



Honolulu Board of Water Supply Stakeholder Advisory Group

Meeting 23 Wednesday, January 10, 2018 4:00 – 6:30 pm

Neal S. Blaisdell Center, Hawaii Suite
777 Ward Avenue, Honolulu, HI

Meeting Notes

PURPOSE AND ORGANIZATION OF MEETING NOTES

The purpose of these notes is to provide an overview of the Board of Water Supply (BWS) Stakeholder Advisory Group meeting. They are not intended as a transcript or as minutes. Major points of the presentations are summarized herein, primarily for context. Copies of presentation materials were provided to all participants and are available on the BWS website. Participants made many comments and asked many questions during the meeting. These are paraphrased to be more concise.

ATTENDEES

There were 13 stakeholders and 2 members of the public present, in addition to BWS and CDM Smith staff. The stakeholders represent diverse interests and communities island-wide.

The following Stakeholders Advisory Group members attended:

Pono Chong	Chamber of Commerce, Hawaii
Bill Clark	Resident of Council District 6
Neil Hannahs	Commission on Water Resources Management
Shari Ishikawa	Hawaiian Electric Co.
Bob Leinau	Resident of Council District 2
Helen Nakano	Resident of Council District 5
Robbie Nicholas	Resident of Council District 3
Dean Okimoto	Nalo Farms
Elizabeth Reilly	Resident of Council District 4
John Reppun	KEY Project
Cynthia Rezentes	Resident of Council District 1
Francois Rogers	Blue Planet Foundation
Cruz Vina Jr.	Resident of Council District 8

MEETING AGENDA

- Welcome
- Public Comment on Agenda Items

- BWS Update
- Accept Notes from Meeting 22
- Consideration of Trends and Rates on the Financial Planning Process
- Initial Results of the Water Rates Modeling

WELCOME

Dave Ebersold, meeting facilitator and Vice President of CDM Smith, welcomed the group and outlined the meeting objectives.

PUBLIC COMMENT ON AGENDA ITEMS

None.

ACCEPTANCE OF NOTES FROM MEETING 22

The group accepted notes from the prior meeting.

BWS UPDATES

Ernest Lau, BWS Manager and Chief Engineer, began by reminding the group of a rates workshop with the BWS Board, held the prior Friday, January 5, 2018. The purpose was to seek high-level direction from the Board regarding varied options for framing rates. Ernest indicated these would serve “guard rails” for staff’s recommendations on various potential rate adjustments under consideration, which will be worked on over the next few months.

A *Star Advertiser* reporter attended the workshop and stayed on after to talk with Ernest and BWS Board President Bryan Andaya. Ernest’s next slide showed the front page of the Saturday edition, with a headline declaring, “Water rates could jump 12.5%.” While the article was accurate, the headline was not. Ernest reminded the Stakeholder Advisory Group that the 12.5% increase did not refer to rates, but rather is the projected five-year growth in revenue requirements. Initial projections are showing about a 44% increase in revenue requirement over a 10-year period.

Ernest thanked Dave Ebersold, who facilitated the workshop, and praised Board Chair Bryan Andaya for running a great meeting. Ernest said he was very honored to have three members of the Stakeholder Advisory Group at the workshop: Cruz Vina, Dick Poirier, and Dean Okimoto. He commented their presence and comments “made a real big difference for the Board.”

The Board made decisions and provided BWS staff general direction on the following nine policy issues that had been presented previously to the Stakeholder Advisory Group.

1. Cost of Service Alignment

In the current rate structure, revenues from single-family residential customers cover about 88% of the cost to serve them (COS). Multi-family residential customers pay more than their COS, effectively providing a subsidy for other ratepayer classes.

The Board approved a guardrail option to adjust single-family and multi-family rates over the next five years so they are closer to cost of service.

2. Affordability

Affordability assistance for low-income customers is increasing as a consideration for water utilities. BWS currently offers varied forms of affordability assistance:

- Inclining block rate structure
- Monthly billing
- Zero interest payment plans (offered case-by-case)
- Accommodations to avoid turn off
- Bill adjustments for underground leaks
- Referral to community social service support.

The Board was shown a variety of additional assistance programs being introduced by other utilities, including a Hawaiian Electric Co. pilot program that eliminates the top tier for qualifying low-income customers.

The Board approved a guardrail option to make no changes to BWS's current affordability practices.

Ernest clarified that even though the current programs appear adequate at this time, additional BWS affordability accommodations may be added in the coming years.

3. Residential Rates

BWS currently uses a tiered rate structure for residential customers. The Board was asked whether they would support changes to the current tiers to establish an “Essential Needs” tier for both affordability and to encourage conservation. The first 2,000 gallons or so would be priced below COS, reducing bills for low water use customers. Ernest commented that many kupuna use 1,000 gallons a month or less. Additional tier adjustments were proposed to shift higher pricing to higher tiers, to encourage more aggressive conservation.

The Board approved a guardrail option to establish an “Essential Needs” tier and to adjust tiers to encourage conservation.

4. Recycled / Non-potable Rates

Rates charged to these customer classes are set well below COS. Recycled water customers incur higher costs including for dual piping and steps to implement Best Management Practices. Ernest noted that Reverse Osmosis (demineralized) water for specialized industrial use is probably the most expensive water provided by BWS.

The Board approved a guardrail option to increase recycled/non-potable rates to recover more of cost of service, especially for RO customers.

5. Agricultural Rates

Current agricultural customers are subsidized substantially compared to their COS. Ernest thanked Dean Okimoto, Nalo Farms, for coming to the workshop and providing valuable testimony.

The Board approved a guardrail option to retain the existing subsidy levels for agricultural rates.

6. Non-Residential Rates

The Board was asked to consider adding tiers to non-residential rates, to encourage more water conservation. However, there are multiple benefits of retaining the current uniform non-residential rates:

- the ability to address a wide diversity of customer types and usage
- not penalizing large efficient water users
- ease of understanding and administering
- equitable recovery of costs in absence of more detailed customer and usage data.

Ernest pointed out that non-residential customers are currently paying more than their cost of service and are subsidizing other customer classes.

The Board approved a guardrail option to make no changes to the non-residential rate structure.

7. Monthly Charge

BWS's current monthly billing charge is a flat rate of \$9.26 for every bill issued – a fixed charge that's the same rate for all customers. Another option is to charge for customer and meter-related expenses based on meter size, a common practice of water utilities. The Stakeholder Group expressed their support for charging by meter size. This practice better aligns with COS and makes clear the methodology of how the charges are computed.

The Board approved a guardrail option to change the structure to a monthly customer charge to vary by meter size.

8. Fee Subsidies

Ernest explained that BWS is being asked to provide subsidies for affordable housing and homeless shelters. BWS is keeping close watch on how the Council and the administration are proceeding, so they can remain in sync with the rest of the City and County. Ernest has been meeting with Council Members on this issue.

The Board approved a guardrail option to provide subsidies for affordable housing, homeless shelters, and fire-sprinkler retrofits.

Ernest explained that the Board did not specify how much of a subsidy would be provided. It is clear BWS has the flexibility to provide some subsidies, but the Board does not seem to want 100% of the costs waived. The Board also was supportive of BWS offsetting some of the cost for fire sprinkler retrofits in high-rise residential buildings.

9. Fire Meter Standby Charge

Owners of buildings with fire sprinkler systems, standpipes, and onsite private fire hydrants incur only a one-time upfront cost upon meter and fixture installation. Although they may be in service for 20, 30, 40, 50 years, there is no recurring monthly charge, as there is with other meters. Costs for this added service could be recovered through a fire meter standby charge that would make up about \$400,000 in revenue currently being subsidized by other customers.

The Board approved a guardrail option to establish a Fire Meter Standby Charge to recover the cost of service.

Ernest summarized that that the Board provided knowledgeable decisions. He mentioned that the Department of Environmental Services is considering rate increases sometime this year.

QUESTIONS, COMMENTS, AND ANSWERS

Q. It looks like affordability folds into other categories. It seems to me that there is ambiguity.

A. Our mission statement is: *provide safe, dependable and affordable water now and into the future* for our community. In the context of our mission statement, *affordability* tries to balance meeting the needs of the water system with keeping rates affordable for our customers so they can continue to pay for the water service.

Q. The recent article by Keoni Dudley says that because of climate change, the water that we're going to be getting in the form of rain will be much less. Has that been factored into our plan of how much water we will have in the future?

A. In the WMP, BWS considered impacts of climate change. Recent studies indicate that the leeward side might get drier, the Waianae Mountains in particular. But other areas might experience heavier rainfall and intense storms. So it remains to be seen what will happen in the long-term impacts. In the Master Plan, we're trying to develop more source capacity, encourage more water conservation and rain catchments, and develop more use of recycled water.

Q. The Dudley article pointed out that paving over more of our urban areas will prevent the rain from going into the ground. I would think that is going to have a major impact on the amount of water that we're going to have in our aquifers in the future.

A. A lot of the high recharge occurs is in the mountains and our watersheds. In the city, we are encouraging Low Impact Development (LID), which minimizes the use of paving and recommends using swales and other methods to help water infiltration. We also want to take steps to reduce the amount of water running off into the ocean and contaminating our beaches and near-shore waters. It helps to develop the land in such a way that more of the rain that falls onto a property infiltrates into the ground, on-site.

Q. Does BWS have a voice in this?

A. Yes. BWS is working very closely with the Department of Facilities Maintenance (DFM), which has stormwater responsibilities with the City. Kathleen Pahinui has been doing joint outreach to the community and developing educational opportunities, working closely with DFM. For new development, we want to encourage LID to manage stormwater and recharge the urban areas. We also have to protect source water quality. Ernest had an editorial on the Red Hill tank issue published January 9, 2018, in the Star Advertiser.

Q. What has been the public response to all this, the Saturday headline and Ernest's editorial? Have we heard from the community?

A. Kathleen said that, surprisingly, most of the public commentary on the Saturday headline and climate change article discussed other topics. A few people responded to Ernest's Red Hill editorial with letters to the editor, most of which are positive and very supportive.

Q: We have a petition campaign going on in Manoa about the trees. Why couldn't we start a petition to the Navy asking them to double line the tanks? Who would do that?

A: Ernest said that the BWS is not a signer of the administrative order of consent with the Navy, the EPA, and Department of Health. They may call us to participate as a subject matter expert. We provide our viewpoint to them and we put everything in writing. We use postings on our website to express where we think they can improve or where we don't agree with where they're headed.

Comment. If somebody would start a petition, we can sign.

Comment. It's important to do the analysis first. You don't double line tanks if that's not going to be effective. Double lining the tanks would add weight, which may cause more problems. It's important to do the engineering analysis before coming up with the solution.

A. Ernest said the Navy will publish a tank upgrades options report later this year. He encouraged stakeholders to take a look at it. For the first time the Navy is seeking public comment, which he applauds. One website where people can get information is epa.gov/red-hill. A very critical decision is going to have to be made and it's going to be the direction that that facility heads for quite a while.

Ernest asked Kathleen to give an update on outreach and communications. Kathleen indicated that she, her staff, and CDM Smith are working on a comprehensive public outreach initiative regarding the Capital Improvement Program (CIP), Long Range Financial Plan, and rate adjustments. Her intent is to be in touch with all Stakeholder Advisory Group members for help setting up meetings with stakeholder groups within the community. It would be valuable to have members of the Stakeholder Advisory Group attend Neighborhood Boards with BWS staff. BWS is looking at an April, May, June timeframe for doing presentations. In addition, BWS

will hold four regional meetings: one Windward, one in West Oahu, one Central Oahu, and then one urban/metro Honolulu. These will be in late April and into May. Kathleen asked the group to start thinking about organizations and other interest groups that BWS can call, similar to what we did for the WMP. It's going to be a great opportunity for community members to weigh in. Kathleen then introduced two new members to her staff, Blaine Fergerstrom and Jane Pascual.

CONSIDERATION OF TRENDS AND RATES ON THE FINANCIAL PLANNING PROCESS

Dave said that presentations at recent Stakeholder Advisor Group meetings have focused the first 10 years of a 30-year planning period. In December, stakeholders heard about building the 10-year revenue requirement with three components: 1) operations and maintenance costs, 2) capital costs, and 3) the financial strategy. Operating expenses forecast for the 10-year financial modeling period are expected to increase about 3.5% per year, growing from the current \$137 million to about \$197 million in 2028.

He discussed the 30-year CIP that identifies specific projects and when they would happen, utilizing the risk-based analysis and the Water Master Planning process.

At the December Stakeholder Advisory Group Meeting, the group heard about how this translates into for the 10-year revenue requirement, including what happens if there's no adjustment to rates. Absent any revenue adjustment, the gap between the revenue requirement and available revenue escalates quickly.

The next 20 years. The financial planning team has looked further into the future than the initial 10 years. Long range planning required making some assumptions. (See table below.)

Long range assumptions	
Item	Assumption
State Revolving Fund Loan Amounts	FY 2029: \$10M FY 2030 – 2035: \$12M/year FY 2030 – 2040: \$15M per year
State Revolving Fund Loan Terms	FY 2018 – 2021: 0% FY 2022+: 0.5% Energy Savings Performance Contract: 0% Annual fees 1% of outstanding balance
Debt issues	Varies by year, overall 50/50 debt/cash
Bond terms	FY 2018 – 2021: 4% FY 2022+: 4.5% Issuance cost: 0.5% 30 years
O&M Escalation	3.5 percent per year
Days of Working Capital	Minimum of 60 days, target of 180 days
Water Demand	0.1% per year growth in customers 5-year GPCD reduction from WMP

Dave indicated that water demand is an important assumption, since demand aligns with revenue. The Water Master Plan (WMP) assumed a 0.2%-per-year growth rate. He reminded the group that in planning infrastructure improvements, it's prudent to aim a little bit high to be

certain you're not under sizing pipes, pumps, etc. In financial planning, it's best to aim a little bit lower, to avoid counting on revenues that may not be there. The WMP anticipates additional conservation, which translates to a reduction in gallons consumed per capita per day, dropping from the current level of 155 gallons per capita per day, down to about 144. In summary, total water demand is likely to remain pretty flat through the 30-year period.

QUESTIONS, COMMENTS, AND ANSWERS

Q. Are the state revolving fund loan amounts on the chart what we get from EPA?

A. Yes.

Q. The state redistributes funds to whatever organization in the state has projects. I notice on the chart you start from fiscal year 2029. The state has been for not utilizing those funds fast enough, with the threat of being reduced. Could we pull in the SRF funds sooner than 2029?

A. The reason why these start at 2029 is that these are long-range assumptions, from 10 years out and forwards. We already have assumptions about state revolving fund use in the first 10 years, based, for the most part on data provided by DOH.

Q. After reading Dudley's article this morning about weather shifts and less water, what about including a saline conversion plant as a long-range assumption? If you're looking out a couple of decades and if the weather really does shift, you could get saline intrusion. Plans for such a facility would take a lot of lead-time.

A. Good point. There are already plans for a Kalaeloa Desalination Project in Ewa. We're going to talk a lot more about climate change when we get into some of the risk analysis issues.

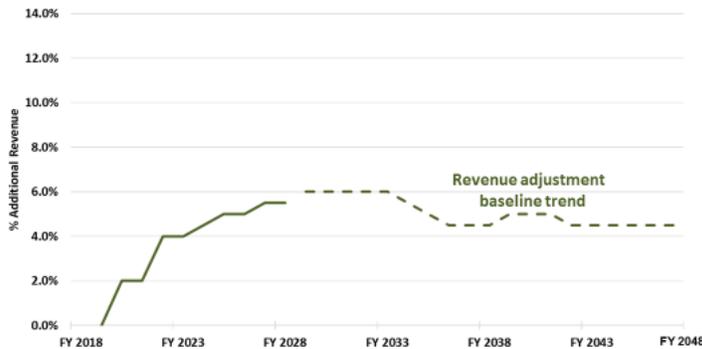
Q. Where is your analysis of the underlying value of land assets? Hawaiian Electric just announced that they're examining the best value or best benefit to ratepayers of the Ward Ave. land right across the street. What about BWS's land, on Beretania or anywhere else?

A. On Beretania, BWS has an open parking lot right behind our building, next to Queens Hospital. We issued an RFP to potential developers. Unfortunately, as we were going to enter negotiations, Queens Hospital withdrew. We're looking at going out again with another RFP to develop the large fleet equipment and employee parking lots. We will prepare an EIS.

BWS also has identified that at some point in the future our organization may need some additional office space on Beretania. There's a small employee parking lot above the engineering building where we might put up a small office building. For the other two large parking lots, we're looking at a public/private partnership. We're trying to monetize by developing a multilevel parking structure or some other type of use on that site. One early option we've identified is potential for assisted living or a long-term care facility, because of its location next to Queens Hospital, which is a major medical center.

Dave then returned to his presentation, pointing out this would cover trends to consider as part of financial planning, based on the assumptions just reviewed. He began with a projection of revenue needs from FY2018 out to FY 2048. The first increase in revenue requirement of 2% would come in 2020. Continuing out into the future, year after year, projected additional revenue needs would range from about 4.5% to 6% per year. (See chart below.)

Additional revenue needs trend (percent of existing rate-based revenue)



QUESTIONS, COMMENTS, AND ANSWERS

Q. Is this up for discussion?

A. It's the results of an analysis that we're sharing.

Q. But didn't the Board decide the rates? What else do we have to do here?

A. Ernest told stakeholders about the genesis of this forecast, why he wanted to do it, and its importance, to provide some context for the discussion. He said that the WMP looks ahead to what BWS needs to do in the next 30 years to maintain and grow the water system. The WMP includes projections for climate change and TOD Development, as well as other trends.

To implement the WMP, BWS developed a 30-Year CIP that identifies and prioritizes projects. More detail regarding projects and their implementation are provided in a 10-Year CIP and even more in a 6-Year CIP. Knowing there are many factors that may negatively impact water service and sustainability, and well aware of our fragile existence on a remote island, Ernest said that he had this idea to help prepare us for the future by doing a Long Range Financial Plan. This plan anticipates how we will remain financially sound under different potential scenarios. We need to know what our risks and exposure might be going into the future, and what the impacts may be on revenue requirements. This information has not yet been brought before the BWS Board. He said he wanted to get stakeholders' input first.

Q. The prior chart shows the 30-year revenue trend based on current rates. In fiscal year 2048 the revenue requirement is \$850,000,000. When I go the 30 Year CIP, in 2046, we require \$200,000,000 a year. What am I missing?

A. The difference is operations and maintenance expenses primarily, and debt service.

Q. Debt service and operations and maintenance are going to be approximately \$600 million of that total \$850 million?

A. Yes. If you add 3.5% per year, year after year after year, it adds up to a big number. The CIP numbers shown are today's dollars, not inflation adjusted.

Q. Can we get all of these charts using the same terms and dollars?

A. Yes.

Q. How much of working capital is for capital improvement? Is it compounded? As costs go up, that amount obviously has to get bigger. And now it's compounding upon itself. How much of that is built in to this?

A. As the overall operating budget increases, maintaining 180 days cash-on-hand (working capital) increases.

Q. I'm assuming you use some cash for capital improvement projects.

A. Yes. The long-term assumption on the CIP is about 50% will be funded with cash, and about 50% will be funded with debt.

Q. But that builds. It's compounding, right?

A. Right.

Q. Do we know what level of compounding effect it is?

A. The impact of increasing the working capital balance is actually a relatively small portion – less than 1%.

Q. This seems like a pretty smart capital optimization model. We try to figure out how best to defray these costs given the cost of capital and what we have in cash. When I think of this as a business, I think: “Where am I going to have opportunities to expand my revenue?” I know my costs are inevitably going to increase.

When I think about our business model, I wonder what kind of life we see for it. Remember, the water utility was started at a time when we had an abundance of high quality resource and

a pretty elastic model of demand that we could grow into. Now we think of climate change possibly diminishing the quantity and the quality of resource. And, we wonder how many more people can we add on the customer side to pay. Is this the only way we have to cover expenses? Inflation and other costs are going to take it beyond what we've come to live with in our lifetime. The next generation, or the one after that, is going to have a new reality. Is there a way to look at the business model and think of new ways to drive revenue?

A. That's a fantastic question. This is what every utility across the country is struggling with. They're all facing exactly the same problem. The costs of operations, maintenance, system repairs and replacement are going up faster than the general rate of inflation. You've already seen the projection of revenue trends from water sales. They're pretty flat. You're hitting the nail on the head.

There are many options out there. The Stakeholder Advisory Group has already discussed consideration of BWS entering into a bottled water business to create another revenue stream. BWS might provide additional services on the customer side of the meter. As one example, the telephone company offers line insurance. We might want to provide leak detection services on the customer property and charge them an amount that will recover our costs or more.

We should think outside the box. For example, in time there might be home units for gray water recycling. This could take some pressure off the water system, enabling people to capture shower water, sink water, washer machine water, rinse water, and recycle it and use it on site. This could reduce how much water customers use or send into the sewer, lowering their bills. The options are going to be driven somewhat by technology. We want to encourage customers to look at innovation on their side of the meter. We want to put more control over bills in the hands of customers.

BWS is still using less than the sustainable yield for Oahu, in part because some large agriculture on the island has been shut down. It may not be cost effective to develop up to the sustainable yield. At some point we could be pushing more use of recycled and non-potable water instead of using high quality resources.

BWS is setting the target of reducing per-capita demand from 154 to 145 gallons per capita per day. But, there's nothing to say that can't be lower than 145. It's really amazing what they did in California. They're basically running out of water and have greatly reduced their per capita demand. Aggressive water conservation is one scenario in the Long Range Financial Plan.

Q. Is the BWS precluded from hydro development? BWS already moves water, and in moving water you can create energy that's saleable.

A. I think BWS can do it. Barry Usagawa, working with CDM Smith, did a study of a hydro managed aquifer recharge project using Nuuanu Reservoirs. Senator Schatz requested that BWS look at inline micro hydro. It makes sense, because water is moving from higher elevation to a lower elevation. For now, the idea isn't penciling out financially. In the future it might

become more cost effective. BWS also is looking at self-generation of renewable energy, to reduce how much is purchased from Hawaiian Electric. We also are looking at ways to address future costs with operating efficiencies. Like any business, BWS looks at cutting costs, but we just need to be careful that we don't compromise service to our customers.

Q. Do any of the BWS water rates go through the PUC?

A. The PUC doesn't regulate the county water department or other water departments across the state.

Comment. The PUC regulate private water systems that sell to other customers.

ANALYSIS OF TRENDS AND RISKS

Dave told stakeholders that in long range planning, there are always uncertainties. The uncertainties that were analyzed for the BWS included the following:

- water demands
- water quality
- economic factors
- regulatory requirements
- climate change

He said the financial planning team developed scenarios for each of these to analyze those uncertainties in different combinations. He then showed a series of slides and discussed projections, assumptions, what effect(s) each scenario would have on revenues or revenue requirements, and options to deal with the effect(s).

Scenario 1 – Aggressive Conservation

Assumes per capita demand decreases at 1% per year (1% each year over year, for 30 years)

The WMP recommends pursuing conservation with the goal of reducing consumption from 155 gallons per capita per day to 145 gcpd. But what would happen to BWS revenues if customers conserved far more than that? This scenario examined the assumption of demand decreasing at a rate of 1% per year (every year) across all customers.

Dave said the analysis of this scenario indicated that revenues would drop down on the order of about \$50 million per year by the end of the 30-year planning horizon. This level of decrease would require some kind of mitigation to balance revenues with revenue requirements. Financial mitigation strategies included:

Scenario 1 – Aggressive Conservation				
Access working capital	Defer expenses	Raise / restructure rates	Issue debt	Public private partnerships
--	X	X	X	--

Key points included:

- Because aggressive conservation is a long-term trend, BWS wouldn't look at a short-term solution like accessing working capital to solve it, but some deferral of expenses would be possible. For example, there may not be the need for as many new facilities to support growth.
- Other opportunities to deal with this are raising or restructuring rates, and/or funding more of the capital program through debt to push those costs out in to the future.

Scenario 2 – Aggressive Growth

Assumes an increase in water demand at 1% per year (1% each year over year, for 30 years).

The WMP identified a “most probable growth” scenario, as well as a “high range demand” projection. For this analysis, the team analyzed an even more aggressive growth scenario where demand for water would increase by 1% each year over year, for 30 years.

Dave pointed out that there would be higher operations and maintenance costs associated with the increase in demand resulting from aggressive growth. Additional revenues generated from increased water sales would offset those higher O&M costs. In fact, a lot less revenue adjustment would be needed because BWS would have significantly more money coming in from the additional water sales. However, if BWS had a short-term need for capital to build additional infrastructure – for example, new sources of water and/or greater capacity in the system – financial mitigation strategies would include:

Scenario 2 – Aggressive Growth				
Access working capital	Defer expenses	Raise / restructure rates	Issue debt	Public private partnerships
X	--	X	X	X

Key points included:

- BWS could access working capital and direct it to the CIP.
- Rates could be raised or restructured, debt could be issued, or public private partnerships could be developed to deal with those additional capital costs.
- By and large, the Water System Facilities Charge should supply the needed funding. It's really an issue of timing that would force BWS to use these types of financial mitigation strategies.

Scenario 3 – Major Natural Disaster

Assumes damages to net assets, revenue loss during initial months of recovery, followed by further revenue loss in subsequent months of recover.

The BWS’s financial policy related to days of cash (working capital) was updated in 2017 in part as a result of discussions about disaster recovery. For each of the three scenarios defined in the table below, the BWS could access working capital and delay projects to reduce immediate expenses. FEMA would be a likely source of repayment of disaster recovery expenses, but the funds are “repayment”, not up-front funding. BWS would have to have funds available to pay for the immediate expenses of recovery. Debt could be issued to finance costs of recovery, and public private partnerships might be possible for triage on certain things.

BWS disaster recovery scenarios

Item	Scenario A		Scenario B		Scenario C	
	Rate	\$ M	Rate	\$ M	Rate	\$ M
Damages % of net assets	2%	\$22.4	4%	\$44.8	4%	\$44.8
Revenue Loss	50% Months 1-3	\$28.9	25% Months 1-3	\$14.4	100% Month 1	\$19.2
Revenue Loss	25% Months 4-12	\$43.3	10% Months 4-12	\$17.3	50% Months 2-3	\$19.2
Days Cash	201		163		177	

Financial mitigation strategies would include:

Scenario 3 – Major Natural Disaster				
Access working capital	Defer expenses	Raise / restructure rates	Issue debt	Public private partnerships
X	X	--	X	X

QUESTIONS, COMMENTS AND ANSWERS

Q. Scenario C considered revenue loss for only 3 months. What is a comparable example?

A. Ernest told the group that the BWS will be talking with representatives of Puerto Rico about its recovery from Hurricane Maria. The US experienced 3 Category 5 hurricanes in 2017. Puerto Rico is still working hard to recover the hurricane that occurred mid-September 2017 (4 months ago). The question about 3 months vs. longer is relevant. What if it takes longer to recover?

Q. You lose income revenue because of a disaster. At the same time you'll be incurring a lot of expenses. The expenses aren't included in this chart, right?

A. They are included as damages % of net assets. Joe Cooper said that amount would be the gross damage. BWS could borrow and pay it off over years. How you account for that could vary. If a loss of 2% of net assets was financed, it would require less cash funding.

Q. What do these hurricanes look like, in terms of number of pumps out, quantities of infrastructure damaged or lost? What do they look like for a Category 2 hurricane?

A. We analyzed some major natural disasters in Hawaii as well as nationally. The biggest impact to Kauai was to the tourism industry. It took 14 years to recover and Kauai has never recovered its loss in population after Hurricane Iniki. We looked at Hurricane Katrina, and storms in Florida and Texas. They were Category 4 or 5 hurricanes. Details like how many pump stations were lost or damaged were not available. Instead we were able to look at financial statements and at the losses the water utilities wrote off in terms of percentages of net assets.

Comment: We need to be careful not to over-capitalize. We need to prepare for the event that is more likely to happen. We used to tell our members they should do emergency planning for their business, that's very important. Yes, plan for a Category 5 hurricane, but plan for what's more likely to occur, like when somebody hits a utility pole and your electricity goes out.

I would caution us about being too careful and planning financially for the big one where the BWS is the only financially viable entity and the rest of the island hasn't done the same.

A. Those are good points. And as a reminder, based on the analysis that was done in development of the financial policies prior to on May 2017, the BWS Board adopted updated financial policies that set that target at up to 180 days cash on hand.

Ernest added that BWS's vision is *Ka Wai Ola* -- Water for Life. Getting water service restored to our community is going to be a top priority for our island. It will be vital for people just to be able to live and not die of waterborne illness because they're drinking out of rivers or streams. BWS needs to be prepared; we're in the middle of the Pacific with climate change and rising sea surface temperatures. We could become more susceptible to more intense storms as we saw in 2015. 15 cyclones crossed our way in just one season. At one time, three Category 4 hurricanes existed in the Eastern, Central, and Western Pacific. As we saw in the Atlantic, three Category 5 hurricanes hit Texas and the Virgin Islands and Caribbean in just a short period of time. I hear what you're saying, but we need to be ready.

Comment: I'm not saying that the BWS shouldn't be financially and operationally ready if an actual disaster should occur. I'm saying that we also need to be careful of over-capitalizing, because I'm assuming BWS will have some access to money from FEMA and possibly others should something large happen. The philosophy that at all costs we need to be financially

viable, especially with the cash capacity, is going to either raise rates or decrease capital improvement projects in everyday life.

A. Ernest said the federal government operates on a reimbursement basis, so BWS would have to front the monies and reimbursement, which sometimes takes years to get through FEMA.

Joe Cooper added that when we were establishing the financial policy about number of days of cash on hand, we discussed "What's enough?" Puerto Rico would need more than 180 days cash on hand to recover from the damage they have. He explained that part of his job is not only to manage the actual cash that we have, but also to consider: What are the other funding possibilities? What are the FEMA loans? What are the municipal bond fund loans? What are the SRS fund loans? What are the grants that we would be able to access in the case of one of these disasters? If we got hit directly by a Category 5 event the islands in general would be struggling, but we would be using all the tools in our toolbox. And we certainly would not have enough cash to recover solely from that. Your point is very important and a lot of other utilities do plan for the most likely disaster -- not the most catastrophic -- and really what we've done is try to plan for the most likely disaster.

Dave added that, with respect to raising or restructuring rates following a major natural disaster, the thought process is that this would not be a permanent event. It would have a defined time period and a recovery period. But if the damage were severe enough, we could certainly come up with a scenario where we might have to adjust rates.

Scenario 4 – Major Water Source Contamination

Assumes a major source (approximately 10 million gallons per day or greater) is impacted by a sudden leak or long-term legacy land-use and contamination will persist.

For this analysis, the financial planning team assumed the costs of construction as well as operations and maintenance as follows:

	Develop new 10 mgd source + 1 mile of 36-in pipeline	5 miles of 36-inch pipeline	Install 10 mgd treatment
Capital Cost	\$85 M	\$125M	\$30 M
Annual Additional O&M Cost	\$500 K	\$1.25M	\$3 M

Dave said these details are just a planning scenario. If BWS had a short term need to get a project going very fast, it could defer expenses to help pay for that. Depending on the size of the problem and the impact, BWS may have to do some mandatory restrictions on water use for a period of time, which would have a short-term decrease in revenues.

Scenario 4 – Major Water Source Contamination				
Access working capital	Defer expenses	Raise / restructure rates	Issue debt	Public private partnerships
x	x	x	X	x

Scenario 5 – Climate Change

Assumes:

- Higher capital replacement is needed due to increased groundwater salinity
- 25 percent of infrastructure is low enough and close enough to the coast to be impacted
- Impact will halve the useful life
- Additional sources will be needed to replace failing groundwater sources
- May require mandatory conservation

QUESTIONS, COMMENTS, AND ANSWERS

Q. Which potential ground water sources would you expect to fail with the climate change scenario? From my understanding, most of our aquifers are inland. How many ground water sources would fail based on climate change, because they are close to the coastline?

A. Barry said the sources are not that close to the ocean. UH climate models suggest that the Leeward side of the island is going to get drier. Today's newspaper article mentioned the upper end could be 80% to 90% less rainfall. Rainfall is expected to decrease by 65% in Waianae, which would probably result in the loss or severe reduction in source yields there. In California, during the recent drought, a lot of the wells didn't have any water. That could happen here as well. Note that the UH climate models show a potential increase in rainfall in Windward and mauka Honolulu watersheds.

Part of the long-range plan is to develop more wells so that we have more water to import to dry areas because there is available sustainable yield in the Waipahu-Waiawa aquifer. We plan the expansion of the Honouliuli water recycling facility. We are also moving on a small seawater desalination plant in Campbell Industrial Park. These projects are planned in anticipation of current brackish wells getting too salty for landscape irrigation. One idea would be to redirect saltier brackish water to the brackish desalination plant proposed in Kapolei Business Park for drinking water, and to use recycled water to replace brackish water irrigation.

We plan adaptation from several different fronts. This is why we engage the University of Hawaii to conduct research for us. Research gives us a forward look of the realm of possibilities, based on their science. Then we can start to fold the results of research into the long range CIP. That is the beauty of a 30-year CIP. We can look at additional sources and strategies that will drive capital spending to address climate change. We just did a study related to sea level rise and additional corrosion of the pipelines. Basically, we have to replace metal

pipes with PVC or HDPE plastic pipe. There are some issues around longevity, but we are looking at those materials in terms of infrastructure replacement.

Q. We are talking about 25% of infrastructure being low and close enough to the coast to be impacted. Is that driving the BWS to reconsider not just replacing 21 miles of pipeline per year in the same location, but to explore moving our water main backbone further inland? If we take the philosophy of: "replace 21 miles per year in the exact same spot", we are going to be in a predicament. Should we be also anticipating this climate change impact, and moving the backbone of our water infrastructure?

A. In the context of sea level rise, pipelines are generally aligned along coastal roads. We are working on with the Office of Climate Change Sustainability and Resiliency to come up with a framework for identifying which of the roads that should be raised. If you look at Miami, they raised a lot of their streets on the Biscayne Bay side about 3.7 feet higher. When you raise roads, you replace the infrastructure little higher, above the anticipated or forecasted sea level rise and account for storm flooding. Elevating the utilities with the roadway will keep it mostly above the saltier water table.

Dave said that because of the many changes to infrastructure that will be needed, the revenue requirement will be higher. If BWS has to restrict sales and if it doesn't have the supplies to meet demands, it will have to make conservation mandatory. That will reduce revenues, so the gap between the revenue trend with and without adjustments will get bigger. Revenue adjustments may be as high as 8%, certainly a lot higher than the baseline scenario we have been talking about. Financial mitigation options include:

Scenario 5 – Climate Change				
Access working capital	Defer expenses	Raise / restructure rates	Issue debt	Public private partnerships
x	--	x	x	x

Dave asked Barry to tell stakeholders about some of the climate change programs the BWS has been working on. Barry said the BWS has been working on the following:

- Hawaii Climate Change Mitigation & Adaptation Commission
- City Climate Change, Sustainability and Resiliency Office – City Resilience Team
- UH Manoa research on climate change modeling forecasts
- Assessing Infrastructure Vulnerability to Climate Change, Water Research Foundation
- Pearl Harbor-Honolulu groundwater modeling to understand groundwater quantity and quality
- BWS Watershed (hupua`a) Management Plans
- Stormwater capture from Nuuanu Reservoir to supplement aquifer recharge

Barry said that we have an idea where rainfall may change in the future. Knowing that helps us figure out which areas are the most vulnerable and then we can prioritize our sources and transmission system, infrastructure replacements and strategies to adapt. The Pearl Harbor-to-Honolulu groundwater model allows us to run climate change scenarios, so we can figure out which sources are maybe impacted. If a source is impacted, we have to consider the infrastructure that connects that source. If we have to cut back, where are we going to get water to serve the area, and how do we reconnect those new pipelines to new supplies? The model helps us drill down in detail.

Our watershed management plans use the ahupua`a concept that sets the policies, strategies, planning, and values on sustaining the island, one watershed at a time. We are also working on the Nuuanu Reservoir hydro managed aquifer recharge project.

Scenario 6 – Economic Downturn

Assumes economic downturn similar to the Great Recession of 2008-2009 that lasted 18 months.

To analyze financial impacts of a serious economic downturn, the team looked closely at the Great Recession (2008-2009). Fluctuation in Hawaii's gross domestic product was a lot more muted than in many other places across the country. In 2009, the gross domestic product (total economic output for Hawaii) went "negative"; in 2007, 2008, and years other than 2009, the gdp wasn't increasing as much as other times. During the recession years, BWS's revenues remained relatively flat and stable. Water sales began declining in 2009 and have remained lower since then. The reasons for the decline could be factors like conservation, lingering effects of the recession, price sensitivity to higher water and/or sewer bills, or some combination of these.

The team analyzed other economic factors including interest rates, construction costs, and total amount of government contracts. The analysis showed:

- Prior to the recession, the construction cost index was high. Then when the recession hit, it dropped down and construction costs decreased for a period of time. Once the economic stimulus kicked in, the construction cost index started rising up again.
- Prior to the recession, government spending in Hawaii was hovering around \$800 million to \$1 billion per year. Then with the recession, government spending plummeted to about half. With the economic stimulus, government contracting increased again.

Given that revenues held fairly steady through the recession, we don't look at raising or restructuring rates as being a necessary solution to an economic downturn. Instead, we see taking advantage of short-term opportunities through accessing working capital or issuing debt. A public private partnership might also be a solution for handling an economic downturn in Hawaii, depending on the nature of the project.

Scenario 6 – Economic Downturn				
Access working capital	Defer expenses	Raise / restructure rates	Issue debt	Public private partnerships
X	--	--	X	--

Dave summed up how to use this analysis of trends and risks. He said the scorecard in the WMP provides a lot of information about different metrics, conservation rates, water demands, the condition of the system, condition of ground water wells, and more. The scorecard is an important tool available to the BWS to utilize and assess changing conditions.

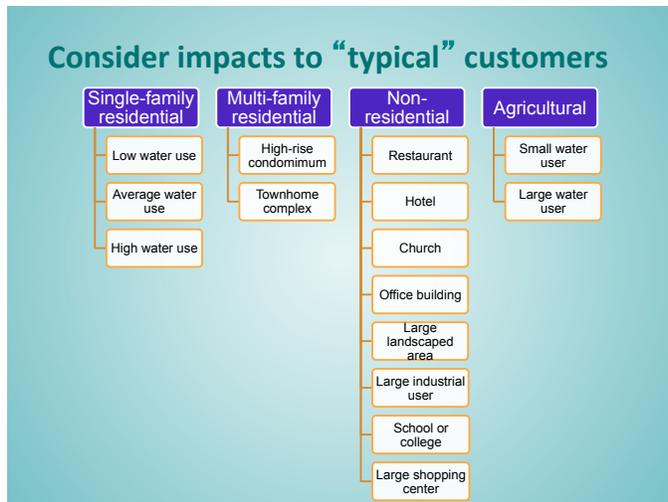
Dave said that there are a number of financial tools available, and they appear to be adequate for the scenarios discussed. The analysis conducted was a sort of paper stress test of these different situations. With a commitment to the implementation of the BWS’s WMP and financial policies, there should be the ability to avoid high rate shock under any of these scenarios. This is a long-term trend analysis meant to give a picture of what tools are available and what the potential impacts could be under a variety of different scenarios.

INITIAL RATES MODELING

Dave told stakeholders that the next agenda item would be a look at initial water rates modeling that were “hot off the press”. The results were so recent that they had not been completely vetted; virtually all information discussed with stakeholders is vetted ahead of meetings to ensure its accuracy. These results were an exception because the BWS felt it was critically important to present the initial information and hear reactions and ideas from stakeholders. Ernest encouraged that input from stakeholders could help BWS refine the next steps.

Because of the very preliminary nature of the modeling, the presentation viewed by everyone included results data but the handouts did not. These meeting notes will also leave out the specific data, but will report the big picture.

Dave reminded the group that it provided guidance on a number of rate objectives: water rates need to be legal, recover the full cost of water, support the BWS's credit strength, be fair and equitable, stable and predictable. One of the things that BWS committed to in looking at rate changes is not to just look at the impacts to the four customer classes as a whole as an “average”, but rather to look at a number of specific typical water bills. The group had previously identified the typical customers shown below for this more specific analysis.



Q. By distinguishing between large and small agricultural users, what was the BWS trying to support – for example, providing food for the local population vs. growing crops to export?

A. Dave said the distinction was just the volume of water used (e.g., 80,000 gallons a month or a quarter million gallons a month). All but four of BWS's agricultural customers have water meters two inches and smaller.

Comment: Large farms constitute around 3% of the total number of farms in Hawaii. These large farms produce 90% of the locally grown food supply. If we are looking at moving the needle on sustainability, a lot of the talk has been to support the small farmers and tax the large farms, but it depends on how you look at it. We need to look at sustainability in a different perspective and encourage small farmers to start getting bigger.

Dave asked Brian Thomas to present the initial results of financial modeling of water rates. Brian said it was important for the group to keep in mind that there are many ways to approach rate setting, and this is just one way to initially model. Brian said the financial team looked at an initial scenario of how to move rates closer to cost of service. The scenario was structured to achieve the following:

- To enable BWS to recover more of cost of service from single-family residential customers, but not spike rates in the first year, the scenario would gradually increase rates for this group over five years.
- Since multi-family residential customers already pay more than 100% of cost of service, the scenario aimed at reducing their rates to recover 100%.
- The scenario established an Essential Needs Tier, limiting the discount (below cost of service) to the first 2,000 gallons.
- To encourage conservation, the scenario would shift subsequent tiers for residential customers downward.
- For customers of recycled/non-potable water, the direction was to slowly recover more of their cost of service.

- Ag rates would retain the existing subsidy level.
- Non-residential customers would keep a uniform rate (no tiers). This rate for this group already recovers more than cost of service. The scenario did not change the rate for this customer class.
- The monthly customer charge would convert to vary by meter size, rolling out over 5 years.
- The fire meter standby charge would be based on meter size.

Brian discussed several examples of typical customers (see chart above) and their bills.

QUESTIONS, COMMENTS, AND ANSWERS

Q. How are we going to explain these numbers? Some rate increases may be more than 12.5% (refers to a headline in a recent newspaper article). People are going to remember that headline and will notice if their rate differs.

A. Brian said this is a very important question, but to keep in mind that this is only an initial run of the rates model, and many changes will be made before rates are proposed. There is flexibility. An important question is: What are we trying to accomplish with the rates?

Comment: There's going to have to be some really good background material put together to educate people on not only the strategy, but also what the strategy really means. The material has to explain what the benefit is going to be for everybody. Important benefits are having 180 days cash on hand for emergencies and disasters, using debt to help smoothing out the impacts to rates, etc. These things are not easy for us, even after many months of going through it. Somehow we need a picture for our general population that communicates that the 12.5% rate increase that came out in the newspaper Friday, doesn't necessarily equate to a 12.5% increase *for you*.

Dave agreed with the comment, and then asked the group if they had feedback on the scenario and information presented. He asked if anyone had input regarding the essential needs tier, or shifting tiers to encourage more conservation. He asked if the group felt the initial scenario's rates looked too high or too low when compared to stakeholders' expectations.

Comment: One stakeholder gave a personal example. He lives on a large parcel, and uses water at a residential rate. When the weather turns dry, he waters his plants twice daily to keep them alive. A potentially much higher rate for higher water use seemed like "punishment because of a weather event". Other stakeholders suggested methods of conserving water, including catchment systems and heavier mulching. Another suggestion was to get together with the water conservation district and prepare a conservation plan.

Comment: Some people in the community will push back. Their large families won't benefit enough from the essential needs tier. They will say that they already don't flush the toilet every time to save money. Many live on incomes and in communities that are below the island's median income. The essential needs tier has to take into consideration these large households.

We're going to have to really clearly explain why the essential needs tier is being added, and where it's coming from. We have to be prepared for the backlash.

A. Brian said that the team will analyze the effects of moving tiers. For example, if we wanted the lower tiers to remain relatively flat (rates would not increase significantly year over year), other tiers would be adjusted to collect the cost of service overall.

Q. You looked at certain break points for separating tiers. What was the rationale for those break points?

A. Brian answered that in this example, the essential needs tier was set for 0 – 2,000 gallons of water use. About 10 % of BWS customers use 2,000 gallons of water per month or less, so that seemed a reasonable upper end for customers who apply very conscientious water conservation. Another break point used was 6,000 gallons per month. About half of BWS's residential customers use 6,000 gallons a month or less.

Dave added that the team also considered the following rationale for this initial scenario:

- The high-rise condo that has a relatively low amount of usage per dwelling unit – about 7,000 gallons per month – and would see a decrease in their bill. One of the objectives was to eliminate the subsidy that multi-family is providing by paying over cost of service.
- To reduce the subsidy that non-residential is similarly providing, this scenario would keep rates flat for non-residential customers over a five-year period.

Comment: The example shown has the multi-family residential user consuming 7,000 gallons a month. That's more than the average single-family residential customer using about 6,000 gallons a month. That looks like we're giving the multi-family customer a break in certain regards. The multi-family home would be using more water than, on average, a single family, which seems really at odds.

A. This was a reflection of the customer selected for the analysis, not for the multi-family customer class as a whole.

Dave said that next month, stakeholders will get to see additional examples. BWS will be looking for some really specific feedback on what makes sense, why and why not.

He reminded the group that there is a tour of the Honouliuli Water Recycling Facility scheduled for January 20, 2018 and a sign up sheet is in the back.

The next Stakeholder Advisory Group meeting will be February 21, 2018 at the Honolulu Club.

He thanked everyone for coming and participating.