

**Honolulu Board of Water Supply
Public Comments on the Draft Water Master Plan and Our Responses
October 21, 2016**

Comment No.	Summarized Comments	Responses to Public Comments
1.	Where can I find additional information about the WMP as well as an electronic copy of the Draft WMP?	An electronic copy of the Draft WMP has been posted on the BWS website at: www.boardofwatersupply.com , concurrent with public release of the WMP. BWS staff is available to provide further information at 808-748-5041.
2.	Recommendation to provide briefings on the Draft WMP to Oahu Neighborhood Boards, coordinated through the Neighborhood Board Commission Office and possibly beginning with Neighborhood Board 23.	The BWS has coordinated dissemination of information about the WMP as well as briefings for Neighborhood Boards through the Neighborhood Board Commission Office. Briefings were given to 19 groups during the public review period. The BWS requested being placed on the Neighborhood Board 23 agenda, but NB 23 was unable to accommodate this request.
3.	Suggestion for the BWS to work more closely with DLNR/DOFAW to conserve watershed lands that produce drinking water on Oahu. Where DLNR/DOFAW is working to conserve those lands, the BWS should, to the extent possible, support these efforts.	In your email to the BWS, you recommend closer coordination between the BWS and DLNR/DOFAW to conserve watershed lands that produce drinking water on Oahu. You also asked BWS's support for current efforts by DLNR/DOFAW to acquire watershed lands mauka of Waimea Valley, owned by Dole. Your organization, Trust for Public Lands, has been helping with an application for the City's Clean Water and Natural Lands funds. You asked that the BWS express support for the project to the Commission, City Council, and the Mayor.
3a.	DLNR/DOFAW is trying to acquire watershed lands mauka of Waimea Valley, owned by Dole. Trust for Public Lands is helping them apply for City Clean Water & Natural Lands funds. Suggestion for the BWS to express support for the project in testimony/letter to the Commission, City Council, and the Mayor.	Per your request, BWS wrote a letter of support for the project, and the effort to acquire the property is moving forward. Please note that the BWS supports DLNR/DOFAW forestry management programs by providing annual funding for fencing projects, invasive species control and wildland fire mitigation. Thank you advocating for the protection of watershed lands.
4.	Advocates a means to adjust the WMP to reflect changing conditions, rather than waiting for a new (master) plan to be implemented. In other words the plan needs to be dynamic.	We agree with you. Section 13.5 of the Draft WMP describes the process of Adaptive Management that provides for flexibility in decision-making as external conditions change. For example, if conservation programs are more successful in reducing per capita demand than anticipated, large growth-related capacity expansion infrastructure could be deferred into the future. Section 13.4 of the Draft WMP describes a Scorecard for Tracking the Health of the Water System. The purpose of the Scorecard is to track how external conditions and other operating factors impact the BWS water system, making it possible to take action more quickly and efficiently.

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4a.	<p>What is being done to ensure there is sufficient electrical power to operate the pump and treatment facilities during instances when HECO cannot supply sufficient electrical power? In other words is there a plan to provide back-up electrical power to the BWS infrastructure? I am questioning the robustness of the treatment and pumping facilities, their dependence on HECO for electrical power, and whether or not the master plan intends to reduce this dependency especially during emergencies.</p>	<p>As you note, operation of the BWS water supply, treatment and transmission facilities are largely dependent on electrical power. Providing a dependable water supply over an extended period requires certain BWS-owned facilities to function even when other utilities, such as Hawaiian Electric Co., are temporarily out of service. Currently, the BWS has six large portable diesel generators in addition to a one stationary diesel generator, to provide power to critical pump stations if electrical power is down.</p> <p>Later this year, BWS plans to begin construction of three additional stationary generators. When complete, those facilities will provide sufficient electrical power for BWS to meet normal indoor water needs (this is about 83 gallons per customer per day) for 75 percent of our customer population. The remainder of the population will have water available at centralized locations in each community affected by the water and electrical outage.</p> <p>In the event of an island-wide power outage, our goal is to provide sufficient water for basic indoor water uses. Water distribution will be available at locations around Oahu for those who may not have water service at their homes, as outlined in the BWS emergency response plan, which will be followed in a situation like this.</p> <p>Consistent with the WMP's goal to improve water service reliability, the Water Master Plan recommends increasing the number of permanent BWS generators to:</p> <ol style="list-style-type: none"> 1) provide broader geographic distribution, to better cover the entire island) and 2) to increase the population reached to 85% during an island-wide power outage.
4b.	<p>Is there a plan to use renewable energy to power the BWS infrastructure separate from HECO's initiatives? Could this be a cost savings measure in the long run in which the savings are passed on to the ratepayers?</p>	<p>You also asked about using renewable energy to power the water system. To save on costs, as well as reduce energy consumption, the BWS developed an Energy Savings Performance Contract with Noresco LLC. This agreement makes it possible for the BWS to implement comprehensive energy efficiency, renewable energy generation, and operational improvements which guarantee enough energy savings over the next 20 years to pay for the improvements without any cost to our customers. Energy conservation measures being installed as part of this innovative agreement will reduce the BWS's annual electrical usage by about eight million kilowatt hours (kWh), or nine percent of the BWS's total purchased electricity. The initiatives include:</p> <ul style="list-style-type: none"> • Photovoltaic systems at 38 sites with facility upgrades and renovations (5,265,850 kWh savings); • Energy efficient pumps in four major production wells (1,348,979 kWh savings); • Energy efficient lighting at BWS facilities (717,027 kWh savings); and • Energy efficient air conditioning upgrades and controls (616,518 kWh savings). <p>Looking forward, the BWS is analyzing the feasibility of a hydroelectric power project utilizing storm water captured in the Nuuanu reservoirs coupled with injection wells to recharge the aquifer.</p>
4c.	<p>Has the master plan considered disruption to vehicular traffic that would isolate communities due to water main breaks and placed that as one of the very high risk factors? The master plan concentrates on supplying water to customers with minimum disruption of water service, which is good, but the disruption to vehicular and pedestrian traffic that could isolate a community due to a water main break should rank near or at the top of the list of impacts.</p>	<p>In ranking pipelines to establish priority for replacement, the BWS considered total risk, which is the product of likelihood of failure and consequence of failure. Many factors are included in the consequence of failure. Three of the highest-weighted (most important) factors are number of customers impacted, proximity of the break to critical facilities (fire stations, police, hospitals, schools and designated emergency shelters), and isolating neighborhoods with no other access.</p> <p>Other consequence factors included traffic disruption, damage to other utilities, and extent of customers impacted by lower water pressure. The impact to pedestrians was not evaluated as a separate factor, but is addressed as part of the isolating neighborhood criterion.</p>

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5.	While it is important to plan for a growing population and future developments, we also need to be mindful that there are resource limitations that should factor into residential development proposals. The Master Plan should not only plan for future growth, but also indicate that our water resources are not unlimited and that development plans should be adjusted accordingly.	<p>You recommend that the Water Master Plan should not only plan for future growth, but should also indicate that our water resources are not unlimited and that development plans should be adjusted accordingly.</p> <p>The BWS agrees that our water resources are not unlimited. There are many references throughout the Draft WMP not only to a water supply that is limited, but also the importance of sustainability, conservation, and watershed protection. (See Sections 2, 4, 6, 7, 8, 10, 12, and 13.)</p> <p>Section 8 includes a comparison of projected water availability and population projections for the 30-year planning period. The projections demonstrate that there will be enough water, even with the planned growth, but also show the extreme importance of conservation. (See figure 8-7.) Section 12 of the Draft WMP includes multiple recommendations to protect, conserve, and diversify our water sources.</p> <p>Plans for development, however, are addressed in the City's Oahu General Plan, which is responsible for balancing economic, environmental, social and other values throughout Oahu. The Plan directs growth by population distribution percentages to South Oahu, to sustain the rural areas of Oahu.</p> <p>Regional Development Plans (DP) and Sustainable Communities Plans (SCP) are where the community expresses their vision of their future, with associated policies and guidelines. The BWS is an active party in reviewing and advising on the DP/SCPs plans related to water availability, resource limitations and the strategies to extend Oahu's limited water supplies through conservation and supply diversification. When these plans are updated, our advice always stresses the critical need to sustain our water resources for the generations that follow.</p>
6.	As a board member of Malama Manoa, one of our goals is to become stewards of conservation and self-sustainability for our community. BWS has a small program related to educating the public about of rain barrels but it is unknown to most citizens in Honolulu. I am hoping the Board of Water Supply could take a more public role in educating people about the use of rain barrels for irrigation.	<p>The BWS agrees completely with the importance and benefits of collecting and storing rainwater for use in landscaping, and has been actively educating individuals to take part in capturing rainwater for many years.</p> <p>As we strengthen our focus on conservation and alternative water supplies, the BWS will continue our rain barrel workshop program – including the public education component. We are currently limited by the number of recycled plastic barrels available to us. However, we are working on an initiative to increase the availability of rain barrels in local retail garden and home improvement stores through an incentives-based conservation program.</p>
6a.	I am hoping that the BWS can use funds to partially subsidize or tax incentivize people to install rain barrels onto their properties. Hawaii citizens have long been avid gardeners. Such a small shift in conserving this water source would almost certainly have a huge impact and in the long run, reduce costs for the BWS.	<p>In addition, we are partnering with the City and County of Honolulu Department of Facilities Maintenance to support their work in storm water management through rain capture and reuse utilizing residential and commercial rain catchment systems.</p>
7.	Water usage in public parks, beaches, and other facilities should be decreased. Faucets and public showers need to be retrofitted with automatic shutoffs, timers, or knobs that must be held down to get water. Public showers should have low-flow showerheads. Public bathrooms should be retrofitted with new waterless urinals.	<p>These are good ideas that we will put forward to the Department of Parks and Recreation, as this City and County Department increases its efforts to conserve water. At select parks, push down timer knobs on showers and sinks and low flow toilets and urinals have been installed. Still, more opportunities exist for water savings, while remaining mindful of the constant and costly vandalism at public parks that detracts from installing water conservation fixtures comprehensively in all parks.</p> <p>The Board of Water Supply meets regularly with other City and County departments and we will be sharing the many water conservation suggestions that thoughtful, civic-minded people like you have offered as part of the Draft WMP review process.</p>

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8.	<p>This is a great plan but it did not address companies that ship our water to the mainland, for example a company that ships island water to 3,600 mainland stores.</p> <p>While ratepayers prepare to fund the needed improvements to the water system, some businesses will take advantage of our system and quality, affordable water.</p>	<p>We understand your concern about some companies selling Hawaii water to mainland stores, as well as your point about Oahu’s groundwater remaining here for local uses. Current laws and regulations do not limit export of local water to out-of-state customers. This is also the case for bottled water, or products that have a high water content like soft drinks, brews, juices and other beverages.</p> <p>Regarding rates, BWS currently applies a uniform non-residential rate to businesses, and equally charges based on the quantity of water used. There is no subsidy for non-residential customers. The non-residential rate equitably and proportionately recovers costs to operate and improve the water system.</p> <p>Another avenue would be to contact your State Senator and State Representative to express your concerns.</p>
8a.	<p>Where can I find information about State laws regulating water?</p>	<p>The Draft WMP describes laws and regulations related to water quality in Section 9. Information also is available on the Commission on Water Resource Management website and click on <i>State Water Code and Rules</i> for information about a wider range of water issues.</p>
9.	<p>When addressing water mains breaks, consider monitoring the water pressure where the new pipes are connected to the old pipes to ensure the old pipes are not subject to higher water pressure. Do this where old and new pipes are joined together to maintain uniform water pressure in the system.</p>	<p>In a typical break repair, the new pipe, (called a splice) is generally less than 10-feet in length. Replacing a pipe that has experienced a main break with a pipe splice of the same diameter does not change the pressure in the old pipe.</p> <p>Pressure along with corrosion and soil settlement are the primary causes of main breaks. The Water Master Plan lays out a prioritized risk-based approach to replace the highest risk pipes utilizing quality pipe materials and improved construction methods to extend pipe life and reduce the occurrence of future main breaks. However, the amount of pipelines is extensive and aging. It will take decades to replace the entire system.</p>
10.	<p>The WMP should include a population use cap. It is known that our water aquifer will not last so please do not exclude a cap of our fresh water resource. When do we conserve our precious resource before it is all gone?</p>	<p>The BWS agrees that Oahu’s water resources are precious and they are not unlimited. It takes proper protection, management, and conservation to make sure Oahu’s aquifers are sustained for the future. The State Commission on Water Resource Management has established a water limit or “cap” called “sustainable yield”. Pumping cannot exceed this cap. Water use efficiency and conservation combined with low-impact development, land use planning and regulations will ensure management of population growth and cost inflation.</p> <p>There are many references throughout the Draft WMP not only to a water supply that is limited, but also to the importance of sustainability, conservation, and watershed protection. (See Sections 2, 4, 6, 7, 8, 10, 12, and 13.)</p> <p>Section 8 provides a comparison of projected water availability (within sustainable yields) with population projections for the 30-year planning period. The projections demonstrate there will be enough water, even with the planned growth. They also show the extreme importance of conservation. (See figure 8-7.) Section 12 of the Draft WMP provides many recommendations specifically to protect, conserve, and diversify our water sources.</p> <p>The City’s Oahu General Plan, along with regional Development Plans and Sustainable Community Plans, are where decisions are made about future growth. The BWS is an active party in reviewing and advising on these plans when they are updated, and our advice always stresses the critical need to sustain our water resources for the generations that follow.</p>

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11.	<p>Can the BWS do anything to prevent Honolulu property owners from paving over or laying concrete on 100% of their land, which results in zero absorption of water into the soil over large land areas. This increases runoff into the storm drains and into the ocean. Will the BWS work with the Building Department and the Department of Planning and Permits to ensure that this concern is addressed?</p>	<p>Several people who commented on the Draft WMP shared your concern about the trend of paving over private property and its impact on producing more runoff and less water infiltration back into aquifers.</p> <p>In 2012, the City adopted Low Impact Development drainage standards to address water quality issues by managing runoff from their properties. Low Impact Development (LID) is a storm water management strategy to maintain or restore the natural hydrologic character of the site, reduce off-site runoff, improve water quality, provide groundwater recharge, and mitigate the impacts of increased runoff and storm water pollution. LID provides design approaches and integrated management techniques that promote the use of natural systems for infiltration, evapotranspiration, treatment, and use of rainwater. This is a City planning function. More information can be obtained from the below link: https://www.honolulu.gov/rep/site/dfmswq/dfmswq_docs/Rules_Section_II_12-4-2012.pdf</p> <p>The City's Land Use Plans and the State's Conservation District lands protect prime watershed recharge areas from development. Forested lands that receive more than 50-inches of annual rainfall are high recharge areas. If these areas are developed, drinking water supply will be depleted.</p>
11a.	<p>Resident lots should be mandated to have a certain percentage dedicated to green space (softscape) to allow percolation of water into our underground aquifers. Owners of residential lots that are currently "hardscaped" should be asked to conform to the new percentage.</p> <p>Most, if not all, lots do not have the required permits for the areas that are covered. Softscaping is mandated in other parts of areas of the country as a preventative measure and forward thinking approach to water management.</p>	<p>Softscaping or bioretention basins and rain gardens, as well as other green infrastructure or storm water quality control facilities, are included in the City's 2012 Low Impact Development Standards which are required for large developments and specific land uses like parking lots and gas stations. On Oahu, the City Department of Facility Maintenance, Storm Water Quality Branch and the Department of Planning and Permitting are responsible for the review, approval and compliance of the standards.</p> <p>LID standards have been incorporated as a core element of Oahu's Watershed Management Plans, to promote groundwater recharge and reduce polluted runoff that affects streams and nearshore waters.</p>
12.	<p>Your brochure says: "Comments will be collected for consideration prior to the plan's anticipated adoption by the BWS's Board of Directors- -"</p> <p>Sounds to me like the train has already left the station and whatever comments I or any other rate and taxpayers might contribute will be ignored.</p>	<p>Your message expressed concern that decisions about the WMP have already been made without ratepayers' input. The purpose of providing a Draft plan and soliciting public input was to ensure time and opportunity for ratepayer input prior to plan finalization and adoption. To that end, the BWS:</p> <ul style="list-style-type: none"> • Reached out to all active Neighborhood Boards • Distributed press releases for local media • Had television coverage about the Draft WMP on KHON's Living808 program • Gave 14 presentations to community organizations • Placed copies of the Draft WMP in all public libraries on Oahu • Distributed an announcement about the plan to all of our customers. <p>We received comments from 45 individuals, all of which were taken into consideration as the Final WMP was prepared.</p> <p>The BWS has worked with a community-based Stakeholder Advisory Group since May 2015 to address the interests and concerns of ratepayers as the plan was developed. The WMP is a reflection of the group's input and they greatly influenced the draft of the WMP.</p> <p>Also of note, the BWS does not receive any tax revenues and solely depends on water rate revenues for the operation and maintenance and improvements of the municipal water systems.</p>

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12a.	<p>You may come up with an ideal master plan but we – the taxpayers – may not be able to afford it. You should have some idea of the costs of the elements of your ideal plan before presenting it for adoption. Otherwise the Board – and ratepayers – will be stuck with funding what they approve without knowing the cost.</p>	<p>Large, complex infrastructure planning efforts traditionally start with a needs assessment, like the WMP. Given the scope, age, and complexity of Oahu’s water system, it was very important to begin with an extensive review of our system, where to focus on repairs and expansion of system, and then look at projects to meet these needs. This planning approach can be likened to planning a trip. A decision is made as to where to go. With that set, you then look at what you can afford to do, where to stay, what to do, where to eat, etc.</p> <p>The WMP provides the long-range plan for water resource management and water systems operations and maintenance and improvements over the next 30 years. Costs of future water facilities will be more specifically developed in a 30-Year Capital Improvement Plan that is a companion document to the Water Master Plan. The BWS prepares 1-Year, 6-Year, 10-Year, and now, 30-Year CIPs that spell out details for projects to be pursued, including costs.</p> <p>You will find important information Sections 13.1 and 13.2 of the Draft WMP that speak to your concerns regarding costs not being included in the Draft document.</p> <p>In the coming year, a financial plan and water rate study for the BWS will be developed and will address the cost issues you reference. With the input of our Stakeholders Advisory Group, the BWS will balance water system needs with costs to ensure safe, dependable and affordable water for our customers.</p>
12b.	<p>If you are going to do "pie in the sky" planning without costing it out, why not include desalination as an option?</p>	<p>Desalination is considered as one of the future options for diversifying our island’s water supply. In Section 12.1 of the Draft WMP, you will find desalination plants have been recommended for two locations in the Ewa area, where the BWS has already set aside land for a future facility.</p>
12c.	<p>In your fact sheet, you say you are doing this without "focusing on costs (yet)" but then you say the Plan reflects a long-standing commitment to integrate ... "economic viability" and the Plan "identifies the infrastructure, policies, and programs necessary to provide ... affordable water." These contradictions are confusing to say the least.</p>	<p>The information contained in the <i>Top 10 Things to Know About the Water Master Plan</i> fact sheet provides a “snapshot” of major highlights of the Draft WMP. The sentence about the identifying infrastructure, policies, and programs necessary to provide ... affordable water can seem like a contradiction since—in an effort to be brief—cost information is absent from the fact sheet.</p> <p>The sentence is more sensible within the context of the WMP Summary and full document. I hope you have taken the opportunity to look at the larger documents which highlight broad economic benefits that will result from having a long-range planning document, all of which strive for safe, dependable, and affordable water for our customers.</p> <p>More specifically, the WMP allows the BWS to:</p> <ul style="list-style-type: none"> • Increase water dependability for residents, businesses, and visitors. • Proactively care for water quality and delivery infrastructure, and reduce costly emergency repairs. • Prioritize investment of limited resources in infrastructure based on benefits and risks. • Spread investments and rate changes over time. • Improve design, construction, and maintenance practices so that infrastructure lasts longer.

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13.	<p>Mahalo for providing information about the master plan. One important thing seems to be missing - the removal of non-native trees and their replacement by native ones. I'm sure you'll hear from environment groups, and I hope it will become part of BWS's plan. Tree replacement is an important collaborative effort and an opportunity for individual volunteers to get involved. It literally goes to the roots of our water supply source.</p>	<p>The removal of invasive species, reforestation with native plants, and protection of intact native vegetation are important objectives of the BWS watershed management program, as well as our partners in watershed management: the State Division of Forestry and Wildlife, the Oahu Invasive Species Committee, and the Koolau and Waianae Mountain Watershed Partnerships.</p> <p>Each watershed management plan lists specific plans, strategies and projects for forestry management, including reforestation with native plants. A list of completed watershed management plans can be found on the BWS web site. The Water Master Plan, which is a long-range infrastructure plan for the BWS, references and integrates with these watershed management plans.</p> <p>The BWS has funded \$1.4 million for watershed management in FY 2016 and our proposed goal is 4 percent of the CIP funding, or \$3.35 million.</p> <p>In the Water Master Plan, Table 13-3, a Scorecard for Tracking Health of the Water System includes key indicators for watershed management that will be tracked and updated in addition to dollars spent for watershed management.</p>
14.	<p>An old <i>Prevention</i> magazine article states that people who wear a pedometer take an additional 2,491 steps a day.</p> <p>If water bills showed the number of gallons used vs. K-gallons, some of your customers would be motivated to save more water.</p>	<p>Thank you for your suggestion for presenting information on our water bills in a way that encourages people to conserve more water. We are looking at ways to make customers more aware of the amount of water they use. A pilot project will be implemented shortly. We are looking at advanced metering technology that will give customers more access to their water use, possibly on a daily basis.</p>
15.	<p>Water is a basic necessity and should be affordable for all Hawaii residents. The bottom line most consumers want to know is how much this water master plan is going to cost.</p> <p>Having a 200+ page draft water master plan that states "rates will be the dominant topic for 2017" and it hasn't been determined "to what extent costs will be distributed among customer types" makes me believe that a 30-year capital improvement program is just another way to bilk hard-working taxpayers out of more money in a non-election year.</p>	<p>You will find important information on this subject in Sections 13.1 and 13.2 of the Draft WMP. The WMP provides the long-range plan for water resource management and water systems operations and maintenance and improvements over the next 30 years.</p> <p>Costs of future water facilities are more specifically developed in a 30-Year Capital Improvement Plan that is a companion document to the Water Master Plan. The BWS prepares 1-Year, 6-Year, 10-Year, and now, 30-Year CIPs that spell out details for projects including costs.</p> <p>In the upcoming financial plan and water rate study that will be developed with the input of our Stakeholders Advisory Group, we will balance water system needs with costs to ensure safe, dependable and affordable water for our customers.</p> <p>Focusing on the subject of controlling costs, having a long-range WMP allows the BWS to:</p> <ul style="list-style-type: none"> • Proactively maintain the water system infrastructure and thus reduce the cost of emergency repairs • Prioritize investments in infrastructure based upon benefits and risks • Spread investments and water rate changes over time and • Improve and strengthen our water infrastructure so that it lasts longer. <p>It is important to note that the BWS does not receive any tax revenues and solely depends on water rate revenues for the operation and maintenance and improvements of the municipal water systems.</p>

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16.	<p>Your plan is well thought out to provide our island home with safe and dependable water service now and for future generations. I trust that this plan is and will be reliable.</p> <p>I have a suggestion to keep water affordable to all who use this service: Customer charges should be based on the value of their property. This includes residential homes, apartments, condominiums and businesses.</p>	<p>Some US cities and/or counties use this approach to pay for storm water management, but none that we are aware of base their municipal water rates on customers' property values.</p> <p>The <i>Manual of Water Supply Practices — M1, Sixth Edition, Principles of Water Rates, Fees, and Charges</i>, published by the American Water Works Association is recognized as the most authoritative guidance nationwide in the establishment of water rates. This manual recommends the development of water rates that are based on the actual costs to serve customers. Accordingly, the BWS has four basic customer classes – residential, non-residential, agricultural and non-potable. In general, rates are based on what it costs to deliver water to the different customer groups.</p> <p>As we prepare the next steps of Water Master Planning – the Financial Plan and Rates Study – we will consider different rates scenarios. This may lead to changes like a supplement for low-income families or agriculture, but it is not likely to lead to customers paying based on property value. To do so would require changes to State laws that affect BWS's mechanisms for collecting revenues.</p> <p>Real property taxes are based on property values which water rates are based on the cost to deliver water to our customers. BWS depends on water rates to maintain and operate our water system and we do not receive any tax revenues.</p>
17.	<p>Mahalo for guarding the island's precious water supplies from contamination. Please continue to work at getting the Navy to close its Red Hill Bulk Fuel Storage Facility in Halawa.</p>	<p>Mahalo for your support for guarding our precious water supplies from contamination, and your concern for the aquifer near the US Navy's Red Hill fuel storage tanks. The BWS is continuing to test these important drinking water sources for fuel contaminants and ensure it is safe to drink. It's critical to be certain the Navy, US EPA, and the State Department of Health diligently fulfill their responsibility to safeguard these water supplies, prevent further leaks and clean up the fuel that has leaked into the groundwater under the fuel tanks. We hope you will continue to support these efforts as this aquifer is irreplaceable. Please visit our web site (www.boardofwatersupply.com) and the U.S. Environmental Protection Agency website (www.epa.gov/red-hill) for more information.</p>
17a.	<p>New real estate development in residential and in industry sectors should be <i>mandated</i>, not just encouraged, to incorporate advanced water conservation measures.</p> <p>Growth in the military and tourism/travel sectors should be discouraged by charging them a higher rate, especially since they are the highest users of potable water besides agriculture.</p>	<p>We appreciate your interest in conservation, which is the least expensive way to stretch our water supply. The BWS is strongly pursuing conservation opportunities. With each new opportunity to conserve, we begin with education and voluntary participation.</p> <p>Simple, effective conservation measures are already in place, helping to reduce water use and associated water and sewer bills. These measures are supported by a broad base of customers, and they benefit all BWS customers.</p> <p>When greater participation in water conserving efforts is needed, incentives are considered. The water industry has found that incentives are effective in driving pivotal changes in water-use practices. The BWS has experienced this first hand. In the past, we've offered incentives for residential customers to change to low-flow toilets, to supplement a low-flow fixture ordinance for non-residential properties. As presented in the Draft WMP, additional incentives are being considered as well as possible mandates for new developments as well as the commercial/industrial sectors. These options are being explored with the BWS Stakeholder Advisory Group.</p> <p>Several people have proposed mandating rather than encouraging advanced conservation. This approach as well the suggestion to charge certain customer sectors higher rates for water will be taken into consideration as we embark on a year-long process of examining water rates and preparing a financial plan.</p>

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17b.	<p>Similar to capturing rainwater in barrels, the BWS should be capturing stormwater in Nuuanu and other areas known to have heavy rains.</p>	<p>Increasing the capture of stormwater has been suggested by several other members of the public and is an excellent idea. You are correct in that the Nuuanu area is a prime candidate for stormwater capture. BWS is currently working with the University of Hawaii, Hawaiian Electric Co., and the Ulupono Initiative to explore the feasibility of piping stormwater captured in Nuuanu Reservoir No. 4 to Nuuanu Reservoir No. 1 down the valley. This would make it possible to generate renewable energy through a hydroelectric turbine generator and increase the water supply by treating and recharging the water into the Kalihi groundwater basin.</p> <p>The BWS has an ongoing campaign encourage use of rain barrels for stormwater capture. We have been doing this program for a number of years and look to expand it in the very near future. The BWS is also partnering with other City Departments to maximize resources for educating the community about stormwater capture.</p>
17c.	<p>Sewer charges should be uncoupled from water bills, to reward those who do not irrigate their lawns.</p>	<p>The suggestion to uncouple the sewer charges from the water bill is made fairly often. While customers receive the charges in a single mailing, water and sewer services are provided by two separate agencies. The BWS provides and charges for water services and the Department of Environmental Services (ENV) provides and charges for sewer services. Currently, ENV is evaluating the creation of a separate sewer bill, but no time frame has been established for implementation. Uncoupling the sewer charges from the water bill will simplify the water billing system and provide a straightforward way for customers to reduce water bills through water conservation measures.</p> <p>In the meantime, there is an option for people who use a significant amount of water for irrigation to reduce their sewer bill. Go to www.Honolulu.gov, and find the Department of Environmental Services section. Under <i>Frequently Asked Questions</i> is information about possible practice to reduce sewer charges. One example is installing a submeter to determine the portion of water actually goes into the sewer, rather than applying the standard formula that assumes 80% of the water used goes to sewer and 20% is used for irrigation.</p>
18.	<p>Our source of potable water is rainfall stored in a huge fresh water bubble under the island. Most of this water is made available through pumping from wells. The average annual rainfall has been decreasing sharply over the past 20 years. This and other circumstances could lead to a higher level of saltwater contamination into the bubble, decreasing the available supply.</p> <p>Apparently there is no way to measure this contamination although water samples taken at the edges should indicate increased salinity.</p>	<p>Average rainfall has decreased by 15% over the last 20 years, according to the University of Hawaii, Manoa. Climate change will result in more severe droughts and floods, and climate models from the University of Hawaii show that the dry areas of Oahu will become drier. As rainfall decreases in Leeward Oahu, the sustainable yields of those aquifers will diminish and pumping will have to be decreased accordingly or seawater intrusion will degrade water quality and ultimately diminish the source.</p> <p>The BWS is proactive in funding climate change research to forecast these rainfall and aquifer yield trends, identify vulnerabilities and develop adaptation strategies such as advanced conservation, doubling recycled water production, and investing in brackish and seawater desalination. With governmental and academic partners, the BWS will continue to monitor water quality to ensure safe drinking water and to inform pump operations to manage water withdrawals as to not detrimentally impact the aquifer.</p>

Comment No.	Summarized Comments	Responses to Public Comments
18a.	There will be a natural limit to the availability of fresh water. At some point restrictions will have to be placed on future development.	<p>The BWS agrees that the island’s water resources are not unlimited. There are many references throughout the Draft WMP not only to a water supply that is limited, but also the importance of sustainability, conservation, and watershed protection. (See Sections 2, 4, 6, 7, 8, 10, 12, and 13.)</p> <p>Section 8 includes a comparison of projected water availability and population projections for the 30-year planning period. The projections demonstrate that there will be enough water, even with the planned growth, but also show the extreme importance of conservation. (See figure 8-7.) Section 12 of the Draft WMP includes multiple recommendations to protect, conserve, and diversify our water sources. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p> <p>Plans for development, however, are addressed in the City’s Oahu General Plan, which is responsible for balancing economic, environmental, social and other values throughout Oahu. The Plan directs growth by population distribution percentages to South Oahu, to sustain the rural areas of Oahu.</p> <p>Regional Development Plans (DP) and Sustainable Communities Plans (SCP) are where the community expresses their vision of their future, with associated policies and guidelines. The BWS is an active party in reviewing and advising on the DP/SCPs plans related to water availability, resource limitations, and strategies to extend Oahu’s limited water supplies through conservation and supply diversification. When these plans are updated, the BWS stresses the critical need to sustain Oahu’s water resources for the generations that follow.</p>
18b.	Although BWS does an admirable job of patching pipeline breaks, a tremendous amount of water is lost. Simple pressure sensors connected to switch valves at strategic locations should minimize this loss. Also, breaks are predominant in certain areas. The BWS budget should include totally re-piping these areas.	<p>Thank you for the kind words. Our crews work very hard to repair main breaks in a rapid and efficient manner.</p> <p>The BWS water system is monitored electronically by a Supervisory and Data Acquisition (SCADA) system that can remotely detect drops in reservoir levels that provide an early warning of a water main break. Your idea to install pressure sensors is a good one, especially at pumping stations that already have a SCADA telemetry connection. The BWS will further evaluate this idea as part of the current SCADA upgrade. It may be a good option to reduce response time between main break and shut off for repairs, reducing water loss.</p> <p>Although there is a delay between the time of main breaks until the water is fully shut off, the interval is necessary to determine the extent of the break, identify which pipeline has broken, and develop a strategy to minimize impact to other users. It is also important to shut off the main slowly to minimize the potential for damaging pressure surges that can occur when valves are closed too quickly.</p> <p>Among the challenges of implementing an automated shutdown system are:</p> <ul style="list-style-type: none"> • The number of valves in this complex system. The BWS has over 15,000 valves in its system (not counting an additional 21,000 hydrant valves) • Determining where and installing pressure sensors on active pipelines, almost all of which are in busy streets • Developing a control system that determines which valve(s) to close, in which sequence, and at what speed • Making certain the low pressure signals were actually caused by a pipe rupture and not a “normal” low pressure condition such as a fire flow—shutting off valves during a fire could be catastrophic! • Providing motorized operators and electric power to each valve • Programming, operating and maintaining this complex system. <p>The BWS’s 30-year Capital Improvement Program has identified numerous pipelines around Oahu for replacement. The prioritization of pipeline replacement is based on risk of the consequence and likelihood of failure.</p>

Comment No.	Summarized Comments	Responses to Public Comments
18c.	<p>Even though BWS deserves credit for preparation of this Master Plan, most of the activities planned are reactive. Ideally the water distribution system should be replaced. Since this is clearly impossible then there should be a plan for replacement of sections of this system over an extended period of time.</p> <p>Secondly, more accurate measurements for water availability should be planned and put in place.</p>	<p>The BWS, including findings of the Draft Water Master Plan, supports the idea of replacing the water distribution system over time and with a prioritized plan for replacing sections of the system over time. The Draft WMP describes the process of prioritizing projects based upon risk, so that the most needed sections of the system are replaced before others (see Section 11.2.2.3 and 11.2.6). You'll find additional information about project prioritization over time in Section 13.2.2. This latter section includes replacement projects along with construction of new facilities. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p> <p>Regarding your comment about more accurate measurements of water availability, you can learn more about the role of the State of Hawaii, Department of Land and Resource Management (DLNR), Commission on Water Resource Management (CWRM) in that regard. The CWRM establishes a "cap", called "sustainable yield", on aquifers. The sustainable yield is the maximum rate that water can be pumped from an aquifer without impairing its utility or quality (see 8.2.2 of the Draft WMP). The BWS agrees with and complies with these caps.</p>
19.	<p>The Water Master Plan is comprehensive and if the BWS is able to carry out the goals, they will provide the positive results intended. Although the plan acknowledges the increasing density of populated urban center areas, what has been done to meet the corresponding increased need for water usage and sewage processing for those areas?</p>	<p>Conservation is a part of the answer. The WMP describes the success of the BWS water conservation program, which started in 1990, that has reduced water use throughout Oahu. In Honolulu, water use decreased from 85 million gallons per day (mgd) to 70 mgd today. Those savings are helping to absorb the growth in Waikiki and Kakaako, especially along the rail transit stations. If the success of our conservation program continues to reduce per capita demand, large growth-related capacity expansion infrastructure could be deferred into the future.</p> <p>The BWS has been preparing for Transit Oriented Developments (TODs) for some time, including in the Draft WMP. Our analysis of the capacity of the existing water system serving these areas shows that it can dependably provide the water needed for an average day (called average day demand), but may become stressed as build out continues, particularly when providing water for peak demands (e.g., hottest days, morning and evening peaks for cooking and bathing). To address these needs, Sections 6 and 10 of the Draft WMP include analysis of water system and identify projects necessary to increase capacity to adequately serve a growing population. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p> <p>Planning, design, construction and operations of Oahu's sewer system are the responsibility of the Department of Environmental Services (ENV). We note that if developments use less water, less wastewater is generated, freeing up sewer collection system and treatment plant capacity. Water conservation benefits both the water and sewer systems.</p>
20.	<p>Make bioswales a requirement for businesses when possible, and incentivize them for homeowners.</p>	<p>Softscaping or bioretention basins and rain gardens, as well as other green infrastructure or stormwater quality control facilities, are included in the Honolulu's 2012 Low Impact Development (LID) Standards, which are required for large developments and specific land uses like parking lots and gas stations. On Oahu, the City Department of Facility Maintenance, Storm Water Quality Branch and the Department of Planning and Permitting are responsible for the review, approval and compliance of the standards. Low Impact Development (LID) is a stormwater management strategy to maintain or restore the natural hydrologic character of the site, reduce off-site runoff, improve water quality, provide groundwater recharge, and mitigate the impacts of increased runoff and stormwater pollution. LID provides design approaches and integrated management techniques that promote the use of natural systems for infiltration, evapotranspiration, treatment, and use of rainwater. In 2012, the City adopted Low Impact Development drainage standards to address water quality issues by managing runoff from their properties. LID standards also have been incorporated as a core element of Oahu's Watershed Management Plans, to promote groundwater recharge and reduce polluted runoff that affects streams and nearshore waters. More information can be obtained from the below link: https://www.honolulu.gov/rep/site/dfmswq/dfmswq_docs/Rules_Section_II_12-4-2012.pdf</p>

Comment No.	Summarized Comments	Responses to Public Comments
20a.	It would be good to see greater detail related to the graphic about supply and demand on page 16 of the Summary of the Draft WMP. It would also be interesting to see replenishment rates of the groundwater and a description of the source yield. How is the water attained? Is it pumped? Is the water wasted if it not used?	<p>The full Draft Water Master Plan includes a number of detailed graphs showing supply and demand. Figures 10-1 A-J show the historical and projected maximum daily demands compared to available supplies by areas of Oahu (e.g., Windward, Leeward, etc.).</p> <p>The full Draft WMP, Section 8, contains information about the sustainable yield of groundwater sources on Oahu. These yields are based on detailed analyses of the hydrogeologic properties of the aquifers, local hydrology, long-term trends, and on-going monitoring. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p> <p>The State Commission on Water Resource Management establishes the amount of water that can be pumped from the aquifers while remaining sustainable, and issues permits to the BWS and other water users in groundwater management areas, which is most of Oahu, except for the Waianae coast. Sustainable yield is calculated based on a hydrologic budget that factors rainfall, evapo-transpiration, runoff, stream flow and coastal spring leakage to calculate recharge. The sustainable yield is then calculated as a percentage of the amount of recharge. We will discuss your suggestion to graph replenishment rates with yield with CWRM, as a means to further illustrate this natural process.</p> <p>It is important to realize that the demand for water doesn't always co-locate with the source, which requires that some water must be moved via transmission pipelines to where it is needed. The BWS pumps only what is needed and does not waste it. What is not pumped stays in the aquifer.</p>
21.	Singapore has a development program for reclaimed water, as part of their water supply. They also assist other global nations with their water needs. Maybe another goal is to have Singapore do the same with a portion of Oahu's water supply.	<p>Mahalo for your supporting ideas for recycled water on Oahu. Recycled water and desalination are both important means for diversifying our water supply and conserving potable groundwater. BWS already has a recycled water program at the Honouliuli Water Recycling Facility. The Draft WMP recommends doubling the amount of non-potable water produced today (see Section 12). The document is available on the BWS web site at http://www.boardofwatersupply.com.</p>
22.	I have been a customer for 35 years and there is an unreasonable differential between in my water charges and sewer charges. Our personal water consumption consists of daily showers, three cycles of laundry per week, and daily dishwashing without a dishwasher.	<p>Your household is like many others on Oahu where City sewer charges are about twice that of water charges. While we are pleased to provide some information you may find helpful, please note that the cost for sewer rates and other charges are the responsibility of the Department of Environmental Services (ENV). The charges come to you with your BWS bill in an effort to reduce the costs of printing and mailing separate water and sewer bills.</p> <p>We understand the sewer charge to have two basic components, a fixed charge and a variable charge based on 80% of your water use. Your bill describes these charges. If you feel that substantially more than 20% of your water use occurs outdoors, a submeter on your irrigation system can be used to measure the actual amount of water contributed to the sewer system, which may result in a discount your sewer charges and reduce your overall sewer bill. Go to the City and County of Honolulu website, www.Honolulu.gov, and find the Department of Environmental Services section. Under <i>Frequently Asked Questions</i>, this department provides information about what you can do to reduce that bill.</p> <p>Another option to possibly reduce your water and sewer bill is by implementing water conservation measures on your property and modifying the way you use water. The BWS website offers several suggestions like leak detection and repair, low flow toilets, low spray shower heads and WaterSense labeled clothes washers. Changing leaking toilet flappers is an inexpensive way to reduce water loss within your home. For outdoor use, soil moisture sensors can reduce the amount of water used for irrigation and a hose bib water meter can provide important feedback on water used for hand irrigation and car washing.</p>

Comment No.	Summarized Comments	Responses to Public Comments
22a.	The way you arrive at your charge is another issue. In Germany, water charges for each 6-month period are based on the previous 6 months of consumption. Customers are informed accordingly, and every month the projected charge is deducted from their bank account. This is perfect for budgeting and paying bill. Can we start moving things in this direction, as everyone benefits?	You also suggested that the BWS change its billing period from monthly to once every six months, with the current billing period being based on your previous six months of water use. While this may be the preferred approach in Germany, experience indicates that the majority of BWS customers prefer to be billed based on their actual water usage, rather than an estimate or average. And, because BWS co-bills with the Department of Environmental Services for their sewer charges, it was determined several years ago to go to monthly billing to help customers as the bi-monthly sewer charge was getting difficult for those on a fixed income.
23.	Will there be a maintenance program for water mains that is scheduled so we do not wait until everything wears out?	We appreciate your interest in the BWS having a proactive maintenance program to stay ahead of pipeline life expectancy. You will find many recommendations in Section 12 of the Draft WMP for maintaining, monitoring, and renewing/replacing our water mains on a proactive schedule. This includes regular maintenance, year-round leak detection, and targeted condition assessments of important transmission pipelines. The document is available on the BWS web site at http://www.boardofwatersupply.com .
23a.	What kind of monitoring programs are in place at the U.S. Navy containers that leaked jet fuel, to measure that there is no more leakage?	<p>The BWS is very closely involved in protecting our water supplies and continues to advocate aggressively for the prompt upgrade of the Navy's fuel storage facility. The BWS provides up-to-date information about the U.S. Navy's Red Hill Bulk Fuel Storage Facility on its website: http://www.boardofwatersupply.com/water-quality. More information is also at the U.S. Environmental Protection Agency's website: www.epa.gov/red-hill.</p> <p>The BWS regularly tests samples from wells near Red Hill, to ensure the safety of the water we serve. The U.S. Navy has its own, separate monitoring program, and has installed additional wells in the vicinity expressly for monitoring the fuel leakage situation. The Hawaii State Department of Health (DOH) has jurisdiction and regulates underground fuel tanks in Hawaii. Under the Administrative Order on Consent, the Parties (State DOH, USEPA, Navy and Defense Logistics Agency) are responsible to address the issues at the Navy's Red Hill Bulk Fuel Storage Facility that was constructed between 1940 and 1943.</p>
23b.	How and when is our water tested to make sure it is drinkable and how does our water quality standards compare to other states?	Chemical testing is performed quarterly and annually based on federal and state drinking water sampling and testing requirements. BWS also conducts daily microbiological testing of the water from the water pipeline system that brings the water from the wells to homes and businesses. All of these tests show the water served by BWS meets Federal and State regulations and is safe to drink. As done by BWS, water utilities in other states that provide municipal drinking water must also meet the same Federal drinking water requirements.
24.	How many new reservoirs are planned to be constructed in Honolulu, and at what locations?	<p>New reservoirs are needed to add storage capacity throughout Oahu. You can find a list of recommended reservoirs and their regional locations in the full Draft WMP in Section 10.3.1, Figure 10.2. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p> <p>In Honolulu, there is a significant reservoir storage deficit and there are very few available sites for new reservoirs due to topography and limited open available space. The WMP evaluated alternatives to providing peak demand as well as operational and emergency storage, with a combination of peaking well pumps, using groundwater as storage, emergency generators to provide water service during power outages, replacing old reservoirs with new larger ones, burying reservoirs in preservation areas to reduce visual impacts, and developing new reservoirs as far away as Waiawa.</p>

Comment No.	Summarized Comments	Responses to Public Comments
24a.	Will Environmental Impact Statements and the associated public review process be required for these projects?	<p>The BWS is exempt from preparing an Environmental Assessment or EIS for projects that replace pipelines and facilities, and other minor actions, thus improving project execution and reducing costs to water rate payers. For other projects, BWS complies with Chapter 343, Environmental Impact Statements (EIS) in the implementation of the BWS capital program. The primary triggers are the use of County lands and funds for the expansion of the municipal water system.</p> <p>All projects must comply with applicable permits that reduce traffic congestion, eliminate and mitigate noise and water pollution, and do not impact coastal zones and conservation districts. Some of the things the BWS is doing to manage the impacts of construction include:</p> <ul style="list-style-type: none"> • Providing information to neighborhood boards and elected officials in affected areas in advance of construction, so they know what to expect and can plan accordingly. • Sending letters to affected residents of water system improvement projects in their neighborhood. • Stopping all construction work, except any required emergency repairs, around major holidays (e.g., Thanksgiving and Christmas).
24b.	Does the BWS have the physical and financial capacity to run non-potable water lines parallel to existing fresh water lines, and if not, how does the BWS anticipate accomplishing this before significant development that is presently being conditionally permitted outpaces the present water supply?	<p>We appreciate your interest in establishing recycled water infrastructure as an important part of the strategy for increasing the island's water supply. The BWS has adopted rules that require the use of non-potable water, if available, for large landscaped areas such as golf courses, parks, schools and roadway landscaping. In addition, BWS has worked with the City Department of Planning and Permitting on land use policies that promote non-potable water and require dual water lines for new developments where practicable, especially in the Ewa district. These rules and policies require developers to install dual water lines in the new roadways they construct. BWS works with developers to secure an adequate non-potable source of supply, like recycled and brackish water sources, as well as the backbone transmission systems that the developers can connect to.</p> <p>Sharing these funding responsibilities with developers allows the BWS to ensure the physical and financial capacity to continue a large capital improvement program that balances repair and replacement of existing assets with the capacity expansion of both potable and non-potable water system facilities throughout Oahu.</p> <p>Figure 8-9 of the Draft WMP shows where recycled water facilities are today, including the very important non-potable water lines. The Draft WMP recommends doubling our non-potable water supply, including expanding the Honouliuli Water Recycling Facility; the recycled water distribution system is planned for expansion as well. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p>
24c.	<p>Is the BWS independently investigating, measuring and addressing</p> <p>a) the magnitude of the Red Hill toxic jet fuel infiltration into the island's water system, and its percolation into the aquifer; and</p> <p>b) the construction piling penetration points of the rail transit support columns, and related impacts on the aquifer lens that protects fresh water from invasive toxins and sea water that could destroy the usable quality of the water supply within the aquifer?</p> <p>With these two unresolved issues compromising Oahu's water quality, it would appear that there is far more loss of safe water capacity than gain from user conservation measures.</p>	<p>BWS is conducting its own independent study of the groundwater aquifer in Halawa Valley to assess the impacts of the January 2014 fuel leak as well as past releases into the groundwater aquifer from the Red Hill Fuel Facility. Additionally, we are testing water the five nearest BWS water sources in close proximity to the Red Hill tanks and have not detected any fuel contamination.</p> <p>BWS has no concerns with the rail columns being installed in areas that could impact the groundwater aquifer or BWS water resources except for the BWS HECO Waiau Well located on the HECO Waiau Power Plant property on Kamehameha Highway in Pearl City. BWS was concerned that the installation of two rail columns fronting the entrance to the HECO Power Plant would impact the quantity and quality of the BWS HECO Waiau Well. To evaluate this possibility a number of geologic assessments and water quality tests were performed before and after installation of the columns. Before installing the columns, the well was shut down on 8/19/15 as a precautionary measure. BWS conducted on-site field investigations while the columns were being installed and water quality tests on the well after the work was completed. The results showed no damage to the HECO Waiau Wells from the rail column installation. The well was placed back in service on 6/2/16.</p>

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24d.	Has BWS considered infrastructure development funds may be vulnerable hijacking for rail transit or other interests, and are there reliable safeguards in place?	We appreciate your concern about ensuring that BWS's water rate funding is protected for the sole use of the water system. The BWS was created in 1929 as a semi-autonomous agency under a seven-member board with full control over the municipal water system including funds generated from water rates and fees are invested into this infrastructure and not diverted for other purposes. Keeping this governance structure will ensure that water funds are used to maintain and improve our water infrastructure. You can find details on this in Section 1.1 of the Draft WMP. The document is available on the BWS web site at http://www.boardofwatersupply.com .
24e.	<p>Has BWS calculated the additional water that will be needed for this now foreseen unlimited development?</p> <p>The exponential population increase based on the City Council's new high-density development leeway from Kapolei to Waikiki does not appear to be reflected in the Water Master Plan's figures.</p>	<p>We believe there is a different time horizon between the two population projections along with inherent uncertainty. The 29,500 for the Primary Urban Center is the City Department of Planning and Permitting (DPP) projection to 2040, while we believe the Kakaako numbers reflect full build out. We recognize that growth will continue beyond the 2040 planning horizon used in the WMP, and therefore, the plan is meant to be iterative, updated every 10 years with new projections and new capacity expansion projects that will be added under the adaptive management guidelines in Chapter 13. Water demands will be monitored annually to determine if the recommended system improvements will need to be accelerated or delayed to adjust to the actual growth and known development plans.</p> <p>In estimating future water demands, the WMP considered factors that affect demands including population growth, historical usage trends within the different parts of Oahu, and the type of user (single family, multi family, high rise, commercial, etc.). Information for population growth specifically in the Transit Oriented Development areas was obtained from the Hawaii Community Development Authority and the City DPP land use model that accounts for new developments and subdivisions.</p> <p>We agree that a proportion of the residential high rise units will consist of transient population and not be fully occupied reducing water demand. Because the BWS water system is integrated from Windward to Leeward through South Oahu, the unavoidable and variable displacement of population can still be accommodated by transferring water within the integrated water system.</p>
24f.	Has BWS calculated the additional water that will be needed for development? The population increase from Kapolei to Waikiki does not appear to be reflected in the Water Master Plan.	<p>In estimating future water demands, the WMP considered factors that affect demands including population growth, historical usage trends within the different parts of Oahu, and the type of user (single family, multi family, high rise, commercial, etc.). Information for population growth specifically in the Transit Oriented Development areas was obtained from the Hawaii Community Development Authority and the City Department of Planning and Permitting (DPP) land use model that accounts for new developments and subdivisions.</p> <p>The 29,500 for the Primary Urban Center is the City DPP projection to 2040, while we believe the Kakaako numbers reflect full build out. We recognize that growth will continue beyond the 2040 planning horizon used in the WMP, and therefore, the plan is meant to be iterative, updated every 10 years with new projections and new capacity expansion projects that will be added under the adaptive management guidelines in Chapter 13. Water demands will be monitored annually to determine if the recommended system improvements will need to be accelerated or delayed to adjust to the actual growth and known development plans. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p> <p>A proportion of the residential high rise units will consist of transient population and not be fully occupied, reducing water demand. Because the BWS water system is integrated from Windward to Leeward through South Oahu, the unavoidable and variable displacement of population can be accommodated by transferring water within the integrated water system.</p>

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24g.	<p>Has BWS considered that their essential infrastructure development funds could be transferred for the rail transit or other interests? Are there reliable safeguards in place to prevent this from happening so BWS can move forward with essential Water Master Plan objectives and priority infrastructure improvements?</p>	<p>The BWS is a semi-autonomous agency and has control over the use of its funds. Water funds will be not transferred for the rail transit project as long as this governance structure remains in place as described in Article VII of the Honolulu City Charter.</p>
25.	<p>Poamoho Camp is historically unique and has extremely unique potable water issues <i>and opportunities</i> that should be considered in light of the BWS Water Master Plan. For example, The City and County of Honolulu Department of Planning and Permitting's approval of Zoning Variance No. 2007/VAR-62 which allowed Poamoho Camp to exceed the maximum number of farm dwellings and certain other non-permitted uses is an indication of just how unique this historically significant community is to the people of Hawaii.</p> <p>Additionally, as you know, Poamoho Camp owns, operates and maintains a private potable water pipeline that connects to the BWS water source in Whitmore Village. This aging water pipeline stretches several miles and crosses multiple land parcels.</p>	<p>The BWS recognizes and appreciates the unique situation of Poamoho Camp and we will continue to participate in important dialogue with residents, landowners and agencies. Our hope is that the legislature appropriates funding for a comprehensive land use and infrastructure master plan of the area that supports diversified agriculture, crop processing facilities, work force housing and community engagement and education.</p>
25a.	<p>Although we understand that the Camp remains solely responsible for the upkeep and maintenance its private water pipeline, certainly the BWS appreciates this creates almost unimaginable financial liability for this small enclave of agrarian retirees and their descendants who continue living at this historically significant site. Poamoho Camp lacks adequate fire protection. Should the waterline be unable to be maintained by the Camp it becomes potentially life threatening to the residents.</p>	<p>The BWS's Water Master Plan is intended to guide both the repair and renewal of our existing facilities and the expansion of our system to meet future demands. The WMP ensures sufficient source of supply, treatment that meets Safe Drinking Water Standards, system reliability and adequate pressures and fire protection within the water system, which extends from the source up to and including the water meter. We understand the on-site fire protection for Poamoho has been coordinated with the Honolulu Fire Department and an on-site tank provides supplemental water supply for fire fighting.</p>
25b.	<p>We have been working in close collaboration with the USDA Rural Development among others to advance a wholly-workable infrastructure and redevelopment plan for Poamoho Camp that substantially addresses what has been so far an untenable situation for the Camp's residents while simultaneously promoting the interests of other stakeholders in the area and the people of Hawaii as well. Our work should be considered as you and the BWS finalize your draft plans for the very same reason that it holds value for other stakeholders interested in advancing the State's legislative mandates for food, energy and diversified agriculture that benefits the people of Hawaii.</p> <p>We do not question the reasonableness of the intent and purpose of the BWS Water Master Plan; however, there is ample reason to believe that should the BWS Water Mater Plan be strictly enforced on Poamoho Camp it would deprive the residents reasonable use of their land as required to maintain/upgrade their potable water supply. The viability of Poamoho Camp lies in the balance and we're certain that the reasonableness of our solution taken together with other stakeholders would significantly aid the BWS Water Master Plan.</p>	<p>The BWS supports Poamoho Camp's efforts to secure external funding for its privately-owned water line, e.g. from the USDA Rural Development Program, and is committed to serving the demands of the Poamoho Camp via this private infrastructure. However, as with all other customers, we provide service to the water meter. Responsibility for the water system beyond that point resides with the individual customer, whether it is the piping in a house, for a high rise, or on a farm.</p>

Comment No.	Summarized Comments	Responses to Public Comments
26.	<p>It is a daunting task to provide water for Oahu's needs. Suggestions to help protect our water supply are:</p> <p>Make laws limiting use of water for landscaping. The City and County require keeping the local median watered, rather than replacing the grass with crushed rock.</p>	<p>Your suggestion for median maintenance has significant merit. Whether the roadway medians are owned and maintained by the City Department of Facility Maintenance (DFM) or by the Makakilo Community Association, there is little reason why grassed medians have to be the norm. There are benefits in changing from grass, including reduced water use, mowing, and sprinkler maintenance; in addition to enhanced worker safety and less water loss from leaks. The resulting cost savings over time can easily off-set the cost of conversion to xeriscape or other alternatives, and while maintaining the medians' attractiveness and property values.</p> <p>We will discuss this with DFM and/or the community association. Rules can be amended and economic incentives can be evaluated. Perhaps a pilot section could be identified and pursued to prove the concept.</p> <p>Xeriscape landscaping is an excellent way to conserve water. The BWS maintains the Halawa Xeriscape Gardens and conducts workshops to educate visitors about drought-tolerant plants.</p>
26a.	<p>Hotels on island post signs encouraging guests to hang up used towels and use them again, to conserve water. It seems that staff still replaces the towels. How could this be enforced?</p>	<p>Hotels voluntarily promote water conservation by encouraging guests to use towels more than once. We understand that it is disappointing when guests cooperate but the towels get replaced anyway. We have opportunities to talk with representatives of the hotel industry and will bring up this concern. We will point out the economic benefit, along with the ecological benefits, of using less water and we will encourage re-education of all staff.</p>
26b.	<p>New-buildings could be required to install devices that circulate hot water, reducing the amount of time to run water just to get hot water.</p> <p>The BWS's efforts to manage Oahu's water and conserve our precious water for future generations is appreciated!</p>	<p>Your suggestion is to require new-builds to install hot water circulators in homes to cut down on water wasted as the shower warms. This idea has its plusses and minuses.</p> <p>On the plus side, several gallons of water could be saved with each "warm up". On the minus side, hot water circulators require additional electrical use—energy is required to circulate the water, and even if the pipes are insulated there is additional heat loss. Not all homes have photovoltaic systems, but if they do, the energy used to heat and recirculate hot water is self-sustaining. It can be challenging to strike the right balance of conserving water without significantly impacting other resources and to balance mandates with economic incentives that produce similar outcomes.</p> <p>The good news is that with new technologies provide a suite of effective water conservation measures that any homeowner and developer could pursue, should they choose to. The key to water conservation starts with education and a little incentive.</p> <p>The BWS is always glad to receive suggestions for conserving water. Keep the ideas coming!</p>

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27.	Action needs to be taken to curb the trend of concrete paving entire house lots. Some kind of permeable paving or site landscaping is necessary to absorb rainwater and recharge groundwater supplies.	<p>As with water conservation, stormwater management is everyone’s responsibility. Low Impact Development is defined as a stormwater management strategy that seeks to maintain or restore the natural hydrologic character of the site, reduce off-site runoff, improve water quality, provide groundwater recharge, and mitigate the impacts of increased runoff and storm water pollution. LID comprises a set of design approaches and integrated management techniques that promote the use of natural systems for infiltration, evapotranspiration, treatment, and use of rainwater</p> <p>In 2012, the City adopted Low Impact Development drainage standards to address water quality issues by managing runoff from their properties. Bioretention basins, rain gardens and permeable pavements, as well as other stormwater quality control facilities, are included in the City’s 2012 Low Impact Development Standards. We would like to add rain barrel catchments to these standards as a means to capture stormwater and irrigate gardens and landscaping. These standards apply to large developments of one acre or larger and specific land uses like parking lots and gas stations. The rules do not apply to a single residential unit, but if the one-acre threshold is exceeded, the rule would apply. This does not preclude each homeowner to meet the rule and this is where education is valuable, one home at a time.</p> <p>On Oahu, the City Department of Facility Maintenance, Storm Water Quality Branch and the Department of Planning and Permitting are responsible for the review, approval and compliance of the standards. The BWS has been including LID techniques as a core element of our Watershed Management Plans. We are initiating the Primary Urban Center Watershed Management Plan and will incorporate your suggestion for the Ala Wai watershed.</p> <p>More information can be obtained from the below link: https://www.honolulu.gov/rep/site/dfmswq/dfmswq_docs/Rules_Section_II_12-4-2012.pdf</p>
27a.	The BWS should not discount water for irrigation use if a home has paved over too much of the house lot. Stormwater runoff is regulated for public and quasi-public buildings, while single-family houses go unregulated.	<p>The BWS uses a tiered water rate structure designed to encourage water conservation. The first 13,000 gallons per month of usage for a single-family residence is priced at \$4.42 per 1,000 gallons, whether the use is inside or outside the home. Rates increase for higher usage amounts.</p> <p>In 2017, the BWS and its Stakeholder Advisory Group will consider a Financial Plan and future water rates to support the Water Master Plan. We will bring your suggestion to the discussion for consideration.</p> <p>Mahalo for your thoughts on this important matter.</p>
28.	<p>Whenever we have a drought here, we are told to watch our water use, time how long we water our yards, and cut down on water used to bath or wash our cars. We do this to conserve our precious water.</p> <p>Climate change is making the water supply situation more serious. There is a limited amount of water source that can be drawn and replenished, so that we can have enough to go around without having to watch our everyday usage. Controlling growth will definitely help conserve our precious water.</p>	<p>Growth should be managed, comply with water conservation and low impact development standards, and only occur if there are sufficient water resources for forecasted climate change with intense drought and flood. If water supply or system capacity is insufficient, the BWS holds a public trust responsibility to make the hard decisions to protect the water resource first and foremost. However, there must also be recognition for the role of water in sustaining the economic and social/cultural health of Oahu in addition to its environment.</p> <p>The BWS agrees that our water resources are precious and they are not unlimited. It takes proper protection, management, and conservation to make sure Oahu’s aquifers are sustained for the future. One of the BWS’s three core Strategic Plan goals is <i>resource sustainability</i>, and two of the objectives that guided the development of the Draft WMP were <i>Water Conservation</i> and <i>Water Resource Sustainability</i>.</p> <p>The City’s Department of Planning and Permitting has oversight for the Oahu General Plan, along with regional Development Plans and Sustainable Community Plans, and is the agency where decisions are made about future growth. The BWS is an active party in reviewing and advising on these plans when they are updated, and our advice always stresses the critical need to sustain our water resources for the generations that follow.</p>

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29.	<p>The Draft Water Master Plan is vague concerning the future provision of water for agriculture. As stated in Section 8.4.3, new Federal regulations under the Food Safety Modernization Act (FSMA) will result in greater demand for BWS potable water for irrigation. Further, Hawaii's Governor recently called for doubling Hawaii's food demand for agricultural water. Water of sufficient quantity and quality is a prerequisite for success in agriculture. We feel that the Plan's strategy as stated in Section 8.4.3 is essentially to wait until demand is apparent. But demand beyond BWS' current ability to supply water will not materialize because potential farmers will see that sufficient water is not available. Even if BWS decides to add capacity, it will take years from that decision until the additional capacity is funded and on line. BWS should proactively anticipate and plan for increased demand, despite uncertainties, rather than waiting for the demand to develop and then trying to catch up.</p>	<p>The BWS understands that new Federal regulations under the Food Safety Modernization Act (FSMA) could result in greater demand for BWS potable water for agriculture. More stringent water quality standards for water supply used to irrigate food crops may make existing surface water supplies unusable for certain irrigation and agricultural practices. However, agriculture irrigation can also be supplied by private groundwater wells that are less susceptible to surface water influences. The groundwater aquifers in Central Oahu, Wahiawa, North Shore and Windward Oahu have ample groundwater supplies available to accommodate on-site irrigation wells for agriculture. Less than one-half of Oahu's ground water is currently used.</p> <p>The BWS supports diversified agriculture where practicable. BWS potable water currently supplies agricultural irrigation at a subsidized reduced water rate in areas such as in Waianae and Waimanalo where access to available groundwater is difficult. The BWS transferred the Waimanalo Well I at no cost to the State Department of Agriculture to supplement their Waimanalo ditch irrigation system, especially during droughts. The Waimanalo Well I located on Waikupanaha Street was contaminated by agricultural chemicals, making it unfit for drinking, but it remained very suitable for agricultural irrigation.</p> <p>Currently, the BWS provides approximately three percent of its island-wide potable water production for agricultural meters. In large agricultural communities such as Waianae and North Shore, the percentage of potable water for agriculture is higher.</p> <p>Water demand forecasts anticipate a proportional increase in agricultural demand in these areas. Given the availability of groundwater for agricultural wells in North Shore, there is uncertainty as to the amount of future potable water meter requests. As is done for all customer classes, the BWS will monitor water demand trends, adjust demand forecasts accordingly, and time new water sources as demand approaches water system capacity allowing sufficient time as to not create a need for a moratorium. This planning sequence is no different in Waianae and North Shore than it is in highly urbanized Honolulu and Ewa.</p>
29a.	<p>The Plan omits any reference to a planned upgrade of water treatment from R-2 to R-1 at the Wilson Reservoir. We strongly encourage BWS to expedite this upgrade.</p>	<p>The City Department of Environmental Services, not the BWS, owns the Wahiawa wastewater treatment plant and has upgraded the treatment process to R-1 quality recycled water. However, the State Department of Health (DOH) will not classify the tertiary disinfected effluent as R-1 as long as it is discharged into Wahiawa Reservoir. We understand the State Agribusiness Development Corporation is planning to pipe the recycled water to their Galbraith lands. When this occurs, the recycled water will be classified as R-1.</p> <p>The Army's Schofield wastewater treatment plant's recycled water has not been classified as R-1 water either because of other DOH conditions that still are pending.</p> <p>Wahiawa Reservoir recycled water improvements have been identified as a key project in the North Shore Watershed Management Plan, developed by BWS and recently adopted by the City Council as an amendment to Chapter 30, ROH and up for review by the Commission on Water Resource Management. You can view the plan at: http://www.boardofwatersupply.com/</p>

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29b.	<p>BWS's standards for potable water quality, based on EPA rules, are not identical to the FDA's standards for agricultural water under the new FSMA regulations. The Plan notes (Section 9.2.1.2) that the BWS uses standards based on total coliform counts. In contrast, FSMA requires a specific test for <i>E. coli</i> rather than total coliforms. The difference in standards may cause problems for farmers using BWS potable water for irrigation, even though the water itself is clean. We hope that this potential conflict of standards can be reconciled.</p>	<p>BWS standards for potable water, which are based on the United States Environmental Protection Agency (EPA) rules, are not identical to the United States Food and Drug Administration's (FDA) standards for agricultural water under the new Food Safety Modernization Act (FSMA).</p> <p>According to the Standards for Growing, Harvesting, Packing and Holding of Produce for Human Consumption, Title 21 Code of Federal Regulations (21 CFR), Part 112, Subpart E (Federal Register Volume 80, No. 228, pages 74554 to 74557), agricultural water used for the growing, harvesting, packing and holding of produce covered under Subpart A must have no detectable generic <i>Escherichia coli</i> (<i>E. Coli</i>) in 100 milliliters (mL) of agricultural water (§112.44). Similarly, the standards for drinking water under 40 CFR Parts 141 and 142, also specifies a maximum contaminant limit (MCL) of zero for <i>E. Coli</i> (§ 141.63). In this regard the EPA and FDA provisions for <i>E. Coli</i> are identical requiring zero <i>E. Coli</i> in their respective waters.</p> <p>However, 21 CFR Part 112 Subpart E, §112.44 does allow a geometric mean of 126 or less colony forming units (CFU) of <i>E. Coli</i> per 100 mL and a statistical threshold value of agricultural water samples of 410 CFU per 100 mL when the agricultural water is applied using a direct water application method. In this regard the FDA requirement is less stringent than the EPA drinking water standard as the FDA rule is allowing <i>E. Coli</i> to be present in the water used in a direct application method.</p> <p>FDA publication on the key requirements of the FSMA Produce Safety Rule (21 CFR Parts 11, 16, and 112) states: <i>"There is no requirement to test agricultural water that is received from public water systems or supplies that meet requirements established in the rule (provided that the farm has Public Water System results or certificates of compliance demonstrating that the water meets relevant requirements), or if the water is treated in compliance with the rule's treatment requirements."</i></p> <p>The FDA rule clearly recognizes public drinking water as compliant with 21 CFR Part 112 Subpart E.</p>
29c.	<p>In Section 10.3.2.1, the Plan indicates, "The current system provides adequate and reliable water service to the customers." But, at a recent East Oahu County membership meeting, one of our members noted that water is not always available at higher elevations. We hope that the planned improvements to the Metro Low system will correct this problem; if not, we encourage BWS to consider further improvements.</p>	<p>The BWS provides potable water for domestic and agricultural irrigation to farms in the Kamilonui Valley in Hawaii Kai. The system's water main, fire hydrants and water meters along Kamilonui Place meet flow and pressure requirements of the Board's Water Systems Standards. Previous field testing and hydraulic analysis indicated an acceptable range of water distribution system pressures.</p> <p>Given the valley's topography, the farms slope up from the roadway and approach the water service limit of 70 feet along the valley walls. Water pressures decrease as the farms elevation increases. Further limiting flow, the required backflow preventer at the water meter reduces available water pressures by up to 15 psi. To help address this, the BWS has advised the farmers to install booster pumps for the higher elevations of their farm, to compensate for the elevation. There are no plans to install a higher pressure system in the valley.</p>

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30.	On several occasions there have been broken sprinklers and water waste that was reported to the BWS, but the situation was not remedied. In one instance, wasted water ran down the road for a month from a broken sprinkler.	<p>The BWS appreciates the efforts of conscientious people like you who help to identify water system problems and wasted water. We are sorry to hear that the problem of broken sprinklers and water waste continued after it was reported. In the future, to report water problems to the BWS, the best number to call is: 808-748-5041.</p> <p>The BWS can only fix broken pipes that are in the street or those that feed the customer's water meter. In almost all cases, the operation and maintenance of irrigation systems and sprinklers are the responsibility of the property owner</p> <p>If the problem is on Department of Parks and Recreation land, as you indicated, the number to call is (808) 768-3003.</p> <p>We will bring this matter to the attention of the respective City departments as well as the City's Managing Director.</p> <p>While the BWS plans for our water future, it's also our kuleana to take care of today.</p>
30a.	The jet fuel leakage from the Navy's storage tanks at Red Hill is a great concern. I have attended meetings and am following newspaper reports on what is being done to make the military accountable for contaminating an important source of our water.	<p>We appreciate your concern for guarding our precious water supplies from contamination from the US Navy's Red Hill fuel storage tanks. The BWS is continuing our work to monitor the situation – particularly the quality of the water in this pristine aquifer – and to insist that the Navy, US EPA, and the State Department of Health diligently prevent any further leaks and safeguard our water supplies. I hope you will support our efforts as a watchdog. We also recognize that the Navy's fuel storage facility is vital to national security and are not trying to get it closed. We believe it is possible for the Navy to both continue its operation of this critical fuel facility and protect the aquifer – especially by fast-tracking steps to contain stored fuel in a leak-proof way. We are also recommending that they also seriously examine the alternative of relocating the fuel storage to their property not located directly over a drinking water aquifer. I assure you that we will be tireless in our efforts, as this aquifer is irreplaceable.</p>
30b.	Water main breaks seem to occur almost monthly on this island. If the water system pipelines are aged and rusting, why not fix them before wasting water?	<p>You asked why water main breaks occur almost monthly, and why they are not fixed proactively. Detailed answers to your questions can be found in Section 11 of the full Draft WMP, which is available on the BWS website at: www.boardofwatersupply.com.</p> <p>Briefly, the number of main breaks on Oahu has been reduced in recent years, from 500 to 300 annually. Main breaks and the associated water loss are unavoidable in large, complex water systems like that on Oahu. The American Water Works Association cites a national average of 25 to 30 breaks per 100 miles of pipeline. In comparison, since 2011 the BWS has averaged about 15, about half the national average. This reduction is largely the result of replacing several key pipelines, changes in water system operations, and a proactive leak detection and repair program.</p> <p>Replacing pipelines is very expensive, in excess of \$5 million per mile. To ensure affordability for customers, information in the Water Master Plan will be used to prioritize pipeline replacement projects. The Water Master Plan also recommends that the BWS begin to ramp up pipeline replacement rate to eventually achieve 21 miles per year.</p>

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31.	<p>How can the community participate in water management, for example promoting the use of large containers to catch water from rain gutters? This seems to be applicable to Hawaii.</p> <p>I hope the BWS is taking a close look at innovative ideas and will implement some pilot projects to test different technologies that allow homeowners to become part of the solution.</p>	<p>The BWS shares your support for community participation in water management. One of our programs is similar to the rain catchment effort you mentioned. The BWS has been actively educating individuals to take part in capturing rainwater for landscaping for many years. We are working to expand the rain barrel workshop program – including the public education component. This initiative will increase the availability of rain barrels in local retail garden and home improvement stores through an incentives-based conservation program.</p> <p>In addition, the BWS is partnering with the City and County of Honolulu Department of Facilities Maintenance to support their work in stormwater management through rain capture and reuse utilizing residential and commercial rain catchment systems.</p>
32.	<p>The adoption of new assessment technologies for analysis and evaluation of the system should be ongoing.</p> <p>New pipeline materials should be considered since Oahu’s saltwater environment is a major corrosive factor.</p>	<p>New assessment technologies are described in detail in Section 11 of the full Draft WMP which is available on the BWS website at www.boardofwatersupply.com</p> <p>Application of these new tools has provided valuable information to help the BWS make important decisions about investing in many of the more costly pipeline replacement projects. These technologies are very expensive, so will be used selectively.</p> <p>Evaluation of the system should be and is an ongoing activity. The BWS’s dedicated leak detection team works daily to survey sections of the 2,100-mile pipeline system.</p> <p>With regard to corrosion resistance, Section 11 of the full Draft WMP includes discussion of a statistical analysis of BWS pipeline materials. The BWS has set a goal of designing ductile iron pipelines that will have service lives of 100 years or more.</p>
32a.	<p>Developers of new residential developments should fund the cost of providing water to their properties. Since water use in downtown Honolulu is likely to increase with the rising population density, residents of the downtown core should be assessed a higher water fee to offset maintenance and repair costs.</p>	<p>Developers are required to pay Water System Facilities Charges to the BWS for resource development, transmission and storage, to recover the costs for new water infrastructure (pipelines, reservoirs, pump stations, etc.). For large developments where there is no water system, such as Ho’opili and Koa Ridge, developers are required to install a new water system.</p> <p>Portions of the Kakaako water system are aging and undersized. As a result, the State Hawaii Community Development Authority and private developers have been required to replace and upgrade specific sections of pipelines adjacent to their high rise developments. These measures assess costs to those creating an increase in water demands and help to moderate water rates, in consideration of supporting affordable housing.</p> <p>The BWS’s water rates are uniform for each customer type, regardless of where on Oahu they are located. This approach recognizes Oahu’s tremendous diversity in multiple factors that can influence maintenance and repair costs, including rainfall, topography, and proximity to the ocean among many others.</p> <p>In 2017, the BWS and its Stakeholder Advisory Group will consider a Financial Plan and future water rates to support the Water Master Plan. We will bring your suggestion to the discussion for consideration.</p>
32b.	<p>What types of new materials are available for pipe replacement?</p> <p>What will the BWS do to protect new pipes from corrosive soil?</p>	<p>Currently the BWS allows two pipe materials for new installations—ductile iron pipe and PVC pipe. The de facto standard is ductile iron. The BWS has robust corrosion protection standards with the goal to achieve 100-year or more lifespans. To achieve this, BWS’s corrosion protection for ductile iron is a multi-pronged approach that includes cathodic protection, polyethylene wrapping, zinc pipe coatings and extra-thick pipe walls on all new ductile iron pipes.</p> <p>BWS also uses PVC in specific pipeline applications up to 24-inches in diameter and in lower pressure systems. Although PVC is inherently less prone to corrosion, PVC pipelines still include metallic fittings and valves.</p>

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32c.	<p>What steps can BWS take to reduce surface runoff? What can be done to channel the runoff back to the aquifer, including irrigation water from agricultural areas?</p> <p>While our unique geological features make for an ideal water capturing system, more needs to be done to get more surface runoff back to the aquifers.</p>	<p>The BWS prepares Watershed Management Plans and forges partnerships with non-profits, landowners, DLNR and other agencies, community organizations, agriculture, and others are essential to protect our surface water supplies and help recharge our aquifers. Each watershed management plan lists specific plans, strategies and projects for forestry management, including reforestation with native plants. A list of completed watershed management plans can be found on the BWS web site. The Water Master Plan, which is a long-range infrastructure plan for the BWS, references and integrates with these watershed management plans.</p> <p>Another means of replenishing our aquifers is increasing the capture of stormwater in suitable areas. The Nuuanu area is a prime candidate for stormwater capture. The BWS is currently working with the University of Hawaii, Hawaiian Electric Co., and the Ulupono Initiative to explore the feasibility of piping stormwater captured in Nuuanu Reservoir No. 4 to Nuuanu Reservoir No. 1 down the valley. This would make it possible to generate renewable energy through a hydroelectric turbine generator and increase the water supply by treating and recharging the water into the Kalihi groundwater basin.</p> <p>In addition, we are partnering with the City and County of Honolulu Department of Facilities Maintenance to support their work in storm water management through rain capture and reuse utilizing residential and commercial rain catchment systems.</p>
32d.	<p>Much more needs to be done environmentally to protect the purity of the aquifers from contamination from chemicals from military and industry in the form of underground tanks or surface runoff. Inspection and evaluation of potential polluters from military and businesses must be done annually. The fuel leaks in Red Hill was a major problem that could have polluted and destroyed the Pearl Harbor aquifer. Small business in the Kakaako area, Pearl City Industrial area, Campbell Industrial Park and others should be monitored to ensure safe elimination of pollutants by users. Stiff financial penalties should be levied against violators with mandatory inspection and monitoring for at least five years after a violation. The burden and cost of the follow-up inspections and monitoring should be paid by the violator.</p>	<p>We recognize the importance of your concern about protecting the purity of aquifers from contamination from various activities, including surface runoff and underground tanks owned by the military and industry. Currently, BWS Rules and Regulations Chapter 3, Water Resources cover the Protection of Water Resources, Waste Disposal Activities and Use of Pesticides which are limited to the review and approval/denial of these proposed activities that may contaminate groundwater. The BWS does not have enforcement authority over contamination from existing facilities or actions.</p> <p>In 2004, the State Department of Health developed their Source Water Assessment Program (SWAP) that provided water utilities groundwater modeling results of capture zone delineations that identify the areas around drinking water sources where potential contaminating activities could detrimentally impact these sources. The SWAP guidelines do not have an enforcement mechanism and are primarily informational and educational for use in reviewing proposed actions that may contaminate aquifers where best management practices could be recommended. State laws grant enforcement authority of releases of petroleum, hazardous substances, pollutants or contaminants to the State Department of Health, Solid and Hazardous Waste Branch. For additional information, you could go to the DOH's website: http://health.hawaii.gov/about/links-to-doh-program-information/environmental-health-administration/#EMD.</p>

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32e.	<p>More efforts to encourage conservation should be focused on large users of water such as the military, agriculture, government and business, rather than residential users who appear to recognize the need for conservation and take positive steps to reduce their water footprint.</p>	<p>The BWS is the process of engaging an expert in conservation program planning, to expand and strengthen the current successful program on Oahu, including increased focus on large water users such as hotels, industry and government. The BWS Stakeholder Advisory Group, comprising of 28 community leaders, has identified the need for an incentives based water conservation program.</p> <p>Since 1990, as people have made water conservation a daily habit, water use on Oahu has dropped 10 percent, conserving 10 billion gallons of water per year. Conservation trends have a saturation point, however. Early efforts capture water savings that are simpler and lower cost. Looking forward, the BWS is preparing to ramp up its water conservation program to counter-balance the demands of a growing population.</p> <p>The 2040 goal is to reduce water use to 145 gallons per capita per day, compared to 187 gallons per capita per day in 1990. Future conservation will be targeted. New real estate development opens up opportunities for encouraging — and possibly mandating — advanced water conservation measures, such as EPA WaterSense higher-efficiency plumbing, smart-irrigation controls, sub-meters for multi-family homes, and graywater reuse. Growth in industry and the tourism/travel sectors allows the potential to advance innovations in cooling tower efficiencies, conductivity meters, water softening, rain water or recycled water supplements, and the capture and reuse of air conditioning condensate. Opportunities being researched include capturing storm water behind an existing dam in Nuuanu to recharge the aquifer.</p>
32f.	<p>New development should be required to install a full range of water conservation measures as part of the approval process.</p>	<p>We appreciate your interest in conservation, which is the least expensive way to stretch our water supply. The BWS is strongly pursuing conservation opportunities. With each new opportunity to conserve, we begin with education and voluntary participation.</p> <p>Simple, effective conservation measures are already in place, helping to reduce water use and associated water and sewer bills. These measures are supported by a broad base of customers, and they benefit all BWS customers.</p> <p>When greater participation in water conserving efforts is needed, incentives are considered. The water industry has found that incentives are effective in driving pivotal changes in water-use practices. The BWS has experienced this first hand. In the past, we've offered incentives for residential customers to change to low-flow toilets, to supplement a low-flow fixture ordinance for non-residential properties. As presented in the Draft WMP, additional incentives are being considered as well as possible mandates for new developments as well as the commercial/industrial sectors. These options are being explored with the BWS Stakeholder Advisory Group.</p> <p>Several people have proposed mandating rather than encouraging advanced conservation. This approach will be taken into consideration as we embark on a yearlong process of examining water rates and preparing a financial plan.</p>

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32g.	The BWS should mount a media campaign aimed at businesses to help them to adopt water conservation practices. The business sector needs to recognize that it's good for their image to become environmental leaders and good community partners.	<p>We agree that there are additional opportunities for conservation in the business community. Because the way that businesses use water varies so much by the type of business, conservation best practices and devices also vary widely by business type. This is part of the reason we have engaged a Stakeholder Advisory Group as part of our Water Master Plan development process.</p> <p>The Stakeholder Advisory Group includes representatives from a wide variety of business types and wide range of water users. We have received extensive input from this group on how to further our conservation efforts and will continue to work with the business community as we implement our conservation programs. We believe that this targeted approach provides the best return on our conservation investments, which are funded by your water rates.</p> <p>A couple of examples on how the Stakeholder Advisory Group is helping: we have the executive director of the Hawaii Restaurant Association in the group and we are working on several programs targeting restaurants on Oahu to help reduce their water use. We expect to start implementing next year. We have also met with the managers of the various golf courses on Oahu and are looking to expand use of recycled water for their irrigation purposes.</p>
32h.	BWS should be commended for engaging the Stakeholder Advisory Group. BWS should also have a strong lobbying effort in the Legislature to ensure political support in the form of new laws or regulations that would be needed to make the efforts of the BWS more attainable. A partnership with eco-minded citizens groups could be effective. BWS needs to enlist their lobbying ability to promote its message to Legislature and Governor.	<p>You are absolutely correct that would be a delicate issue for the BWS to direct lobbying efforts. However, we do believe it is important to keep our legislators informed. We have provided each of our Oahu-based elected officials with the Draft WMP and the WMP Summary. We are also working on a briefing to members of our State legislature.</p> <p>We also have partnered with other organizations, such as the Hawaii Community Foundation's Freshwater Council, to help establish statewide objectives to ensure adequacy and sustainability for our precious and limited freshwater supplies. The Freshwater Council has established goals to ensure 100 mgd of freshwater is secure by 2030 in the areas of water conservation, reuse and storm water capture for aquifer recharge. More information can be viewed at their website:</p> <p>http://www.hawaiicommunityfoundation.org/strengthening/fresh-water</p>
32i.	BWS cannot rely solely on government for the necessary capital, as there is a great deal of competition for these scarce funds. Water purity and supply cannot rest on whether or not there is enough money or not. Remember what happened in Flint, Michigan.	<p>We appreciate your concern about the adequacy of BWS's funds, nearly all of which comes from our water ratepayers rather than taxes or other government sources.</p> <p>The BWS is very cognizant of the importance of sufficient funding to keep our water safe, and ensuring the safety of our water is our first and highest priority. For detailed information about the background of the BWS and its semi-autonomy over decision-making and funds, please see Section 1.1 of the full Draft WMP. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p>
32j.	Sustainability is a tremendous responsibility. Thank you for doing the good job you are doing to ensure we all have enough pure water for generations to come.	<p>We agree that sustainability is a tremendous responsibility. We take it seriously, and we share that responsibility with people like you; other City and State departments; our watershed partners; non-profits; businesses; agriculture and many others. The Draft Water Master Plan recommends more than doubling our annual investments in watershed protection, and linking the amount of these investments to our Capital Improvement Plan to recognize their importance in the overall health of our water system. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p>

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33.	BWS should address power outages that affect water-pumping facilities reliant on electricity. Consider a hybrid solar-electric plant to produce emergency power.	<p>Operation of the BWS water supply, treatment and transmission facilities is largely dependent on electrical power. Supplying water in a reliable fashion over an extended period requires certain BWS-owned facilities to function even when electric power is temporarily out of service. Currently, the BWS has six large portable emergency generators and one stationary generator to provide emergency power. Later this year, BWS plans to begin construction of three additional stationary generators.</p> <p>The existing and proposed emergency generators are powered by diesel engines. These must be located on the actual site of critical facilities in case electric power distribution lines are out of service. Unfortunately solar + battery facilities have three distinct limitations in this application:</p> <ul style="list-style-type: none"> • The critical pump stations tend to have very large horsepower pumps and the resulting solar panels would have a large space requirement that wouldn't fit on most of the sites. • We are not aware of technology that makes the solar panels hurricane resistant. • The batteries would be exceptionally large as the facilities must be sized to operate for several days before the electric utility service is restored. <p>BWS is employing solar power in other ways and we are currently implementing a program to install solar panels on top of some of our drinking water reservoirs. Visit the BWS Website for information on the Energy Savings Performance Contract at www.boardofwatersupply.com. We are also evaluating hydroelectric generation at our Nuuanu dams as the location lends itself to this type of energy generation.</p> <p>BWS will continually look for ways to protect and enhance our power generation capabilities.</p>
33a.	BWS should implement a desalination facility situated in the Honolulu urban core, in Hawaii Kai, and/or offshore. This recommendation should be considered in addition to the BWS desalination facility in the Ewa-Kalealoa district.	<p>The BWS is moving forward on the implementation of a moderate sized (1 million gallons per day) desalination facility in the Kalaeloa Ewa area that will be expandable based on water demand growth. This site has saltwater wells and sufficient area to install photovoltaic panels to offset the high electrical demand of such a facility.</p> <p>Locating a desalination facility in the urban core is much more difficult and costly, especially with the limited availability of land. The water master plan envisions an integrated groundwater and alternative source water system to provide additional water supplies for Honolulu including desalination and recycled water.</p>
33b.	A “do nothing” approach would not incur any risk factors in upgrading the aging water supply infrastructure. Even though this approach would be the least desirable, was it considered?	<p>You are correct that the “do nothing” approach was analyzed.</p> <p>The existing system was analyzed for its condition and capacity to handle future flows if the BWS “did nothing” to renew, replace, and expand the system. You can find detailed information about the analyses of the existing system in Sections 10 and 11 of the full Draft WMP. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p>
33c.	Consider rainwater catchment where water is held for later usage.	<p>Increasing the capture of stormwater has been suggested by several other members of the public and is an excellent idea. The Nuuanu area is a prime candidate for stormwater capture. The BWS is currently working with the University of Hawaii, Hawaiian Electric Co., and the Ulupono Initiative to explore the feasibility of piping stormwater captured in Nuuanu Reservoir No. 4 to Nuuanu Reservoir No. 1 down the valley. This would make it possible to generate renewable energy through a hydroelectric turbine generator and increase the water supply by treating and recharging the water into the Kalihi groundwater basin.</p> <p>The BWS has an ongoing campaign encourage use of rain barrels for stormwater capture. We have been doing this program for a number of years and look to expand it in the very near future. The BWS is also partnering with other City Departments to maximize resources for educating the community about stormwater capture.</p>

Comment No.	Summarized Comments	Responses to Public Comments
33d.	Expenses need to be considered, however if it costs more to pay for these improvements and upgrades, I am in support. The system will serve us in the future, and this is a shared investment.	<p>We greatly appreciate your support. The BWS mission is to provide safe, dependable and affordable water now and into the future. The water master plan is a comprehensive program that looks ahead 30 years to evaluate the entire water system, quantify future demands and source options, identify necessary improvements, and balances needs with costs of providing water to residents and visitors. The WMP provides a basis for identifying and prioritizing Capital Improvement Program projects and a sustainable financial program.</p> <p>Your support will definitely be considered as we enter the next phase of the WMP, which is the financial plan and water rate study.</p>
34.	A BWS representative spoke to our Rotary Club at Kapolei and pointed out the value of the WMP, objectives, sustainability, project prioritization, and having enough water. This type of information shows the BWS is committed to doing the right thing.	<p>Mahalo for attending the presentation to the Rotary Club at Kapolei! We appreciate your support of our efforts. The Water Master Plan is a comprehensive program that looks ahead 30 years to evaluate the entire water system, quantify future demands and source options, identify necessary improvements, and balances needs with costs of providing water to residents and visitors. The WMP provides a basis for identifying and prioritizing Capital Improvement Program projects and a sustainable financial program.</p> <p>BWS is committed to doing the right thing and will ensure potable water continues to support the economic growth of Oahu while balancing environmental and social/cultural values.</p>
35.	The Nature Conservancy supports the Board of Water Supply's Draft Water Master Plan and particularly appreciates the support for watershed management and partnerships to help ensure water supply and sustainability.	Mahalo for your support of watershed management! The Nature Conservancy of Hawaii and the BWS have had an excellent partnership for many years.
35a.	<p>Fresh water is not a limitless resource and likely effects of climate change are already apparent: More frequent and severe storms that can increase runoff and siltation; but Overall, less rainfall in many locations and therefore less fresh water; and Higher temperatures that affect watershed health and can be beneficial to pests.</p> <p>UH's Rainfall Atlas catalogues a century of declining rainfall, with an increase in the rate of that decline in recent decades and fewer trade wind days, increase in temperature, and record number of storms. The storms damaged homes, power lines and trees.</p>	<p>The BWS shares your concern about the effects of climate change on our water supply and the environment. We are doing a number of things to adapt:</p> <ul style="list-style-type: none"> • Increasing our conservation efforts to stretch limited supplies. • Pursuing stormwater capture and replenishment to increase supplies through watershed management. • Broadening BWS's portfolio of supply options (increasing recycled water, brackish and seawater desalination) to ensure our water system is less vulnerable. • Ongoing monitoring of trends incorporated into the adaptive management process. <p>The BWS is also proactive in funding climate change research to forecast these rainfall and aquifer yield trends, identify vulnerabilities and develop adaptation strategies such as advanced conservation, doubling recycled water production, and investing in brackish and seawater desalination. With governmental and academic partners, the BWS will continue to monitor water quality to ensure safe drinking water and to inform pump operations to manage water withdrawals as to not detrimentally impact the aquifer.</p>

Comment No.	Summarized Comments	Responses to Public Comments
35b.	<p>The native ōhi'a and koa forests in the area are resilient to the storms and are better at capturing rain water and recharging the aquifers than invasive species.</p>	<p>We agree with your point about the benefits of native forests. Our Watershed Management Plans include partnerships and projects to remove invasive species and restore native forests to improve conditions for recharging our aquifers.</p> <p>Our partnerships with non-profits, landowners, DLNR and other agencies, community organizations, agriculture, and others are essential for watershed health and we do what we can to support them. The Draft Water Master Plan recommends more than doubling our annual investments in watershed protection, and linking the amount of these investments to our Capital Improvement Plan to recognize their importance in the overall health of our water system.</p>
35c.	<p>In response to these conditions, we must plan and implement mitigative and adaptive measures to ensure the resilience of our natural and human systems.</p> <p>Healthy Hawaiian forests that are not overrun by invasive species act like a sponge, collecting rain and moisture, slowly delivering fresh water into aquifers and streams, absorbing greenhouse gases, and reducing runoff and siltation into near shore waters during storm events. Additionally, we must improve our efficiencies and reuse of our fresh water resources.</p> <p>We are grateful that the BWS and the proposed Water Master Plan for Oahu recognizes these conditions and prioritizes addressing them.</p>	<p>We agree that we must plan and implement mitigation and adaptive measures to ensure resilience of our natural and human systems. In Section 13.1.2 of the Draft WMP, we discussed funding strategies for the BWS's sustainability programs: watershed management (recharge), conservation, and water reuse (recycling). We proposed that, as part of our upcoming water rates study, along with our Stakeholder Advisory Group, we consider the establishment of a dedicated funding stream for our sustainability programs, with specific levels of funding tied to the Capital Improvement Program. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p>
36.	<p>The Draft WMP is a great comprehensive Plan. The pipeline breakage analysis is a breakthrough.</p>	<p>Mahalo for your kind words. The pipeline breakage analysis, indeed, allows us to prioritize projects based on risk rather than other, less vital factors. This is changing the way we renew and replace our water infrastructure going forward utilizing limited water rate funding in the most efficient way possible.</p>
36a.	<p>Provisions for periodic updating and adaptive management are necessary for such a long plan--30 years. Way to go HBWS.</p>	<p>We appreciate your support for periodically updating the WMP and employing adaptive management to build in flexibility to respond to evolving conditions.</p> <p>The long-range plan allows us to prepare for a safe, dependable, and affordable water future. The updates and adaptive management strategy helps us ensure the plan addresses changing conditions.</p>
37.	<p>There is no question that the Water Master Plan must go forward, however, the cost will be very high. Please consider Oahu's aging population and those on fixed incomes.</p>	<p>Mahalo for your support for the Water Master Plan. We agree that water must be affordable for all, and we assure you that we will consider Oahu's aging population and those on fixed incomes as we conduct the Financial Plan and Water Rates Study in 2017. We have received several comments on the creation of a subsidized sustenance water rate for elderly and low-income families on fixed incomes.</p>

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38.	<p>Our bill fluctuates from month to month. I've called on many occasions to inquire about our rate and to see if someone is really reading our meter, not estimating our usage.</p> <p>The Water Master Plan budget does not sound like it will be managed well. Will this be another burden cast on the public with no oversight and proper management? Many people have moved or are planning to move to the mainland because the cost of living in Hawaii is too expensive.</p>	<p>Water must be affordable for all, and we assure you that we will consider your concern as we conduct the Financial Plan and Water Rates Study in 2017. The BWS's current water rates are among the most affordable of major cities in the U.S., and we expect that they will continue to be affordable in the future as we implement the WMP.</p> <p>We take the fiscal management of BWS very seriously and do not wish to exceed our ability to fund and pay for improvements. Our Board of Directors currently includes several business people including one with a financial background.</p> <p>Funding for BWS comes mostly from water ratepayers as well as other financial funding mechanisms such as bonds.</p> <p>We invite you to visit our website for water conservation tips that can reduce your water use and your water bill. Conservation measures include leak detection such as checking and replacing the toilet flapper that constitutes the largest water loss in a home. WaterSense labeled low flow shower and faucet fixtures and clothes washers address the next largest water use in the home. Finally, landscape irrigation can be reduced through changes in irrigation schedules utilizing soil moisture sensors and considering xeriscape drought tolerant landscaping that maintains attractiveness and property values while reducing water use and associated costs.</p> <p>We will be looking closely at all of our rates in the next year and there will be ample opportunity for the community to weigh in on potential rate changes. Your future input will be appreciated.</p>
39.	<p>Additional water catchments should be a priority when looking at long-range sustainable water management plans.</p>	<p>Increasing the capture of stormwater has been suggested by several members of the public and is an excellent idea. The Nuuanu area is a prime candidate for stormwater capture. BWS is currently working with the University of Hawaii, Hawaiian Electric Co., and the Ulupono Initiative to explore the feasibility of piping stormwater captured in Nuuanu Reservoir No. 4 to Nuuanu Reservoir No. 1 down the valley. This would make it possible to generate renewable energy through a hydroelectric turbine generator and increase the water supply by treating and recharging the water into the Kalihi groundwater basin.</p> <p>The BWS has an ongoing campaign encourage use of rain barrels for stormwater capture. We have been doing this program for a number of years and look to expand it in the very near future. The BWS is also partnering with other City Departments to maximize resources for educating the community about stormwater capture.</p>

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40.	<p>The WMP does not include any reference to the principal of "No Net Loss" (NNL) of water off of developed lands. There are a variety of ways that NNL can be accomplished, primarily by reducing impervious surfaces and increasing water retention capacity both on a micro and macro scale. This is a overarching concept that, if adopted, could be scaled up or down to address most situations.</p>	<p>As with water conservation, stormwater management is everyone's responsibility. No Net Loss is similar to Low Impact Development, which is defined as a stormwater management strategy that seeks to maintain or restore the natural hydrologic character of the site, reduce off-site runoff, improve water quality, provide groundwater recharge, and mitigate the impacts of increased runoff and storm water pollution. LID comprises a set of design approaches and integrated management techniques that promote the use of natural systems for infiltration, evapotranspiration, treatment, and use of rainwater.</p> <p>In 2012, the City adopted Low Impact Development drainage standards to address water quality issues by managing runoff from their properties. Bioretention basins, rain gardens and permeable pavements, as well as other stormwater quality control facilities, are included in the City's 2012 Low Impact Development Standards. We would like to add rain barrel catchments to these standards as a means to capture stormwater and irrigate gardens and landscaping. These standards apply to large developments of one acre or larger and specific land uses like parking lots and gas stations. The rules do not apply to a single residential unit, but if the one-acre threshold is exceeded, the rule would apply. This does not preclude each homeowner to meet the rule and this is where education is valuable, one home at a time.</p> <p>On Oahu, the City Department of Facility Maintenance, Storm Water Quality Branch and the Department of Planning and Permitting are responsible for the review, approval and compliance of the standards. The BWS has been including LID techniques as a core element of our Watershed Management Plans.</p> <p>More information can be obtained from the below link: https://www.honolulu.gov/rep/site/dfmswq/dfmswq_docs/Rules_Section_II_12-4-2012.pdf</p>
40a.	<p>Figure 8-3 mistakenly depicts recharge only in the mauka areas. In a natural, non-urban watershed, much of the recharge also comes from the lower lands---streams, wetlands, floodplains, and lowlands---where water runoff collects and percolates into the ground. The ability of an urban ahupua'a to recharge is in large part dependent on the location and percentage of the pervious lands. In partnership with City and State agencies, the BWS might want to identify goals of No Net Loss and restrictions on impervious surfaces.</p>	<p>You are correct that Figure 8-3 depicts only the mauka areas and leaves out the many details that you described. It was intended to show the concept of the water cycle. The details of recharge that you described are accurate. We point out that the mauka lands receive the highest amounts of rainfall, the islands prime recharge areas which supply our drinking water sources downgradient and therefore, deserves our direct focus. Rainfall occurring makai of our sources, although still recharging the underlying aquifer with benefits to estuaries, streams and nearshore waters, does not directly supply our wells.</p> <p>The BWS identifies low impact development goals, which are related to no net loss and restrictions on impervious surfaces, in our Watershed Management Plans. We agree that the goal of reducing runoff and managing runoff on-site is important to our island's water resources.</p>
40b.	<p>The Water Master Plan identifies stream water health as one of BWS responsibilities. A vegetative riparian corridor is the single most effective way to reduce contaminates from flowing into streams. The BWS might consider the incorporation of this principal into discussions with other State and County agencies.</p>	<p>Regarding your interest in sustaining healthy streams, we agree that vegetative riparian corridors are an effective means of reducing contamination to streams. You may be interested in any of our Watershed Management Plans that contain extensive information on strategies that protect our surface water supplies and help recharge our aquifers.</p> <p>State and County agencies are among our partners who are actively involved in implementing the Watershed Management Plans. You can find these on our website at http://www.boardofwatersupply.com/water-resources/watershed-management-plan</p>

Comment No.	Summarized Comments	Responses to Public Comments
40c.	The public needs to be made more aware of improper landscape irrigation and swimming pool flushing as related to water conservation. This water often goes into the storm water system, causing a different set of problems. Education, reporting protocols, and economic sanctions are good tools to reduce this waste. These may differ as applied to the users.	<p>Your recognition of the linkage between water conservation practices and stormwater quality is correct, and the BWS can play an active role in education as part of our water conservation awareness programs. However, the BWS is not a regulatory agency and the responsibility for runoff quality is vested in the State Department of Health, Clean Water Branch.</p> <p>You can find more information on their website at: http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/polluted-runoff-control-program/</p>
40d.	There was little support of economic incentives and sanctions in the Water Master Plan, which are proven to be the most effective way of achieving participation in Best Management Practices.	<p>Regarding your interest in water conservation, which is the least expensive way to stretch our water supply. The BWS is strongly pursuing conservation opportunities. With each new opportunity to conserve, we begin with education and voluntary participation. Simple, effective conservation measures are already in place, helping to reduce water use and associated water and sewer bills. These measures are supported by a broad base of customers, and they benefit all BWS customers.</p> <p>When greater participation in water conserving efforts is needed, incentives are considered. The water industry has found that incentives are effective in driving pivotal changes in water-use practices. The BWS has experienced this first hand. In the past, we've offered incentives for residential customers to change to low-flow toilets, to supplement a low-flow fixture ordinance for non-residential properties. As presented in the Draft WMP, additional incentives are being considered as well as possible mandates for new developments as well as the commercial/industrial sectors. These options are being explored with the BWS Stakeholder Advisory Group.</p> <p>Your suggestion will be taken into consideration as we embark on a yearlong process of examining water rates and preparing a financial plan.</p>
41.	One of your recommendations is to have no more than 8 percent non-revenue water loss. What is the current level of non-revenue loss is for the Board of Water Supply?	Our current non-revenue water loss is 10.5%, which can be found in Section 12 of the Draft WMP. This was determined using the average potable source production and metered consumption data from the years 2008 – 2012. The Draft WMP is available on the BWS web site at http://www.boardofwatersupply.com .
42.	Why are we building so many homes here when we know our water system cannot support them?	<p>The City's Oahu General Plan, along with regional Development Plans and Sustainable Community Plans, are where decisions are made about future growth. The BWS is an active party in reviewing and advising on these plans when they are updated, and our advice always stresses the critical need to sustain our water resources for the generations that follow.</p> <p>Oahu's water resources are precious and not unlimited. It takes proper protection, management, and conservation to make sure Oahu's aquifers are sustained for the future. The State Commission on Water Resource Management has established a water limit or "cap" called "sustainable yield". Pumping cannot exceed this cap. Water use efficiency and conservation combined with low-impact development, land use planning and regulations will ensure management of population growth and cost inflation.</p> <p>There are many references throughout the Draft WMP not only to a water supply that is limited, but also to the importance of sustainability, conservation, and watershed protection. (See Sections 2, 4, 6, 7, 8, 10, 12, and 13.)</p> <p>Section 8 provides a comparison of projected water availability (within sustainable yields) with population projections for the 30-year planning period. The projections demonstrate there will be enough water, even with the planned growth. They also show the extreme importance of conservation. (See figure 8-7.) Section 12 of the Draft WMP provides many recommendations specifically to protect, conserve, and diversify our water sources. The document is available on the BWS web site at http://www.boardofwatersupply.com.</p>

Comment No.	Summarized Comments	Responses to Public Comments
42a.	The BWS should request that the City and State consult with you before approving additional plans for any future condos or single-family dwellings.	The BWS is an active party in reviewing and advising on these land use plans when they are updated, and our advice always stresses the critical need to sustain our water resources for the generations that follow. All building permit applications for new development and renovations of existing buildings requiring water supply are reviewed and approved by BWS. We evaluate each permit against current water system capacity for domestic use and fire protection to meet our water system standards and Rules and Regulations.
42b.	There is nowhere to get additional drinking water supply. We do not want to drink seawater.	<p>We note that most bottled water products utilize desalination and is of high quality. The Draft WMP analyzed future water supplies along with future demands. There are a number of ways to stretch the water supply we already have. This includes:</p> <ul style="list-style-type: none"> • Increasing our conservation efforts to stretch limited supplies • Pursuing stormwater capture and replenishment to increase supplies • Broadening BWS's portfolio of supply options (increasing recycled water, brackish water desalination) to make it less vulnerable • Ongoing monitoring of trends incorporated into the adaptive management process <p>Please note that desalinated water is an acceptable method of providing quality drinking water. Our concern is that it is an expensive way to provide drinking water and must be applied sparingly within a comprehensive planning framework such as the water master plan.</p>
43.	All farmers should be required to use some kind of catchment system so as not to irrigation crops with drinking water.	<p>Regarding catchment systems for agriculture irrigation, your suggestion makes tremendous sense, and as with many other things, the solution is not so simple. On Oahu, large surface water (ditch) systems whose origins date back to the days of sugar plantations have traditionally been used for agricultural irrigation. These systems use natural stream catchments, diverting water from the streams to agricultural fields. These diversions, which are necessary to move surface water from where it occurs to suitable agricultural lands, date back over a century and are a source of significant environmental damage in addition to being the subject of numerous legal cases. In 2003, the State of Hawaii Department of Agriculture released its Agricultural Water Use Development Plan (AWUDP). The plan was conceived by the State Legislature to ensure that the plantation irrigation systems affected by plantation closures would be rehabilitated and maintained for future agricultural use. The need for substantial investments was identified in order to rehabilitate these systems. On Oahu, the Department of Agriculture manages the Waimanalo and Kahuku ditch systems. Other ditch systems remain privately held and are in various states of repair.</p> <p>Complicating matters even more, the recently enacted Food Safety Modernization Act (FSMA) establishes minimum standards for the safe growing, harvesting, packing, and holding of fruits and vegetables grown for human consumption. The final rule establishes criteria for microbial water quality, requires testing to confirm their presence or absence, and requires treatment if present. These microbes are often naturally occurring in Hawaii's surface waters. All of this comes at significant expense to farmers and to the viability of diversified agriculture on Oahu.</p> <p>The BWS is leading the development of Watershed Management Plans for each of Oahu's eight Planning Districts. To date, we have completed plans for four districts. These plans, adopted by Ordinance by the City Council, establish a framework to meet all of the water demands within a planning area, inclusive of agriculture, and beyond those customers who are served by the BWS potable water system.</p> <p>For more information on these plans, please visit http://www.boardofwatersupply.com/water-resources/watershed-management-plan.</p>

Comment No.	Summarized Comments	Responses to Public Comments
44.	<p>Future political instability will impact our food supply, and force much more local food production. Has the BWS planned for means to supply enough water to meet the increased demands that will come from increased commercial agriculture or home gardening?</p>	<p>BWS plans for growth in agriculture water demand in two areas:</p> <ul style="list-style-type: none"> • From the BWS water system through the Water Master Plan and • In our Watershed Management Plans for private agricultural water systems. <p>Currently, BWS provides approximately three percent of our island-wide potable water production for agricultural meters. In large agricultural communities such as Waianae and North Shore, the percentage of potable water for agriculture is higher. Our water demand forecasts account for a proportional increase in agricultural demand in these areas.</p> <p>Agriculture irrigation is primarily supplied by surface water, the most inexpensive source of supply. But surface waters have lower water quality and are particularly affected by even minor droughts. Irrigation can also be supplied by private groundwater wells, which are often coupled with surface water supplies as back-ups supplementing variable stream flows. The groundwater aquifers in Central Oahu, Wahiawa, North Shore and Windward Oahu have ample groundwater supplies available to accommodate on-site irrigation wells for agriculture. Less than one-half of Oahu’s groundwater is currently used. Our Watershed Management Plans assess existing agricultural irrigation systems and available surface and groundwater supplies for future growth on prime and unique agricultural lands identified in the State’s Agricultural Lands of Importance in the State of Hawaii, (ALISH). The Watershed Management Plans are adopted by the City Council as Ordinance in Chapter 30, ROH, and thus institutionalize these plans and policies for sustainable agricultural growth on Oahu.</p>
45.	<p>With so much development continuing to go on, aquifers will not be able to sustain our needs at some point in time. Do developers of new homes, hotels, apartments, etc. research the availability of water in those areas before considering development?</p>	<p>The availability of water supply and water system capacity for new developments is assessed throughout the City’s land use planning process.</p> <p>The City’s Oahu General Plan, along with the regional Development Plans and Sustainable Communities Plans, are where decisions are made about future growth. The BWS is an active party in reviewing and advising on these plans when they are updated, and our advice always stresses the critical need to sustain our water resources for the generations that follow. Based on these land use plans, the BWS Watershed Management Plans integrates land use and water supply. New groundwater and alternative water sources are identified in the quantities necessary to support the land use plans.</p> <p>Developers of large and small parcels of land research the availability of water system capacity for their proposed developments by inquiring with BWS. Building permit applications for new development and renovations of existing buildings requiring water supply are reviewed and approved by BWS. We evaluate each permit against current water system capacity for domestic use and fire protection to meet our water system standards and Rules and Regulations. We invite you to review the Plan Implementation section of the Overview chapter of our Watershed Management Plans for more detail on the water allocation process.</p> <p>http://www.boardofwatersupply.com/water-resources/watershed-management-plan</p>