OFFICE OF THE CITY AUDITOR
City and County of Honolulu
State of Hawai'i

Audit of Select Management and Operational Practices at the Board of Water Supply

Report No. 14-03/September 2014

Audit of Select Management and Operational Practices at the Board of Water Supply

A Report to the
Mayor
and the
City Council
of Honolulu

Submitted by

THE CITY AUDITOR
CITY AND COUNTY
OF HONOLULU
STATE OF HAWAI`I

Report No. 14-03
September 2014

OFFICE OF THE CITY AUDITOR
CITY AND COUNTY OF HONOLULU
1001 KAMOKILA BOULEVARD, SUITE 216, KAPOLEI, HAWAII 96707/ PHONE: (808) 768-3134 / FAX: (808) 768-3135

EDWIN S.W. YOUNG
CITY AUDITOR

September 8, 2014

The Honorable Ernest Y. Martin, Chair
and Members
Honolulu City Council
530 South King Street, Room 202
Honolulu, Hawai'i 96813

Dear Council Chair Martin:

A copy of our final report on the *Audit of Select Management and Operational Practices at the Board of Water Supply* is attached. This audit was conducted pursuant to City Council Resolution 13-201, FD1, which requested the city auditor to conduct a comprehensive management, performance, and financial audit of Honolulu's Board of Water Supply (BWS). This audit was included in the *Office of the City Auditor's Proposed Annual Work Plan for FY 2013-14* and performed in accordance with generally accepted government auditing standards from November 2013 to August 2014.

The overall audit objective was to perform a comprehensive management, performance and financial audit of the Board of Water Supply. The sub-objectives, per the resolution, were to determine (1) whether management policies and procedures fulfilled the BWS mission and benefit Honolulu ratepayers; (2) what performance measurements are utilized to adequately gauge the effectiveness and efficiency of BWS operations; and (3) which financial tools and controls are in place to provide assurance the BWS is using ratepayer funds effectively and efficiently. Other audit sub-objectives were to determine (4) whether the status and powers of the BWS as a semi-autonomous agency should be maintained; (5) what problems were associated with the new billing system implementation, including conversion from bi-monthly to monthly billing and increased meter reading responsibilities; and (6) whether the BWS rate structure was fair to all customers when comparing BWS rates, water costs and operational costs with similar jurisdictions. The seventh audit objective was to determine whether the BWS can improve its operational efficiency, effectiveness, and reduce costs by (a) improving its management policies and/or procedures; (b) improving customer service, especially by decreasing call wait times; and (c) improving transparency through better communication with the public and the city council.

Background

The Board of Water Supply is the largest municipal water utility in the State of Hawai'i and provides approximately 145 million gallons of water a day to nearly one million people on the island of O'ahu.

The semi-autonomous entity has the authority to manage, control and operate the water systems that include nearly 2,100 miles of pipeline, 171 reservoirs, and 94 active potable water sources. BWS fixes and adjusts water rates and charges for water services so that the revenues derived are sufficient to make the BWS self-supporting as authorized by the provisions of Article 7, Revised Charter of Honolulu.

Beginning in 2008, BWS initiated a project to replace its old customer billing system, the Customer Account System (CAS), with a new Oracle based Customer Information and Billing System (CIS/CC&B).* The system was developed in-house by BWS staff that was augmented by consultants and other staff that could provide BWS project management, configuration, and implementation support services. Originally estimated to cost about $5 million and be implemented in 18 months, the system cost $16.4 million as of August 2014. After lengthy delays, the system was activated in January 2013.

Audit Results

After going live, billing problems resulted in complaint calls to the Customer Care Center that increased significantly in May 2013 and continued through October 2013. BWS assigned more staff to handle the increased complaints, but reacted too slowly to prevent abandoned calls, long waits, and many complaints to the city council. BWS also discovered an increase in estimated billings and billing errors that resulted in big bills which generated more complaints to the city council.

Billing System Implementation. The Oracle guide details specific steps for implementing its utilities customer care and billing system. The BWS contract files also detailed additional steps for implementing the new customer billing system. Although BWS followed the guide and implementation steps, it underestimated the cost and time needed to implement its new billing system and was unprepared for the impact of the problems related to the system billing errors. BWS did not follow its consultants' advice and was not proactive in providing the resources needed to handle the flood of customer complaints that resulted from the system billing errors. As a result, the BWS call center was overwhelmed, customers abandoned calls, and many others complained of long waits as the number of customer complaints increased.

Billing Charges. The city charter, Section 7-109, authorizes the BWS to generate revenues that are sufficient to make BWS self-supporting and to meet all expenditures. In November 2011, the BWS increased its water rates over the following five-year period. The increase included a monthly billing charge that will cumulatively increase 45 percent from January 2012 to 2016. According to BWS, the monthly billing charge covers costs associated with billing customers for their water. BWS was unable to readily provide the data we requested to support the billing and rate increases. Best practices recommend better transparency to justify rate and charge increases.

---

* The Oracle Customer Information and Billing System (CIS/CC&B) is also referred to as the Oracle Customer Care and Billing System (CC&B). The names are interchangeable for this report.

Automatic Meter Readings. According to BWS guidelines, the Automatic Meter Reading (AMR) *no read* rate should be five percent. Approximately 24,000 (15%) of water meters require meter readers to make as many as three attempts to obtain actual reads from the same meter in any billing review period. Even after multiple attempts, actual meter reads are not always obtained because meters readers are unable to locate meters, or an automatic or manual read is not possible due to the meter's condition. As a result, the BWS meter reading process is inefficient and ineffective. For example, the meter reader section accumulated costly overtime because its staff had to go onsite to read the meters manually. The overtime expenses for meter readers in 11 of the 12 months in FY 2014 increased 213 percent and totaled $96,884, compared with $30,960 in all of FY 2013. BWS managers need to address and resolve issues related to its malfunctioning AMR equipment. If left unresolved, multiple problems will continue, such as water meters not being located, water meters not transmitting data, inaccurate meter readings, more estimated bills, avoidable overtime and labor expenses, increased billing costs, and upset customers.

Operations. BWS' policies and procedures are generally consistent with its mission, objectives, and legal requirements. It is complying with all city ordinance and all, but two, city charter requirements. BWS could improve its organization by conforming to best practices and focusing on customer service as established by other water related entities. Financial tools and resources are adequate to support its operations. Existing performance measures focus on operations and are adequate to comply with federal, state, and local mandates. BWS' water rates are lower than similar jurisdictions. However, BWS lacks performance measures for customer service and benchmarks to measure its progress in servicing customers. BWS does not comply with industry best practices related to customer service and stakeholder involvement.

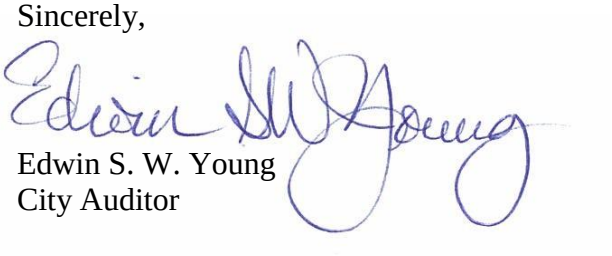
Charter Amendment and Governance. The city council could amend the City Charter to improve oversight of the Board of Water Supply and its governing structure. Our sampling results for 30 cities and entities show mixed governance structures; the sampling results of municipal and other water entities indicate the common practice is for the executive branch, city council, or some other entity to review and approve water budgets and water rates. Public hearings on these issues are common and transparency is the norm. The final decision to amend the BWS governance structure to improve oversight is a policy decision for the city council.

The Board of Water Supply management generally agreed with our findings and recommendations; except for those related to justifying the monthly billing fee, accounting for revenues collected from outside agencies, and the impact on ratepayer charges. Although BWS provided a plethora of accounting and financial data, the BWS staff was unable to convert or synthesize the data into a format that the ratepayer or city council could accept as substantiation for the increases in water rates and billing charges, and was unsuccessful in recreating the methodology and calculations used by the consultant to justify the billing and water rate increases. BWS agreed with our recommendations to adopt best practices for justifying and communicating water rates and charges, and for developing and

implementing a formal public involvement program for future rate increases. If BWS adopts these best practices, our concerns regarding substantiation and justification for water rates and billing charges should be resolved. In response to our management discussion draft report, BWS provided explanations and additional data for our review. Based on our examination of the additional BWS information, we modified the final audit report. The changes did not have a material impact on the report content and we stand by our findings and recommendations.

We express our appreciation for the cooperation and assistance provided us by the managers and staffs of the Board of Water Supply and the many others who assisted us during the audit. We are available to meet with you and your staff to discuss the review results and to provide more information. If you have any questions regarding the audit report please call me at 768-3134.

Sincerely,



Edwin S. W. Young
City Auditor

c: Kirk Caldwell, Mayor
Ember Shinn, Managing Director
Nelson Koyanagi, Director, Department of Budget and Fiscal Services
Ernest Lau, Manager and Chief Engineer, Board of Water Supply
Ellen Kitamura, Assistant Manager and Assistant Chief Engineer, Board of Water Supply
Troy Shimasaki, Senior Auditor
Darin Kawamoto, Auditor

Table of Contents

Chapter 5 Improvements in BWS Operations Are Possible

Chapter 6 Charter Amendment and Governance Is a Policy Decision

Chapter 7 Conclusion and Recommendations

Appendices

List of Exhibits

This page intentionally left blank.

Chapter 1
Introduction and Background

Introduction

This audit was conducted pursuant to City Council Resolution 13-201, FD1, which requested the city auditor to conduct a comprehensive management and performance audit of Honolulu's Board of Water Supply (BWS). This audit was included in the *Office of the City Auditor's Proposed Annual Work Plan for FY 2014-15* and performed in accordance with generally accepted government auditing standards from November 2013 to August 2014.

In Resolution 13-201, FD1, the city council expressed several concerns. These concerns included the BWS management policies and procedures; performance measurements used to gauge operations; and financial tools and controls in place to provide assurance the BWS is using ratepayer funds effectively and efficiently. Other issues concerned the status and powers of BWS as a semi-autonomous agency; problems associated with the new billing system; and the conversion from bi-monthly to monthly billing.

The audit objectives were to determine if BWS could improve its operational efficiency, effectiveness, and reduce costs by (1) improving its management policies and/or procedures; (2) improving customer service, especially by decreasing call wait times; and (3) improving transparency through better communication with the public and the city council. The audit also determined if the BWS rate structure was fair to its customers by comparing BWS rates, water costs and operational costs with similar jurisdictions across the nation.

Background

The Board of Water Supply is the largest municipal water utility in the State of Hawai'i and provides approximately 145 million gallons of water a day to nearly one million people on the island of O'ahu. The semi-autonomous entity has the authority to manage, control and operate the water systems that include nearly 2,100 miles of pipeline, 171 reservoirs, and 94 active potable water sources. BWS fixes and adjusts water rates and charges for water services so that the revenues derived are sufficient to make the BWS self-supporting as authorized by the provisions of Article 7, Revised Charter of Honolulu.

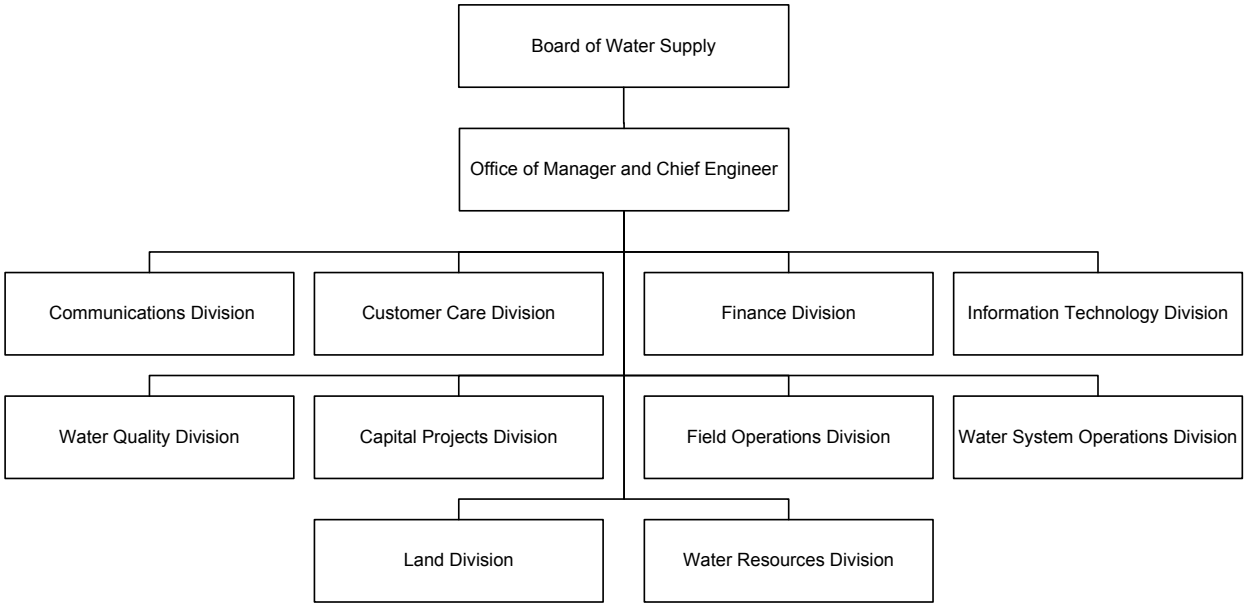
Beginning in 2008, BWS initiated a project to replace its old customer billing system, the Customer Account System (CAS), with a new Oracle-based Customer Information and Billing System (CIS/CC&B). The system was developed in-house by BWS staff that was augmented by consultants and other staff that could provide BWS project management, configuration, and implementation support services. Originally estimated to cost about $5 million and take 18 months to implement, the system cost $16.4 million as of August 2014. After lengthy delays, the system was activated in January 2013.

After going live, billing problems resulted in complaint calls to the Customer Care Center that increased significantly in June 2013 and generally continued through October 2013. BWS assigned more staff to handle the increased complaints, but reacted too slowly to prevent abandoned calls, long waits, and many complaints to the City Council. BWS also discovered an increase in estimated billings and billing errors that resulted in big bills which generated more complaints to the City Council.

As a semi-autonomous agency of the City and County of Honolulu, BWS is governed by a seven-member board. Five of the members are appointed by the mayor and confirmed by the City Council. The remaining two directors are ex-officio, and include the State of Hawai‘i Director of the Department of Transportation and the Chief Engineer for the city's Department of Facility Maintenance. The board is a policy-making body that appoints the BWS manager and chief engineer to administer the department, and approves the department's annual operating and capital budgets. The board also sets policies and prescribes regulations for the management, control and operations of BWS, and establishes the schedule of rates and charges for water service. BWS' mission, *Water for Life,* is to provide a safe, dependable and affordable water supply. The agency's three main strategic objectives are: resource, economic, and organizational sustainability.

The organizational chart for the Board of Water Supply is shown in Exhibit 1.1.

Exhibit 1.1
Board of Water Supply Organizational Chart



Source: Honolulu Board of Water Supply

BWS Staffing and Budget

The exhibit below shows the BWS revenues, expenditures, income/loss, authorized staffing, and vacancies for the last five fiscal years.

Exhibit 1.2
Board of Water Supply Resources (FY 2009-2013)

Fiscal Year	*Operating Revenues ($ million)*	*Operating Expenses ($ million)*	*Operating Income (Loss) ($ million)*	*Total Authorized FTE*	*Total Vacant FTE*
2009	$139.6	$149.9	($10.3)	711	182
2010	$152.2	$147.5	$4.7	714	227
2011	$149.9	$151.8	($1.9)	714	204
2012	$159.5	$158.7	$0.8	714	207
2013	$180.5	$173.5	$7.0	714	187

Source: Honolulu Board of Water Supply Financial Statements and Supplementary Information (FY 2009-2013), and 2013 Service Efforts and Accomplishments Report (Honolulu), p. 231

The water portion of the bill is comprised of a billing charge and a consumption charge, which combined make up a customer's monthly water charge. The billing charge is assessed each time a bill is rendered, and is for costs associated with billing customers for their water use. The consumption charge bills customers for the quantity of water used.

BWS monthly water charges for the last five years for single family residences are detailed below.

Exhibit 1.3
Honolulu's Water Rates

	July 1, 2009	*July 1, 2010*	*January 1, 2012*	*July 1, 2012*	*July 1, 2013*	*July 1, 2014*	*July 1, 2015*
Billing Charge	$5.56	$5.84	$6.40	$7.02	$7.70	$8.44	$9.26
Quantity Charge[a]							
First 13,000 Gallons	$2.66	$2.79	$3.06	$3.35	$3.68	$4.03	$4.42
13,001 to 30,000 Gallons	$3.20	$3.36	$3.68	$4.04	$4.43	$4.86	$5.33
Over 30,000 Gallons	$4.77	$5.01	$5.49	$6.02	$6.61	$7.24	$7.94

Source: Honolulu Board of Water Supply Schedule of Rates and Charges. [a]Quantity Charge Rates: Per 1,000 gallons of water drawn.

Audit Objectives

As listed in City Council Resolution 13-201, FD1, the overall audit objective was to perform a comprehensive management and performance audit of the Board of Water Supply.

The sub-objectives in the resolution were to determine (1) whether management policies and procedures fulfilled the BWS mission and benefit Honolulu ratepayers; (2) what performance measurements are utilized to adequately gauge the effectiveness and efficiency of BWS operations; and (3) which financial tools and controls are in place to provide assurance the BWS is using ratepayer funds effectively and efficiently. The other audit sub-objectives were to determine (4) whether the status and powers of the BWS as a semi-autonomous agency should be maintained; (5) what problems were associated with the new billing system implementation, including conversion from bi-monthly to monthly billing and increased meter reading responsibilities; and (6) whether the BWS rate structure was fair to all customers when comparing BWS rates, water costs and operational costs with similar jurisdictions. The seventh audit objective was to determine whether the BWS can improve its operational

efficiency, effectiveness, and reduce costs by (a) improving its management policies and/or procedures; (b) improving customer service, especially by decreasing call wait times; and (c) improving transparency through better communication with the public and the City Council.

Audit Scope and Methodology

The audit team addressed the audit objective and sub-objectives by performing many different tasks. These included reviewing BWS' policies, procedures, rules, regulations, management directives, and management reports; reviewing Board of Directors agendas and meeting minutes; attending board meetings; and interviewing managers, staff, and technicians. We performed on-site inspections and visits of water facilities, and accompanied water technicians on their daily routes to observe their operations. We also audited the BWS' databases; transaction records; and complaint records.

For the new CC&B billing system implementation, we reviewed BWS' information technology strategic plans and annual reports; reviewed information technology contracts for the CC&B system; examined project change orders; and quantified project costs. We reviewed project consultant reports and quality assurance reports; interviewed BWS customer care staff; reviewed customer complaint logs; and reviewed call center staffing before and after the new system went live. We also interviewed Hawaiian Electric Company (HECO) executives and discussed HECO's problems related to their new customer billing system; reviewed the City of Palo Alto's reports on its utility customer billing system problems; and performed internet research on the Los Angeles Department of Water and Power's (LADWP) problems with its utility billing system. We also reviewed and compared customer data related to estimated bills, call center volume, and other operational functions.

For performance measurements, we examined various performance measures maintained by the BWS related to financial management, operations, and water quality standards. The audit team interviewed BWS administrators and staff, conducted site visits at BWS' operations throughout Oʻahu, and accompanied staff to observe the bill-reading electronic and manual activities. We also followed up on electronic reading errors; analyzed follow-up actions and activities; and monitored the error reading corrections.

For the financial tools and controls, we reviewed BWS financial statements, the audited financial statements for 2009 to 2013, analyzed the financial statements; and interviewed the Chief Financial Officer and other managers regarding the financial tools and controls used. We also reviewed the BWS' federal audit results for the period 2009 to 2011, and 2013.[1]

For the management policies and procedures, we examined 126 current and pending internal BWS directives. We also reviewed 63 BWS Rules and Regulations, which are posted on the agency's website. As part of our analysis, we determined whether the directive, policy, or procedure aligned with BWS' mission or objectives. Additionally, we identified requirements in the Revised Charter of Honolulu, Section 7 and Revised Ordinances of Honolulu, Chapter 30, and determined whether the BWS had a policy, procedure, guideline, or practice to ensure compliance with these requirements.

For assessing BWS as a semi-autonomous agency and BWS rate structure, we performed internet research on 30 water jurisdictions across the United States, and contacted the jurisdictions as needed. We researched the governance structure, composition of the oversight bodies, and city charter or municipal codes of the jurisdictions. We identified the approvals needed for the water entity's operating budgets, capital budgets, bonds, and utility rates; and downloaded and analyzed financial data for income, revenues, expenses, and current ratios. The audit team quantified water rates; examined bill compositions; and other aspects of the water utilities.

We analyzed the BWS' operational efficiency, effectiveness, and ability to reduce costs by reviewing management policies and/or procedures; quantifying the customer service performance and call wait times; and evaluating BWS transparency with the public and the City Council.

Our audit, *Audit of Selected Management Issues at the Honolulu Board of Water Supply (October 2006),* identified a number of management issues and concerns regarding BWS operations and practices.

[1] According to BWS, the agency was not subject to federal audit in 2012 because BWS did not spend up to the threshold of federal funds that would trigger an audit.

Our review covered the period of FY 2009 to FY 2013. FY 2014 data was incorporated for comparison purposes, when available or appropriate. The audit was performed in accordance with generally accepted government auditing standards from November 2013 to August 2014. Those standards require that we plan and perform the audit to obtain sufficient and appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Audit Results

BWS inadequately planned for its utility customer billing information system (CIS/CC&B) implementation. BWS monthly water charges[2] need to be substantiated and could be reduced. The BWS' meter-reading process is inefficient and contributes to the high number of estimated bills.

BWS policies and procedures are generally consistent with its mission and objectives; financial tools and resources are adequate to support its operations. The BWS' water rates were lower than about half of the other jurisdictions we reviewed. Existing performance measures focus on operations and are adequate to comply with federal, state, and local mandates.

However, improvements are still possible. BWS lacks performance measures for customer service and benchmarks to measure its progress in servicing customers. BWS does not comply with industry best practices related to customer service, stakeholder involvement, and rate-making transparency. Since governance is a policy decision, the city council could amend the BWS governance structure to improve oversight.

[2] Monthly water charges include billing and water consumption charges.

This page intentionally left blank.

Chapter 2

BWS Implementation of the Utility Customer Information and Billing System (CIS/CC&B) Was Flawed

The Oracle guide details specific steps for implementing its utilities customer care and billing system. The Board of Water Supply (BWS) contract files also detailed additional steps for implementing the new customer billing system. Although BWS followed the guide and implementation steps, it underestimated the cost and time needed to implement its new billing system and was unprepared for the impact of the problems related to the system billing errors. BWS did not follow its consultants' advice and was not proactive in providing the resources needed to handle the flood of customer complaints that resulted from the system billing errors. As a result, the BWS call center was overwhelmed, customers abandoned calls, and many others complained of long waits as the number of customer complaints increased.

Background

In 2009, BWS purchased an Oracle license and services agreement for the company's utilities customer care and billing system. The purchase included licenses for commercial and residential customers. The Oracle Utilities Customer Care and Billing System (also called the Customer Information and Billing System (CIS/CC&B)) was supposed to replace the aging BWS Customer Accounting System (CAS). The Oracle guide for implementing this system provides specific steps and details for implementing the system.

The BWS Information Technology Division staff assumed responsibility for configuring and implementing the new billing system and contracted with two consultants (EMA, Inc. and EP^{2}M, LLC[3]) to augment the BWS efforts. The consultants provided BWS

[3] EP2M, LLC later assigned its contract to Five Point Partners, LLC (FPP).

project management, configuration, and implementation support services. More specifically:

- EMA provided project management services and reported on the project progress and status.

- EP²M was responsible for the interface work, system configuration, system implementation, offshore work done in the Philippines, and other support services and interfaces. EP²M also issued quality assurance reports on project management, business transformation, and project implementation.

- EMA, EP²M, and Five Point Partners, LLC[4] provided oversight and advice to BWS staff.

- BWS in-house staff was responsible for implementing the system. The BWS staff functions included planning, administering, and coordinating the design, development, implementation, maintenance, and support of the BWS information systems. The BWS staff also handled the Maximo interface which related to work orders and other BWS processes.

The BWS set-up placed the full burden for implementing a successful system on the BWS staff, and reduced the liability of the contractors and consultants for installing a working billing system.

The BWS Information Technology Division consisted of administrative personnel and staff from three other branches. As of July 2013, the BWS Information Technology Division had 38 authorized fulltime equivalent positions[5]:

- Four FTE in the administration, nine FTE in the Application Systems Development Branch; and

- Twelve FTE in the Technical Engineering Projects Branch; and thirteen FTE in the Operations Support Branch.

[4] EP²M, LLC later assigned its contract to Five Point Partners, LLC (FPP).

[5] As of July 2013, 12 of the 38 positions were vacant. Vacancies were two FTE in administration, one FTE in the Applications System Development branch; four FTE in the Technical Engineering Projects branch, and five FTE in the Operations Support branch.

BWS implemented the new CIS/CC&B system to replace its aging CAS. Under the CIS/CC&B system, customers were billed for their combined water and wastewater use every month instead of bimonthly. The BWS and the Department of Environmental Services (ENV) expected the switch to monthly billing to lead to more timely information and improved customer service by:

- Allowing customers to better align their payments with other bill schedules;
- Providing more frequent consumption data to assist customers in making adjustments to their water use;
- Enabling customers to identify property leaks sooner, allowing for prompt repair, and thereby reducing the magnitude of high bills caused by leaks; and
- Making the bills more affordable for customers by paying a smaller monthly bill instead of a larger bill every other month.

BWS Underestimated the Cost and Time Needed to Implement Its New Billing System

BWS initiated a project to replace its existing CAS system with a new, automated CIS/CC&B billing system because its CAS system hardware was failing. After BWS performed research, it selected the Oracle CIS/CC&B system for the new project. BWS determined it could develop the system in-house with off-the-shelf software and estimated its information technology staff could implement the new system with consultants providing project management and system integration service. BWS also projected that the system could be implemented in 18 months at an estimated cost of about $5 million in capital improvement program (CIP) funds.

Project costs were underestimated

BWS was not aware that the CIS/CC&B system usually takes 18 to 24 months, and costs $8 to $16 million to configure and implement. Problems and billing errors are usually associated with new utility billing systems. As a result, after BWS signed a contract with EMA for project management services for $796,000 in June 2008, project costs continued to increase. The table below shows the actual contract costs and excludes BWS in-house costs for personnel, materials, and supplies.

Exhibit 2.1
Summary of BWS Contract Costs for CIS/CC&B Billing System

Date	Description	Company	Amount	Contract Total
06/30/2008	Agreement for Professional Services	EMA, Inc.	$796,000	$796,000
06/01/2009	Contract Modification 1	EMA, Inc.	$84,000	$880,000
06/21/2010	Modification 2	EMA, Inc.	$2,500	$882,500
07/20/2010	Modification 3	EMA, Inc.	$360,000	$1,242,500
06/01/2011	Modification 4	EMA, Inc.	$840,519	$2,083,019
04/01/2012	Modification 5	EMA, Inc.	$608,691	$2,691,710
06/18/2012	Modification 6	EMA, Inc.	$565,139	$3,256,849
04/01/2012	Modification 7	EMA, Inc.	$520,705	$3,777,554
10/15/2012	Modification 8	EMA, Inc.	$174,359	$3,951,913
01/01/2013	Modification 9	EMA, Inc.	$0	$3,951,913
04/26/2013	Modification 10	EMA, Inc.	$109,000	$4,060,913
08/20/2013	Modification 11	EMA, Inc.	$184,042	$4,244,955
02/19/2010	Agreement for Goods and Services	EP2M, LLC	$2,391,629	$2,391,629
10/01/2010	Contract Modification 1	EP2M, LLC	$0	$2,391,629
10/08/2010	Contract Modification 2	EP2M, LLC	$77,739	$2,469,367
12/14/2010	Contract Modification 3	EP2M, LLC	$77,277	$2,546,645
12/15/2010	Contract Modification 4	EP2M, LLC	$20,864	$2,567,509
04/01/2011	Contract Modification 5	EP2M, LLC	$576,963	$3,144,472
06/15/2011	Contract Modification 6	EP2M, LLC	$130,205	$3,274,677
06/06/2011	Contract Modification 7	EP2M, LLC	$17,141	$3,291,819
08/05/2011	Contract Modification 8	EP2M, LLC	$439,078	$3,730,897
11/01/2011	Contract Modification 9	EP2M, LLC	$2,210,407	$5,941,304
01/01/2012	Contract Modification 10	EP2M, LLC	$932,984	$6,874,288
07/01/2012	Contract Modification 11	EP2M, LLC	$226,723	$7,101,011
11/01/2012	Contract Modification 12	EP2M, LLC	$531,890	$7,632,901
10/01/2012	Contract Modification 13	EP2M, LLC	$1,642,332	$9,275,233
05/01/2013	Contract Modification 14	Five Point	$356,255	$9,631,488
08/20/2013	Contract Modification 15	Five Point Partners, LLC	$1,154,676	$10,786,164
06/25/2010	Contract Change Order 1	Oracle USA, Inc	$1,256,514	$1,256,514
06/25/2010	Contract Change Order 1	Oracle USA, Inc	$88,967	$88,967
	Total		**$16,376,600**	**$16,376,600**

Source: BWS contract files

Project time and length were underestimated

When BWS started the new customer billing project it assumed it could develop and implement the system in-house with consultants providing project management and system integration service support. BWS was not prepared for the development and implementation delays caused by staffing shortages, vacancies, and hiring freezes. BWS did not anticipate the delays caused by the introduction of new sewer billing rates introduced by the Department of Environmental Services just before the system was planned to go-live. BWS also was not aware that the project would

take 12 to 18 months to implement. The project chronology was as follows:

- In January 2001, a BWS consultant (EMA Services, Inc.) issued a Strategic Information Technology Plan for BWS. The plan discussed computer technology as a strategy, a technology vision for BWS, applications and systems, and technology architecture for BWS.

- In June 2008, BWS and EMA, Inc. signed an agreement for professional services to manage the deployment of a new Customer Information System for BWS. The new system was to replace the existing CAS system that was implemented in 1997. The agreement allowed program management for 12 months with an extension for 6 months. The total estimate for the 18 months was $796,000. Subsequent modifications to the contract increased the contract amount to $4.2 million, including: continued program management services; change management services; organizational and technical support through the system go-live; and post go-live support.

- In March 2009, BWS issued a request for proposals (RFP). The RFP invited qualified suppliers to submit proposals for a new utility customer information and billing system (CIS/CC&B). The scope of services included replacing the existing BWS Customer Accounting System (CAS) that was developed in-house by BWS and in use since 1997. In the solicitation, BWS stated that the winning vendor was expected to integrate about six existing systems with the new billing system, including the existing Automatic Meter Reading (AMR) system.

- Project placed on hold from March 2009 to March 2010 due to the recession, budget deficits, a hiring freeze, and staffing shortages.

- In December 2009, BWS purchased the licenses for the CIS/CC&B system. The license and support fees cost $1.2 million and a change order increased the license cost to $1.3 million.

- In February 2010, BWS selected the proposal submitted by EP^{2}M, LLC for the CIS/CC&B. The estimated cost was $2.4 million. Subsequent contract modifications and change orders increased the project costs to $10.8 million. The scope of work and change orders included the purchase of Oracle software for the CIS/CC&B system; development

of about 28 interfaces, Kauai and Maui interfaces; and design, development, unit testing, quality assurance, and packaging and testing of all products listed in the contracts. EP²M, LLC subsequently assigned its contract to Five Point Partners, LLC (FPP).

- In 2012, BWS selected EMA, Inc. to provide project management services to oversee and assist in the implementation of the information technology project.

- BWS, using EMA and EP²M consultant expertise, designed the new business processes, flowcharts, trained the staff, and performed system testing (integration testing, flash cut, six dry runs, ran the system in test and production environments, and ran the system in parallel). BWS validated bills and was getting ready to cut-over and go-live in April 2012.

- The City Council introduced Bill 3 in February 2012 which increased the Department of Environmental Services' sewer and wastewater rates and rate structure. Bill 3 caused BWS to delay the *go-live* date.

- In mid-2012, the new BWS Manager and Chief Engineer delayed the *go-live* date to 2013, increased staffing, filled vacancies, and provided resources to accommodate the new system.

- In January 2013, BWS activated and completed installation of the new CIS/CC&B. The new system replaced its aged customer information and billing system that was installed in 1997.[6]

- In July 2013, BWS released a new *Information Technology Strategic Plan for FY 2014 – FY 2018*. BWS stated it had executed the 2001 strategic plan and achieved the major initiatives outlined in the plan.

BWS stated the move to the CIS/CC&B allowed BWS to convert

[6] According to BWS managers, BWS did not receive official notification from ENV of the passage of Bill 3 until June 2012. The *go-live* date was pushed back to September 2012 in order to accommodate the effort required to effect, test and confirm the new system changes related to Bill 3. Following two consecutive hardware failures of its aged customer information and billing system, BWS decided to activate the new system on January 21, 2013.

to monthly billing. BWS also reported several challenges in converting residential customer accounts from bi-monthly to monthly billing.

System development was classic

The BWS system development was a classic, text book case study. The project involved off-the-shelf software that required system configuration, implementation, and change management processes that are typical to introducing new billing systems. BWS conducted textbook testing before going-live. BWS used a parallel system run. BWS used both the system test and production environment, validated billings, used stress and script testing, and followed other text book procedures. BWS and its consultants followed best practices for design, change management, configuration, conversion, and migration. BWS business processes, testing, cutover, reports, and operations were classic textbook.

BWS Was Unprepared for the Problems Related to the System Billing Errors

BWS was not aware of the problems, complexities, and shortcomings associated with customer utility billing systems implemented by other entities. For example:

- The City of Palo Alto, California issued approximately 360,000 utilities bills totaling an estimated $198.5 million each year. The city replaced its outdated customer billing system with a new information system to better integrate its customer billing and financial systems. The system cost over $8.7 million and was activated in May 2009. Shortly after going live, customers and the city reported utilities billing problems that affected approximately six percent of its customers. The problems involved billing errors, billing delays, and increased system and business processing times to catch and resolve the errors. The new system generated over 1,000 customer calls and complaints per week that exceeded the city's call center capacity of about 850 calls per week. The city reported wait times up to 30 minutes and abandoned calls (i.e. where customers hang-up prior to reaching a customer service representative) totaled about 30 percent of the incoming calls. The problems created additional work related to account verifications, increased processing times, and required additional staffing to manage the added workload.

- The City of Los Angeles, California Department of Water and Power (LADWP) provided water services to 666,000 customers, as well as served 1.4 million electric customers. The city went live with its new utilities billing system, which replaced a 40 year-old customer information system. The new billing system cost over $162 million. After activating the system in September 2013, the Department of Water and Power reported that three to five percent of its customers had incorrect bills, delayed bills, and late notices. The news media reported the LADWP was swamped with complaints with many callers complaining of being stuck on hold for too long. A City Council member reported customers complained that they were unable to resolve billing conflicts or inaccuracies; having to wait 1.5 hours on the phone to talk to a representative; and long lines at LADWP service centers. The LADWP general manager resigned in January 2014, partly due to the utility billing information system problems.

- The Hawaiian Electric Company (HECO) serves 299,500 electric customers in Honolulu. HECO indicated its new utility billing system cost about $50 million to implement. After activating the new billing system in May 2012, HECO customers complained about billing errors, delayed billings, late notices, and problems similar to those reported by Palo Alto and Los Angeles. HECO anticipated the problems by expanding its call center before activating the new billing system. The increased call volume and additional workload caused HECO to shut down the billing system and not issue bills until the problems could be resolved.

BWS consequently was unprepared for the problems that other jurisdictions encountered when they replaced outdated customer billing information systems with a new utility billing system. Before the new system was activated, BWS did not sufficiently increase staffing in its call center and did not adequately increase resources needed to handle the increased number of complaints, billing errors, and workload resulting from the billing deficiencies.

BWS Response to Consultant Advice and Handling of Customer Complaints Was Inadequate

In May 2012, the EP²M consultant reported in its quality assurance review #4 that special focus should be placed on in ensuring the call center had adequate staff and technology to address the 20+ minute extended wait times. The consultant further recommended that:

- The automated meter reading problems should be addressed;
- The need to address call center staff concerns related to lack of knowledge in the new system procedures and policy changes;
- The need to prepare for the potential impact of the long wait times when the new system was activated; and
- The need to address the impact of changing from bi-monthly to monthly billing.

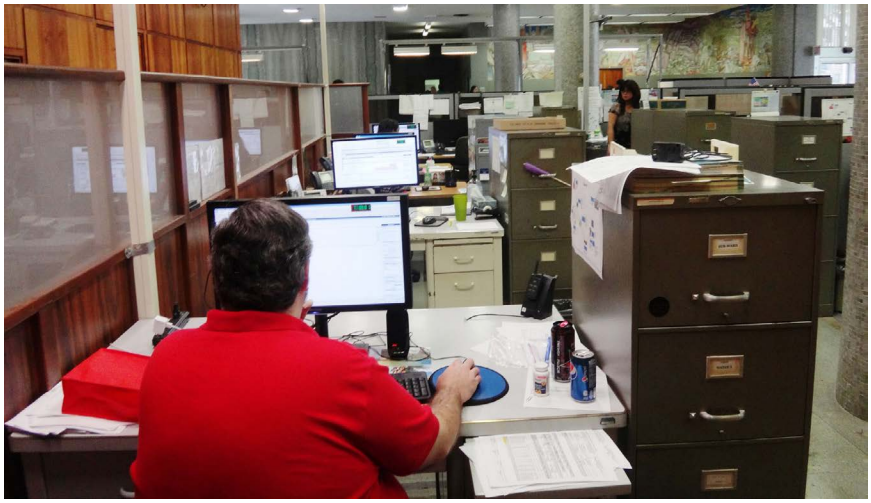
BWS did not adequately address the consultant concerns. As a result, when the CIS/CC&B system was activated, BWS experienced problems similar to those reported by other entities, including billing errors, billing delays, and excessively high bills. The increased customer complaints overwhelmed the BWS' call center which was not prepared to deal with the increased call volume.

BWS call center was overwhelmed

The BWS Customer Service Division was responsible for servicing customers after the new billing system was activated.

- The Customer Care Division served as the primary point of contact with the customers and the public. Its responsibilities included collection, credits, investigation, meter maintenance, and engineering services.
- The division had 87 fulltime equivalents assigned to the division administration and its other 2 branches - the Customer Service Branch had 68 fulltime equivalents and the Engineering Services Branch had 16 FTEs. The Administration branch had 3 FTEs.

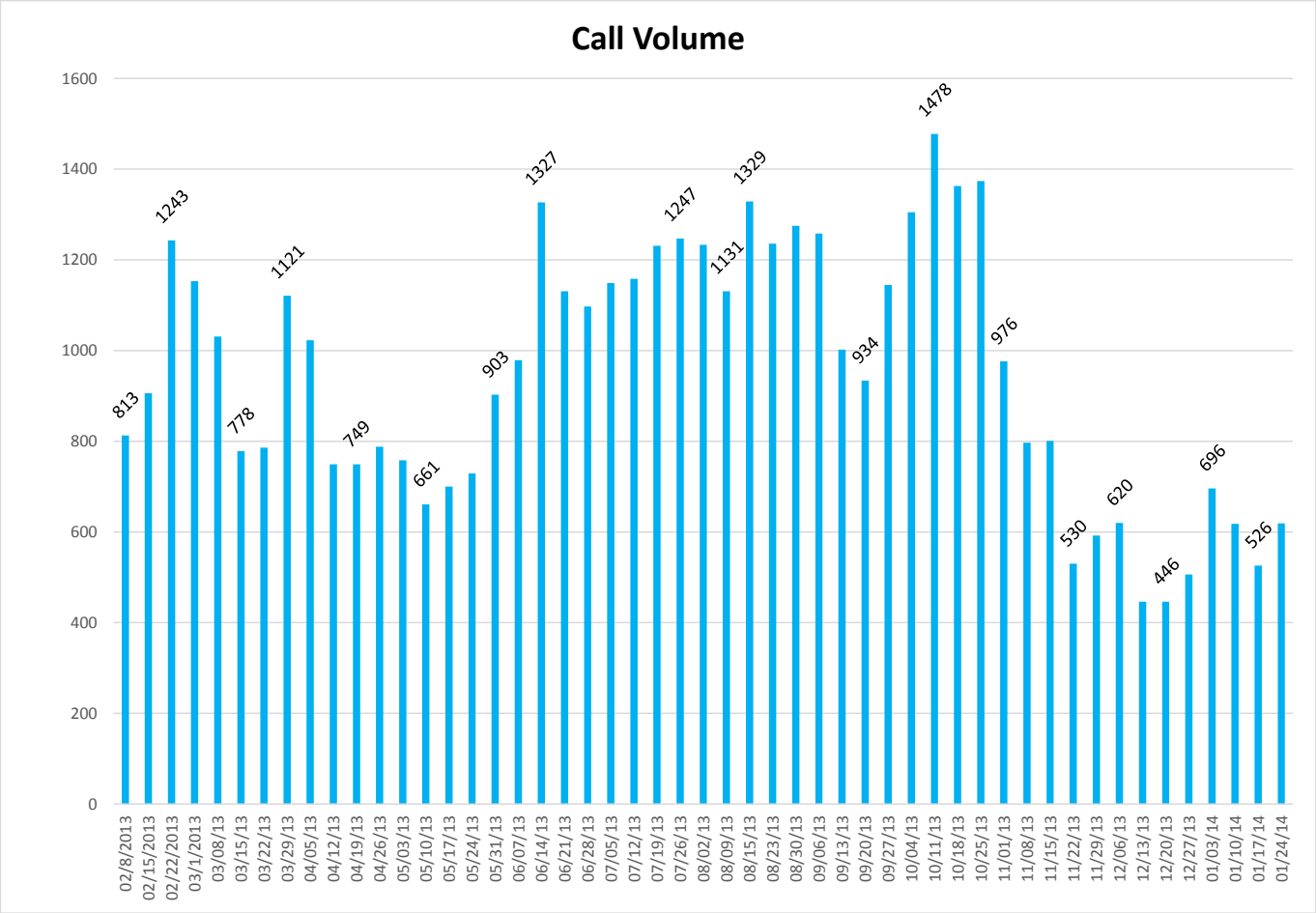
Exhibit 2.2
A Customer Service Representative Assists a Caller at BWS Customer Care Center



Source: Office of the City Auditor photo

Exhibit 2.3 shows the increase in call volume after the new customer billing system was activated in January 2013.

Exhibit 2.3
BWS Call Center: Number of Calls Received (February 2013 to January 2014)



Source: BWS call volume data
Note: This graph quantifies calls to BWS Customer Service Representatives and excludes calls handled by BWS operators.

After activating the system in January 2013, billing problems started showing up in February to May 2013. Complaint calls to the Customer Care Center increased significantly in May 2013 and continued through October 2013. BWS discovered an increase in estimated billings, billing errors (due to estimated and actual meter readings), and tried to correct the problems. Correcting the estimated billings and billing errors resulted in exorbitant bills totaling as much as $7,000. As a result, the BWS call center

received thousands of customer complaints and customers reported long waits on the phone. For example:

- Customer complaints covered billing errors, exorbitant bill amounts, long waits, customer complaint volume, dropped calls, and no follow-up on complaints.

- For the first week in February 2013, BWS received an average of 813 calls per day. Staff was able to handle an average of 629 calls per day, or 77 percent. An average of 184 calls per day, or 23 percent were abandoned. The maximum wait time was 18 minutes.

- In early May, the average call volume was 661 calls per day. By the end of May, average call volume rose 37 percent to 903 per day.

- By mid-June, average weekly call volume rose to 1,327 calls per day. Call center staff was able to handle 703 calls (53%) and abandoned 624 calls (47%). The maximum wait time rose to 73 minutes.

- Maximum call wait times peaked in July 2013 with average Customer Service Representative wait times ranging from 98 to 114 minutes.

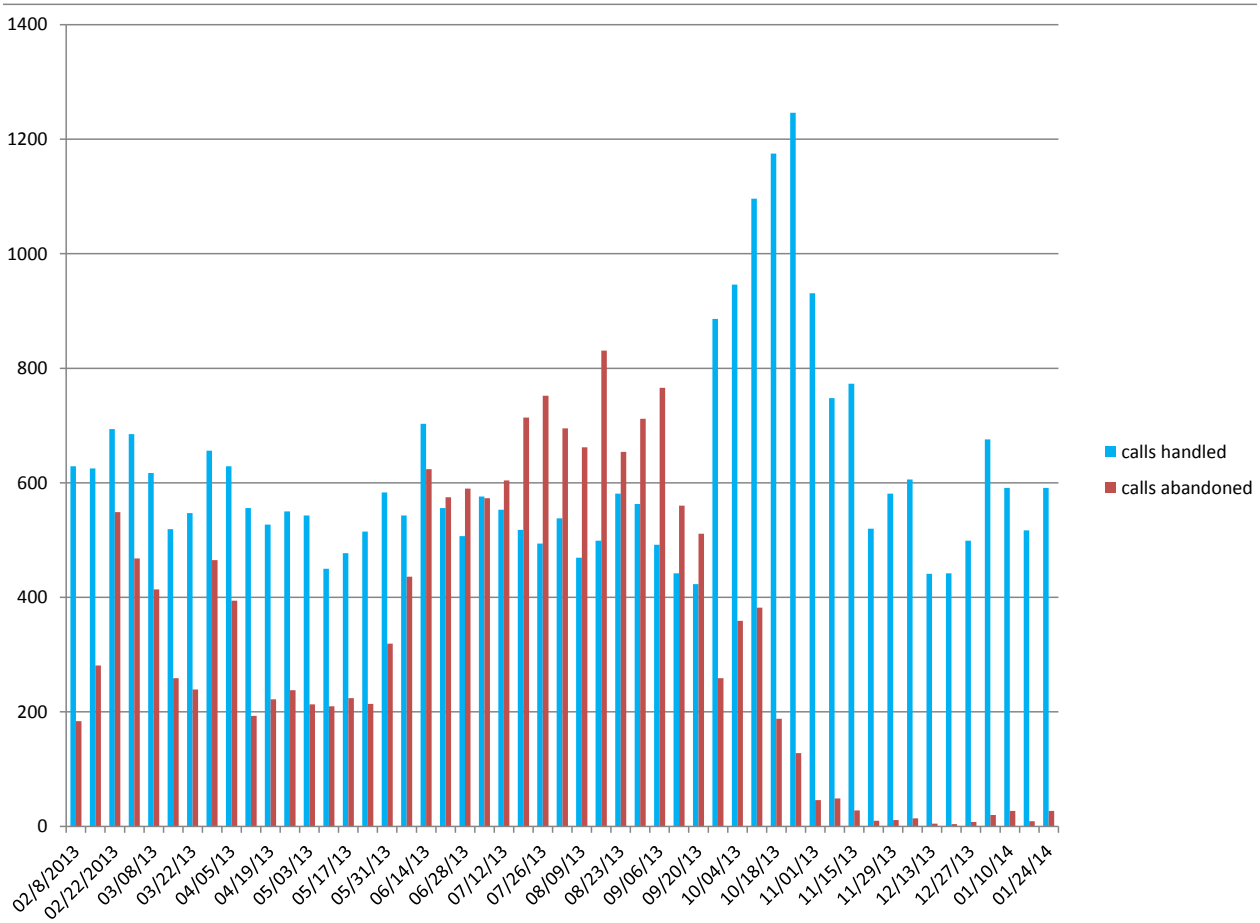
- BWS customers abandoned more than half of its calls for nearly a three-month period from the middle of June through the middle of September 2013. The third week in August 2013 experienced the highest abandoned rate average when the call center failed to answer approximately 831 calls, or 63 percent of its average weekly calls.

- Call volume peaked during the first week of October 2013 with an average of 1,478 calls per week.

- Call volume dropped in the middle of December 2013 to an average of 446 weekly calls after BWS resolved the billing problems. In December, BWS staff handled 99 percent of the calls and only 4 calls were abandoned.

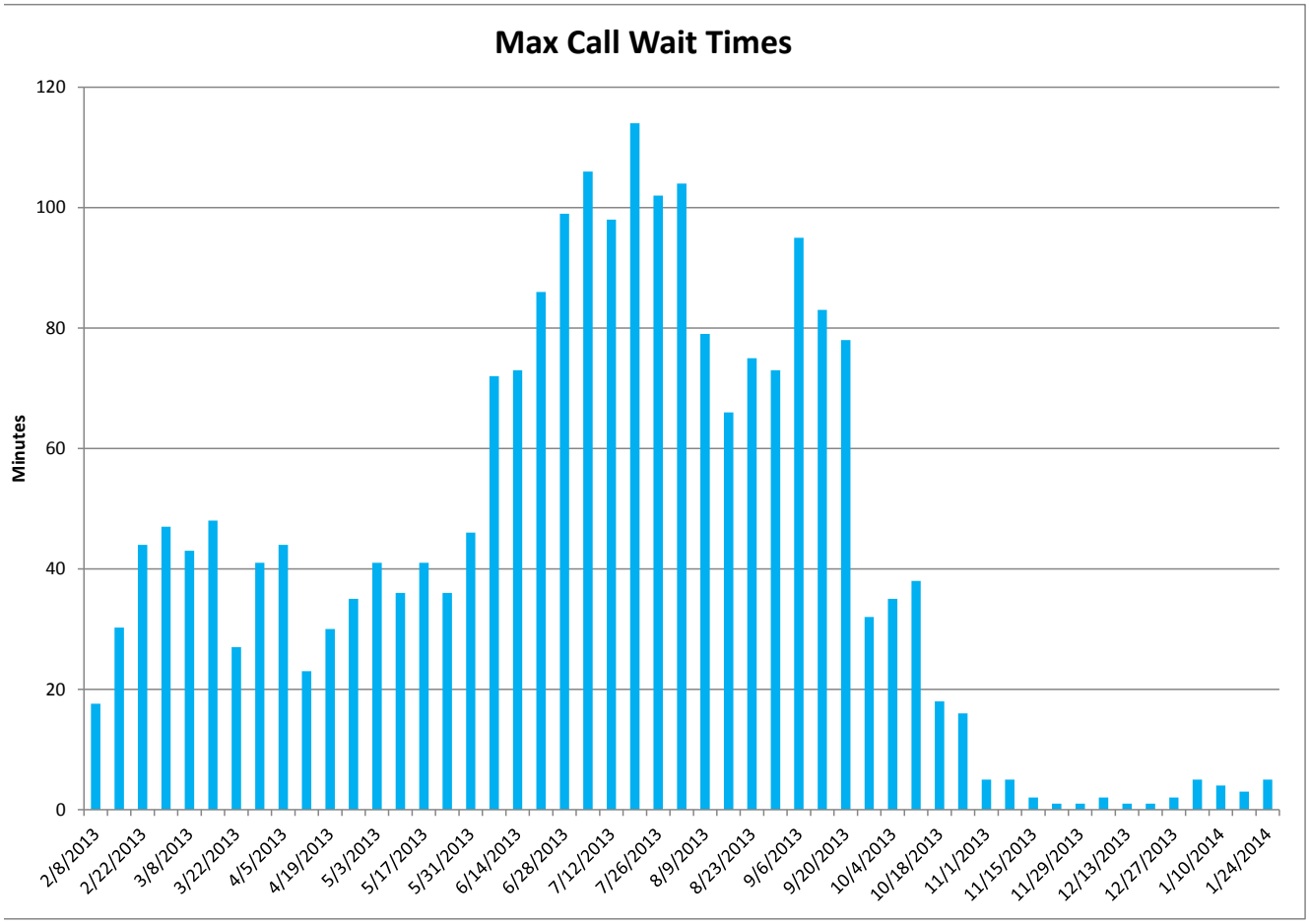
Exhibits 2.4 and 2.5 graph the number of abandoned calls and the increase in wait times. The graphs show the weekly totals for BWS call volume, abandoned rate, and maximum call wait times for the period February 2013 through January 2014.

Exhibit 2.4:
BWS Call Center: Calls Handled and Abandoned (February 2013 to January 2014)



Source: BWS Data
Note: This graph quantifies calls to BWS Customer Service Representatives and excludes calls handled by BWS operators.

Exhibit 2.5
BWS Call Center: Maximum Call Wait Times (February 2013 to January 2014)



Source: BWS Data
Note: This graph quantifies calls to BWS Customer Service Representatives and excludes calls handled by BWS operators.

BWS was unprepared and was not proactive in addressing the system errors

Our review of the BWS Board of Directors minutes indicated the BWS was not prepared for the billing system deficiencies. The BWS Board of Directors discussed the new billing system only twice between November 2012 and September 2013.

Board of Directors meetings. At the February 2013 Board of Directors meeting, the BWS staff and the Board of Directors discussed the staffing needed once the on-line service became available to the customers. At the August 2013 meeting, the BWS Board of Directors and the BWS staff discussed the resolutions introduced by the city council, the billing problems, and asked about resolving the public's loss of trust and credibility problems

with BWS. Although the Board suggested working out amicable and fair solutions to the billing fiasco, the BWS staff indicated they expected to be paid for any water consumed. The discussion included the number of Customer Service Representatives needed, but did not discuss how to manage the crisis, customer complaints, or how to resolve the new information system problems. This was the only meeting related to the new CIS/CC&B system problems. The Board of Directors discussions indicated that BWS staff was insufficiently prepared to address the volume of issues and problems that needed to be addressed after the *go-live* date.

Performance standards. According to a BWS call center administrator the call center does not have a formal performance standard for answering calls, but strives for a zero abandoned call rate. Its current average is about 2 percent. Based on call center data after the billing change, BWS exceeded its average 2 percent abandon rate from February 2013 through the middle of November 2013. The abandoned calls rate reached as high as 63 percent in August 2013.

BWS Eventually Identified One Cause of the Billing Errors

After the customer complaint volume increased, BWS identified a problem in the CIS/CC&B system that caused the billing errors. The new billing system used estimated meter consumption and, when corrected for the actual consumption, generated excessive water bills for many customers. BWS discovered that the AMR system was overwriting or erasing previous water meter entries whenever an error or uncorrelated entry was found. The batch erasures resulted in multiple defaults to estimated billings. BWS reconfigured the system to accept meter reading entries as they occur and to estimate only single entries. BWS' patchwork reduced customer complaints from over 57 percent in April and May 2013 to 1.2 percent in November and December 2013.

BWS is currently in the post-implementation phase, stabilizing the new CIS/CC&B system, and applying triage (i.e. system patches) to resolve the billing problems. BWS estimated it would need six months to stabilize the system.

Lessons Learned

BWS went live with their new billing system in January 2013. While transition challenges are common for water agencies introducing or tweaking billing operations, adequate planning can mitigate some of those challenges. Longer and more realistic time tables and proper planning, and providing sufficient

staff for the customer service call center could improve system implementation. For future systems:

- BWS should adequately plan for customer care and the migration from the old to the new system, such as changing from bi-monthly to monthly billings. Over half of the customer service calls were abandoned because additional customer care resources were not available to handle the surge in customer complaints and inquiries.

- BWS should adequately plan for the increase in customer complaints and questions before it goes live with a new system. BWS was reactive rather than proactive and, as a result, customers experienced long wait times or non-responses when contacting BWS.

- BWS should consult other jurisdictions such as HECO before activating a new system. This would allow BWS to anticipate problems and to minimize the transition and resulting challenges. The BWS failure to consult other jurisdictions and to properly plan for customer inquiries caused unnecessary frustration for customers and could have been avoided with better planning.

- BWS should provide sufficient staff to handle customer calls when implementing a new system. After BWS added staff to its call center, the number of calls and wait times declined. Customer calls began to decline in November 2013 to less than 1,000. By early December, the number of weekly calls was less than 500. By the end of October, the percent of abandoned calls was 10 percent or less. In December 2013, the percent of abandoned calls was 2 percent or less for three consecutive weeks.

Recommendations

For future information systems, BWS should:

1. Consult with other public and private utilities about their experiences prior to launching new initiatives that may impact the public.

2. Improve planning, conduct risk assessments, and establish a formal action plan to mitigate problems when launching future initiatives that may impact the public.

3. Provide adequate resources in the BWS call center and added support staff before activating the system.

4. Be proactive in identifying, preparing for, and addressing customer complaints.

5. Develop more customer service oriented policies and practices such as formal performance benchmarks and performance goals for call center activities so that customer complaints do not increase.

6. Use available data to create reports that can be used to better manage BWS operations and programs.

This page intentionally left blank.

Chapter 3
BWS Monthly Charges Are Not Substantiated

The city charter, Section 7-109, authorizes the Board of Water Supply (BWS) to generate revenues that are sufficient to make BWS self-supporting and to meet all expenditures. BWS increased monthly billing charges 45 percent and water rates 70 percent from January 2012 to July 2015. Although BWS claimed the monthly charges covered costs associated with billing customers for their water and the water consumed, BWS was unable to readily provide data needed to support the billing and rate increases.

Background

Section 7-109 of the city charter states the Board of Water Supply has the power to fix and adjust reasonable rates and charges for furnishing water and providing water services. The revenues should be sufficient to make the department self-supporting and to meet all necessary expenditures.

In November 2011, the BWS increased ratepayer charges to cover the cost of infrastructure upgrades. The increases included a cumulative 70 percent increase in water rates spread annually over five years from January 2012 through 2016, and a monthly billing charge that cumulatively increased 45 percent from January 2012 through 2016. According to BWS, the increase covered costs associated with billing customers for their water use, the new billing system, meter maintenance and repair, and billing and customer service personnel, as well as the water consumed. The table below details the BWS increases.

Exhibit 3.1
Honolulu's Water Rates

	July 1, 2009	*July 1, 2010*	*January 1, 2012*	*July 1, 2012*	*July 1, 2013*	*July 1, 2014*	*July 1, 2015*
Billing Charge	$5.56	$5.84	$6.40	$7.02	$7.70	$8.44	$9.26
Quantity Charge [a]							
First 13,000 Gallons	$2.66	$2.79	$3.06	$3.35	$3.68	$4.03	$4.42
13,001 to 30,000 Gallons	$3.20	$3.36	$3.68	$4.04	$4.43	$4.86	$5.33
Over 30,000 Gallons	$4.77	$5.01	$5.49	$6.02	$6.61	$7.24	$7.94

Source: Honolulu Board of Water Supply Schedule of Rates and Charges. [a]Quantity Charge Rates: Per 1,000 gallons of water drawn.

Billing Charges

As of July 1, 2014, BWS charged each water customer a billing charge of $8.44 per month ($101.28 per year). The monthly billing charge was supposed to cover the increased cost of switching from bimonthly to monthly billing. According to BWS, the CIS/CC&B system allowed BWS to issue bills monthly, but increased the cost of its operations. BWS reported the billing charge increase was necessary to cover the increased cost of issuing bills each month.

Water Consumption Charges

In addition to the billing charge, as of July 2014, BWS charged single family residences $4.03 for the first 13,000 gallons of water consumed and $4.86 for 13,001 to 30,000 gallons of water used each month.

Sewer Charges

In addition to issuing bills for its Oahu customers, BWS also collects sewer fees on behalf of the Department of Environmental Services (ENV). The sewer charges are in addition to the monthly water bill amounts.

BWS Needs to Follow Industry Best Practices for Raising Rates

The American Water Works Association (AWWA) identifies best practices and standards for establishing and increasing water rates and charges. Its *Principles of Water Rates, Fees, and Charges*, recommends involving the public in setting and increasing water rates.

Industry best practices

According to AWWA, historically, most utility decision making has been a relatively closed process. Typically, utility staff or consultants conduct all major steps of the rate development process (e.g. projection of usage characteristics, estimation of revenue requirements, allocation of costs to customer classes, and rate design) with limited or no input or review by affected customer representatives. For municipal utilities, the annual budget adoption process or public hearing on rates is analogous to a rate filing package; public involvement occurs at or very near to the end of the process.

AWWA states involving the public in the rate-making process can provide a number of benefits that outweigh the costs. The public involvement process provides a forum for interactive exchange of ideas and information between utility decision makers and public stakeholders and requires two-way communications and interaction. In contrast, public relations and education is largely a one-way communications effort.

AWWA states water agencies should establish a formal public involvement plan in rate making. A meaningful public involvement effort is one that begins long before and continues well after the rate study process. AWWA recommends a 10-step approach to public involvement that includes framing the problem; identifying constraints; and identifying and describing decision steps and project milestones. The 10-step approach further includes identifying and understanding potentially affected shareholders; determining vulnerability and must-resolve issues; and determining the appropriate level of public involvement. Other steps included selecting processes and techniques; developing a public involvement work plan; implementing and monitoring the work plan; and managing change.

AWWA states that affected parties are more likely to accept the rate decisions if they had the opportunity to participate in the rate development process.

BWS rate setting process

BWS stated it attended numerous neighborhood board meetings to advise the community about the rate changes. The outreach activity was helpful for public relations and public education, but fell short of the AWWA best practices that recommend stakeholders be involved in the rate setting process and to provide meaningful participation in the decision-making process.

BWS also commented that it conducted a focus group related to the billing and rate changes. However, this focus group was limited to six individuals and was focused on how best to communicate the billing and rate changes and did not involve stakeholders in the rate setting process.

In our opinion, the BWS public involvement activities related to its 2011 rate increases were inadequate to comply with the AWWA best practices and standards.

BWS Monthly Charges Should Be Adjusted for Other Revenues Collected

BWS collects revenues from the Department of Environmental Services, Maui County, and Kauaʻi County for processing and mailing their bills. BWS could not clearly show whether any of the revenues were considered when establishing Oʻahu customer's water rates and charges.

Environmental Services department revenues

A November 2012 memorandum of agreement between the BWS and the ENV contained guidelines for cost sharing associated with the billing and collection of sewer service charges by BWS. Some of the charges ENV agreed to pay to the BWS in FY 2013 included:

- A base charge of $700,000;
- 50 percent of the annual software license fee;
- 50 percent of printing, mailing and online billing costs;
- A capital recovery payment of $604,705; and
- Credit card service fees.

BWS was unable to clearly show its billing charges and costs were adjusted to reflect the revenue paid by ENV to the Board of Water Supply for its billing services.

County Revenues

BWS handles billings for water utilities in Maui and Kauaʻi Counties and collects revenues from these counties for its services. The revenues collected exceeded BWS expenses for postage and processing, and the excess for calendar year 2013 was $93,864 from Kauai and $174,603 from Maui. BWS was unable to show how the excess revenues were used or if Oʻahu ratepayer charges were adjusted for these services and surplus. Each county's expenses and revenues received by BWS are shown below.

Exhibit 3.2
BWS Billing Charge Revenues (CY 2013)

Billing Charge Revenue Sources	*Revenues Collected*	*Processing Expense*	*Postage Expense*	*Total Expense*	*Revenues Collected in Excess of Processing and Postage*
Kaua`i County Bill Processing	$147,866	$48,382	$5,620	$54,002	$93,864
Maui County Bill Processing	$265,322	$81,140	$9,579	$90,719	$174,603

Source: Board of Water Supply

BWS Is Unable to Readily Justify the Rate Increases

According to the American Water Works Association, water utilities should fully explain to customers the design of rates in general, and specifically the design of fixed and variable charges. Its best practices suggest that water agencies should plan and execute a public involvement plan and maintain easily understood information about its charges and customer fees. Although BWS has a plethora of financial and accounting data, it does not maintain data in a form that clearly substantiates its billing and consumption charges.

BWS states its monthly charges cover several customer costs related to providing customers with water and billing services. These costs include:

- Current and future costs of the new Customer Care & Billing (CIS/CC&B) system;
- Current and future meter maintenance and repairs;
- Personnel costs for billing and customer service;
- Future improved payment services, including online bill payment; and
- Costs to process and mail water bills, and to collect payments.

We attempted to verify if the billing charges represented the full recovery of the BWS costs. BWS staff and managers were unable to provide adequate and sufficient data that justified the increase in its individual and monthly charges. According to a BWS administrator, the charges are buried within various BWS divisions and would involve many hours to quantify each division's expenses. BWS does not have a cost allocation system that provided the data we requested. As a result, BWS could not justify the increase in its monthly charges.

BWS Monthly Billing Charges Need to Be Justified

BWS stated the switch from bi-monthly billing to monthly billing would allow water customers to detect leaks sooner, make repairs, and reduce the size of their bills caused by leaks. The switch would also result in more affordable bills for customers; and smaller monthly bills instead of a large bill every other month. The new customer billing system

generated billing errors that produced monthly charges that were higher and lower than previous water bills.

The CIS/CC&B system was funded through the use of capital improvement project (CIP) resources. The billing system costs are being amortized over a 10-year period. Although the capital costs were budgeted in the annual BWS capital budget and such costs are usually not recovered, BWS charged the water ratepayers for the full recovery of the billing system costs and used a 10-year schedule to recapture the capital costs. Our calculations show the BWS billing charges for the five years will total over $79 million, which significantly exceeds the $16.4 million cost of the new information and billing system.[7]

We requested data from BWS to verify and assess the revenues, expenses and allocations associated with the separate billing and consumption charges, and to determine if the charges were justified. BWS staff and managers were unable to provide sufficient data to make this determination. BWS was able to provide volumes of financial data, but not in a form to clearly distinguish between billing and consumption charges. According to a BWS administrator it would take significant time and effort to allocate revenues and expenses according to the charge categories.

In addition to BWS data, we requested calculations, projections, and assumptions used by BWS' consultants when it issued its *Cost of Service Study*, June 2011. The study recommended increases in rates and charges for water service. The study itself did not include detailed information identifying which expenses were intended to be covered by the billing charge or the consumption charge. BWS was unable to provide the consultants' data. As a result, even if BWS were able to provide financial data allocating revenues and expenses for the separate billing and consumption charges, we would be unable to compare the actual data against the base assumptions used to determine those charges. As a result, we concluded, BWS cannot effectively monitor charges to determine whether they are too high, too low, or justified.

[7] We estimated the BWS monthly billing charges for 2014 will total about $15.6 million.

Recommendations

The Board of Water Supply Chief Engineer should:

7. Adopt best practices by justifying and communicating water rates and charges for future rate increases.

8. Adopt best practices by developing and implementing a formal public involvement plan for future rate increases.

9. Improve transparency by accounting for how revenues collected from outside agencies are allocated to appropriate fixed costs, and, as appropriate, reduce customer charges to reflect the payments made by the city's Department of Environmental Services, Kaua'i County, and Maui County.

10. Justify the monthly billing and water rate charges. If the charges cannot be substantiated, the BWS, as appropriate, should refund the monthly charges back to the water customers as cash or credits to the water customer accounts.

This page intentionally left blank.

Chapter 4
BWS Meter Reading and AMR Process Are Inefficient and Ineffective

According to Board of Water Supply (BWS) guidelines, the standard Automatic Meter Reading (AMR) *no read* rate is about five percent. Approximately 24,000 (15%) of water meters are not read by the AMR system and meter readers may make as many as three attempts to obtain actual reads from the same meter in any billing review period. Even after three attempts, actual meter reads are not always obtained because meter readers are unable to locate meters, an automatic or manual read is not possible due to the meters' condition, access to the meter is obstructed, or due to other obstacles. As a result, the BWS meter reading process is inefficient and ineffective.

For example, the meter reader section accumulated costly overtime because of the high AMR *no read* rate and its staff had to go onsite to read the meters manually. The overtime expenses for meter readers in 11 of the 12 months in FY 2014 increased 213 percent and totaled $96,884, compared with $30,960 in all of FY 2013. BWS managers need to address and resolve issues related to its malfunctioning AMR equipment. If left unresolved, multiple problems will continue, such as water meters not being located, water meters not transmitting data, inaccurate meter readings, more estimated bills, unnecessary overtime and labor expenses, increased billing costs, and upset customers.

Background

In January 2013, the BWS implemented a Customer Care & Billing (CIS/CC&B) system to replace its aging Customer Accounting System (CAS). Under the CIS/CC&B system, customers are now billed monthly for water and wastewater. The switch from bimonthly to monthly billings required BWS staff to collect water meter readings and to process billing information in half the time than was previously allotted under the older system.

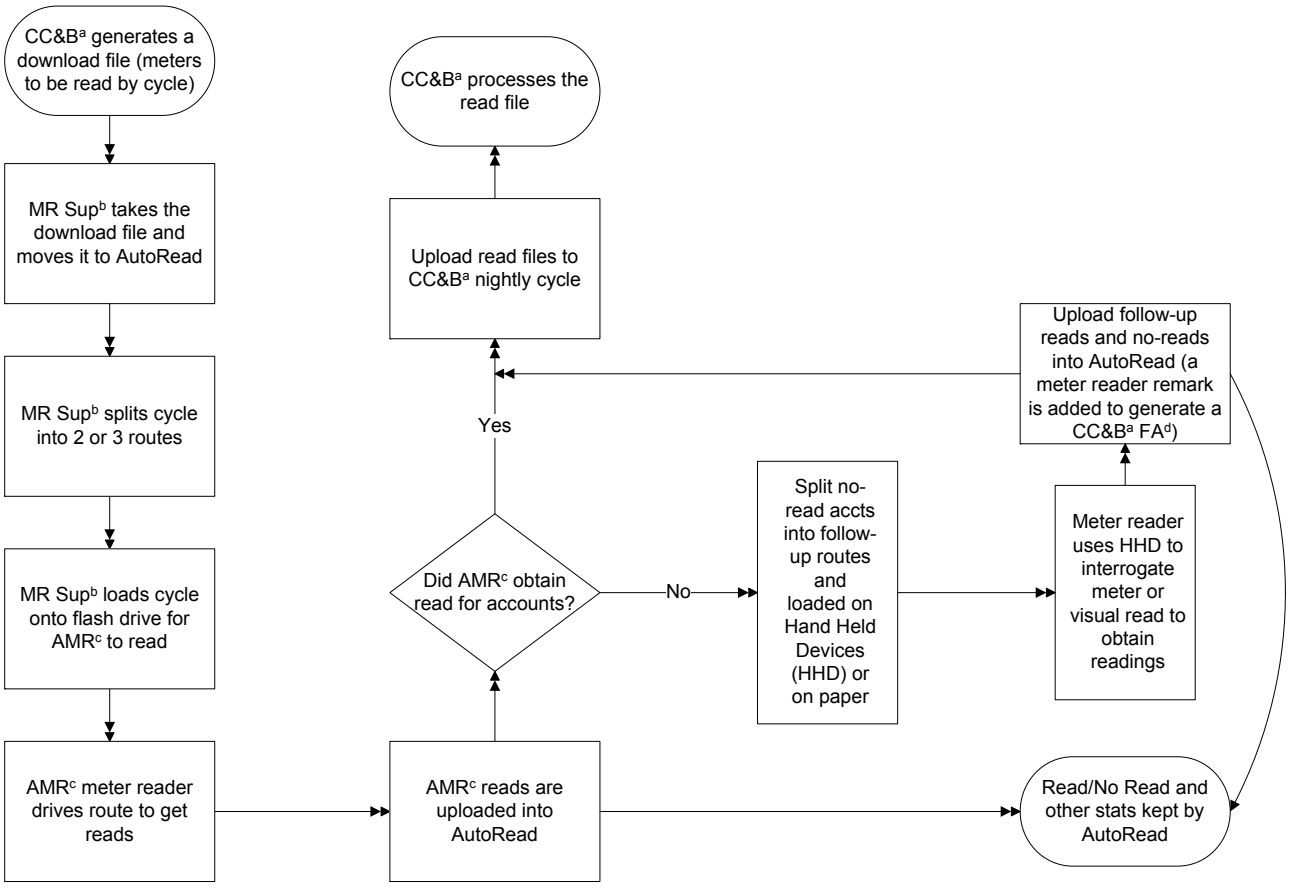
The BWS Automatic Meter Reading system is used to expedite the meter reading by remotely transmitting water consumption and meter reading data to BWS equipment. Under this process, BWS staff will drive by a meter and the BWS equipment in the passing vehicle is supposed to record the water consumption data.

If the data is not recorded, the BWS staff will send another staff member to use a handheld device to read the meter, or to take a visual read of the water meter. If a third reading attempt is unsuccessful, an investigator is sent to inspect and resolve any meter reading problems. However, if an actual read is not obtained after a third attempt, it usually results in an estimated bill. As required, a repair person is sent to fix leaks and/or replace or repair malfunctioning water meters.

Meter Reading and AMR Process

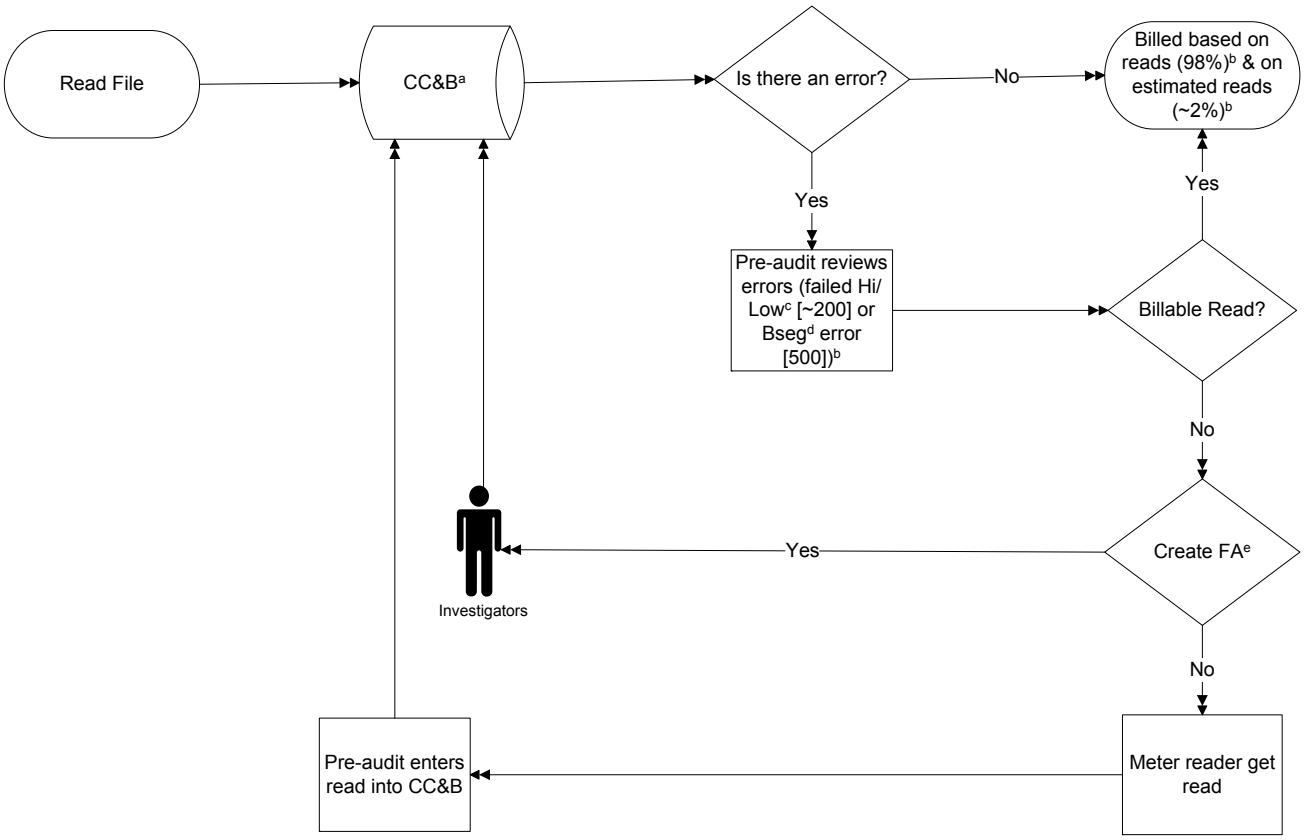
The meter reading and AMR process are illustrated below.

Exhibit 4.1
Meter Reader Read Process



Source: Honolulu Board of Water Supply. [a]CC&B: Oracle Customer Care and Billing System (CIS/CC&B). [b]MR Sup: Meter reading (MR) supervisor. [c]AMR: Automatic Meter Reading. [d]FA: Field activity.

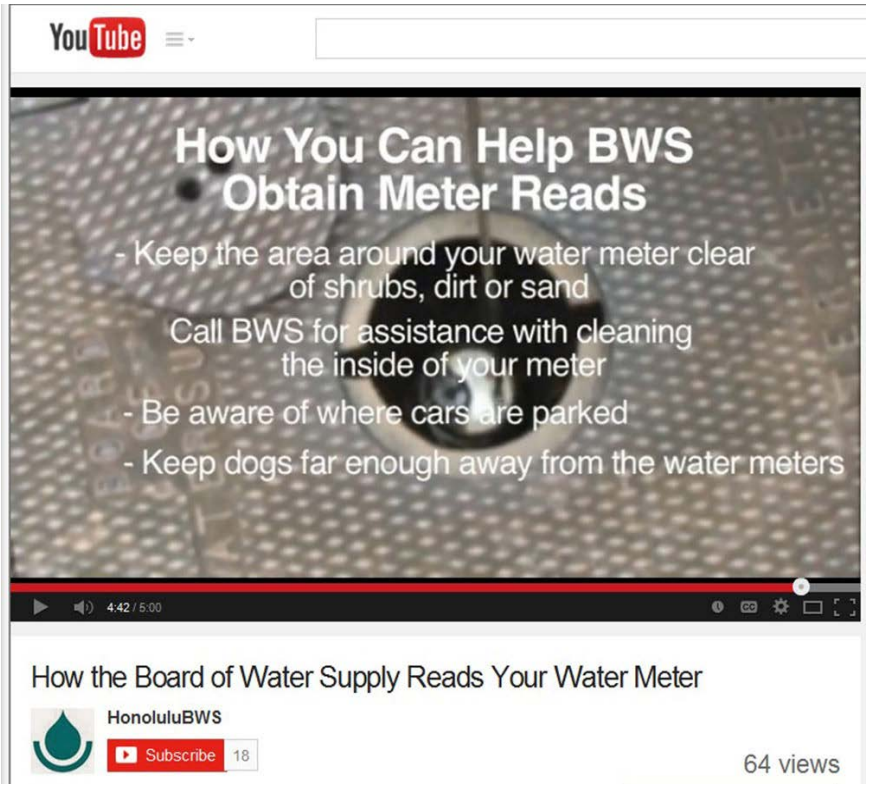
Exhibit 4.2
Meter Reading Data Collection and Data Processing



Source: Honolulu Board of Water Supply. [a]CC&B: Oracle Customer Care and Billing System (CIS/CC&B). [b]Figures based on 10,000 readings. [c]Hi/Low: Bills that are high or low when compared with a customer's prior usage. [d]Bseg: Bill segmented error. (e.g. Customer has two or more consecutive estimated bills.) [e]FA: Field activity.

At our request, the BWS created a five-minute video titled, *How the Board of Water Supply Reads Your Water Meter*. The video, which is posted on the BWS website and on YouTube, describes for the public the meter-reading process, meter readers challenges, and recommendations to help facilitate accurate meter reads. The video can be found at: *http://www.boardofwatersupply.com/cssweb/display.cfm?sid=1068*.

Exhibit 4.3
Screenshot of BWS' YouTube Video Titled, How You Can Help BWS Obtain Meter Reads



Source: http://www.boardofwatersupply.com/cssweb/display.cfm?sid=1068

AMR reading and re-reading process is inefficient and ineffective

Before BWS bills its customers for their monthly water consumption, a reading of their water meter is usually obtained through one of the following methods:

- Automatic Meter Reading (AMR) drive-by
- Meter read with hand-held device or manually
- Follow-up meter read

The meter reading and AMR process involves up to three attempts to obtain a water meter reading. Despite these attempts, accurate readings are not always obtained.

AMR drive-by

The AMR drive-by is the initial task in the meter reading process. The majority of water meters are read by this method. As BWS staff drive preprogrammed routes, Automatic Meter Reading Meter Transceiver Units (MXU) transmit meter readings to a receiver in the vehicle. Staff are able to monitor meter readings from a laptop in the vehicle. Photos of the meter reading equipment are shown below. The green dots indicate meters on the route that have not been read or did not transmit a reading. As the AMR vehicle gets into signal range of the meters, the green dots turn red if meter readings are successfully transmitted.

Exhibit 4.4
Photos of AMR Equipment

Automatic Meter Reader (AMR) Route

Meter Transceiver Unit (MXU)

Source: City and County of Honolulu Office of the City Auditor

Meter reading with handheld device or manually

The meters that the AMR system was unable to read are referred to meter readers who go onsite to obtain meter readings with handheld devices or manually. Meter readers are assigned an average 80-145 properties a day to obtain meter readings. Some factors that prevent meter readers from completing their assignments include: flooded meter boxes due to rain; problems with vehicles or handheld devices; temporary staff shortages due to injury or illness; obstructions on the meter boxes; dense vegetation; and animals. If a meter reader is unable to obtain a reading with the handheld device, a visual or manual read is attempted and recorded. Manual reads are not always accurate. For example, a meter reading recorded as 872,000 was actually

372,000. If meters are difficult to locate, blue markings on the street help the meter readers to locate and identify the meters. Photos of the hand held devices and blue marking are shown below.

Exhibit 4.5
Photos of Handheld Device and Meter Location Markings (Blue)

Handheld Device

Meter Reader Attempting to Get a Read

Markings to Identify Meter Locations

Source: City and County of Honolulu Office of the City Auditor

Follow-up meter reading

If meter readers are not able to obtain readings from the AMR system, handheld devices, or manual readings, a follow up attempt is made. This is called a *get read.* Meter readers perform about 20 follow-up reads a day, once or twice a week. This is the third and last attempt to get a reading by the meter readers, either

through handheld devices or manual reads. If meter readers are unsuccessful it is referred to the Investigation section or Field Operations division, depending on the problem, for further review, but usually results in an estimated bill.

- The Investigation section investigates readings that are considerably high or low when compared to a customer's prior water usage. The investigator's other responsibilities include locating hard to find meters and responding to customers' water problems.

- The Field Operations division repairs and replaces equipment. An example of a water leak is shown in the exhibit below.

Exhibit 4.6
Photo of a Water Meter Leak

Source: City and County of Honolulu Office of the City Auditor

Water meter "no reads"

The AMR system, handheld devices, and follow-up meter reads may not obtain a meter reading within the billing review period. Some of the factors that prevent the BWS staff from obtaining meter readings include:

- Rainy weather which can flood meter boxes and interfere with radio signals used to pick up meter readings;

- Physical objects blocking radio signals sent from the meter, such as a parked car;

- Malfunctioning meters or AMR equipment; and
- Multiple holidays in a month, which reduces the meter readings picked up.

AMR *No Reads* Are High Despite the AMR Process

Of the approximately 160,000 AMR readings completed each month, there are an average of 24,000 meters (15%) that do not get an accurate reading. BWS staff reported the AMR system is not functioning as it should due to not regularly replacing batteries, weak signals, and incompatible frequencies of the MXUs. We accompanied a BWS meter reader on a route through an Ewa community and observed 3,212 meters on the AMR route. Of these meters, 2,534 meters were automatically read and 678 meters (21%) were not read.

The Meter Maintenance section checks meters, conducts routine meter maintenance, and tests new meters prior to installation. The *Tiger* team maintains and troubleshoots AMR equipment, and changes MXU batteries. Even with these two sections, the AMR process still results in a high percentage of no reads due to malfunctioning AMR equipment.

In addition to the disconnect between the meter read and maintenance sections, work orders are not properly managed and communicated by the Information Technology systems, Maximo, CIS/CC&B, and Sensus Auto Read. When a meter reader discovers that the AMR equipment is not functioning properly, they input a code into the CIS/CC&B system, which creates a Field Activity (FA). The FA is sent to the appropriate section, which uses Maximo, a computer maintenance system. The data from Maximo is uploaded to the CIS/CC&B system, which records the changes. The information is then sent to the Sensus Auto Read system, which the meter readers use to complete their AMR routes. However, the same problem still exists on the next AMR drive-by. According to a BWS administrator, the three systems are not synchronized.

From October 2011 to January 2013, there were 48,920 water meter *no reads* where meter readers were not able to obtain readings through a combination of the AMR system, handheld devices, and onsite visits within a given review period. Of these *no reads*,

38,868 had a *no read* code of *Skip*[8] attached to it. The reasons and frequency for why meter readers were not able to obtain readings are shown below.

Exhibit 4.7
Reasons for *No Read*

Most Frequent Reasons for a "No Read"		
Rank	***Description***	***Frequency***
1	Skip	38,868
2	Unable to Locate the Meter	2,390
3	Parked Car	1,372
4	Meter is Covered by Dirt	1,103
5	Meter has a Misty Glass	1,003

Source: Honolulu Board of Water Supply

The following exhibit provides an example of why meter readings were not obtained. According to the meter reading staff, the initial reasons were that a parked car prevented the reading. Later, it was reported the meter was covered by dirt or gravel. After five billing periods, BWS staff concluded the reason for the *no read* was that the meter could not be located.

Exhibit 4.8
Example of *No Read* Property

Premise ID	***Meter Read Date*** [a]	***"No Read" Description***
1001610	Dec-11	Car Parked
1001610	Feb-12	Car Parked
1001610	Apr-12	Car Parked
1001610	Jun-12	Dirt/Gravel Over Meter
1001610	Aug-12	Dirt/Gravel Over Meter
1001610	Oct-12	Can't Locate Meter

Source: Honolulu Board of Water Supply. [a]Meters were read bi-monthly.

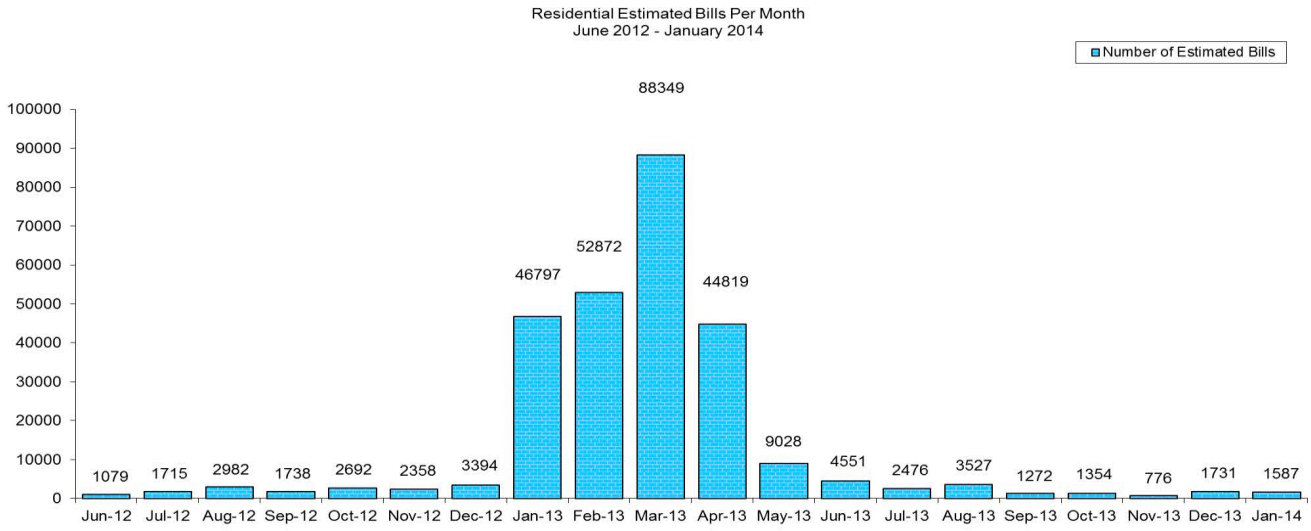
[8] The transition from bi-monthly to monthly billing necessitated a realignment of the days meters are read and billed so they fall within a billing window of 26-34 days. This included several bi-monthly cycles that were intentionally set to estimate water bills. These meters were given the no read code *Skip*.

"No reads" contributed to a high number of estimated bills

If an actual meter reading is not obtained, an estimated bill will be generated, which is based on a customer's historical average water usage. In CY 2013, nearly four out of five BWS customers received at least one estimated bill. Of these, 21 percent (130,000 customers) were billed higher and 79 percent were billed lower than actual use. Once actual readings are obtained, the resulting bills can be significantly higher for those who received underestimated bills. These higher than expected bills prompted a large volume of calls and complaints.

Some of the reasons for the estimated billings included malfunctioning AMR equipment; the shortened bill review period for manual meter reads; and insufficient staff to do the manual meter readings. According to BWS website's *Estimated Readings Information*, the agency explained to its customers that the number of accounts requiring manual meter reads and reviews grew so high that BWS staff was unable to handle the volume within the billing review periods. Without the actual meter readings, the billing system automatically generated estimated billings. The number of estimated bills sent to customers before and after the implementation of the CIS/CC&B billing system is shown below. Estimated billings totaled 3,394 in December 2012. After the CIS/CC&B billing system was activated in January 2013, estimated billings rose to a peak of 88,349 estimated bills.

Exhibit 4.9
Estimated Residential Water Bills (June 2012 to January 2014)



Source: Honolulu Board of Water Supply

AMR Meter Reading Process Compounds the Billing Problems

According to BWS, the AMR failure rate should be about five percent, but approximately 15 percent of water meters failed to provide an initial reading. The malfunctioning AMR equipment required meter readers to make as many as three attempts to obtain readings from the same meter during the billing period. As a result, BWS reported high overtime expenses; increased manual readings that were prone to human error; the increased need for two to three read attempts on the same meter in a given review period; and a large number of estimated bills despite all of the BWS efforts.

If the AMR equipment functioned properly, the need for manual meter reads would be minimal. However, the majority of meter readers on the BWS staff were performing manual readings because the AMR system was not providing an acceptable amount of automated readings. Even after multiple manual read attempts, actual meter readings were not obtained because BWS staff was unable to locate meters, or a reading was not possible because of the condition of the water meters.

If the AMR issue is not remedied in a timely manner, the process will repeat itself in future readings and increase the overtime and related labor costs for BWS.

Customer Care and Billing System (CIS/CC&B) Does Not Facilitate AMR Monitoring

The new BWS CIS/CC&B billing system lacks the ability to generate useful and timely historical information. As a result, BWS staff cannot manage, monitor, or correct estimated bills that are related to the AMR deficiencies.

We randomly selected a sample of 30 BWS customer accounts from a total of 121,593 accounts with estimated bills provided by the BWS Information and Technology (IT) division. The number of estimated bills per account ranged from one to twelve. We attempted to match the number of estimated bills with its corresponding individual account histories in the CIS/CC&B system.

More than half of our sample accounts needed further research by BWS staff because the individual account histories did not match the estimated bill numbers provided by the IT division. Information like a complete account history is not easily accessible through the CIS/CC&B system and must be accessed through multiple pages.

The Customer Accounting System, which is the predecessor to CIS/CC&B, was able to generate *no read* descriptions in a format that could be categorized and counted, such as the accounts with no meter readings due to a parked car during a given time period. The CIS/CC&B system is not able to generate this type of information.

In order to view *no read* descriptions, individual accounts need to be accessed individually to view the reasons for no readings. As a result, BWS does not have access to account information to properly monitor accounts and to follow up on accounts with multiple estimated bills or AMR related problems.

Meter Reader Overtime Increased in FY 2014

According to BWS managers and staff, the implementation of the CIS/CC&B system, insufficient staff, and the shortened billing review period caused an increase in overtime, as well as the number of estimated bills. Another cause of the increased number of estimated bills was the malfunctioning AMR equipment.

Before the implementation of the CIS/CC&B system, the Meter Reading section had 10 employees. After the billing system was activated, the Meter Reading section staff increased to 18 persons (4 permanent and 14 personal service contract positions). On any given day, two to three meter readers perform AMR drive-bys, while the other meter readers are obtaining readings through handheld devices or manual readings. Although the staff numbers have increased, many of the meter readers work overtime to keep up with the increased workload and to resolve AMR reading problems. As a result, overtime expenses for meter readers in 11 of the 12 months in FY 2014 increased 213 percent and totaled $96,884, compared with $30,960 in all of FY 2013.

In our opinion, BWS could reduce overtime costs if the AMR meter-reading problems were resolved and the AMR process improved.

Recommendations

11. BWS should streamline the AMR and re-reading process.

12. BWS should focus on repairing and maintaining the AMR system so that a higher water meter reading rate is attained for the AMR system.

13. BWS should synchronize and improve the process in which work orders are managed and communicated between the Maximo, CIS/CC&B, and Sensus Auto Read systems.

14. BWS should reduce manual readings, overtime expenses, and estimated billings by resolving the high AMR *no read* rate.

This page intentionally left blank.

Chapter 5
Improvements in BWS Operations Are Possible

Policies and procedures are generally consistent with Board of Water Supply's (BWS) mission, objectives, and legal requirements. BWS is complying with most city charter and all city ordinance requirements.

The agency could improve its organization by conforming to best practices and focusing on customer service as established by other water related entities. BWS does not comply with industry best practices related to customer service and stakeholder involvement. The agency also lacks performance measures for customer service and benchmarks to measure its progress in servicing customers.

Financial tools and resources are adequate to support its operations. Existing performance measures focus on operations and are sufficient to comply with federal, state, and local mandates. BWS' water rates are lower than similar jurisdictions.

Background

BWS' mission, *Water for Life*, is to provide a safe and dependable water supply that is affordable to its customers, now and into the future. BWS' three primary objectives are: resource, economic, and organizational sustainability. To fulfill its mission and attain its objectives:

- BWS has 126 current and pending internal directives related to operational areas such as finance, human resources, customer care, community relations and security. Other directives were related to general management, risk management and safety, information technology, operations, engineering, and water resources. Directives that are internal to the organization are not generally disclosed to the public.

- BWS has 63 rules and regulations covering service functions such as water systems requirements, customer service, conservation, and general provisions. These are available publicly on the BWS website and address areas such as: water system requirements for developments; water service to consumers; and protection, development and conservation of water resources. Besides general provisions, other rules related to parking at the Board of Water Supply.

BWS is also subject to many city requirements. More specifically, BWS is subject to 36 requirements in Article VII, Revised Charter of Honolulu (RCH), and 10 requirements in Chapter 30, Revised Ordinances of Honolulu (ROH).[9]

We identified 29 best practices for the water industry as described in *Ten Attributes of Effectively Managed Water Sector Utilities*. The attributes were established by a consortium of municipal water agencies, the U.S. Environmental Protection Agency, and water industry associations.[10] The attributes are for utility managers seeking to make organization-wide improvements and address 10 functional areas, including customer satisfaction and stakeholder understanding and support. Other categories relate to employee and leadership development, operational optimization, financial viability, and infrastructure stability. The remaining four areas focus on operational resiliency, community sustainability, water resource adequacy, and product quality.

Policies and Procedures Are Consistent With BWS Mission, Objectives, and Legal Requirements

To determine whether BWS policies and procedures are consistent with its mission and objectives, we evaluated the agency's current and pending internal directives, and external rules and regulations. We found that all 126 internal directives and 63 external rules and regulations complied with the agency's mission and objectives. In addition, we identified 36 requirements in the Revised Charter of Honolulu (RCH), Article VII, *Board of Water Supply*, and 10 requirements in the Revised Ordinances of Honolulu, Chapter 30, *Water Management*, that were applicable to BWS. Our analysis showed that BWS had a policy, procedure, or practice consistent with 34 of 36 city charter requirements and had a policy, procedure, or practice consistent with all 10 of the city ordinance requirements.

[9] Revised Charter of Honolulu, Article VII, Board of Water Supply (36 requirements selected)
Revised Ordinances of Honolulu, Chapter 30, Water Management (10 requirements selected)

[10] Consortium members include American Public Works Association, American Water Works Association, National Association of Clean Water Agencies, Association of Metropolitan Water Agencies, Kansas City Water Services Department, Philadelphia Water, Sacramento Regional County Sanitation District, St. Cloud, Florida Environmental Utilities, and City of Albany Department of Public Works, among others.

BWS does not have a written policy or procedure for Section 7-105(f), RCH, which authorizes the agency to recommend to the city council the sale, exchange, or transfer of real property under its control. A BWS administrator explained that the agency does not have written policies and procedures because it has not exercised this function since 1996. Nevertheless, BWS has initiated real property transactions in the past and may do so in the future. Furthermore, real property transactions have a significant impact on the community. Thus, BWS should have a formal, written policy to ensure that real property transactions are done consistently and in accordance with charter requirements.

Additionally, Section 7-111, RCH, requires that all moneys expended by BWS shall be disbursed according to procedures prescribed by the Department of Budget and Fiscal Services (BFS). Although BWS has policies regarding disbursements, there is no evidence that they are prescribed by BFS. BWS should have their disbursement policies reviewed and affirmed by BFS to ensure compliance with the charter requirement.

BWS Complies With Most Industry Best Practices, but Needs to Focus on Customer Service

We compared BWS practices against the 29 best practices for the water industry. BWS complied with 23 of the 29 best practices established by the consortium of industry experts. BWS did not comply with 6 best practices: These were related to customer service, stakeholder understanding and support, community, sustainability, and operational resiliency. Exhibit 5.1 identifies the six best practices that BWS does not adequately incorporate into its operations.

Exhibit 5.1
BWS Non-Compliance With Industry Best Practices

	Attribute	*Best Practice*	*BWS Practice*	*Suggested Action*
1	Customer Satisfaction	Receive timely customer feedback via survey	BWS does not survey its customers	BWS should conduct periodic surveys of its customers. Surveys can be conducted through monthly billing or on-line using *Survey Monkey* or other on-line application.
2	Customer Satisfaction	Responsive to customers via performance benchmarks (e.g. call response rate, first call resolution, etc.)	BWS does not have formal performance benchmarks for customer-related operations.	BWS has informal guidelines for its call center such as picking up a call by the third ring, abandon call rate of 2%, call wait time of 2-5 minutes, calls lasting no more than 8 minutes. However, these benchmarks are not formally tracked or reported. BWS should formally adopt appropriate performance benchmarks, collect data, and report it to the board and public on a regular basis.
3	Operational Resiliency	Proactively establishes tolerance levels and effectively manages risks, with an emphasis on work-related injuries such as incident rate and number of insurance claims filed	BWS does not have formal risk tolerance levels or report data on workplace injuries	BWS publishes a comprehensive human resources annual report. However, the report does not contain workplace injury-related data. BWS should conduct a risk assessment for workplace injuries, collect data, and report outcomes in its human resources annual report.
4	Community Sustainability	Service affordability and low income billing assistance.	BWS has standard water rates for residential and commercial entities	BWS should consider offering alternative water rates to low-income household, senior citizens, and other disadvantaged groups. Any alternative water rates would have to be incorporated into the financial plan and be financially viable for BWS.
5	Stakeholder Understanding and Support	Surveys to gauge stakeholder satisfaction, responsiveness, and message recollection (focus group)[a]	BWS does not survey its customers or stakeholders	BWS should conduct periodic surveys of its customers. Surveys can be conducted through monthly billing or on-line using *Survey Monkey* or other on-line application.
6	Stakeholder Understanding and Support	Measures utility's actions to reach out to and consult with stakeholders through active input (not passive), outreach, and frequency	BWS does not routinely communicate with the City Council or executive branch administration	BWS should communicate with City Councilmembers and select members of the administration on a periodic basis to inform them of BWS' activities, particularly those that may directly impact citizens. This can be done with face-to-face meetings, memos, or other communication tool specific to these stakeholders.

Source: Office of the City Auditor and Ten Attributes of Effectively Managed Water Sector Utilities

[a]In July 2011, BWS convened a focus group to evaluate proposed messages to convey future billing changes resulting from the transition from bi-monthly to monthly billing. The focus group, consisting of six members, included a single-family home resident, a business customer, and a property management representative. The focus group, while helpful, focused on the narrow issue of shaping BWS' message about the billing changes, and not the billing changes themselves.

Four of the six areas where BWS did not conform to best practices involved reaching out to customers and stakeholders. BWS generally does a good job of passively disseminating information to customers and stakeholders through its comprehensive website, itemized bills, and board meetings that are open to the public. BWS, however, should take a more active role in reaching out to its customers and stakeholders rather than asking them to come to BWS. BWS management did not make customer service a high priority because it assumed satisfactory customer service would occur if BWS focused on its operations.

Our analysis indicated BWS should adopt industry best practices by:

- Conducting periodic customer surveys and/or focus groups, and use that data to plan and enhance program operations;

- Conducting a risk assessment for workplace injuries, collect data, and report outcomes in BWS' human resources annual report;

- Evaluating the feasibility of offering alternative water rates to low-income households, senior citizens, and other disadvantaged groups; and

- Establishing a formal communications program with City Councilmembers and select members of the administration to inform them of BWS activities, particularly those that may directly impact citizens and constituents.

In response to our draft report, BWS management noted that its staff routinely attend Neighborhood Board meetings to inform the public about BWS activities and upcoming events that affect BWS customers (e.g. rate increases, consumer confidence reports, construction projects). This is also an opportunity to address customer concerns and obtain feedback. While we acknowledge and commend BWS for attending these important community meetings, it falls short of what the best practices suggest in terms of customer involvement. Neighborhood board meetings only reach a narrow sector of the total customer base. Surveys and focus groups of a broader section of the customer base will allow BWS to obtain both qualitative and quantitative data that can be used to improve operations.

Financial Tools Are Adequate to Support Its Operations

Our financial analysis of the Board of Water Supply financial statements indicate it is financially self-sufficient as a semi-autonomous agency. Its operations and projects are financed with revenues generated by water transmission and distribution fees; and federal grants. As shown below, in FY 2012 and FY2013, BWS revenues exceeded operating expenditures from $800,000 to over $7 million.

Exhibit 5.2
BWS Financial Data (FY 2009 – FY 2013)

Fiscal Year	*Operating Revenues ($ million)*	*Operating Expenses ($ million)*	*Operating Income (Loss) ($ million)*	*Total Authorized FTE*	*Total Vacant FTE*
2009	$139.6	$149.9	($10.3)	711	182
2010	$152.2	$147.5	$4.7	714	227
2011	$149.9	$151.8	($1.9)	714	204
2012	$159.5	$158.7	$0.8	714	207
2013	$180.5	$173.5	$7.0	714	187

Source: Honolulu Board of Water Supply Financial Statements and Supplementary Information (FY 2009-2013), and 2013 Service Efforts and Accomplishments Report (Honolulu), p. 231

In FY 2013, BWS revenues increased 13.2 per cent from the prior year. Operating revenues totaled $180.5 million and expenses totaled $173.5 million. Operating income increased from $784,000 in FY 2012 to $7 million in FY 2013. The BWS ratio of current assets to current liabilities was 1.75 in FY 2013. The bond ratings indicated the BWS maintained strong financial performance and a manageable capital program. The financial data indicated BWS operations were adequate to support its on-going operations.

Exhibit 5.3
BWS Financial Data (FY 2012 – FY 2013)

Honolulu Board of Water Supply Financial Data		
Description	***FY 2012***	***FY2013***
Operating Revenues	$159.5 million	$180.5 million
Operating Expenses	$158.7 million	$173.5 million
Net Income	$784,000	$7.0 million
Current Assets	$78.3 million	$62.5 million
Current Liabilities	$27.3 million	$35.6 million
Current Ratio of Current Assets to Current Liabilities	2.87	1.75
Moody's Bond Rating	Aa2	Aa2
Fitch Bond Rating	AA+	AA+

Source: Board of Water Supply Financial Statements (FY 2012 and FY 2013)

In March 2009, BWS stated it serviced approximately 170,000 meters and generated approximately 80,000 bills each month for water customers. The average was 4,000 customer bills per day. The majority of the bills included Sewer Collection fees that were a percentage of the metered water usage. An additional 800 bills per day were produced for Kaua`i and Maui counties.

Performance and Output Measures Lack a Sufficient Customer Service Focus

The U.S. Office of Management and Budget (OMB) distinguish between outputs, outcomes, performance goals, and performance measures.[11] OMB states that output data does not focus on results. Performance measures show results and provide data that can be used to show trends and to evaluate performance.

[11]The U.S. Office of Management and Budget (OMB) defines outputs as the goods and services produced by a program or organization and provided to the public or others. Outcomes describe the intended result or consequence that will occur from carrying out a program or activity.

BWS reported 33 performance and output measures. Of those measures, 30 of 33 were related to BWS operations; 2 were related to compliance with government requirements, and 1 related to customer service (number of complaints).[12] Only 2 of the 33 measures had performance benchmarks to gauge BWS performance or progress. For example, the American Water Works Association established a nationwide benchmark of no more than 25-30 breaks per 100 miles of pipeline. BWS reported approximately 16 water main breaks per 100 miles of pipeline in FY2013. This allowed BWS to measure its actual performance against a nationwide benchmark.

In another example, BWS also established and reported on water main, fire hydrant, and valve maintenance performance (Exhibit 5.4), which demonstrates the usefulness of performance measures and goals.

[12] For our review, we categorized BWS output measures as operational, compliance, or customer service oriented. The BWS measures were for the number of new hires; accounts receivable; water consumption; capital improvement project (CIP) status; monthly electricity use by BWS worksites; groundwater level status; and number of water main breaks. Two of the 33 measures were related to compliance (Annual Water Quality Report and Oahu Water Management Plan Overview). Only one of the measures related to customer service (number of complaints received).

Exhibit 5.4
BWS Water Main Breaks and Fire Hydrant and Valve Maintenance
Metro District Performance Outcomes – January 1, 2013 to June 30, 2013

	Task	*Performance Target*	*Measured Performance*
1	Main Breaks: 4”	44.3 worker hours average per break	43.9 worker hours
2	Main Breaks: 6”	51.7 Worker hours average per break	61.8 worker hours
3	Main Breaks: 8”	80.9 worker hours average per break	56.1 worker hours
4	Main breaks: 12”	108.6 worker hours average per break	77.8 worker hours
5	Response time	Respond within 3.5 hours 80% of the time	Responded within 3.5 hours 82% of the time
6	Service Leak Repairs	12.0 worker hours average per repair	12.5 worker hours
7	Fire hydrant maintenance worker hours	0.96 worker hours per hydrant	0.85 worker hours per hydrant
8	Fire hydrants: number maintained	2,458 hydrants	2,595 hydrants maintained
9	Valve maintenance worker hours	0.73 worker hours per valve	0.59 worker hours per valve
10	Valve maintenance: number maintained	6,036 valves	6,255 valves maintained

Source: Honolulu Board of Water Supply

As these two examples demonstrate, establishing, collecting data, and reporting on performance benchmarks can be a useful management tool. If the agency established appropriate performance benchmarks in other areas of its operations, it could make operational changes quicker. For example, the performance measures could have been used to determine the need for corrective action when the customer billing system was activated in January 2013. If BWS had formally established an abandoned call rate of two percent as the performance goal and the abandoned call rate exceeded two percent, it could have taken corrective action sooner.

BWS management’s primary focus was reporting output measures and not on evaluating performance against established benchmarks. Of the 33 performance measures reported by

BWS, 31 were actually output measures that did not adequately gauge performance. Although these measures were adequate to comply with government requirements, they lacked a sufficient customer service focus because the agency merely tracked the number of complaints, but did not have established benchmarks to determine, for example, whether the level, type, frequency or resolution rate of complaints were acceptable. BWS consequently could not effectively measure its customer service performance.

BWS Customer Outreach Is Extensive

Although BWS does not comply with best practices related to engaging stakeholders or have performance benchmarks related to customer service, its customer outreach is extensive. In our sample of water jurisdictions, 70 percent provided transparency through websites. The websites for the water jurisdictions provided information on the comprehensive annual financial reports, annual reports, and financial statements. Other information included press releases, public notices, water commission and water board meeting agenda and minutes, and on-line videos.

The Honolulu BWS website provided more information and was more transparent than other water entity websites. The BWS website provided financial statements (e.g current capital improvement program budget; single audit of federal financial assistance programs; balance sheets; and statement of revenues, expenses, and change in net assets); budget data, and bond statements. It also provided information about the agency and its billing policies, BWS rules and regulations, board meeting notices and minutes.

The BWS website was comprehensive and allowed customers to view and pay bills on-line. The BWS website organized information in six primary categories: customer service, water quality, conservation, water resources, and community. Through the website, customers were able to conduct transactions on-line; view and pay water bills via credit card; start or stop water service; and update account information. Other information included current and future water rates; how to read a water meter; background on estimated bills; and drinking water quality reports. The website even provided a list of on-going construction projects.

In the area of education and community outreach, the website provided information about its various programs. The website included information on the BWS facilities tour program (i.e. Fred Ohrt Water Museum, Halawa Xeriscape Garden,

Nu'uanu Watershed, Honouliuli Water Recycling, Halawa Shaft and Underground Pumping Station, and Waihe'e Tunnel Tour); requests for speakers at schools and community events; emergency preparedness; conservation initiatives; and xeriscape classes and workshops.

Exhibit 5.5
BWS Offers Educational Tour of the Nu`uanu Reservoir

Source: Office of the City Auditor photo

BWS is also active on social media,[13] including *Facebook, Twitter, YouTube, Instagram, Tumblr*, and *Nixle*. BWS maintained a Facebook account (376 likes) and Twitter account (789 followers) which provided information similar to its website. BWS water bills also provided a breakdown of both water and sewer charges. For FY 2014, BWS launched a quarterly newsletter that will accompany customer billings. The newsletter will contain forward-looking information, water conservation tips, and educational material related to water. The newsletter has the potential to provide information to customers that do not have access to on-line technology.

[13] As of February 1, 2014, BWS had 376 likes on its Facebook page, a 283% increase from 133 likes in January 2012. The agency also counted 789 followers on its Twitter feed and 17 subscribers on its YouTube channel. Its most popular YouTube video, *How to Detect Leaks* tutorial, had 10,530 views. Social media's goal is to direct people to the BWS website where detailed information and guidance is provided.

While BWS makes effective use of on-line technology and social media, these tools provide information in a passive format. BWS presents information so interested individuals can navigate the website to find what they need. This may be adequate for customers, but stakeholders like the city council need more timely and accurate information for their jobs.

BWS Needs to Improve Communications With the City Council

BWS provides ad hoc communications to the city council, such as when it notified city council members via e-mails that BWS would commence its delinquent collection process, and when BWS discussed the impact of Bill 3 on the new information system. In our opinion, the announcements do not constitute two way communications with the city council and are not a substitute for stakeholder involvement in decision making as recommended by the American Water Works Association. We believe BWS could improve its relationships and transparency with the city council by providing more routine communications about its operations and plans; and holding open discussions with the city council about its operations.

According to a BWS administrator, the agency does not have a formal communications program with the city council. As a semi-autonomous agency of the City and County of Honolulu, the BWS operates separately from the city. For the average citizen, however, this governance distinction is not apparent. They view the BWS as a city agency and will direct inquiries and complaints to their city council representative or the mayor's office. According to some city councilmembers, they received numerous calls and complaints when BWS transitioned to its new billing system in January 2013. However, the city council members were generally unaware of the specific problems at BWS and could not provide sufficient answers to their constituents.

Although the city council cannot directly intervene or provide solutions to BWS problems, it can provide explanations and support for BWS programs. For example, in October 2013, BWS suspended collections on delinquent accounts due to billing errors and its impact on BWS customers. The agency estimated that there were 1,800 to 2,000 accounts that were 120+ days in arrears. In March 2014, BWS announced to the city council via e-mail that BWS would resume collecting on the delinquent accounts. In our opinion, open discussions with the city council before BWS resumed collections could have mitigated the confusion and complaints among water customers.

We believe more frequent BWS communications with the city council could result in improved opinions of government services. According to the 2013 National Citizen Survey, 41percent of Honolulu residents rated the quality of services provided by the City and County of Honolulu as good or excellent, which was a decline from 53 percent in the previous year. In 2012, only 63 percent of Honolulu residents rated the city's customer service as good or excellent. While the BWS alone is not the only cause for the rating decline, improved communications between BWS and its stakeholders in city government will go a long way toward improving citizens' views of government services.

Recommendations

15. BWS should adopt industry best practices by conducting periodic customer surveys and focus groups, and use the data to improve BWS operations. Surveys can be conducted through monthly billing surveys, on-line using Survey Monkey, or other on-line applications.

16. BWS should adopt industry best practices by conducting a risk assessment for workplace injuries, collect data, and report outcomes in the BWS human resources annual report.

17. BWS should adopt industry best practices by evaluating the feasibility of establishing an affordability program that offers alternative water rates to low income households, senior citizens, and other disadvantaged groups.

18. BWS should adopt industry best practices by establishing better and more frequent communications with the City Council and select members of the executive branch to inform them of BWS activities, particularly those that directly impact citizens. This can be done with face-to-face meetings, memos, or other communication tools specific to these stakeholders, on a regular basis.

19. BWS should formally adopt performance benchmarks, collect data, and report it to the board and public on a regular basis. The performance benchmarks could be formal guidelines for its call center, such as picking up a call by the third ring, abandon call rate of 2 percent, call wait time of 2-5 minutes, calls lasting no more than 8 minutes.

20. BWS should establish written policies or procedures in accordance with Section 7-105(f), Revised Charter of Honolulu (RCH), related to real property transactions.

21. BWS should request BFS to review and affirm BWS' disbursement policy, as required in Section 7-111, RCH.

Chapter 6
Charter Amendment and Governance Is a Policy Decision

The City Council could amend the City Charter to improve oversight of the Board of Water Supply and its governing structure. Our sampling results for 30 cities and entities show mixed governance structures, and indicate the common practice is for the executive branch, City Council, or some other entity to review and approve water budgets and water rates. Public hearings on these issues are common and transparency is the norm. The final decision to amend Honolulu's Board of Water Supply (BWS) governance structure to improve oversight is a policy decision.

Background

The BWS is the largest municipal water utility in the State of Hawai'i. It serves approximately 145 million gallons of water a day to roughly 1 million residents on the island of O'ahu, which is the City and County of Honolulu. The BWS system consists of 94 active potable water sources, 171 reservoirs, and nearly 2,100 miles of pipeline serving every community on O'ahu.

In FY 2013, the BWS workforce totaled 550 personnel (714 authorized FTE; 164 vacancies). BWS consisted of 14 offices and divisions.

1. Business Development Division
2. Capital Projects Division
3. Communications Office
4. Customer Care Division
5. Field Operations Division
6. Finance Division
7. Human Resources Office
8. Information Technology Division
9. Land Division

10. Legal Counsel Office

11. Office of the Manager and Chief Engineer

12. Security Office

13. Water Resources Division

14. Water System Operations Division

A seven-member board presides over and determines BWS' policies. Five members are appointed by the mayor and confirmed by the City Council. The remaining two serve in their capacities as the State of Hawai'i Director of the Department of Transportation and the city's Director of the Department of Facility Maintenance. The BWS Board appoints the Manager and Chief Engineer to administer the department. The Manager and Deputy Manager provide leadership and direction for the organization and supervise the department's daily business activities.

Governance

In 2013 and 2014, the City Council introduced a series of resolutions related to BWS. Draft Resolution 13-216, FD1 initiated an amendment to the city charter that proposed prohibiting the BWS from billing retroactively. Draft Resolution 14-63, introduced a charter amendment regarding the composition of the BWS Board of Directors. Resolution 14-19 urged the BWS to improve its bill estimating system and retroactive billing practices. Resolution 13-201 requested the city auditor to determine whether BWS should continue as a semi-autonomous agency.

Comparisons With Other Cities

As shown in Appendix D, 30 cities and water entities were sampled across the country. The sample included water jurisdictions with customer populations that ranged from 20,000 to 3.9 million. The sample results show that different governance arrangements exist across the country. The major forms include: governmental (53.3%), independent or private (23.3%), and semi-autonomous (13.3%). In California, state or city public utility commissions may regulate the independent or private water entities. Semi-autonomous water boards are in the minority and compose only 13.3 percent of the water jurisdictions examined. Including Honolulu, 56.6 percent of the water entities had a board or commission overseeing the water entity.

Exhibit 6.1
Ownership Sample Results

Entity Type	*Number*	*Percent (%)*
City Owned	16	53.3%
Independent/Private	7	23.3%
Semi-Autonomous	4	13.3%
Unknown	3	10%
Total	30	99.9%

Source: Office of City Auditor Sampling Results
Note: Percent total does not add up to 100% due to rounding.

Budget approval comparisons

In our sample results, budgets for the water entities were approved by their City Councils (56.7%) or by a water commissions or board (26.7%). Budget approval data was not found for 10 percent of the water jurisdictions. Honolulu is not unique in having the Board of Directors approve the BWS budget. More details are shown below.

Exhibit 6.2
Budget Approval Sample Results

Type of Approval	*Number*	*Percent (%)*
City Council	17	56.7%
Water Board / Commission	8	26.7%
Other	2	6.7%
Unknown	3	10%
Total	30	100%

Source: Office of City Auditor Sampling Results
Note: Percent total does not add up to 100% due to rounding.

Water rates approval comparisons

Water rates were approved by the City Council (48.4%), by the water board (32.3%), by a public utility commission (12.9%), or the water commissioner (3.2%). Data was not available for 3.2 percent of the sample. More details are shown in Exhibit 6.3.

Exhibit 6.3
Water Rate Approval Sample Results

Type of Approval	*Number*	*Percent (%)*
City Council	15[a]	48.4%
Water Board/ Commission	10[a]	32.3%
Public Utility Commission	4	12.9%
Other	1	3.2%
Unknown	1	3.2%
Total	31	100%

Source: Office of City Auditor Sampling Results
[a]Detroit rates are approved by the City Council and a water board and included in both categories.

Water and Sewer Rates comparisons

By comparison, our sampling results show Honolulu has one of the lowest base water rates ($7.70) and ranks in the lower half for water charges ($44.50). Honolulu sewer charges are in the mid-range ($97.20) and in the middle for total utilities charges for water and sewer ($141.70). The high sewer rates are due to the 2010 consent decree with the State of Hawai'i and the U.S. Environmental Protection Agency.

Exhibit 6.4
Water Rates Sample Results

City	*Base Water Charge*	*Estimated Water Charge Estimated Monthly Charge (10,000 gallons)*	*Sewer Charge (Estimated Monthly) (10,000 gallons)*	*Total Utilities Charge*
Honolulu, HI	$7.70	$44.50	$97.20	$141.70
Baltimore, MD	$36.77	$85.93	$115.54	$201.47
Dallas, TX	$4.65	$34.47	$53.40	$87.87
Ft. Worth, TX	$9.00	$39.80	$45.21	$85.01
Portland, OR	$31.21	$77.21	$116.31	$193.52
San Diego, CA	$19.93	$67.62	$63.44	$131.06
San Francisco, CA	$8.40	$78.02	$118.80	$196.82
San Jose, CA	$17.70	$59.78	$33.83	$93.61
Seattle, WA	$13.75	$27.95	$157.09	$185.04
Washington, D.C.	$3.86	$64.01	$58.90	$122.91

Source: Office of City Auditor Sampling Results

Policy Decision

While each form of governance has weaknesses and advantages, pros and cons, changing the form may not improve BWS operations, efficiency, or effectiveness. In our opinion, while there are areas for BWS improvement, citizens are unlikely to realize significant benefit with a transfer to city management. If BWS operations and resources are transferred to the city, the City Council will have to ensure BWS current assets and cash reserves are protected and used only for BWS capital improvements such as replacing sewer and water infrastructure. A charter amendment to place BWS under the city's direct authority is unlikely to improve BWS effectiveness or efficiency. Ultimately, however, this is a policy decision for the City Council.

Honolulu City Charter Imposes Uneven Requirements for Semi-Autonomous Entities

The Honolulu City Charter imposes requirements for semi-autonomous entities, and as a result the city's Board of Water Supply (BWS) and the Honolulu Authority for Rapid Transportation (HART) have restrictions imposed on it. The following table details the city charter requirements for the city's semi-autonomous bodies.

Exhibit 6.5
Honolulu City Charter Requirements for Semi-Autonomous Entities

City Charter	*Article VII Board of Water Supply (BWS)*	*Article XVII Public Transit Authority*[a]
Appropriation requests	No restrictions (Section 7-109)	City Council approves appropriation requests, with or without amendments. (Section 17-106)
Line-item appropriation request for proposed operating and capital budgets	No restrictions (Section 7-109)	City Council approves appropriation requests, with or without amendments. (Section 17-106)
Rates	Public hearing required prior to fixing and adjusting rates (Section 7-110)	Public hearings required prior to fixing and adjusting rates (Section 17-107)
Budget	Public hearing required prior to adoption of the budget (Section 7-110)	Public hearings required before adopting a proposed budget (Section 17-107)
Revenue Collections	Collections and all receipts shall be paid daily into city treasury (Section 7-111)	Collections and all receipts shall be paid daily into city treasury (Section 17-108)
Bond Sales	No restrictions (Section 7-113)	All bond sales subject to City Council approval (Section 17-109)

Source: Honolulu City Charter
[a]Honolulu Authority for Rapid Transportation (HART)

As shown above, Article VII and Article XVII require both the BWS and HART to be transparent by requiring public hearings prior to fixing and adjusting rates and adopting a budget. Both revenues and collections must be deposited in the city treasury.

Article VII imposes no restrictions for BWS on appropriation requests, line-item appropriations, or bond sales. Article XVII requires City Council approval for HART appropriation requests, line-item appropriations, and bond sales. A charter requirement may be needed to resolve the differences.

Recommendation

22. Any charter amendment to modify the structure of the Board of Water supply is a policy decision.

Chapter 7
Conclusion and Recommendations

Honolulu residents are fortunate to have some of the best drinking water available in the world. Our water is safe and of high quality. In 2013, 74 percent of Honolulu residents[14] rated drinking water quality as good or excellent. This rating for drinking water quality has exceeded 70 percent over the last four years. The Honolulu Board of Water Supply (BWS) has done a good job of managing our water resources to ensure that quality water is available to O'ahu residents, businesses, and visitors today and into the future. Infrastructure upgrades, increasing water demand, and expanding operational costs pose challenges for the BWS. Improvements are needed for BWS to sustain O'ahu's water collection, treatment, and distribution system.

In January 2013, BWS implemented a new customer care and billing system, which also included a change from a bi-monthly to a monthly billing cycle. The changeover was fraught with problems, most notably increased billing errors that caused a surge in customer complaints. BWS' call center was overwhelmed with customer calls which resulted in many dropped calls or long wait times. BWS has since corrected the problems and the call center is normalized. This was a *lesson learned* opportunity for BWS. Going forward, when BWS implements program or infrastructure changes, they need to heed the advice of consultants, improve planning by consulting other jurisdictions who have implemented similar program changes, and consult with customers to identify any end-user impacts.

Operational improvements are also needed to ensure program effectiveness and efficiency. The Automatic Meter Reading (AMR) meter readers are not performing as expected. BWS has relied on redundant attempts to conduct reads and increased overtime to get accurate reads. While BWS could argue that it is effective in getting meter reads, the process is far from efficient. Additionally, BWS needs to account for its monthly water charges to O'ahu customers. BWS claims that the billing charge is justified to defray administrative costs associated with billing and cost recovery for installing the new billing system. BWS, however, could not provide sufficient data to support its current monthly billing charge. In the spirit of full disclosure and accountability, BWS should provide detailed justification for its current and future billing charges.

[14] The National Citizen SurveyTM, Honolulu, HI, 2013

BWS should also make customer service a higher priority. The agency does a good job of communicating and disseminating information outward via its website, social media applications, and attendance at community meetings. It lacks, however, adequate communication within the organization and with its stakeholders. Best practices suggest surveying customers and possibly conducting focus groups to gauge public input. BWS should also establish performance benchmarks related to customer service, collect appropriate data, and report results to various stakeholders, particularly the city council. This can be a valuable tool for management to gauge customer service levels and make improvements as necessary. For stakeholders, the results can reveal BWS performance and, hopefully, assure customers that they are receiving satisfactory service.

Recommendations

The Board of Water Supply should:

1. Consult with other public and private utilities about their experiences prior to launching new initiatives that may impact the public.

2. Improve planning, conduct risk assessments, and establish a formal action plan to mitigate problems when launching future initiatives that may impact the public.

3. Provide adequate resources in the BWS call center and added support staff before activating the system.

4. Be proactive in identifying, preparing for, and addressing customer complaints.

5. Develop more customer service oriented policies and practices such as formal performance benchmarks and performance goals for call center activities so that customer complaints do not increase.

6. Use available data to create reports that can be used to better manage BWS operations and programs.

7. Adopt best practices by justifying and communicating water rates and charges for future rate increases.

8. Adopt best practices by developing and implementing a formal public involvement plan for future rate increases.

9. Improve transparency by accounting for how revenues collected from outside agencies are allocated to appropriate fixed costs, and, as appropriate, reduce customer charges to reflect the payments made by the Department of Environmental Services, Kaua'i County, and Maui County.

10. Justify the monthly billing and water rate charges. If the charges cannot be substantiated, the BWS, as appropriate, should refund the monthly charges back to the water customers as cash or credits to the water customer accounts.

11. BWS should streamline the AMR and re-reading process.

12. BWS should focus on repairing and maintaining the AMR system so that a higher collection of water meter readings is attained for the AMR system.

13. BWS should synchronize and improve the process in which work orders are managed and communicated between the Maximo, CIS/CC&B, and Sensus Auto Read systems.

14. BWS should reduce manual readings, overtime expenses, and estimated billings by resolving the high AMR *no read* rate.

15. Adopt industry best practices by conducting periodic customer surveys and focus groups, and use the data to improve BWS operations. Surveys can be conducted through monthly billing surveys, on-line using *Survey Monkey*, or other on-line applications.

16. Adopt industry best practices by conducting a risk assessment for workplace injuries, collect data, and report outcomes in the BWS human resources annual report.

17. Adopt industry best practices by evaluating a feasibility of offering alternative water rates to low income households, senior citizens, and other disadvantaged groups.

18. BWS should adopt industry best practices by establishing better and more frequent communications with the city council and select members of the executive branch to inform them of BWS activities, particularly those that directly impact citizens. This can be done with face-to-face meetings, memos, or other communication tools specific to these stakeholders, on a regular basis.

19. Formally adopt performance benchmarks, collect data, and report it to the board and public on a regular basis. The

performance benchmarks could be formal guidelines for its call center, such as picking up a call by the third ring, abandon call rate of 2 percent, call wait time of 2-5 minutes, calls lasting no more than 8 minutes.

20. Establish written policies or procedures in accordance with Section 7-105(f), Revised Charter of Honolulu (RCH), related to real property transactions.

21. Request BFS to review and affirm BWS' disbursement policy, as required in Section 7-111, RCH.

22. Any charter amendment to modify the structure of the Board of Water supply is a policy decision.

Management Response

Board of Water Supply (BWS) management generally agreed with our findings and recommendations; except for those related to justifying the monthly billing fee, accounting for revenues collected from outside agencies (including the Department of Environmental Services, Maui County and Kaua'i County), and the impact on ratepayer charges. Management claims that it provided sufficient data to address these issues and provided clarifying information on other issues raised in the report. Although BWS provided a plethora of accounting and financial data, the BWS staff was unable to convert or synthesize the data into a format that the ratepayer or city council could accept as substantiation for the increases in water rates and billing charges. BWS staff was unsuccessful in recreating the methodology and calculations used by the consultant to justify the billing and water rate increases, and was unable to provide satisfactory answers to our many questions regarding revenues and allowed expenses. Our estimates indicate the 45 percent increase in billing charges and 70 percent increase in water rates may have been excessive. The BWS reliance on broad financial and accounting data to justify increases do not promote transparency and accountability in ratemaking as suggested by best practices. We therefore stand by our findings and recommendations.

BWS agreed with our recommendations to adopt best practices for justifying and communicating water rates and charges, and for developing and implementing a formal public involvement program for future rate increases. If BWS adopts these best practices, our concerns regarding substantiation and justification for water rates and billing charges should be resolved.

In response to our management discussion draft report, BWS provided explanations and additional data for our review. The BWS comments attached to their management response relate to the management discussion draft report. Based on our examination of the additional information provided by BWS, we modified the final audit report. The changes did not have a material impact on the report content and we stand by our findings and recommendations. Finally, we made technical, non-substantive changes to the report for purposes of clarity and style. A copy of the management response can be found on page 74.

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HI 96843

September 5, 2014

Mr. Edwin S. W. Young
City Auditor
Office of the City Auditor
City and County of Honolulu
1001 Kamokila Boulevard, Suite 213
Kapolei, Hawaii 96707

Dear Mr. Young:

Subject: Management and Performance Audit of the Board of Water Supply

Thank you for the opportunity to comment on the Management and Performance Audit of the Board of Water Supply (BWS). BWS appreciates the many hours that you and your staff spent researching and collecting data, conducting interviews, and obtaining feedback from BWS regarding your preliminary findings.

The BWS is committed to continuously improve its operations and the service to its customers. We are pleased that overall, the audit findings indicate that BWS fulfills its mission of providing safe, dependable, and affordable water to the community. As stated in the report:

> *"Policies and procedures are generally consistent with its mission, objectives, and legal requirements. BWS is complying with city charter and city ordinance requirements. BWS could improve its organization by conforming to best practices and focusing on customer service as established by other water related entities. Financial tools and resources are adequate to support its operations. Existing performance measures focus on operations and are adequate to comply with federal, state, and local mandates. BWS water rates are lower than similar jurisdictions."* (Transmittal Letter, Page 2)

In addition, the report stated:

> *"The Honolulu Board of Water Supply (BWS) has done a good job of managing our water resources to ensure that quality water is available to O'ahu residents, businesses and visitors today and into the future."* (Chapter 7, page 57)

We offer the following comments regarding the audit results for the five broad areas identified in the Transmittal Letter:

Billing System Implementation:

A major portion of the audit report focused on the estimated billing issues that occurred back in 2013 shortly after the January 22, 2013 implementation of the Board's new customer information system, Customer Care & Billing or CC&B. Prior to the launching of CC&B, BWS

tested the new software, and hired and trained more staff to support the transition, however in retrospect it was insufficient to address the issues and problems encountered during the initial implementation of the system.

Implementing the new billing system was a learning experience for BWS. We appreciate that the audit report recognized that BWS used this as an opportunity to improve services and have "*since corrected the problems and the call center is normalized.*" (Chapter 7, Page 57). We are pleased to report that currently:

- Less than 2% of our customers receive an estimated bill in any given month. Since September 2013, BWS obtains at least 98% of its actual meter readings so that no more than 2% of the bills must be estimated due to no reads. These bills are usually reconciled during the following billing period.

- Procedures are in place to prevent customers from receiving no more than two consecutive estimated bills. BWS billing system has been reconfigured to identify and hold any bill estimated for more than two consecutive months. These bills must be reviewed and manually approved before they are released.

- Staffing requirements have been addressed. BWS has hired more meter readers, billing staff, and customer service representatives.

- The average number of calls to the Call Center decreased from a high of 1,478 to approximately 650 calls daily.

- The average maximum call wait time is between 2 – 5 minutes.

Billing Charges:

BWS respectfully disagrees with the audit findings that BWS was unable to readily provide the data to support the monthly billing charge. BWS provided the City Auditor the following documents:

- American Water Works Associated (AWWA) Cost of Service Study that included financial worksheets that determined the consumption and billing service charges in accordance with the AWWA's M1 Manual of Practice – Principles of Water Rates, Fees and Charges, Sixth Edition.
- 24 AWWA worksheets which clearly identified BWS cost of service, revenue requirements, rate setting details entitled:
  - 5 year projected Operating Expenses
  - Cash Funding Analysis
  - Bond Funding Analysis
  - Adjusted Cost of Service per Unit
  - Cost of Service Adjustments
  - Revenues
  - Normalization of Potable Maximum Day and Maximum Hour Extra Capacity
  - Cost Component Unit Costs
  - Cost Components to Customer Class
  - System Functions to Cost Components

  - Revenue Requirement by Functional Class
  - Allocation Factors
  - Allocation Basis
  - Allocation of Fixed Charges
  - Allocation of Equipment
  - Allocation of Materials and Supplies
  - Allocation of Personnel Services
  - Allocation of Positions
  - Allocation by Functional Class
  - Allocation by Budget to Functional Class
  - Annual Operating Budget Summary
  - Blended Actual with Budget
  - Adjusted Annual Operating Budgets
  - Annual Operating Budget
- BWS annual budget and expenditure data for FY 2009 to FY 2013 that included nine reports entitled:
  - Budget versus actual by: Division and Object, Business Unit, Business Unit - 12 months.
  - Total BWS: Summary, Cost Object, Encumbrance, Encumbrance Detail by Business Unit, Expenditure by Business Unit, 12 month expenditures by Business Unit.
- Audited annual financial statements that are available on the internet at our website: www.honolululuboardofwatersupply.org and previously transmitted to City Council and Administration for fiscal years 1999 to 2013.
- Monthly Balance Sheet and Statements of Revenues, Expenses and Changes in Net Assets that are available on the internet at HBWS.org for the period 2005 – 2014.
- Annual costs less the payments by the Department of Environmental Services (ENV), and the Water Departments of Kauai and Maui Counties incurred against the revenues collected as proposed to the rate study.
- Cost of Service Study for Honolulu Board of Water Supply by Tokumoto & Company, CPAs LLC, June 2011
- Final Report of Draft BWS Assessment of Capital and Operating Needs – Capital Improvement Program Review, prepared in association with Tokumoto & Company by RW Beck, April 2011

BWS staff also had 2 extensive meetings with the City Auditor's staff to review, discuss, and respond to questions on the materials submitted.

Automatic Meter Readings:

The report also covered the need for BWS to improve its automatic meter reading (AMR) process. BWS has taken action to address the AMR issues encountered:

- Between February and March 2013, BWS replaced approximately 25,000 aging batteries in the AMR system.
- In June 2013, consultant services were secured to perform an AMR study to conduct an assessment of the current BWS AMR system and compare various meter reading options available. The study will also recommend the most efficient, cost effective meter

reading system and implementation strategy for BWS. We anticipate completion of the study in early 2015.

- In October 2013, the administrative oversight of AMR maintenance unit was transferred to Field Operations. BWS felt this change was appropriate to ensure that the maintenance of the AMR equipment was given proper guidance and attention. Consultation with the public employee unions on the proposed reorganization has recently concluded.
- Currently, BWS is working with the AMR vendor to pilot new procedures to identify problems and improve AMR drive-by performance. Preliminary results show an increase of about 5% in the drive-by meter reading rate and have eliminated the need for approximately 8,400 follow-up reads. Additionally, new products and technologies are being piloted in select areas to test improvements in signal strength and reliability of reads through the AMR drive-by system.

BWS is cognizant of the need to reduce unnecessary expenses to maximize the use of ratepayer funds. We also recognize the importance of providing our customers with accurate and timely water bills and will continue to use all resources available to ensure that quality of service. We continually assess our operations and adjust staff scheduling to control costs. Recently, our AMR drive-by meter reading rate has improved from 85% to 90%. We anticipate as we implement procedures to improve the performance of the AMR system, overtime costs with decrease accordingly.

Operations:

The need to increase communication of BWS operations and activities to various stakeholders and improve overall customer service was also identified in the report. We appreciate the City Auditor's validation of BWS's efforts in these areas.

Since early 2014, BWS Board of Directors and Senior Management team has been closely collaborating in the development of a three-year strategic plan for the Department. The 3-Year BWS Strategic Plan (2014-2017) was adopted by the BWS Board of Directors in August 2014. The Effective Utility Management Manual, June 2008 (Appendix B, page 23) cited in the audit report, was used as the framework identify areas for improvement. Using the self-assessment tool, the strategic plan identified Communications and Customer Service as particular areas of focus. To ensure that the goals and objectives in the strategic plan are met, the following key actions plans have been identified:

- Communications:
  - Use multi-media to keep internal and external stakeholders informed of BWS programs, project and plans
  - Increase educational workshops and tours to instill better understanding of the importance of water stewardship
  - Broaden the BWS message of the Value of Water
- Customer Service:
  - Develop customer service standards
  - Implement process improvement procedures
  - Develop and implement a Quality Assurance Program which will include
    - Call monitoring
    - Performance measures

- Customer feedback process

BWS strives to continuously improve operational efficiency and is currently developing the BWS Water Master Plan which includes an infrastructure condition assessment, 30-Year Capital Improvement Program and financial and rate study to identify ways to extend the life of the existing infrastructure as well as determine where attention and funding can be best invested to maintain water quality and safety, ensure system reliability and carefully balance infrastructure needs with affordability for customers. The Water Master Plan will also include a comprehensive communications plan to provide outreach to various stakeholders on the Water Master Plan and obtain feedback to ensure that the plan incorporates and addresses the needs of the community.

This includes efforts to inform and engage stakeholders in BWS water issues as well as establishing a stakeholder focus group to acquire input and feedback on the implementation of the Water Master Plan.

Charter Amendment and Governance:

BWS appreciates the extensive research and survey performed by the audit staff in the area of governance. We are pleased that the research did not find a compelling reason to alter the existing governance structure and we agree with the City Auditor's opinion, "*while there are areas for BWS improvement, citizens are unlikely to realize significant benefit with a transfer to city management.*" (Chapter 6, Page 55)

Below are comments to the specific recommendations cited in Chapter 7 of the report:

City Auditor Report: The Board of Water Supply should:

1. Consult with other public and private utilities about their experiences prior to launching new initiatives that may impact the public.

   BWS Response: BWS has been increasing outreach to other utilities to discuss and compare processes and "lessons learned" to improve operations. BWS and HECO executives meet annually and their staff meets quarterly. BWS management also meets quarterly with the Managers of the other County water departments.

   BWS also is a member of the AWWA and the American Metropolitan Water Agencies (AMWA), an organization of the largest publicly owned water utilities in the United States. We continually participate in surveys and questionnaires conducted by both agencies to gain and share knowledge of the operations and best business practices of other water utilities across the nation.

2. Improve planning, conduct risk assessments, and establish a formal action plan to mitigate problems when launching future initiatives that may impact the public.

   BWS Response: BWS actively pursues improvements in its operations, and accepts this recommendation as valuable feedback which we can utilize moving forward. Although planning, risk assessments, and problem mitigation is always considered and

undertaken, future BWS initiatives, both IT or non-IT related, that may impact the public will undergo an additional level of scrutiny. In particular, contingency planning and risk mitigation aspects will be thoroughly examined for the appropriate steps to minimize any impact to the public.

In the area of IT initiatives, further rigor in policies and procedures governing system development projects are currently being implemented. Additionally, the BWS has also formed an IT Executive Steering Committee comprising all BWS Division Executives to ensure decision-making occurs at the right levels regarding goals, policies, standards, and priorities for BWS IT investments. The committee also provides oversight of IT and input in the areas of strategic alignment, value realization, resource investment and risk management.

3. Provide adequate resources in the BWS call center and added support staff before activating the system.

   BWS Response: The BWS agrees that identifying resource requirements and properly preparing to support its staff and customers is essential to any change. We will proactively seek information and input from leaders and resources both in and outside of our industry, community groups, and customer segments, as appropriate.

   BWS managers and staff from the Customer Care, Information Technology, Field Operations and Finance Division continue to meet bi-monthly to discuss and resolve issues that involve the Call Center operations, CC&B, and AMR systems.

4. Be proactive in identifying, preparing for, and addressing customer complaints.

   BWS Response: The BWS will begin incorporating customer feedback into its design processes, keeping the ratepayer top of mind. We realize that issues will arise during the course of our normal operations so our current efforts include regular cross-division communication and collaboration so that we can inform and equip our staff to respond to our customers' inquiries and needs.

5. Develop more customer service oriented policies and practices such as formal performance benchmarks and performance goals for call center activities so that customer complaints do not increase.

   BWS Response: Staff in our Customer Care Division have begun discussions and scheduled additional meetings for the express purpose of reviewing, evaluating, and identifying changes required of the BWS' policies and procedures and rules and regulations. A plan and timeline will be developed over the next month. We intend to involve stakeholders and take steady action towards addressing issues. The BWS is committed to providing a quality experience in every customer interaction.

6. Use available data to create reports that can be used to better manage BWS operations and programs.

BWS Response: As was indicated in #2 above, this is an area where IT will facilitate the reporting needs of the BWS Divisions and Programs, to mitigate risks and problems, and improve management of operations and programs.

7. Adopt best practices by justifying and communicating water rates and charges for future rate increases.

   BWS Response: BWS continues to, and strives to fully implement the AWWA Manual of Water Supply Practice M1 Principles of Water Rates Fees and Charges, Sixth Edition". This manual provided guidance and advice using the "*Ten step approach to public involvement*" (Chapter VII.1, Page 287) to establish a methodology to ensure that various stakeholder interests are addressed in the development of potential rate increases.

   In addition, we are in the process of developing our Water Master Plan which incorporates a comprehensive communication, financial policies and rate-setting plan and will include an extensive community input component to obtain feedback to ensure that the plan incorporates the needs of the community and proposed water rates are well-substantiated and communicated.

8. Adopt best practices by developing and implementing a formal public involvement plan for future rate increases.

   BWS Response: BWS continues to, and strives to fully implement the AWWA Manual of Water Supply Practice M1 Principles of Water Rates, Fees and Charges, Sixth Edition". This manual provided guidance and advice using the "*Ten step approach to public involvement*" (Chapter VII.1, Page 287) to establish a methodology to ensure that various stakeholder interests are addressed in the development of potential rate increases.

   In addition, we are in the process of developing our Water Master Plan which will include an extensive communication and public engagement and involvement strategy.

9. Improve transparency by accounting for how revenues collected from outside agencies are allocated to appropriate fixed costs, and, as appropriate, reduce customer charges to reflect the payments made by ENV, Kauai County, and Maui County.

   BWS Response: BWS respectfully disagrees with this finding. The ENV, Kauai County and Maui County reimbursement costs information were provided to the auditor.

   Maui and Kauai County Water Departments are assessed a postage charge that is reflected as credit to BWS postage account and reduces BWS's postage expenditures. They are also assessed a "per bill" charge which covers reimbursement of their proportionate share of IT staff time with related overhead, computer hardware replacement, billing service fees and software license fees. This per bill charge is recorded as miscellaneous revenues and identified as a contribution offsetting the total cost of billing service.

Specific to ENV is an assessment of a capital recovery fee which is their proportionate share of the amortized cost of the CC&B system. This fee is recorded as a reduction of the cost of the capital cost of the CC&B system, and reduces the cost of the CC&B system to BWS ratepayers. ENV is also billed a base charge which includes their proportionate share of IT, customer service and accounting staff services with related overhead, meter reading services, and computer hardware replacement. This revenue is recorded as a contribution in aid and identified a contribution offsetting the total cost of billing service.

10. Justify the monthly billing charges. If the charges cannot be substantiated, the BWS, as appropriate, should refund the monthly billing charges back to the water customers as cash or credits to the water customer accounts.

    BWS Response: BWS respectfully disagrees with this finding. Our monthly billing charges and expenditures are justified.

    In addition to our cost of service study and the 24 AWWA format worksheets, BWS provided the auditors with a copy of Council Resolution 13-62 that included a spreadsheet on the projected budget for projected revenues to be collected from the billing service charge for Fiscal Years 2012 - 2016. BWS also gave the auditors an updated spreadsheet with actual expenditures to validate revenues collected by the monthly billing charge.

    The monthly billing charge is a fixed cost associated with furnishing water service to the customer. It pays for CC&B software costs, vendor billing services, AMR and meter equipment and maintenance, and BWS staff services associated with providing customer account service.

    In developing the monthly billing fee, BWS follows the guidelines set in the AWWA M1 Manual of Water Supply Practice, Principles of Water Rates, Fees and Charges, Sixth Edition which states "*Customer costs comprise those costs associated with serving the customer irrespective of the amount or rate of water used. They include but are not limited to meter reading, billing, customer accounting, customer service, and collecting expense as well as maintenance and capital costs related to meters and services.*" (Chapter II.6, Page 62)

11. Streamline the AMR and re-reading process.

    BWS Response: BWS is making continuous improvements in the AMR and re-reading process.

    - Currently, BWS is working with the AMR vendor to pilot new procedures to identify problems and improve AMR drive-by performance. Preliminary results show an increase of about 5% in the drive-by meter reading rate and eliminating the need for about 8,400 follow-up reads. Additionally, new products and technologies will be piloted in select areas to test improvements in signal strength and reliability of reads through the AMR drive-by system.
    - In June 2013, consultant services were secured to perform an AMR study to conduct an assessment of the current BWS AMR system and compare various meter reading options. The study will also recommend the most efficient, cost

effective meter reading system and implementation strategy for BWS. We anticipate completion of the study in early 2015.

12. Minimize manual readings and focus on repairing and maintaining the AMR system so that a higher water meter reading rate is attained for the AMR system.

    BWS Response: Recently, we have increased the AMR drive-by rate from 85% to 90% of our meters. Our goal is to increase the AMR drive-by meter reads to 95% or better and we are continuously working to improve repair and maintenance of the AMR system to achieve this.

    In October 2013, the administrative oversight of the maintenance team was transferred to our Field Operations Division. Recently they have started to utilize a new report made available by the AMR manufacturer that can more accurately diagnose malfunctions with individual water meter units. This will allow us to focus our service efforts where they will have the biggest effect and avoid unnecessary service calls. As the maintenance team fine tunes the components of the AMR system, we anticipate that the AMR drive-by read rate will increase.

13. Improve the process in which work orders are managed and communicated between the Maximo, CC&B, and Sensus Auto Read systems.

    BWS Response: IT is currently in the process of upgrading its work management system (Maximo), and through that upgrade project, we will be addressing the interfaces and data transmitted between the systems. The focus will be on accuracy of the data, and simplification of the data communication process.

14. Reduce overtime expenses and estimated billings by resolving the high AMR "no read" rate.

    BWS Response: BWS is cognizant of the need to reduce unnecessary expenses to maximize the use of ratepayer funds. We also recognize the importance of providing our customers with accurate and timely water bills and will continue to use all resources available to ensure that quality of service.

    We continually assess our operations and adjust staff scheduling to control costs. Recently, our AMR drive-by meter reading rate has improved from 85% to 90%. We anticipate as we implement procedures to improve the AMR system, overtime costs will decrease accordingly.

15. Adopt industry best practices by conducting periodic customer surveys and focus groups, and use the data to improve BWS operations. Surveys can be conducted through monthly billing surveys, on-line using Survey Monkey, or other on-line applications.

    BWS Response: BWS agrees that it's necessary to measure the quality of the service we provide and we will work to deploy online surveys and paper surveys for those who do not have email/Internet access. Additionally, keeping in mind the possibility of overrepresented satisfaction and dissatisfaction in such surveys, as cited in the Effective

Utility Management, June 2008 (Appendix C, page 28) referenced in the audit report, we will also look into other ways of obtaining stakeholder feedback.

16. Adopt industry best practices by conducting a risk assessment for workplace injuries, collect data, and report outcomes in the BWS human resources annual report.

    BWS Response: The BWS Human Resources Office (HRO) currently collects worker compensation information and will add these statistics to their annual report henceforth. The newly created Executive Support Office (ESO) will oversee the risk management and safety functions of the Department. ESO will perform risk assessment activities and the maintenance of workers compensation data will transfer from HRO to ESO in the near future.

17. Adopt industry best practices by evaluating a feasibility of offering alternative water rates to low income households, senior citizens, and other disadvantaged groups.

    BWS Response: BWS is currently developing a Water Master Plan to identify ways to extend the life of the existing infrastructure and determine investment strategies to carefully balance water quality, infrastructure needs and affordability for customers. The Water Master Plan will include a financial plan and rate study which will incorporate a "lifeline" or "hardship" subsidy analysis. The program costs to support a discounted rate for fixed and low income customers would ultimately be subsidized by customers not receiving such assistance. Therefore it is necessary to carefully research and justify the true cost of such program to all of our rate payers.

    Since over 80% of our customers have a combined water (BWS) and sewer (ENV) bill, we will need to engage ENV and the City Council in discussions about alternative rate options in this area.

18. Adopt industry best practices by establishing a formal communications program with the City Council and selected members of the executive branch to inform them of BWS activities, particularly those that directly impact citizens. This can be done with face-to-face meetings, memos, or other communication tool specific to these stakeholders.

    BWS Response: BWS will continue its current practice of proactive, open and timely communications with members of the City Council and City Administration to inform them of BWS activities. The BWS currently meets weekly with the City Administration and also provides updates on BWS issues via email, face-to-face meetings, and memorandums to the City Administration and City Council. Earlier this year, the BWS launched its customer newsletter, Water Matters, to increase awareness of the value of water and encourage interaction with elected officials and ratepayers.

19. Formally adopt performance benchmarks, collect data, and report it to the board and public on a regular basis. The performance benchmarks could be formal guidelines for its call center, such as picking up a call by the third ring, abandon call rate of 2%, call wait time of 2-5 minutes, calls lasting no more than 8 minutes.

BWS Response: The newly adopted 3-Year Strategic Plan establishes the direction of the Department and includes key action plans to achieve the goals and objectives identified in the plan. BWS Management is revising current Board reports to incorporate additional metrics to show progress for each of the objectives described in the plan. Additionally, BWS will continue to participate in the annual American Water Works Association (AWWA) Benchmarking Survey. This nationally recognized survey is published annually and provides a performance measurement system specific to water and wastewater utilities to help utilities continuously improve operational and managerial effectiveness.

As the audit report indicates, call center metrics are available. The BWS is in the process of defining performance metrics and enhancing its reporting process.

20. Establish written policies or procedures in accordance with Section 7-105(f), RCH, related to real property transactions.

    BWS Response: As recommended, BWS will establish a Board policy and written procedures of real property disposal in accordance with Section 7-105(f), RCH.

21. Request BFS to review and affirm BWS' disbursement policy, as required in Section 7-111, RCH.

    BWS Response: As recommended, BWS will request BFS to review and affirm BWS's established disbursement policy and procedures to ensure that both BWS and BFS are in compliance with Section 7-111, RCH.

22. Any charter amendment to modify the structure of the Board of Water supply is a policy decision.

    BWS Response: BWS appreciates the extensive research and survey performed by the audit staff in the area of governance. We are pleased that the research did not find a compelling reason to alter the existing governance structure and we agree with the City Auditor's opinion, "*while there are areas for BWS improvement, citizens are unlikely to realize significant benefit with a transfer to city management.*" (Chapter 6, Page 55)

Attached is a more detailed response to correct specific discrepancies and clarify misunderstandings within the report.

BWS appreciates the opportunity to work with you and your staff to enhance our operations and services to the citizens of O'ahu. This independent audit indicates that overall, the BWS is upholding our responsibility to the community to preserve and protect our water resources and provide dependable and affordable water today and for generations to come.

Very truly yours,

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

Mr. Edwin S.W. Young
September 5, 2014
Page 12

ATTACHMENT

Chapter 1: Audit Results

City Audit Report: "BWS billing fees and services charges are not substantiated and could be reduced"

BWS Response: BWS respectfully disagrees with this finding. Our monthly billing charges and expenditures are justified.

In addition to our cost of service study and the 24 AWWA format worksheets, BWS provided the auditors with a copy of Council Resolution 13-62 that included a spreadsheet on the projected budget for projected revenues to be collected from the billing service charge for Fiscal Years 2012 - 2016. BWS also gave the auditors an updated spreadsheet with actual expenditures to validate revenues collected by the monthly billing charge.

The monthly billing charge is a fixed cost associated with furnishing water service to the customer. It pays for CC&B software costs, vendor billing services, AMR and meter equipment and maintenance, and BWS staff services associated with providing customer account service.

In developing the monthly billing fee, BWS follows the guidelines set in the AWWA M1 Manual of Water Supply Practice, Principles of Water Rates, Fees and Charges, Sixth Edition which states "*Customer costs comprise those costs associated with serving the customer irrespective of the amount or rate of water used. They include but are not limited to meter reading, billing, customer accounting, customer service, and collecting expense as well as maintenance and capital costs related to meters and services.*" (Chapter II.6, Page 62)

Chapter 2: BWS Call Center was overwhelmed

City Auditor Report: "Customer complaints covered billing errors, exorbitant bill amounts, long waits, customer complaint volume, dropped calls and no follow-up on complaints."

BWS Response: BWS acknowledges there were challenges with the initial implementation of its new billing system. However, BWS did implement a procedure to follow-up on complaints. During the period when the BWS Call Center was experiencing a higher number of calls, BWS was concerned about the increasing number of customer complaints and created an escalation team comprising of Customer Care management staff to follow-up on customer inquiries. A complaint log recording issues across the organization was developed and monitored and expectations regarding response and resolution timeframes were established. The escalation team responded to the customer within three to five business days. Many of the inquiries required involvement from Finance's pre-audit staff who responded within three business days. Complex cases and those that required special handling were personally handled by the pre-audit supervisor.

Also, an operator pool was established to allow customers to quickly reach a BWS employee who would record their request which would be followed up later by the customer service representative in the Call Center.

Mr. Edwin S.W. Young
September 5, 2014
Page 13

Chapter 3: BWS Billing Fee and Service Charges are not Substantiated

City Auditor Report: "BWS was unable to provide the data we requested to support the rate increases."

BWS Response: BWS respectfully disagrees with the audit findings that BWS was unable to readily provide the data to support the monthly billing charge. BWS provided the City Auditor the following documents:

- American Water Works Associated (AWWA) Cost of Service Study that included financial worksheets that determined the consumption and billing service charges in accordance with the AWWA's M1 Manual of Practice – Principles of Water Rates, Fees and Charges, Sixth Edition.
- 24 AWWA worksheets which clearly identified BWS cost of service, revenue requirements, rate setting details entitled:
    - 5 year projected Operating Expenses
    - Cash Funding Analysis
    - Bond Funding Analysis
    - Adjusted Cost of Service per Unit
    - Cost of Service Adjustments
    - Revenues
    - Normalization of Potable Maximum Day and Maximum Hour Extra Capacity
    - Cost Component Unit Costs
    - Cost Components to Customer Class
    - System Functions to Cost Components
    - Revenue Requirement by Functional Class
    - Allocation Factors
    - Allocation Basis
    - Allocation of Fixed Charges
    - Allocation of Equipment
    - Allocation of Materials and Supplies
    - Allocation of Personnel Services
    - Allocation of Positions
    - Allocation by Functional Class
    - Allocation by Budget to Functional Class
    - Annual Operating Budget Summary
    - Blended Actual with Budget
    - Adjusted Annual Operating Budgets
    - Annual Operating Budget
- BWS annual budget and expenditure data for FY 2009 to FY 2013 that included nine reports entitled:
    - Budget versus actual by: Division and Object, Business Unit, Business Unit - 12 months.
    - Total BWS: Summary, Cost Object, Encumbrance, Encumbrance Detail by Business Unit, Expenditure by Business Unit, 12 month expenditures by Business Unit.
- Audited annual financial statements that are available on the internet at our website: www.honolululuboardofwatersupply.org and previously transmitted to City Council and Administration for fiscal years 1999 to 2013.

- Monthly Balance Sheet and Statements of Revenues, Expenses and Changes in Net Assets that are available on the internet at HBWS.org for the period 2005 – 2014.
- Annual costs less the payments by ENV and the Water Departments of Kauai and Maui Counties incurred against the revenues collected as proposed to the rate study
- Cost of Service Study for Honolulu Board of Water Supply by Tokumoto & Company, CPAs LLC, June 2011
- Final Report of Draft BWS Assessment of Capital and Operating Needs – Capital Improvement Program Review, prepared in association with Tokumoto & Company by RW Beck, April 2011

Chapter 3: BWS monthly charges should be adjusted for other revenues collected

City Auditor Report: "BWS was unable to clearly show its billing charges and costs were adjusted to reflect the revenue paid by ENV to the Board of Water Supply for its billing services...BWS was unable to show how the excess revenues were used or if O`ahu ratepayer charges were adjusted for these services and surplus."

BWS Response: BWS respectfully disagrees with this finding. ENV, Kauai County and Maui County reimbursement costs were provided to the auditors.

Maui and Kauai County Water Departments are assessed a postage charge that is reflected as credit to the BWS postage account and reduces BWS's postage expenditures. They are also assessed a "per bill" charge which covers reimbursement of their proportionate share of IT staff time with related overhead, computer hardware replacement, billing service fees and software license fees. This per bill charge is recorded as miscellaneous revenues and identified as a contribution offsetting the total cost of billing service.

Specific to ENV is an assessment of a capital recovery fee which is their proportionate share of the amortized cost of the CC&B system. This fee is recorded as a reduction of the cost of the capital cost of the CC&B system and reduces the cost of the CC&B system to BWS ratepayers. ENV is also billed a base charge which includes their proportionate share of IT, customer service and accounting staff services with related overhead, meter reading services and computer hardware replacement. This revenue is recorded as a contribution in aid and identified a contribution offsetting the total cost of billing service.

Chapter 3: BWS is unable to readily justify the rate increases

City Auditor Report: "BWS staff and managers were unable to provide adequate and sufficient data that justified the increase in its individual and monthly charges."

- BWS Response: BWS respectfully disagrees with this finding. In addition to our cost of service study and the 24 AWWA format worksheets, BWS provided the auditors with a copy of Council Resolution 13-62 that included a spreadsheet on the projected budget for projected revenues to be collected from the billing service charge for Fiscal Years 2012 - 2016. BWS also gave the auditors an updated spreadsheet with actual expenditures to validate revenues collected by the monthly billing charge, the Cost of Service Study for Honolulu Board of Water Supply by Tokumoto & Company, CPAs LLC,

June 2011, and the Final Report of Draft BWS Assessment of Capital and Operating Needs – Capital Improvement Program Review, prepared in association with Tokumoto & Company by RW Beck, April 2011

The monthly billing charge is a fixed cost associated with furnishing water service to the customer. It pays for CC&B software costs, vendor billing services, AMR and meter equipment and maintenance, and BWS staff services associated with providing customer account service. In developing the monthly billing fee, BWS follows the guidelines set in the AWWA M1 Manual of Water Supply Practice, Principles of Water Rates, Fees and Charges, Sixth Edition which states "*Customer costs comprise those costs associated with serving the customer irrespective of the amount or rate of water used. They include but are not limited to meter reading, billing, customer accounting, customer service, and collecting expense as well as maintenance and capital costs related to meters and services.*" (Chapter II.6, Page 62)

Chapter 3: BWS monthly billing charges cannot be justified

City Auditor Report: "As a result, we concluded, BWS cannot effectively monitor charges to determine whether they are too high, too low, or justified."

BWS Response: BWS respectfully disagrees with this finding. In addition to our cost of service study and the 24 AWWA format worksheets, BWS provided the auditors with a copy of Council Resolution 13-62 that included a spreadsheet on the projected budget for projected revenues to be collected from the billing service charge for Fiscal Years 2012 - 2016. BWS also gave the auditors an updated spreadsheet with actual expenditures to validate revenues collected by the monthly billing charge.

The monthly billing charge is a fixed cost associated with furnishing water service to the customer. It pays for CC&B software costs, vendor billing services, AMR and meter equipment and maintenance, and BWS staff services associated with providing customer account service.

In developing the monthly billing fee, BWS follows the guidelines set in the AWWA M1 Manual of Water Supply Practice, Principles of Water Rates, Fees and Charges, Sixth Edition which states "*Customer costs comprise those costs associated with serving the customer irrespective of the amount or rate of water used. They include but are not limited to meter reading, billing, customer accounting, customer service, and collecting expense as well as maintenance and capital costs related to meters and services.*" (Chapter II.6, Page 62)

Chapter 4: AMR drive-by

City Auditor Report: "Manual reads are not always accurate. For example, a meter reading recorded at 872,000 was actually 372,000."

BWS Response: BWS has a system in place to minimize erroneous readings. The auditors participated in a ride-alongs with a BWS meter reader to observe the equipment and procedures used to collect meter readings using the AMR drive-by and the hand-held device. During the ride-alongs the meter reader was able to obtain 100% of the readings assigned that day using either the AMR drive-by or the hand-held device. Since all of the meter reads collected during the ride-along were correct, the auditors requested that the meter reader enter an incorrect

meter read into the hand-held device and he complied. This was for demonstration purposes only and did not result in an incorrect meter read uploaded into the system.

While the meter reader demonstrated that it is possible to enter an incorrect reading into the hand-held device, BWS has built checks into the billing process to intercept these errors before a bill is generated.

- The hand-held device is programmed to alert the meter reader if the meter reading is outside of a certain range. If the reading is higher or lower than the expected reading, the device will alert the meter reader and require confirmation before accepting the read.
- CC&B is programmed to alert the pre-audit clerk of unusually high/low reads by generating notifications for meter reads that exceeds the bill maximum amount thresholds and low readings. The pre-audit clerk reviews these notifications daily and forwards them to the appropriate division for follow up and resolution.

Chapter 4: AMR "No Reads" are high despite the AMR process

City Auditor Report: "Of these "no reads", 38,868 had a "no read" code of *Skip"* attached to it."

BWS Response: The *"Skip"* code was created by BWS Information Technology staff during the switch from bi-monthly to monthly billing to align the read-to-read and bill-to-bill days in CC&B and adjust for the 26-34 day meter reading window for generating monthly bills. It was an operational adjustment and does not indicate that the meter reader skipped the meter. During the period of January 18, 2013 to August 27, 2014, the "Skip" code was not used as a reason for a "no read".

Chapter 4: "No Reads" resulted in a high number of estimated bills

City Auditor Report: "The number of accounts requiring manual meter reads and reviews grew so high that BWS staff was unable to handle the volume within the billing review period."

BWS Response: This statement is incorrect. The number of "no reads" did not result in a high number of estimated bills. The average number of no reads between February 2013 and August 2014 was 2%. As discussed in Chapter 2, "BWS eventually identified one cause of the billing errors", BWS discovered a meter reading upload error was overwriting and erasing previous water meter entries as a result of a software configuration and led to the high number of estimated bills. This upload error was discovered in April 2013 and corrected within 4 days. Because the Pre-Audit staff was not able to review and correct the number of estimated bills that were created, a high volume of estimated bills were mailed to the customers. As seen by the graph – Exhibit 4.9: Estimated Residential Water Bills (June 2012 to January 2014), the correction made in April significantly reduced the number of estimated bills beginning in May 2013.

Chapter 4: Customer Care and Billing System (CIS/CC&B) does not facilitate AMR monitoring

City Auditor Report: "The new BWS CIS/CC&B billing system lacks the ability to generate useful historical information."

BWS Response: Historical meter read information is retained with CC&B. Standard reports and functions such as "To Dos" and field activity assignments are available and used by BWS staff on a daily basis. Custom reports and queries are used to facilitate AMR monitoring. The assessment of actions to be taken to improve the AMR system has been implemented based on the historical information available from the BWS CIS/CC&B billing system.

Chapter 5: BWS complies with most industry best practices, but needs to focus on customer service.

City Auditor Report: BWS, however, should take a more active role in reaching out to its customers and stakeholders rather than asking them to come to BWS.

BWS Response: BWS is the only city agency besides HFD and HPD that regularly participates at most of the Neighborhood Board meetings. BWS has a representative at these meetings to inform the public of BWS activities and upcoming events that affect BWS customers such as rate increases, Customer Consumer Reports, and construction projects. They also address community concerns and report back at subsequent Neighborhood Board meetings on the resolution of these concerns. Since the meetings are publicized, open to the public and sometimes televised on 'Olelo, BWS has found the monthly Neighborhood Board meetings to be effective in conveying information and awareness of BWS activities and programs to the general public. During the transition to CC&B and monthly billing, BWS Management proactively attended several Neighborhood Board meetings to give presentations and address customer comments and billing concerns.

Chapter 5: BWS needs to improve communications with City Council

City Audit Report: "In March 2014, BWS began collecting on those delinquent accounts...The administrator acknowledged that BWS did not notify anyone at the City Council about their collection plans."

BWS Response: This statement is incorrect. BWS provided communication to its Board and to the City Council as noted in another statement in the report which reads:

> *"BWS provides ad hoc communications to the City Council, such as when it notified City Council members that BWS would commence its delinquent collection process..."*

Also, BWS sent two emails, dated March 14, 2014 and April 8, 2014, to Council Chair Martin informing the Council that BWS would be commencing with the collection of delinquent accounts on March 18, 2014. Chair Martin acknowledged and thanked BWS for the notification via email on April 17, 2014.

Chapter 6: Charter Amendment and Governance is a Policy Decision

City Audit Report: "If BWS operations and resources are transferred to the city, the City Council will have to ensure BWS current assets and cash reserves are protected and used only for BWS capital improvements such as replacing sewer and water infrastructure."

Mr. Edwin S.W. Young
September 5, 2014
Page 18

BWS Response: This statement is partially incorrect. BWS does not fund sewer infrastructure projects.

This page intentionally left blank.

Appendix A
Revised Charter of Honolulu Section 7 and Revised Ordinances of Honolulu, Chapter 30

This table compares BWS policies, procedures, and operations against select provisions of the Revised Charter of Honolulu and Revised Ordinances of Honolulu as they relate to BWS management and operations.

Exhibit A1.1
Revised Charter of Honolulu, Section 7

	Revised Charter of Honolulu, Section 7	BWS has a policy, procedure, or practice in place	BWS policy, procedure, or practice is consistent with its mission
1	Section 7-103, 3(a): The department shall make studies, surveys, investigations and estimates relating to the locations and sources of water supply within the city, the amounts available for current and prospective uses, the water resources which may be made available for such uses and the maximum productivity of such sources.	√	√
2	Section 7-103, 3(b): The department shall investigate, examine, inspect and ascertain the manner and extent of use or other disposition of any water by any person irrespective of ownership thereof and any machinery, pump or other plant or equipment and conduits, pipes or other means used for the elevation, transmission or distribution of water, upon either public or private property and, in the case of wells, ascertain, as far as practicable, the depth thereof, depth and thickness of the different strata penetrated, pressure, quantity, quality or chemical composition of the water, and the general conditions surrounding the same, including encasement, capping and other equipment or means of control thereof.	√	√
3	Section 7-103, 3(c): The department shall devise ways and means for the economic distribution and conservation of water.	√	√
4	Section 7-103, 3(d): Make contracts necessary or convenient to execution and performance of its powers, duties, and functions.	√	√
5	Section 7-105 (d): Determine the policy for construction, additions, extensions and improvements to the water systems of the city which shall include a long range capital improvement program covering a period of at least six years which may be amended or modified by the board from time to time	√	√

	Revised Charter of Honolulu, Section 7	BWS has a policy, procedure, or practice in place	BWS policy, procedure, or practice is consistent with its mission
6	Section 7-105(e): Have the authority to acquire by eminent domain, purchase, and lease or otherwise, in the name of the city, all real property or any interest therein necessary for the construction, maintenance, repair, extension or operation of the water systems of the city. The City Council shall take no action to acquire real property or any interest therein for the department without the written approval of the board.	√	√
7	Section 7-105(f): Have the authority to recommend to the City Council the sale, exchange or transfer of real property or any interest therein which is under the control of the department. The City Council shall take no action to dispose of such property without the prior approval of the board, and all proceeds from the disposition of such property shall be paid into the special fund of the department.	**No**	**No**
8	Section 7-105(g): Have the authority to enter into arrangements and agreements, as it deems proper for the joint use of poles, conduits, towers, stations, aqueducts, and reservoirs, for the operation of any of the properties under its management and control.	√	√
9	Section 7-105(h): Have the authority to issue revenue bonds under the name of “board of water supply.”	√	√
10	Section 7-105(i): Modify, if necessary, and approve and adopt annual operating and capital budgets submitted by the manager and chief engineer.	√	√
11	Section 7-105(j)(1): Rules for the regulation of water systems and necessary appurtenances for subdivisions and other properties and requirements for adequate water supply and storage facilities for domestic use and fire protection.	√	√
12	Section 7-105(j)(2): Rules for the prevention of waste and pollution of water.	√	√
13	Section 7-105(j)(3): Rules for the manner in which new wells or shafts may be bored, drilled or excavated, cased and capped or recased.	√	√
14	Section 7-105(j)(4): Rules for the manner in which wells or shafts shall be maintained, controlled and operated to prevent waste of water or the impairment of potability.	√	√
15	Section 7-105(j)(5): Rules for the limitation to beneficial uses of all water.	√	√
16	Section 7-105(j)(6): Rules relating to times of shortage or threatened shortage of water or of danger to potability of the water of any ground water basin or area by overdraft on such basin, the restriction of the drawing of water in all wells supplied from such basin on a basis proportionate to the proper and beneficial uses served by them respectively.	√	√

	Revised Charter of Honolulu, Section 7	BWS has a policy, procedure, or practice in place	BWS policy, procedure, or practice is consistent with its mission
17	Section 7-105(j)(7): Rules related to other matters having for their object the proper conservation and beneficial use of water resources available for the city.	√	√
18	Section 7-105(k): Hear appeals from the order of the manager and chief engineer refusing, suspending or revoking any permit for the sinking, drilling or reopening of any well or shaft for the development of underground water supply.	√	√
19	Section 7-106(a): manager and chief engineering shall administer the affairs of the department, including the rules and regulations adopted by the board.	√	√
20	Section 7-106(b): manager and chief engineer shall grant, suspend or revoke permits under conditions prescribed by the rules and regulations for the drilling, casing, recasing or reopening of any well or shaft for the development of underground water.	√	√
21	Section 7-106(h): manager and chief engineer shall maintain proper accounts in such manner as to show the true and complete financial status of the department and the results of management and operation thereof.	√	√
22	Section 7-106(i): manager and chief engineer shall prepare annual operating and capital budgets.	√	√
23	Section 7-106(j): manager and chief engineer shall prescribe rules and regulations as are necessary for the organization and internal management of the department.	√	√
24	Section 7-107(2): The department shall be subject to the centralized purchasing and disposal of personal property provisions of this charter.	√	√
25	Section 7-107(3): The department shall come within the purview of the performance audit conducted by the managing director and such audits as may be required by the City Council or conducted by the city auditor	√	√
26	Section 7-108: The accounts and financial status of the department shall be examined annually by a certified public accountant whose services shall be contracted, and the result of such examination shall be reported to the board, the City Council and the mayor.	√	√
27	Section 7-109: The board shall have the power to fix and adjust reasonable rates and charges for the furnishing of water and for water services so that the revenues derived there from shall be sufficient to make the department self-supporting.	√	√
28	Section 7-109: All water furnished to the city or any department thereof shall be charged to the respective departments and collected at the regular rates established by the board.	√	√

	Revised Charter of Honolulu, Section 7	BWS has a policy, procedure, or practice in place	BWS policy, procedure, or practice is consistent with its mission
29	Section 7-109: There shall be no free water, except as authorized by the State.	√	√
30	Section 7-110: The board shall hold public hearings prior to fixing and adjusting rates and prior to the adoption of the budget.	√	√
31	Section 7-111: The department shall make its own collections, but all receipts shall be paid daily into the city treasury and maintained in a fund separate and apart from any other funds of the city.	**No**	**No**
32	Section 7-111: All moneys expended by the department shall be disbursed with the written approval of the department according to the procedures prescribed by BFS.	√	√
33	Section 7-112: The board may provide for the accumulation of funds for the purpose of financing major replacements, or extensions and additional to the water systems, the average estimated annual increment to which, for a period of ten years, shall not exceed fifteen percent of the gross revenues of the water systems of the department in any fiscal year.	√	√
34	Section 7-114: Whenever there are on deposit with the director of budget and fiscal services funds belonging to the department in an amount greater than is necessary for the immediate needs of the department, the director shall, upon the direction of the board, deposit such funds in such depositories as provided by law for the city. All interest received by the director upon the funds so deposited shall be credited to the department. All interest from all other moneys of the department on deposit in any bank shall likewise be credited to the department.	√	√
35	Section 7-115: The board may require an individual or blanket bond in such amount as it shall deem proper for any or all employees, which bond shall be duly conditioned for the faithful performance of duties, and the board may provide that the premium on the bond be paid out of the revenues of the department.	√	√
36	Section 7-118(1): Any order of the manager and chief engineer refusing any permit or suspending or revoking any permit for the sinking, drilling or reopening of any well or shaft for the development of underground water shall be subject to an appeal there from to the board. The board shall have power to review and to affirm, modify or reverse any decision or order of the manager and chief engineer so appealed from. Such appeal shall be taken within ten days after service of the order of the manager and chief engineer.	√	√

Exhibit A1.2
Revised Ordinances of Honolulu, Chapter 30

	Revised Ordinances of Honolulu Chapter 30	BWS Policy, Procedure, or Practice	Does BWS Policy, Procedure, or Practice Comply?
1	Section 30-1.6: The Department of Planning and Permitting, working in conjunction with BWS, shall be responsible for the preparation of updates to the regional watershed management plans.	Although there are no formal policies and procedures, DPP complies with the ROH requirement as stated in the O`ahu Management Plan Overview	Yes
2	Section 30-2.2: BWS to establish an O`ahu Water Plan	O`ahu Water Management Plan Overview	Yes
3	Section 30-2.3: Based on the findings and projections in the O`ahu water management plan, provisions for adequate supply of water to meet island wide needs for at least twenty years shall be addressed.	O`ahu Water Management Plan Overview	Yes
4	Section 30-2.3(c)(1): Strategy One. Develop water resources in consonance with the general plan population projections and the land use policies contained in the development plans and depicted on the development plan use maps. Priority shall be given to affordable housing projects shown on the development plan land use maps or processed under HRS Chapter 201E.	O`ahu Water Management Plan Overview	Yes
5	Section 30-2.3(c)(2): Strategy Two. Continue to safely develop the remaining available groundwater in accordance with the requirements of the state water code.	O`ahu Water Management Plan Overview	Yes
6	Section 30-2.3(c)(3): Strategy Three. Use surface water more effectively and efficiently.	O`ahu Water Management Plan Overview	Yes
7	Section 30-2.3(c)(4): Strategy Four. Continue to refine the near and long-term projections of agriculture on the island to more accurately project the future net release of water currently committed to agricultural use.	O`ahu Water Management Plan Overview	Yes

	Revised Ordinances of Honolulu Chapter 30	BWS Policy, Procedure, or Practice	Does BWS Policy, Procedure, or Practice Comply?
8	Section 30-2.3(c)(5): Strategy Five. Maintain and ongoing water conservation program through the board, using such approaches as pricing, public information, educational programs, water saving devices, and use restrictions and allocations.	O`ahu Water Management Plan Overview	Yes
9	Section 30-2.3(c)(6): Strategy Six. Develop and use nonpotable water sources, wherever feasible, for the irrigation of agricultural crops, parks and golf courses, landscaping and for certain industrial uses.	O`ahu Water Management Plan Overview	Yes
10	Section 30-2.3(c)(7): Strategy Seven. Continue efforts to develop economical methods of demineralizing brackish water and desalting seawater.	O`ahu Water Management Plan Overview	Yes

Appendix B

Board of Water Supply Call Center Statistics (February 2013 – January 2014)

Period Ending	No. of Calls	Calls Handled	% Handled	Calls Abandoned	% Abandoned	Max Call Waiting Times (Minutes)
02/8/2013	813	629	77%	184	23%	18
02/15/2013	906	625	69%	281	31%	30
02/22/2013	1243	694	56%	549	44%	44
03/1/2013	1153	685	59%	468	41%	47
03/08/13	1031	617	60%	414	40%	43
03/15/13	778	519	67%	259	33%	48
03/22/13	786	547	70%	239	30%	27
03/29/13	1121	656	59%	465	41%	41
04/05/13	1023	629	61%	394	39%	44
04/12/13	749	556	74%	193	26%	23
04/19/13	749	527	70%	222	30%	30
04/26/13	788	550	70%	238	30%	35
05/03/13	758	543	72%	213	28%	41
05/10/13	661	450	68%	210	32%	36
05/17/13	700	477	68%	224	32%	41
05/24/13	729	515	71%	214	29%	36
05/31/13	903	583	65%	319	35%	46
06/07/13	979	543	55%	436	45%	72
06/14/13	1327	703	53%	624	47%	73
06/21/13	1131	556	49%	575	51%	86
06/28/13	1097	507	46%	590	54%	99
07/05/13	1149	576	50%	573	50%	106
07/12/13	1158	553	48%	604	52%	98
07/19/13	1231	518	42%	714	58%	114
07/26/13	1247	494	40%	752	60%	102
08/02/13	1233	538	44%	695	56%	104
08/09/13	1131	469	41%	662	59%	79
08/15/13	1329	499	38%	831	63%	66

Period Ending	No. of Calls	Calls Handled	% Handled	Calls Abandoned	% Abandoned	Max Call Waiting Times (Minutes)
08/23/13	1236	581	47%	654	53%	75
08/30/13	1275	563	44%	712	56%	73
09/06/13	1258	492	39%	766	61%	95
09/13/13	1002	442	44%	560	56%	83
09/20/13	934	423	45%	511	55%	78
09/27/13	1145	886	77%	259	23%	32
10/04/13	1305	946	72%	359	28%	35
10/11/13	1478	1096	74%	382	26%	38
10/18/13	1363	1175	86%	188	14%	18
10/25/13	1374	1246	91%	128	9%	16
11/01/13	976	931	95%	46	5%	5
11/08/13	797	748	94%	49	6%	5
11/15/13	801	773	97%	28	3%	2
11/22/13	530	520	98%	10	2%	1
11/29/13	592	581	98%	11	2%	1
12/06/13	620	606	98%	14	2%	2
12/13/13	446	441	99%	5	1%	1
12/20/13	446	442	99%	4	1%	1
12/27/13	506	499	99%	8	2%	2
01/03/14	696	676	97%	20	3%	5
01/10/14	618	591	96%	27	4%	4
01/17/14	526	517	98%	9	2%	3
01/24/14	619	591	95%	27	4%	5

Appendix C
Ten Attributes of Effectively Managed Water Sector Utilities

1. **Product Quality**

   Produces potable water, treated effluent, and process residuals in full compliance with regulatory and reliability requirements and consistent with customer, public health, and ecological needs.

2. **Customer Satisfaction**

   Provides reliable, responsive, and affordable services in line with explicit, customer-accepted service levels. Receives timely customer feedback to maintain responsiveness to customer needs and emergencies.

3. **Employee and Leadership Development**

   Recruits and retains a workforce that is competent, motivated, adaptive, and safe-working. Establishes a participatory, collaborative organization dedicated to continual learning and improvement. Ensures employee institutional knowledge is retained and improved upon over time. Provides a focus on and emphasizes opportunities for professional and leadership development and strives to create an integrated and well-coordinated senior leadership team.

4. **Operational Optimization**

   Ensures ongoing, timely, cost-effective, reliable, and sustainable performance improvements in all facets of its operations. Minimizes resource use, loss, and impacts from day-to-day operations. Maintains awareness of information and operational technology developments to anticipate and support timely adoption of improvements.

5. **Financial Viability**

   Understands the full life-cycle cost of the utility and establishes and maintains an effective balance between long-term debt, asset values, operations and maintenance expenditures, and operating revenues. Establishes predictable rates—consistent with community expectations and acceptability—adequate to recover costs, provide for reserves, maintain support from bond rating agencies, and plan and invest for future needs.

6. **Infrastructure Stability**

   Understands the condition of and costs associated with critical infrastructure assets. Maintains and enhances the condition of all assets over the long-term at the lowest possible life-cycle cost and acceptable risk consistent with customer, community, and regulator-supported service levels, and consistent with anticipated growth and system reliability goals. Assures asset repair, rehabilitation, and replacement efforts are coordinated within the community to minimize disruptions and other negative consequences.

7. **Operational Resiliency**

   Ensures utility leadership and staff work together to anticipate and avoid problems. Proactively identifies, assesses, establishes tolerance levels for, and effectively manages a full range of business risks (including legal, regulatory, financial, environmental, safety, security, and natural disaster-related) in a proactive way consistent with industry trends and system reliability goals.

8. **Community Sustainability**

   Is explicitly cognizant of and attentive to the impacts its decisions have on current and long-term future community and watershed health and welfare. Manages operations, infrastructure, and investments to protect, restore, and enhance the natural environment; efficiently uses water and energy resources; promotes economic vitality; and engenders overall community improvement. Explicitly considers a variety of pollution prevention, watershed, and source water protection approaches as part of an overall strategy to maintain and enhance ecological and community sustainability.

9. **Water Resource Adequacy**

   Ensures water availability consistent with current and future customer needs through long-term resource supply and demand analysis, conservation, and public education. Explicitly considers its role in water availability and manages operations to provide for long-term aquifer and surface water sustainability and replenishment.

10. **Stakeholder Understanding and Support**

    Engenders understanding and support from oversight bodies, community and watershed interests, and regulatory bodies for service levels, rate structures, operating budgets, capital improvement programs, and risk management decisions. Actively involves stakeholders in the decisions that will affect them.

Source: *Effective Utility Management: A Primer for Water and Wastewater Utilities, June 2008*

Appendix D
City Comparisons

Cities	Number of Customers Serviced	Ownership/Management/Operations Board
Honolulu	Water/wastewater-144,660; Water only- 24,299; Sewer only- 2,294	7 members- 5 by mayor/approved by council, DTS & DFM directors. Board appoints BWS manager
San Antonio	Water- 460,000; Wastewater- 411,000	7 members- mayor plus 6 members appointed by the City Council
San Diego	280,000 metered water service connections	
Dallas	Water & wastewater services to 2.4 million people in Dallas & 27 communities	
Indianapolis	Natural gas, water & wastewater services to more than 1 million customers	Non-partisan 5 member Board of Trustees- make nominations to both boards, appointed by mayor; Non-partisan 9 member Board of Directors- oversight of management & long-term direction; Indiana Utility Regulatory Commission and other agencies
San Jose	San Jose has the following three water retailers, each with its own service areas.	
San Jose Municipal Water System	100,000 customers	
San Jose Water Co.	1 million served	
Great Oaks Water Co.	20,000 customers	
Austin	890,000 customers	7 member Water and Wastewater Commission-appointed by and advises the city council
Jacksonville	Electric - 420,000; Water - 305,000; Sewer - 230,000	7 member board of directors appointed by the mayor and confirmed by the city council
San Francisco	2.6 million customers	5 member Public Utilities Commission (PUC) nominated by the mayor and approved by the Board of Supervisors
Columbus	1.1 million residents	
Fort Worth	757,810 residents; 350,000 residents from 30 wholesale customers	
Charlotte	805,242 customers	7 member advisory committee (1 appointed by mayor; 3 by city council; 3 by county commissioners)
Detroit	1 million served in Detroit; 3 million served in other counties	7 water commissioners appointed by the mayor (4 represent Detroit, 3 represent other counties)
El Paso	192,063 customers	7 member Public Service Board of trustees (four- year terms). 6 members appointed by city council, and the 7th member is the mayor
Memphis	257,000 customers	5 member Board of Water Commissioners appointed by mayor and approved by City Council for a three year term
Boston	1 million	3 member board of commissioners (four-year staggered terms) appointed by the mayor and confirmed by the city council
Seattle	1.3 million	
Denver	1.3 million	5 member Board of Water Commissioners appointed by mayor to staggered six year terms
Washington D.C.	600,000 customers	11 principal members and 11 alternate members: Comprised of 6 DC representatives and alternates, appointed by the mayor and confirmed by city council. The remaining 5 representatives and alternates are from surrounding jurisdictions, appointed by the mayor.
Nashville	176,000 accounts	
Baltimore	1.8 million	
Louisville	850,000 customers	6 member Board of Water Works appointed by mayor and whose four year terms are staggered. Myor also serves as an ex-officio member.
Portland	935,000 customers	
Oklahoma City	580,000	
Atlanta	1 million	
Los Angeles	4 million residents	5 member Board of Water and Power Commissioners, appointed by the Mayor and confirmed by the City Council
Palo Alto		7 member Utilities Advisory Commission appointed by the City Council and serve three year terms
Philadelphia	1.7 million; 471,916 accounts	Commissioner appointed by the Managing Director of the City with the approval of the Mayor

Cities	Ownership/Management/Operations				
	City	Private	Other	Budget Approval	Rate Approval
Honolulu			Semi- Autonomous	Board of Directors, Board of Water Supply	Board of Directors, Board of Water Supply
San Antonio	Owned by city			Board of Trustees, San Antonio Water System	Board of Trustees, San Antonio Water System AND City Council
San Diego	Under the self-sustainable Public Utilities Dept			City Council	City Council
Dallas	Self-sustainable not-for-profit department			City Council	City Council
Indianapolis		Citizens Energy Group- utility service company operating as a public charitable trust	Board of Trustees & Board of Directors are fully accountable to state and local elected officials and regulators		Indiana Utility Regulatory Commission
San Jose	San Jose has the following three water retailers, each with its own service areas.				
San Jose Municipal Water System	Owned and operated by the city			City Council	City Council
San Jose Water Co.		Regulated by California PUC			California Public Utilities Commission
Great Oaks Water Co.		Regulated by California PUC			California Public Utilities Commission
Austin	Owned and operated by the city			City Council	City Council
Jacksonville			Not-for-profit, community-owned	City Council	Board of Directors, JEA
San Francisco	PUC is a self sustaining enterprise department of the City and County of San Francisco			San Francisco Public Utilities Commission (SFPUC) Commission	San Francisco Public Utilities Commission (SFPUC) Commission
Columbus	Under the Dept of Public Utilities			City Council	City Council
Fort Worth	Department under the mayor and city council			City Council	City Council
Charlotte	Self-sustaining department of the City of Charlotte			City Council	City Council
Detroit	Department under the City of Detroit			City Council	City Council and Board of Water Commissioners
El Paso				Water Utilities Public Service Board	Water Utilities Public Service Board
Memphis	Division of City of Memphis			City Council	City Council
Boston	Independent agency of the City of Boston			Boston Water and Sewer Commission	Boston Water and Sewer Commission
Seattle				City Council	City Council
Denver		Independent entity from the City of Denver		Board of Water Commissioners	Board of Water Commissioners
Washington D.C.	Independent authority of D.C.			Board of Directors, District of Columbia Water and Sewer Authority	Board of Directors, District of Columbia Water and Sewer Authority
Nashville	Department of the County			City Council	City Council
Baltimore	Bureau under the Department of Public Works			City Council	Baltimore City Board of Estimates
Louisville	Owned by city			Board of Water Works	Board of Water Works
Portland	Bureau under the City of Portland			City Council	City Council
Oklahoma City				City Council	
Atlanta	Department under the City of Atlanta			City Council	City Council
Los Angeles	Department under the City of Los Angeles			Board of Water and Power Commissioners, Department of Water and Power of the City of Los Angeles	City Council and Mayor
Palo Alto	Owned by city				City Council
Philadelphia	Department under the City of Philadelphia			City Council	Water Commissioner, Philadelphia Water Department

Cities	Combined Bill		Bill Payments		Est. Bill		Affordability Programs (discounts, rebates)
	With Waste Water/ Sewer	With Other	Monthly	Bimonthly	Yes	No	
Honolulu	√		√		√		--
San Antonio	√	Stormwater fee- $3.22/mo (up to 4,999 sq.ft. billing unit)	√		√		$3.63 to $13.63 monthly discount for qualified low-income residents.
San Diego	√	Storm Drain Fee		√	√		--
Dallas	√	Storm water quality fee; Sanitation fee	√		√		Operation WaterShare-donations for families temporarily unable to pay water bills; Free minor plumbing repairs & fixture replacement-low-income
Indianapolis	√	Gas	√		√		--
San Jose	San Jose has the following three water retailers, each with its own service areas.						
San Jose Municipal Water System		Garbage; Recycling; Yard trimmings		√	--		--
San Jose Water Co.				√	--		15% discount for low income households
Great Oaks Water Co.				√	--		--
Austin	√	Drainage; Electricity; Solid waste; Street service	√		--		Customer Assistance Discounts-low or fixed incomes; Services for medically vulnerable; Free home energy improvements-low to moderate income
Jacksonville	√	Electricity; Irrigation	√		√		--
San Francisco	√		√	√	√		Low Income Assistance - 15% discount on water and 35% discount on sewer
Columbus	√	Storm water	Billed Quarterly		√		Low Income Discount - 20% off water & sewer usage charges; Senior Discount - water base fees (daily service charges) are waived
Fort Worth	√	Garbage and recycling collection	√				Low Income Bill Assistance Program: Maximum of $300/yr for water/sanitation bills. Maximum of $1,000/yr for plumbing repairs
Charlotte	√	Storm water	√			√	--
Detroit	√		Billed quarterly, but approved for monthly		√		
El Paso	√		√		--		--
Memphis	√	Fire Protection	√		--		--
Boston			√		√		25% discount for senior citizens (65+) and disabled persons
Seattle			√		√		50% credit on water bill for low income customers
Denver	√		√		√		--
Washington D.C.	√	PILOT fee; Right-of-Way fee; Stormwater fee	√		--		Backup water valve rebate up to $6,000
Nashville	√		√		--		--
Baltimore	√		Billed quarterly		--		Low Income and Senior Citizens
Louisville			√		√		--
Portland	√		√[a]		√		Bill discounts for income eligible households
Oklahoma City	√		√		√		--
Atlanta			√		--		Low Income Senior Citizens Discount - 30% on water and sewer bills
Los Angeles				√	--		Low Income Discount Program; Senior Citizens, Disability Discounts on water bills
Palo Alto			√		--		--
Philadelphia	√	Storm water fee; Wastewater charge	√		--		25% Senior Discount rate on water and sewer bill

[a] Portland also offers customers the option of quarterly or bi-monthly billing.

Cities	2013/2014 Residential Water Rates (A+B+C=D)				Criteria used to calculate residential water bill
	Monthly 5/8" Base Charge (A)	Monthly Usage Charge (B)	Monthly Service/Misc. Fees (C)	Estimated monthly charge-10,000 gal (D)[b]	
Honolulu	$7.70	$3.68 per 1000 gallons for first 13,000 gallons	--	$44.50	Water consumption; Property Use
San Antonio	$7.14	$0.0948 per 100 gal for first 5,985 gal, $0.1372 per 100 gal for next 6,732 gal	Fee-$0.03425 per 100 gal; Fee-$0.18/mo	$21.93	Water consumption; Meter size; Standard or seasonal rate type; Inside or outside city limits
San Diego	$19.33	$3.612 per 748.05 gallons for first 10,472.7 gallons	--	$67.62	Water consumption; Meter size
Dallas	$4.65	$1.80 per 1000 gal for first 4000 gal, $3.77 for 4001 to 10,000 gal	--	$34.47	Water consumption; Meter size
Indianapolis	$9.63	$2.719 per 748.05 gallons for first 11,220.78	--	$45.98	Water consumption; Meter size
San Jose	San Jose has the following three water retailers, each with its own service areas.				
San Jose Municipal Water System	$11.27	$2.567 per 748.05 gallons for 0-14 HCF	5% utility tax	$47.31	Water consumption; Meter size; Elevation
San Jose Water Co.	$17.70	$2.6141 & $2.8745 per 748.05 gal for 0-13 & over 13 ccf, respectively	1.5% PUC surcharge, 5% utility tax, surcharges and other fees	$59.78	Water consumption; Meter size
Great Oaks Water Co.	$9.64	$2.144 & $2.3222 per 748 gal for 0-13 & 13-32 ccf, respectively	1.5% PUC surcharge, 5% utility tax, surcharges and other fees	$43.33	Water consumption; Meter size
Austin	$7.10 plus $7.45 (6001-11000 gal)	$1.84 (0-2000 gal); $3.39 (2001-6000 gal); $6.20 (6001-11000 gal) - Rates per 1000 gal	$0.15 per 1000 gallons surcharge	$58.09	Water consumption; Meter size
Jacksonville	$12.60	$0.93 (1-6 kgal); $2.60 (7-20 kgal) - Rates per kgal	Environmental-$0.37 per kgal; 3% franchise fee; 10% public service tax	$36.58	Water consumption; Meter size
San Francisco	$8.40	$4.20 (first 2244.16 gal); $5.50 (all additional gal) Rates per 748.05 gal	--	$78.02	Water consumption; Meter size
Columbus	$31.75	$2.596 for first 5 CCF, $2.886 over 5 CCF	$7.27	$76.16	Water consumption; Meter size
Fort Worth	$9.00	$1.97 & $2.80 per 748.05 gal for 1st 8 ccf & >8 to 20 ccf, respectively	--	$39.80	Water consumption; Meter size
Charlotte	--	$1.20 (1-4 ccf); $2.40 (5-8 ccf); $4.30 (9-16 ccf) Rates per ccf	Fixed Fee: $2.46; Availability Fee: $2.47 (5/8" meter)	$42.41	Water consumption
Detroit	$5.51	$20.71 (first 3000 cu.ft.) (Rate per 1000 cu.ft.)	--	$33.20	Water consumption; Meter size
El Paso	$5.18	$1.56 (per 4 CCF to 150% of AWC); $3.68 (over 150% to 250% of AWC); $5.27 (over 250% of AWC) *Charges based on Average Winter Consumption (AWC)	$6.39 (Water Supply Replacement Charge)	$28.92	Water consumption; Meter size
Memphis	$6.36	$1.505 per 100 cu. ft.	--	$26.48	Water consumption; Meter size
Boston	--	$6.23 per 1,000 gallons (first 19 days); $6.53 per 1,000 gallons (next 20 days)	--	$45.41	Usage charge
Seattle	$13.75	$5.13 (up to 5 CCF); $6.34 (next 13 CCF); $11.80 (over 18 CCF)	$4.99 Off Peak Usage	$27.95	Water consumption; Usage charge
Denver	$6.33	$2.59 (0-11,000 gallons); $5.18 (12,000-30,000 gallons); $7.77 (31,000-40,000 gallons); $10.36 (more than 40,000 gallons)	--	$33.38	Water consumption
Washington D.C.	$3.86	$4.83 per 1,000 gallons	$11.85 (Clean Water Impervious Area Charge)	$64.01	Water consumption; Meter size
Nashville	$3.13	Based on metered water consumption	9.25% sales tax	$45.72	Water consumption; Meter size
Baltimore	$12.26	$3.677 per Unit (748 gallons)	--	$61.42	Water consumption; Meter size
Louisville	$9.25	$2.40 per 1,000 gallons	--	$33.25	Water consumption; Meter size
Portland	$31.21	$3.441 per Unit (748 gallons)	--	$77.21	Water consumption; Meter size
Oklahoma City	$10.97	$2.65 per 1,000 gallons	$3.71 additional charge	$41.18	Water consumption; Meter size
Atlanta	$6.56	$2.58 (1-3 CCF); $5.34 (4-6 CCF); $6.16 (7 & Above CCF)	$0.15 (security surcharge)	$89.06	Water consumption; Meter size
Los Angeles	--	$4.725 (Tier 1 per HCF)	--	$63.17	Water consumption
Palo Alto	$14.67	$4.99 (tier 1 usage); $7.58 (tier 2 usage)	$6.00 (temporary unmetered service)	$27.09	Water consumption; Meter size
Philadelphia	$6.44	$37.12 (first 2 Mcf)	--	$56.07	Water consumption; Meter size

[b] Some jurisdictions have varying water rate structures. For purposes of this report, we used the first/minimum rate available.

Cities	2013 Residential Sewer Rates (A+B+C=D)				Criteria used to calculate residential sewer bill
	Monthly Base/ Minimum Charge (A)	Monthly Usage Charge (B)	Monthly Service/Misc. Fees (C)	Estimated monthly charge-10,000 gal (D)	
Honolulu	$65.76	$3.93 per 1000 gal (less 20% irrigation factor)	--	$97.20	Base charge; Volume charge-reduced by 20% irrigation factor; Irrigation Factor (20%)-water used to water plants, wash cars, and other water uses that don't enter the sewer
San Antonio	First 1496 gallon-$11.49	Over 1496 gal-$0.3047 per 100 gal	Fee of $0.06 per month	$37.45	Based on the average monthly use of water during 3 complete consecutive billing periods from mid-November through mid-March; Minimum charge; Usage charge
San Diego	$15.33	$3.5983 per 748.05 gallons	--	$63.44	Based on the lesser of 2 winter months billing cycles; Base charge; Usage charge
Dallas	$4.40	$4.90 per 1000 gallons	--	$53.40	Based on an average of water used during the previous winter months or the current month's water use, whichever is less; Base charge; Usage charge
Indianapolis	$8.55	$3.9585 per 1000 gallons for first 7500 gallons, $4.1614 per 1000 gallons for over 7500 gallons	--	$48.64	For May through September billings, based on the lesser of average of water used or delivered for previous 12 months, May through April or current actual water use; Base charge; Usage charge
San Jose	$33.83 - Monthly residential (single family residence) sewer service & use charge rate (FY13-14)				
San Jose Municipal Water System	--	--	--	--	--
San Jose Water Co.	--	--	--	--	--
Great Oaks Water Co.	--	--	--	--	--
Austin	$10.00	$4.32 (0-2000 gal); $8.94 (2001 & over)-Rate per 1 kgal	--	$90.16	Base charge; Usage charge
Jacksonville	$14.10	$4.94 (1-6 kgal); $6.02 (7-20 kgal)-Rates per kgal	Environmental-$0.37 per kgal; 3% franchise fee	$73.67	Base charge; Usage charge
San Francisco	--	$7.90 (first 3 discharge units/mo.); $10.53 (all additional discharge units)		$118.80	Discharge unit - metered water use multiplied by the flow factor (90% for single family residential users)
Columbus	$10.86	$3.72 per CCF	$3.62	$64.21	Water usage
Fort Worth	$5.10	$3.00 per 748.05 gallons	--	$45.21	Service charge based on meter size. Volume charge
Charlotte	--	$4.46 (up to 16 ccf) Rate per ccf	Fixed Fee: $2.46; Availability Fee: $4.56 (5/8" meter)	$66.64	Water usage
Detroit	$18.27	$42.50 per 1,000 cu. ft.	--	$75.09	Service charge based on meter size; Volume charge
El Paso	--	--	--	--	--
Memphis	--	--	--	--	--
Boston	--	$8.07 per 1,000 gallons (first 19 days); $8.32 per 1,000 gallons (next 20 days)	--	$57.99	Usage charge
Seattle	--	$11.75 per 100 CCF	--	$157.09	Water usage; Volume charge
Denver	--	$3.58 per 1,000 gallons	$9.79 Unit Minimum	$45.59	Usage charge
Washington D.C.	--	$5.89 per 1,000 gallons	--	$58.90	Usage charge
Nashville	$7.62	Based on metered water consumption	--	$101.87	Base charge; Usage charge
Baltimore	$49.44	$4.944 per Unit (748 gallons)	--	$115.54	Base charge; Usage charge
Louisville	--	--	--	--	--
Portland	--	$8.70 per cubic feet	--	$116.31	Usage charge
Oklahoma City	$3.13	$3.79 per 1,000 gallons	--	$41.03	Base charge; Usage charge
Atlanta	$6.56	$9.74 (1-3 CCF); $13.64 (4-6 CCF); $15.69 (7 & Above CCF)	--	$216.32	Base charge; Usage charge
Los Angeles	--	--	--	--	Water usage
Palo Alto	--	$29.31 domestic dwelling unit	--	$29.31	Base charge
Philadelphia	$6.36	--	--	$6.36	Combined monthly charge with water

Cities	Contacting Customer Services	Website Content/Public Info	
		Financial Transparency	Other Content & Info (agendas, minutes)
Honolulu	Phone: 7:45AM-4:30PM, Monday-Friday, 24 hours/7days a week for emergencies; Email; Online & electronic forms	Budget, financial audits, bond statements, balance sheets, statement of revenues, expenses & change in net assets	Board meeting notices and minutes. Public may request BWS records, fees apply
San Antonio	4 customer center locations, 8:00AM-5:00PM, Monday-Friday; Phone: business hours, 24 hours/7 days a week for emergencies; Email	CAFR, annual budget, monthly financial reports, annual reports, quarterly reports	Board meeting agendas
San Diego	Customer care helpline: 7:30AM-5:00PM, Monday-Friday; Email; Emergency hotline	CAFR accessed through City of San Diego website	Independent Rates Oversight Committee (advisory body to the mayor and city council) agenda, minutes, and annual reports
Dallas	Phone: 8:00AM-5:00PM, Monday-Friday; 24 hours/7days a week for emergencies	Dallas Water Utilities' financial statements accessed through City of Dallas transparency website	--
Indianapolis	Online submission; Phone: 7:00AM-7:00PM, Monday-Friday, 9:00AM-1:00PM, Saturday; Customer service lobby: 8:00AM-6:00PM, Monday-Friday, 9:00AM-12:00PM, Saturday; Crisis hotline	Financial statements and reports	Board schedule, agenda and minutes
San Jose	San Jose has the following three water retailers, each with its own service areas.		
San Jose Municipal Water System		CAFR accessed through City of San Jose website	
San Jose Water Co.	Phone: Everyday 8:00AM-5:30PM, 24 hours/7days a week for emergencies	Annual report accessed through San Jose Water Co. website	
Great Oaks Water Co.	After hours emergency line; By email	Annual report accessed through California Public Utilities Commission website	
Austin	24-hour emergency service number; Online customer care; Phone: Mon-Fri, 7:00AM-9:00PM; By email	CAFR accessed through City of Austin website	--
Jacksonville		Annual report accessed through JEA website	Videos of board meetings
San Francisco			Live streaming video of Commission meetings; Agenda and minutes
Columbus	24-hour emergency service number; Phone: Mon-Fri, 7:00AM-6:00PM; Hearing Impaired; Email; Fax		
Fort Worth	24-hour customer service line; By email; By mail; Online; In-person	CAFR accessed through City of Fort Worth website	--
Charlotte	24-hour customer service line; By email; Online	CAFR accessed through City of Charlotte website	Advisory Committee annual report and meeting minutes
Detroit	Call center (M-F, 8:30 AM - 5:00 PM); 3 customer service centers; Emergency service line - 24/7		Board of Water Commissioners public hearing notices; Newsletters; Press releases; Online videos
El Paso	Phone: Mon-Fri 8:00AM-5:00PM; 24/7 Emergency Line; By email	CAFR accessed through City of El Paso Water Utilities website	Public service board live video web casts; Agendas, scheduled meetings; News releases
Memphis	Phone: Mon-Fri 7:00AM-7:00PM; Web Chat: Mon-Fri 9:00AM-5:00PM	CAFR accessed through City of Memphis website	Live streaming videos of Commissioners' meetings; Agenda and minutes; News releases
Boston	Phone; By email	Annual report accessed through Boston Water and Sewer Commission	Commission Meetings
Seattle	Phone: Mon-Fri 7:30AM-6:00PM; 24/7 Emergency Line; In person	Financial Statements accessed through Seattle website	Meeting schedules, agenda, notes, presentations, work plans
Denver	Phone; By email	CAFR accessed through City of Denver Water website	Board meetings, agenda and minutes
Washington D.C.	Phone: Mon-Fri 8:00AM-5:00PM; By email	CAFR accessed through D.C. Water website	Videos of board meetings; Newsletter, brochures and presentations (publications)
Nashville	Phone: 24/7 Hotline; By email; In-person: Mon-Fri 8:00AM-5:00PM	CAFR accessed through City of Nashville website	Meeting agendas and minutes
Baltimore	Phone; By email; In person	CAFR accessed through City of Baltimore website	Press releases; Public notices; Brochures, Maps and Publications
Louisville	Phone: Mon-Fri 8:00AM-7:00PM; By email; By mail; By fax; In-person: Mon-Fri 8:00AM-5:00PM	Annual Report accessed through City of Louisville Water Company website	Meeting agendas and minutes
Portland	Phone; By email; In person	CAFR accessed through City of Portland website	Meeting agenda and minutes; News releases
Oklahoma City	Phone: Mon-Fri 7:00AM-6:00PM; By email; In-person: Mon-Fri 8:00AM-6:00PM	Annual Financial Report accessed through City of Oklahoma Water Utilities website	Meeting agendas and minutes
Atlanta	Phone or email	CAFR accessed through City of Atlanta website	Press releases
Los Angeles	Phone: Mon-Fri 7:00AM-7:00PM, Sat 7:00AM-2:00PM, 24/7 emergency line; By email In-person: Mon-Fri 9:00AM-5:00PM	CAFR accessed through City of Los Angeles website	Board of Commissioners' meeting agendas, minutes and video
Palo Alto	Phone and Walk-In: Mon-Thurs 7:30AM-5:30PM, Fri 8:00AM-5:00PM	CAFR accessed through City of Palo Alto website	Public meetings
Philadelphia	Phone: Mon-Fri 8:00AM-5:00PM, 24 hours/7days a week for emergencies	CAFR accessed through City of Philadelphia website	Commission meetings; Newsletter

Cities	Financial Statements (2012)			
	Operating Revenues	Operating Expenses	Operating Income/(Loss) Operating Revenues - Operating Expenses	Operating Ratio Operating Expense / Revenues
Honolulu	$159,507,729	$158,723,650	$784,079	99.51%
San Antonio	$438,527,289	$339,509,894	$99,017,395	77.42%
San Diego	$408,119,000	$346,687,000	$61,432,000	84.95%
Dallas	$527,374	$355,714	$171,660	67.45%
Indianapolis	$170,856,000	$125,704,000	$45,152,000	73.57%
San Jose	San Jose has the following three water retailers, each with its own service areas.			
San Jose Municipal Water System	$28,472,000	$29,259,000	-$787,000	102.76%
San Jose Water Co.	$261,547,000	$206,250,000	$55,297,000	78.86%
Great Oaks Water Co.	$14,022,525	$10,613,215	$3,409,310	75.69%
Austin	$442,707,000	$286,379,000	$156,328,000	64.69%
Jacksonville	$1,908,382,000	$1,426,429,000	$481,953,000	74.75%
San Francisco	$342,101,000	$304,562,000	$37,539,000	89.03%
Columbus	$178,345,000	$125,800,000	$52,545,000	70.54%
Fort Worth	$345,444,000	$284,101,000	$61,343,000	82.24%
Charlotte	$292,836,000	$191,093,000	$101,743,000	65.26%
Detroit	$336,129,945	$261,807,648	$74,322,297	77.89%
El Paso	$175,447,596	$147,123,862	$28,323,734	83.86%
Memphis	$86,382,000	$72,029,000	$14,353,000	83.38%
Boston	$303,062,836	$265,800,603	$37,262,233	87.70%
Seattle	$213,474,169	$163,397,428	$50,076,741	76.54%
Denver	$282,557,000	$201,410,000	$81,147,000	71.28%
Washington D.C.	$440,566,000	$343,037,000	$97,529,000	77.86%
Nashville	$200,762,485	$163,524,402	$37,238,083	81.45%
Baltimore	$132,340,000	$114,937,000	$17,403,000	86.85%
Louisville	$158,046,893	$109,328,401	$48,718,492	69.17%
Portland	$130,911,138	$92,855,724	$38,055,414	70.93%
Oklahoma City	$195,132,062	$130,253,086	$64,878,976	66.75%
Atlanta	$466,052,000	$302,587,000	$163,465,000	64.93%
Los Angeles	$811,897,000	$650,984,000	$160,913,000	80.18%
Palo Alto	$31,467,000	$27,830,000	$3,637,000	88.44%
Philadelphia	$601,801,000	$392,942,000	$208,859,000	65.29%

Cities	Financial Statements (2012)			
	Operating Revenues	Operating Expenses	Operating Income/(Loss) Operating Revenues - Operating Expenses	Operating Ratio Operating Expense / Revenues
Honolulu	$159,507,729	$158,723,650	$784,079	99.51%
San Antonio	$438,527,289	$339,509,894	$99,017,395	77.42%
San Diego	$408,119,000	$346,687,000	$61,432,000	84.95%
Dallas	$527,374	$355,714	$171,660	67.45%
Indianapolis	$170,856,000	$125,704,000	$45,152,000	73.57%
San Jose	San Jose has the following three water retailers, each with its own service areas.			
San Jose Municipal Water System	$28,472,000	$29,259,000	-$787,000	102.76%
San Jose Water Co.	$261,547,000	$206,250,000	$55,297,000	78.86%
Great Oaks Water Co.	$14,022,525	$10,613,215	$3,409,310	75.69%
Austin	$442,707,000	$286,379,000	$156,328,000	64.69%
Jacksonville	$1,908,382,000	$1,426,429,000	$481,953,000	74.75%
San Francisco	$342,101,000	$304,562,000	$37,539,000	89.03%
Columbus	$178,345,000	$125,800,000	$52,545,000	70.54%
Fort Worth	$345,444,000	$284,101,000	$61,343,000	82.24%
Charlotte	$292,836,000	$191,093,000	$101,743,000	65.26%
Detroit	$336,129,945	$261,807,648	$74,322,297	77.89%
El Paso	$175,447,596	$147,123,862	$28,323,734	83.86%
Memphis	$86,382,000	$72,029,000	$14,353,000	83.38%
Boston	$303,062,836	$265,800,603	$37,262,233	87.70%
Seattle	$213,474,169	$163,397,428	$50,076,741	76.54%
Denver	$282,557,000	$201,410,000	$81,147,000	71.28%
Washington D.C.	$440,566,000	$343,037,000	$97,529,000	77.86%
Nashville	$200,762,485	$163,524,402	$37,238,083	81.45%
Baltimore	$132,340,000	$114,937,000	$17,403,000	86.85%
Louisville	$158,046,893	$109,328,401	$48,718,492	69.17%
Portland	$130,911,138	$92,855,724	$38,055,414	70.93%
Oklahoma City	$195,132,062	$130,253,086	$64,878,976	66.75%
Atlanta	$466,052,000	$302,587,000	$163,465,000	64.93%
Los Angeles	$811,897,000	$650,984,000	$160,913,000	80.18%
Palo Alto	$31,467,000	$27,830,000	$3,637,000	88.44%
Philadelphia	$601,801,000	$392,942,000	$208,859,000	65.29%

Note: Data in this entire table (pages 103 to 110) reflects the most recent available information posted on each city/ agency's website, unless otherwise specified.

Appendix E
City Council Resolution 13-201, FD1

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

No. 13-201, FD1

RESOLUTION

REQUESTING THE CITY AUDITOR TO PERFORM A COMPREHENSIVE MANAGEMENT AND PERFORMANCE AUDIT OF THE BOARD OF WATER SUPPLY.

WHEREAS, the Board of Water Supply ("BWS") is a semi-autonomous agency with the following characteristics:

- The BWS mission is to manage Oahu's municipal water supply and distribution system, with full and complete authority to manage, control, and operate Oahu's water systems;
- The BWS supplies approximately 150 million gallons of water a day to roughly one million customers through an intricate system of 94 active potable water sources, 170 reservoirs, and nearly 2,100 miles of pipeline islandwide;
- The BWS has sole discretion to set water charges, whereas the City Council sets charges and fees for all other City services;

and

WHEREAS, in October 2006, the Office of the City Auditor ("City Auditor") released an audit report of selected management issues at the BWS (Report No. 06-07) that raised a number of concerns, including the inability of the BWS to adequately devote resources to growing maintenance and repair needs while awarding bonuses and salary increases to BWS executives, and project management and accounting deficiencies. These and other findings resulted in the City Auditor making sixteen recommendations to address problems and issues; and

WHEREAS, the City Auditor issued an audit recommendations status report in May 2011 (Report No. 11-04) that noted that all sixteen audit recommendations were either completed, resolved or dropped, which highlighted the need for the audit, its findings, and subsequent recommendations as seen in the actions and compliance of the BWS in response to the audit recommendations; and

WHEREAS, since the 2006 BWS audit report, new and troubling issues and concerns have arisen, including the following:

- Reports that the recent change from a bimonthly billing system to a monthly billing system has resulted in the doubling of a service fee that ratepayers expected to be halved, and, in fact, is anticipated to increase in the future;

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

No. 13-201, FD1

RESOLUTION

- Reports that the BWS has recently charged ratepayers an estimated billing amount instead of the amount based on actual usage, resulting in confusion and frustration for water users;
- Concerns regarding the efficiency of BWS strategic planning;
- Concerns regarding the economy, effectiveness, and efficiency of BWS operations;
- Concerns regarding the costs of BWS operations; and
- Concerns regarding the frequency of BWS water line breaks due to aging infrastructure;

and

WHEREAS, the City Council finds an updated audit is needed to go beyond City Auditor Report No. 06-07; now, therefore,

BE IT RESOLVED by the Council of the City and County of Honolulu that the City Auditor is requested to perform a comprehensive management and performance audit of the Board of Water Supply; and

BE IT FURTHER RESOLVED that the Council requests the City Auditor to report its findings and recommendations on concerns and issues including, but not limited to, the following determinations:

- Whether management policies and procedures fulfill the BWS mission and benefit Honolulu taxpayers;
- What performance measurements are utilized that adequately gauge the effectiveness and efficiency of BWS operations;
- Which financial tools and controls are in place that provide assurance that the BWS is using taxpayer funds effectively and efficiently;
- Whether the status and powers of the BWS as a semi-autonomous agency should be maintained;
- What problems were associated with the new billing system implementation, including conversion from bi-monthly to monthly billing and increased meter reading responsibilities;

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII

No. 13-201, FD1

RESOLUTION

- Whether the BWS can improve operational efficiency and effectiveness and reduce costs by: 1) improving its management policies and/or procedures; 2) improving customer service, especially by decreasing call wait times; 3) comparing costs and operations with other water jurisdictions; and 4) improving transparency through better communications with the public and the Council; and

- Whether the BWS rate structure is fair to all customers when comparing BWS rates, water costs and operational costs with similar jurisdictions that are water providers;

and

BE IT FINALLY RESOLVED that copies of this Resolution be sent to the Mayor, the Managing Director, the Chair of the Board of Water Supply, and the City Auditor of the City and County of Honolulu.

INTRODUCED BY:

Ron Menor

DATE OF INTRODUCTION:

August 22, 2013
Honolulu, Hawaii

Councilmembers

CITY COUNCIL
CITY AND COUNTY OF HONOLULU
HONOLULU, HAWAII
CERTIFICATE

RESOLUTION 13-201, FD1

Introduced: 08/22/13 By: RON MENOR

Committee: PUBLIC WORKS AND SUSTAINABILTIY

Title: RESOLUTION REQUESTING THE CITY AUDITOR TO PERFORM A COMPREHENSIVE MANAGEMENT AND PERFORMANCE AUDIT OF THE BOARD OF WATER SUPPLY.

Voting Legend: * = Aye w/Reservations

09/25/13	PUBLIC WORKS AND SUSTAINABLILITY	CR-289 – RESOLUTION REPORTED OUT OF COMMITTEE FOR ADOPTION.
10/09/13	COUNCIL	RESOLUTION AMENDED TO FD1. 9 AYES: ANDERSON, CHANG, FUKUNAGA, HARIMOTO, KOBAYASHI, MANAHAN, MARTIN, MENOR, PINE. CR-289 AND RESOLUTION 13-201, FD1 WERE ADOPTED. 9 AYES: ANDERSON, CHANG, FUKUNAGA, HARIMOTO, KOBAYASHI, MANAHAN, MARTIN, MENOR, PINE.

I hereby certify that the above is a true record of action by the Council of the City and County of Honolulu on this RESOLUTION.

BERNICE K. N. MAU, CITY CLERK

ERNEST Y. MARTIN, CHAIR AND PRESIDING OFFICER