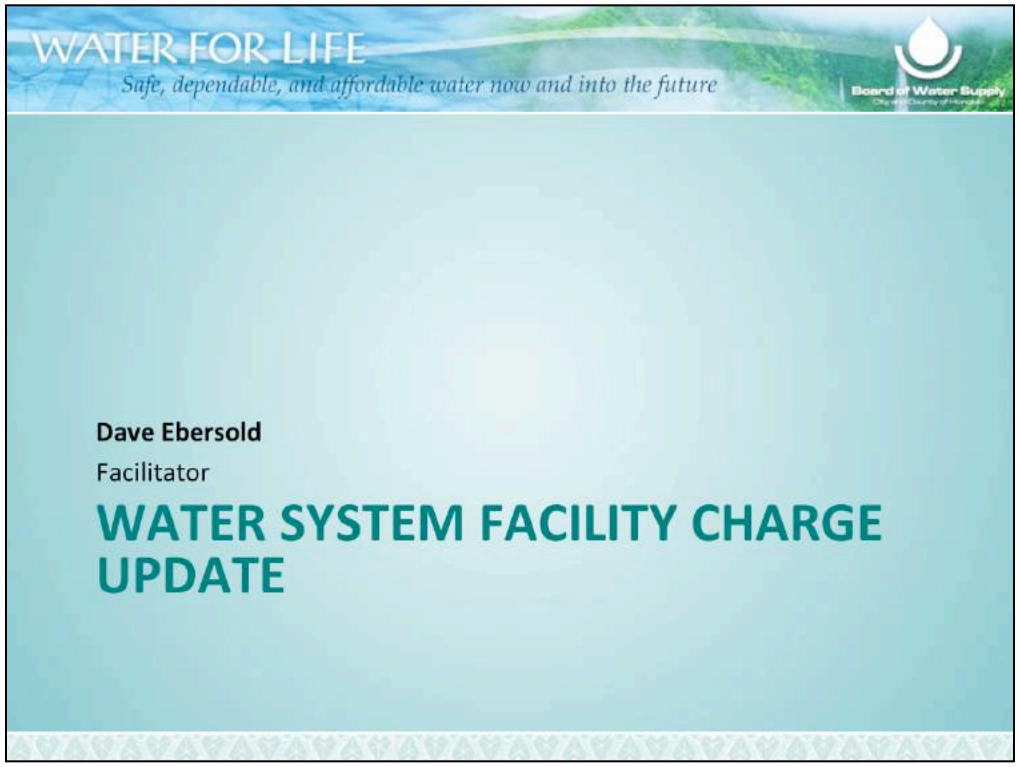
## Mahalo!

## Questions & Answers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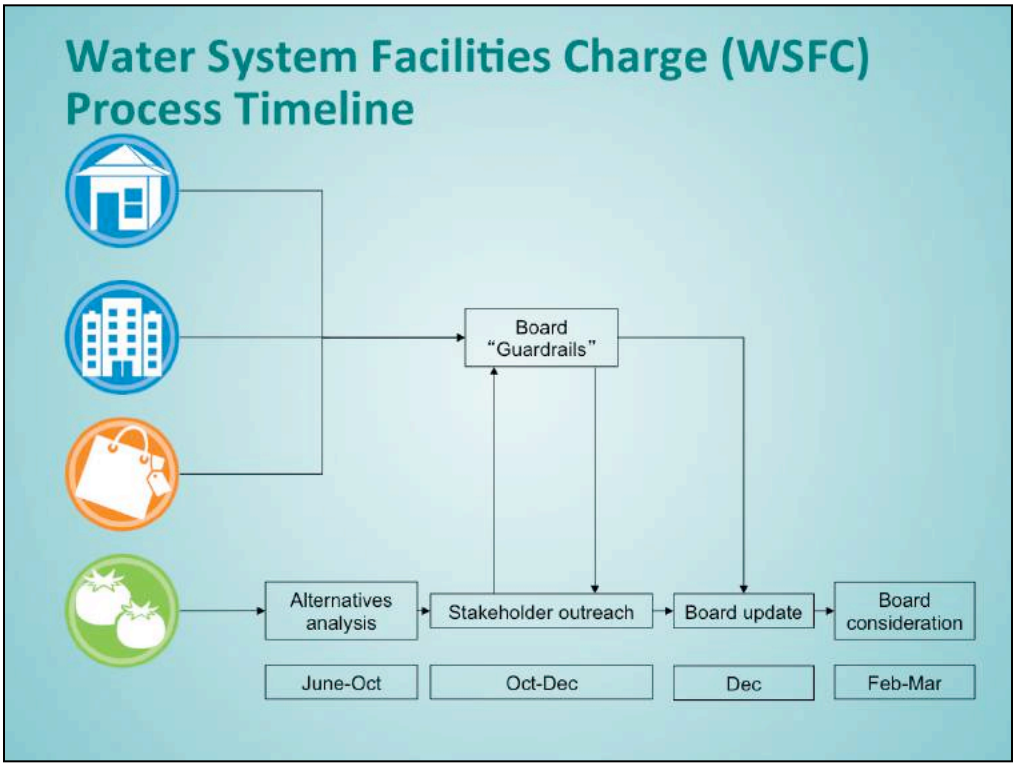
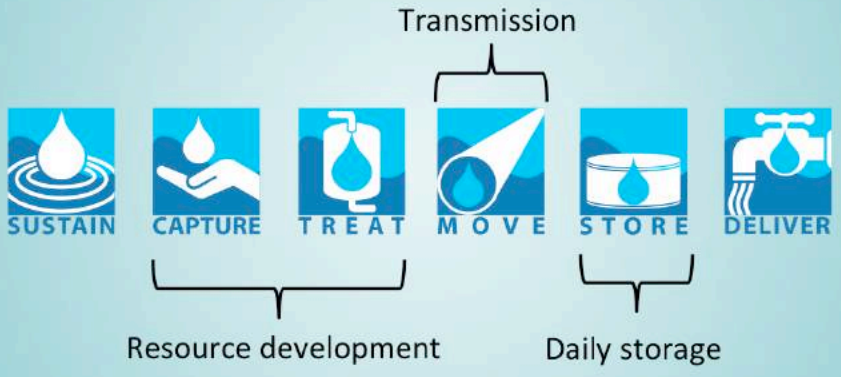
WATER SYSTEM FACILITY CHARGE UPDATE


Water System Facilities Charge (WSFC) Process Timeline
Board "Guardrails"
Alternatives analysis
Stakeholder outreach
Board update
Board consideration
June-Oct
Oct-Dec
Dec
Feb-Mar

## 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
- Fund growth-related capacity expansions
- Equitably recover earlier investments in oversizing infrastructure to accommodate new customers

## WSFC is for the backbone system only (general use facilities)




[AWWA M1 Manual]

## Why update the WSFC now?

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

## Five basic steps to updating the WSFC

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

## What's a fixture unit (fxtu)?

- A unit of measure, based on the rate of discharge, time of operation and frequency of use, that expresses the hydraulic load of that fixture on the system
- Equal to one cubic foot of water drained in an 1 1/4" pipe over one minute

1.6 fxtu | 1.6 fxtu | 2.0 fxtu | 2.5 fxtu

Source: 1997 Uniform Plumbing Code

# Water System Facilities Charges Summary of Changes

- Analyses completed for all customer classes

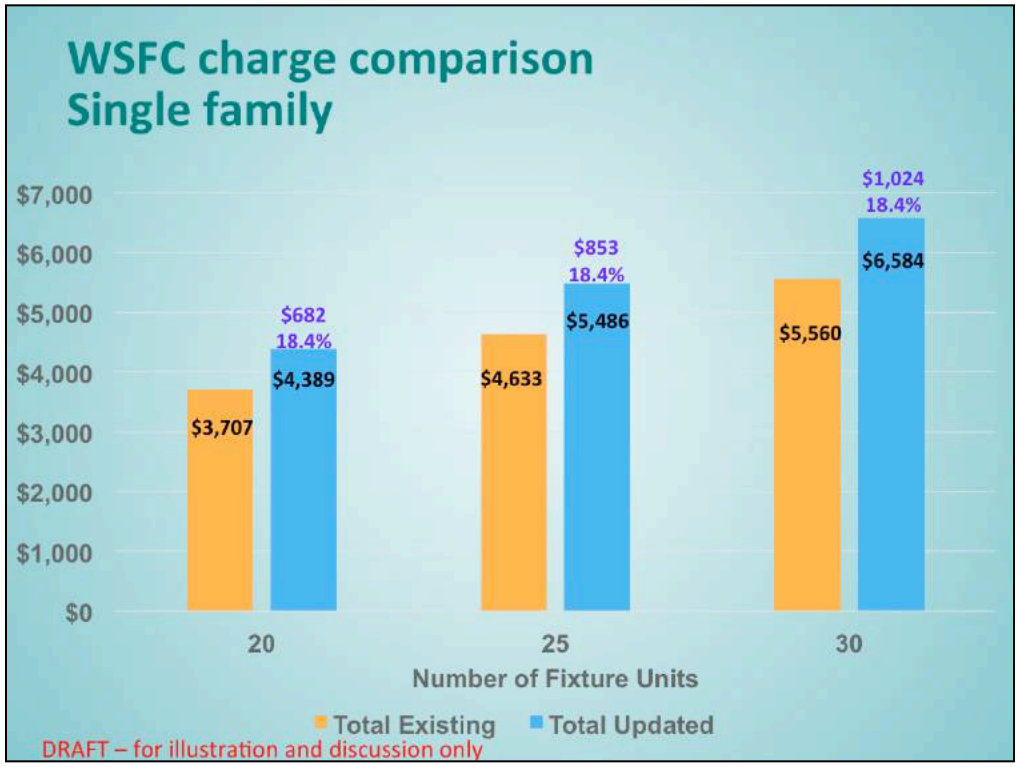
| Customer Type | Change |
|---|---|
| Single-family | + 18.4% |
| Multi-unit low rise | + 6.5% |
| Multi-unit high rise | + 7.8% |
| Non-residential <50 fxtu | - 40% |
| Non-residential >50 fxtu | Increases as number of fxtu increases |
| Agricultural | Large increases reflecting actual agricultural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

fxtu: fixture unit

DRAFT – for illustration and discussion only

## Potential WSFC policy / guardrail issues

- For what customer classes should changes be phased in (subsidized)
- What BWS goals should be supported by a decision to subsidize, e.g.
  - Avoid rate shock
  - Encourage conservation
  - Easy to understand and implement
  - Others?
- How much should subsidies be?
- Should receipt of a subsidy be conditional, e.g.
  - Submit agricultural water use plan to ensure "right-sizing" of meter
  - Require participating in agricultural water conservation education program


WSFC charge comparison
Single family
$7,000
$6,000
$5,000
$4,000
$3,000
$2,000
$1,000
$0
$3,707
$682
18.4%
$4,389
$4,633
$853
18.4%
$5,486
$5,560
$1,024
18.4%
$6,584
20
25
30
Number of Fixture Units
Total Existing
Total Updated
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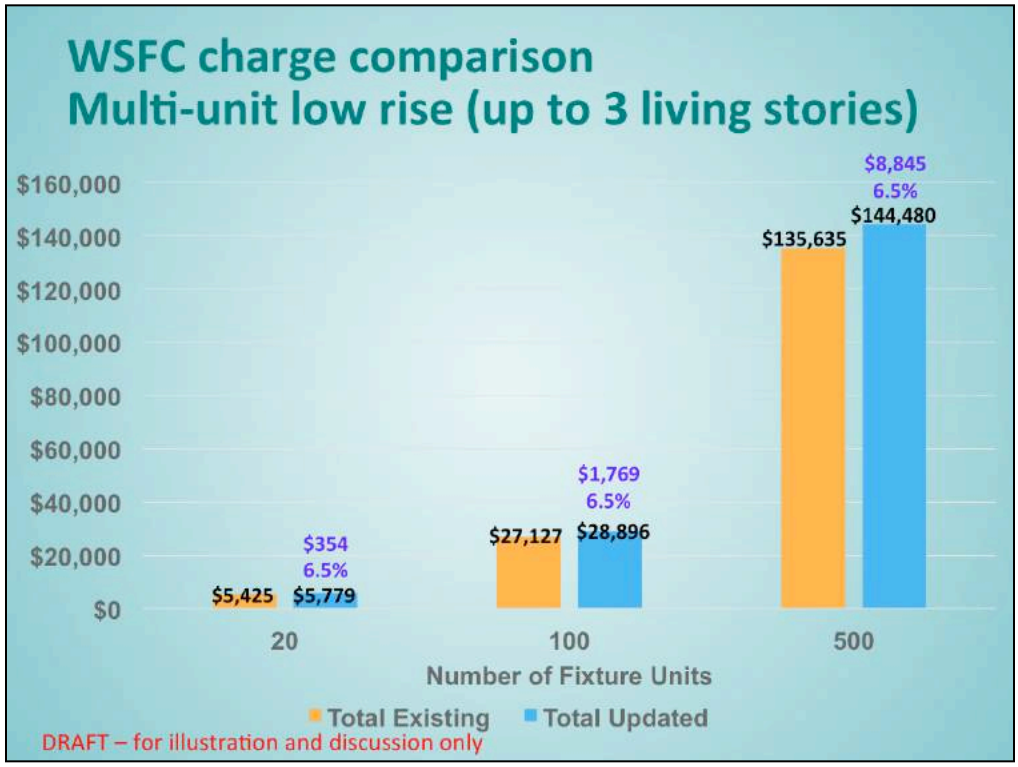
WSFC charge comparison
Multi-unit low rise (up to 3 living stories)
$160,000
$140,000
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
$5,425
$354
6.5%
$5,779
$27,127
$1,769
6.5%
$28,896
$135,635
$8,845
6.5%
$144,480
20
100
500
Number of Fixture Units
Total Existing
Total Updated
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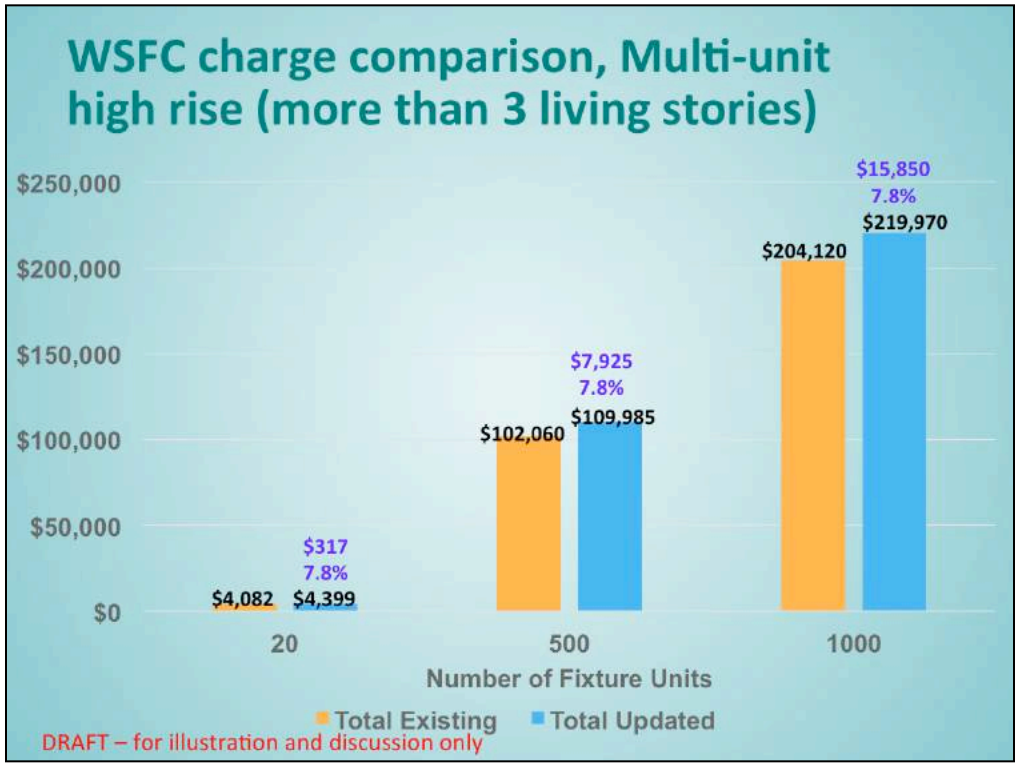
WSFC charge comparison, Multi-unit high rise (more than 3 living stories)
$250,000
$200,000
$150,000
$100,000
$50,000
$0
$4,082
$4,399
$317
7.8%
$102,060
$109,985
$7,925
7.8%
$204,120
$219,970
$15,850
7.8%
20
500
1000
Number of Fixture Units
Total Existing
Total Updated
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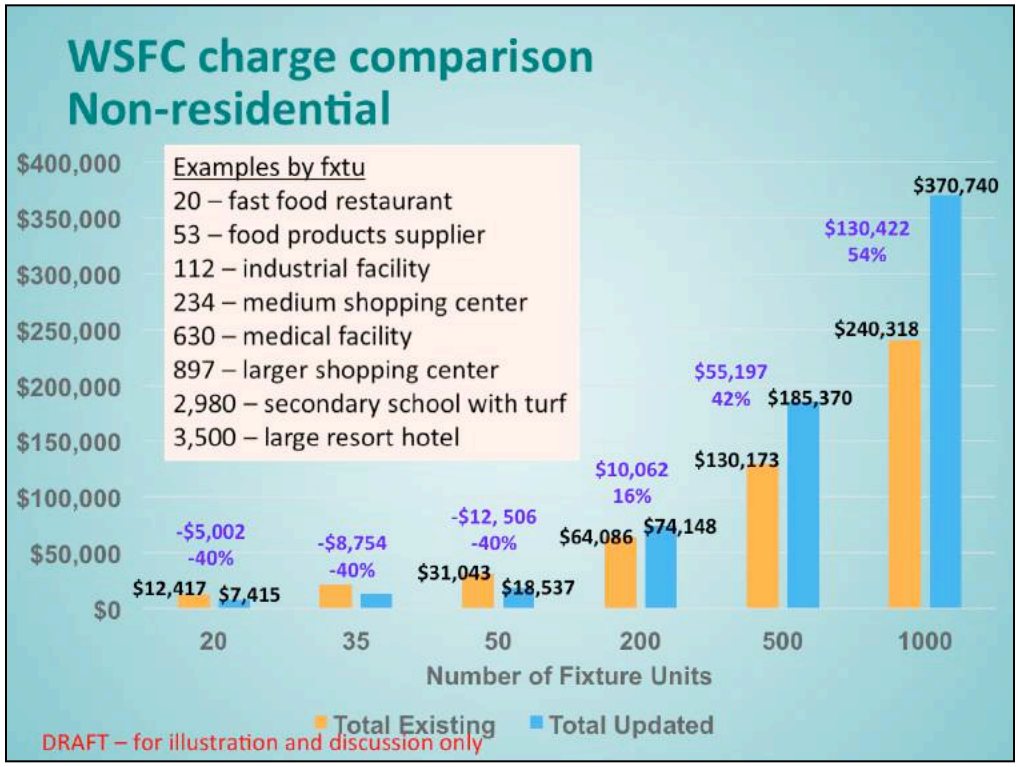
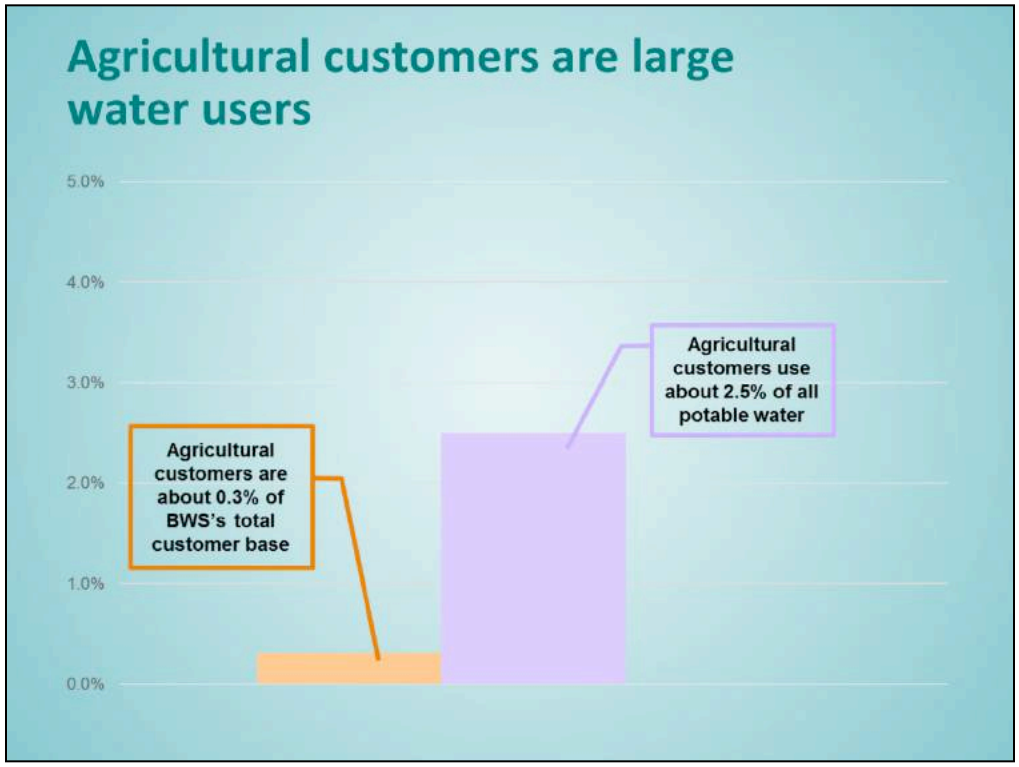

WSFC charge comparison
Non-residential
Examples by fxtu
20 – fast food restaurant
53 – food products supplier
112 – industrial facility
234 – medium shopping center
630 – medical facility
897 – larger shopping center
2,980 – secondary school with turf
3,500 – large resort hotel
$400,000
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$0
-$5,002
-40%
$12,417
$7,415
-$8,754
-40%
-$12, 506
-40%
$31,043
$18,537
$10,062
16%
$64,086
$74,148
$55,197
42%
$130,173
$185,370
$130,422
54%
$240,318
$370,740
20
35
50
200
500
1000
Number of Fixture Units
Total Existing
Total Updated
DRAFT – for illustration and discussion only

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

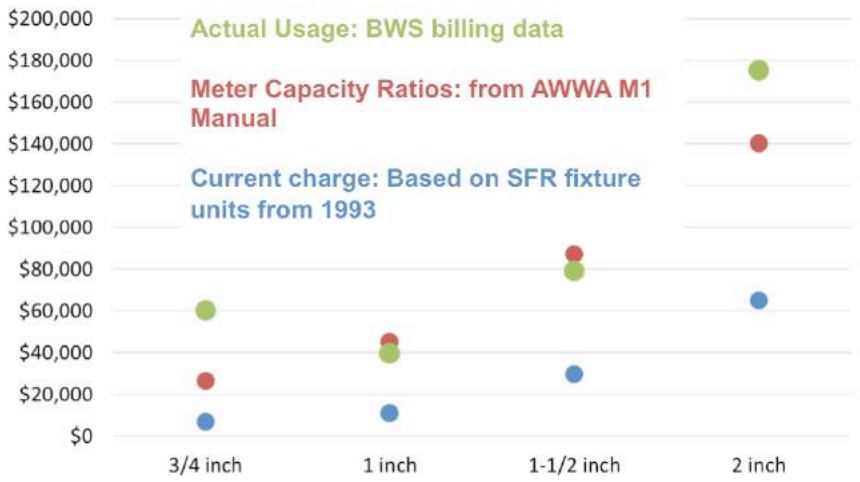
- "The WSFC for the selected meter size is based on an average single-family residential fixture unit count for that meter size and the correlated average water use for a single-family residential unit."
  *Ernst & Young 1993*

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

**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
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
Agricultural customers use about 2.5% of all potable water
Agricultural customers are about 0.3% of BWS's total customer base

# Comparison of WSFC options for Ag



## Policy considerations for Ag

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

# Scenario: Implement 100% charge in FY 2020

**Potential Water System Facility Charge – Ag (per account)**

| Meter Size | FY 2019 | FY 2020 |
|---|---|---|
| 3/4 inch | $6,671 | $26,438 |
| 1 inch | $10,934 | $44,944 |
| 1-1/2 inch | $29,651 | $87,244 |
| 2 inch | $64,866 | $140,121 |
| Total Revenue from 10 new customers* | $376,954 | $938,542 |

| Amount of Subsidy | FY 2019 | FY 2020 |
|---|---|---|
| | $561,588 | $0 |

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Agricultural WSFC comparisons to other islands

| | BWS* | Maui | Kauai | Hawaii |
|---|---|---|---|---|
| 3/4" | $26,438 | $18,884 | $21,170 | NA |
| 1" | $44,944 | $33,356 | $35,290 | $13,750 |
| 1.5" | $87,244 | $71,948 | $70,580 | $27,500 |
| 2" | $140,121 | $125,012 | $112,920 | $44,000 |

*based on meter size methodology
Other islands' WSFC based on meter size for all customers

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## Comparison of subsidy scenarios for Ag

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

# Scenario: keep at current

**Potential Water System Facility Charge – Ag**

| Meter Size | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | % Recovery |
|---|---|---|---|---|---|---|
| 3/4 inch | $6,671 | $6,671 | $6,671 | $6,671 | $6,671 | 25% |
| 1 inch | $10,934 | $10,934 | $10,934 | $10,934 | $10,934 | 24% |
| 1-1/2 inch | $29,651 | $29,651 | $29,651 | $29,651 | $29,651 | 34% |
| 2 inch | $64,866 | $64,866 | $64,866 | $64,866 | $64,866 | 46% |
| Total Revenue from 10 new customers | $376,954 | $376,954 | $376,954 | $376,954 | $376,954 | |

| Amount of Subsidy | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|---|---|
| | $561,588 | $561,588 | $561,588 | $561,588 | $561,588 |

**Total 5 year subsidy = $2,807,942**

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Scenario: 5% annual increase

**Potential Water System Facility Charge – Ag**

| Meter Size | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | % Recovery |
|---|---|---|---|---|---|---|
| 3/4 inch | $6,671 | $7,005 | $7,355 | $7,723 | $8,109 | 31% |
| 1 inch | $10,934 | $11,480 | $12,054 | $12,657 | $13,290 | 30% |
| 1-1/2 inch | $29,651 | $31,133 | $32,690 | $34,324 | $36,041 | 41% |
| 2 inch | $64,866 | $68,109 | $71,514 | $75,090 | $78,845 | 56% |
| Total Revenue from 10 new customers | $376,954 | $395,801 | $415,591 | $436,371 | $458,189 | |

| Amount of Subsidy | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|---|---|
| | $561,588 | $542,741 | $522,951 | $502,171 | $480,353 |

**Total 5 year subsidy = $2,609,804**

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Scenario: 10% annual increase

**Potential Water System Facility Charge – Ag**

| Meter Size | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | % Recovery |
|---|---|---|---|---|---|---|
| 3/4 inch | $6,671 | $7,339 | $8,072 | $8,880 | $9,768 | 37% |
| 1 inch | $10,934 | $12,027 | $13,230 | $14,553 | $16,008 | 36% |
| 1-1/2 inch | $29,651 | $32,616 | $35,877 | $39,465 | $43,412 | 50% |
| 2 inch | $64,866 | $71,352 | $78,487 | $86,336 | $94,970 | 68% |
| Total Revenue from 10 new customers | $376,954 | $414,649 | $456,114 | $501,725 | $551,898 | |

| Amount of Subsidy | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|---|---|
| | $561,588 | $523,893 | $482,428 | $436,817 | $386,644 |

**Total 5 year subsidy = $2,391,371**

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Scenario: 60% recovery

**Potential Water System Facility Charge – Ag**

| Meter Size | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | % Recovery |
|---|---|---|---|---|---|---|
| 3/4 inch | $6,671 | $8,969 | $11,267 | $13,565 | $15,863 | 60% |
| 1 inch | $10,934 | $14,942 | $18,950 | $22,958 | $26,966 | 60% |
| 1-1/2 inch | $29,651 | $35,325 | $40,999 | $46,672 | $52,346 | 60% |
| 2 inch | $64,866 | $69,667 | $74,469 | $79,271 | $84,073 | 60% |
| Total Revenue from 10 new customers | $376,954 | $423,496 | $470,039 | $516,582 | $563,125 | |

| Amount of Subsidy | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|---|---|
| | $561,588 | $515,046 | $468,503 | $421,960 | $375,417 |

**Total 5 year subsidy = $2,342,513**

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Scenario: resource development waiver

**Potential Water System Facility Charge – Ag (per account)**

| Meter Size | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | % Recovery |
|---|---|---|---|---|---|---|
| 3/4 inch | $6,671 | $9,561 | $12,451 | $15,340 | $18,230 | 69% |
| 1 inch | $10,934 | $15,948 | $20,962 | $25,977 | $30,991 | 69% |
| 1-1/2 inch | $29,651 | $37,278 | $44,905 | $52,532 | $60,159 | 69% |
| 2 inch | $64,866 | $72,804 | $80,742 | $88,681 | $96,619 | 69% |
| Total Revenue from 10 new customers | $376,954 | $444,506 | $512,059 | $579,612 | $647,165 | |

| Amount of Subsidy | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|---|---|
| | $561,588 | $494,036 | $426,483 | $358,930 | $291,377 |

**Total 5 year subsidy = $2,132,414**

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Scenario: double in 5 years (or 100%)

**Potential Water System Facility Charge – Ag**

| Meter Size | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | % Recovery |
|---|---|---|---|---|---|---|
| 3/4 inch | $6,671 | $8,339 | $10,007 | $11,675 | $13,343 | 50% |
| 1 inch | $10,934 | $13,667 | $16,401 | $19,134 | $21,867 | 49% |
| 1-1/2 inch | $29,651 | $37,063 | $44,476 | $51,889 | $59,302 | 68% |
| 2 inch | $64,866 | $81,082 | $97,298 | $113,515 | $129,731 | 93% |
| Total Revenue from 10 new customers | $376,954 | $471,192 | $565,430 | $659,669 | $753,907 | |
| **Amount of Subsidy** | **FY 2019** | **FY 2020** | **FY 2021** | **FY 2022** | **FY 2023** | |
| | $561,588 | $467,350 | $373,112 | $278,873 | $184,635 | |

**Total 5 year subsidy = $1,865,559**

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Scenario: full charge

**Potential Water System Facility Charge – Ag**

| Meter Size | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 | % Recovery |
|---|---|---|---|---|---|---|
| 3/4 inch | $6,671 | $11,613 | $16,555 | $21,496 | $26,438 | 100% |
| 1 inch | $10,934 | $19,436 | $27,939 | $36,441 | $44,944 | 100% |
| 1-1/2 inch | $29,651 | $44,049 | $58,447 | $72,846 | $87,244 | 100% |
| 2 inch | $64,866 | $83,679 | $102,493 | $121,307 | $140,121 | 100% |
| Total Revenue from 10 new customers | $376,954 | $517,351 | $657,748 | $798,145 | $938,542 | |

| Amount of Subsidy | FY 2019 | FY 2020 | FY 2021 | FY 2022 | FY 2023 |
|---|---|---|---|---|---|
| | $561,588 | $421,191 | $280,794 | $140,397 | $0 |

**Total 5 year subsidy = $1,403,971**

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

# Comparison of % recoveries and subsidies FY 2023

| Meter Size | Current | 5% Annual | 10% Annual | 60% Recovery | RD Waiver | Double in 5 Years | Full Charge |
|---|---|---|---|---|---|---|---|
| 3/4 inch | 25% | 31% | 37% | 60% | 69% | 50% | 100% |
| 1 inch | 24% | 30% | 36% | 60% | 69% | 49% | 100% |
| 1-1/2 inch | 34% | 41% | 50% | 60% | 69% | 68% | 100% |
| 2 inch | 46% | 56% | 68% | 60% | 69% | 93% | 100% |
| 5-year Subsidies ($ million) | $2.81 | $2.61 | $2.39 | $2.34 | $2.13 | $1.87 | $1.40 |

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

Current charges are still in effect in FY2019.
Revenue at full charge $0.9 million.

## BWS's subsidies for Ag

- Usage charges recover 60% of cost of service
- Annual usage charge subsidy is $1.6 million, or about $8 million over 5 years
- WSFC subsidy options range between $1.4 million and $2.8 million over 5 years

## Potential WSFC policy / guardrail issues

- For what customer classes should changes be phased in (subsidized)
- What BWS goals should be supported by a decision to subsidize, e.g.
  - Avoid rate shock
  - Encourage conservation
  - Easy to understand and implement
  - Others?
- How much should subsidies be? Why?
- Should receipt of a subsidy be conditional? If so, upon what?
- What should be the role of BWS in supporting Ag?

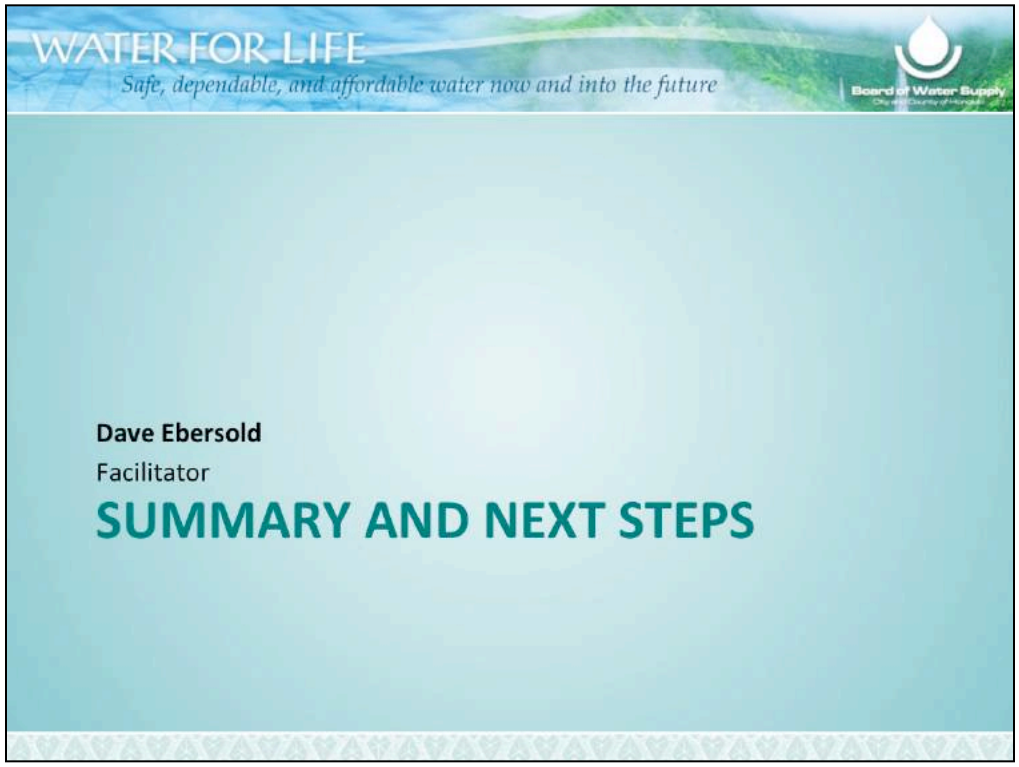
WATER FOR LIFE

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

Board of Water Supply
City and County of Honolulu

## Mahalo!

## Questions & Answers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Board of Water Supply
Dave Ebersold
Facilitator
SUMMARY AND NEXT STEPS