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BOARD OF WATER COMMISSIONERS

June 28, 2019

Mr. Christopher Wiseman, Superintendent  
Cotuit Fire District Water Department  
P.O. Box 451  
4300 Falmouth Road  
Cotuit, MA 02635

Subject: Cost of Service and Water Rate Study  
T&H No. 5032

Dear Mr. Wiseman:

In accordance with our agreement, Tata & Howard, Inc. is pleased to present this letter report summarizing the cost of service and water rate study (rate study) for the Cotuit Fire District Water Department (Water Department). Water rates have not been reviewed or adjusted since 2005. The District collects annual revenue from its water customers based on these old rates and fees which do not generate sufficient funds to pay for the true cost of service for the water system. The revenue collected through the water rates is supplemented by District taxes each year to fund the additional water system expenses.

The cost of service and rate study was conducted to evaluate the true cost of service for the potable water system including annual operations and maintenance expenses, salaries, administrative costs, capital costs, and debt services. After determining the true cost of service to run the water system, the rate study evaluated the Water Department's current billing practices, existing rate and fee structures, and typical revenue collected through the water rates. The rate study estimated future expenses and determined the proposed rate structures and fees necessary to meet the future budgetary requirements. The rate study included an evaluation of the impact of the new rate changes on each tier of water customers based on water consumption and compared the water rates with surrounding towns and communities.

Water rates were evaluated for a five-year period, consisting of fiscal years (FY) 2020 through 2024. The results of the study are presented herein. For the purpose of this study, all projected costs presented for FY20 through FY24 are rounded to the nearest hundreds place to avoid reporting statistically insignificant figures.

## Background

The Cotuit Fire District (District) is located in the village of Cotuit in Barnstable, Massachusetts. The District is comprised of three Departments or Committees including the Fire Department,

the Prudential Committee, and the Water Department. The District maintains and employs its own Fire Department. The Prudential Committee is responsible for the finances and governing of the village. The Water Department operates and maintains the water system that supplies potable water to approximately 95-percent of the District and fire protection to 100-percent of the District. Customers that receive potable water are charged for their water usage based on the water rates set by the Board of Water Commissioners, and all property owners within Cotuit are charged District taxes for fire protection and District expenses. A full review and evaluation of the District finances and budget were required as part of this cost of service evaluation to identify the true allocation of expense costs between the water system (funded through the water rates) and the District (funded through taxes).

As stated in the American Water Works Association (AWWA) Manual for Water Supply Practices, a water supplier must provide adequate water service to its customers as well as receive sufficient revenue to provide for operation and maintenance, system upgrades, and maintenance of the supplier's financial integrity. This includes covering all cash needs, debt obligations, and basic expenses required for a water system. The Massachusetts Department of Environmental Protection (MassDEP) recommends each public water system (PWS) establish of an appropriate rate structure to maintain the prescribed service standards and to fully support all operations and maintenance costs for treating and delivering water to the customers, the system's debt service, and to meet future needs. MassDEP recommends a PWS review and adjust their water rates on a routine basis and at least once every five years to continue to self-support the water system.

### **Current Water Rates and Service Fees**

The Water Department currently charges all consumers on an annual basis. Usage rates are based on 1,000 gallon increments. Consumers are charged a flat minimum use bill of \$36 for the first 20,000 gallons of usage. Water consumption after the first 20,000 gallons is referred to as excess usage. The excess usage charge is an ascending block rate structure to encourage conservation among water users, as required by MassDEP. Table No. 1 identifies the existing annual water rate structure.

**Table No. 1**  
**Existing Annual Water Rate Structure**

<b>Water Usage (Gallons)</b>	<b>Rate/1,000 Gallons</b>
<b>Minimum Use Bill</b>	
0 – 20,000	\$36 (flat rate)
<b>Excess Usage Rates</b>	
20,001 – 40,000	\$1.80
40,001 – 80,000	\$2.45
80,001 – 120,000	\$2.70
120,001 & Greater	\$3.00

In addition, the Water Department charges a variety of non-rate revenue service fees for services requested or required by customers. These service fees contribute to the overall revenue collected to support the water system. The existing non-rate revenue service fees are identified in Table No. 2.

**Table No. 2**  
**Existing Non-Rate Revenue Service Fees**

Water Department Service	Non-Rate Service Fee
Service Connections	
5/8-Inch Meter	\$550
3/4-Inch Meter	\$550
1-Inch Meter	\$550 Plus Cost of Meter
2-Inch Meter	\$550 Plus Cost of Meter
Other Meter	\$550 Plus Cost of Meter
Basic Use <sup>1</sup>	\$600
Turn On/Off	\$35
Other	
Regular Hourly Rate <sup>2</sup>	\$35
Meter Readings	\$15
Repairs	Materials Cost Plus Hourly Rate (1 Hour Min.)
Backflow/Cross Connection	\$30
Hydrant Meter	\$35 Plus Usage (Billed at Highest Tier Rate)
Penalties	10% of Past Due Bill

1. The Basic Use fee is applied to new service connections at homes built after 1973.
2. The Regular Hourly Rate is applied to any other service not specifically identified in Table No. 2.

## Projected Budgets

A review and evaluation of the District's full budget was required to identify the true allocation of expense costs between the water system (to be funded through the water rates) and the District (to be funded through taxes). As a result of this evaluation, the water system's cost of service includes allocated expenses from the District budget comprised of five sources. The first expenses were those included in the Water Department's annual operation and maintenance budget to operate the water system. Information regarding the Water Department's operation and maintenance budget was obtained from the FY19 Prudential Committee Annual District Meeting (ADM) Financial Articles Funding Requests, prepared May 1, 2018. The ADM article identified the FY16 and FY17 expended budgets, the FY18 current budget, and FY19 requested budget. The FY19 requested budget was approved at the ADM in May 2018 and is the current budget in use by the Water Department through June 2019.

The water system's cost of service includes annual costs for any system improvements under the Capital Plan, and annual existing debt service payments for completed water system improvement projects. Capital Plan and debt service payment information was provided by the Water Department and District Treasurer.

The appropriate employee benefits, including health, dental, and life insurance benefits for current and retired employees, and other post-employment benefits were evaluated as part of the cost of service for the water system. Finally, administrative costs of the District were also reviewed to determine the costs associated with the water system's cost of service. Information was obtained from the FY19 Prudential Committee ADM Financial Articles Funding Requests and was clarified by the District Treasurer. Each aspect of the cost of service for the water system is presented below.

#### Projected Water Department Operation and Maintenance Budget

The Water Department's operation and maintenance budget includes expenses for daily operation of the water system including, but not limited to, Water Department staff salaries, maintenance costs, operations costs including electrical and chemical costs, engineering costs, and water service repair and replacement costs. The operations and maintenance budget for FY19 as included in the Prudential Committee ADM Financial Articles Funding Requests was used as the baseline to estimate annual operating expenses through FY24. Generally, historical trends were evaluated to determine if budget expenses were expected to increase in future years, as well as the rate of these increases. The annual rate increases applied to each budget line item used to determine the cost in future years are discussed herein. The Water Department's operations and maintenance budget for the study period is summarized in Table No. 3. The following is a list of assumptions made to project various line items in the budget for future years:

- Future Water Department salaries and wages were increased by three percent annually, including a step increase from a Level 3 (L3) to a Level 4 (L4) for the Office Manager in 2020, and a step increase from L3 to L4 for both Operator A and B in FY22.
- Salaries and wages identify a new Assistant Superintendent position, but there was no immediate plan to fill the position when this study was completed. After the cost of service and water rate study was completed, the Senior Operator position was eliminated, and the Assistant Superintendent position was filled. Based on similar annual salaries between the two positions, the change will not have a significant impact on the projected Water Department operations and maintenance budgets.
- The salaries and wages overtime line item includes estimated overtime costs and a fixed weekly on-call rate for operators. The overtime line item was estimated to increase by 1.5-percent annually based on historical costs and projected overtime hours for FY20 through FY24.
- Future Water Department maintenance expenses were generally projected to remain constant through the study period years, with the following line item deviations:
  - Water Testing budget line item was increased by three percent annually based on historical trends for testing costs.
  - Stations/Tanks budget line item was increased by two percent annually based on historical trends. The Station/Tanks line item does include the annual \$15,000 maintenance costs required by the USDA loan to be invested by the District into the maintenance of the West Street Tank.
- Future Water Department operation expenses were generally projected to remain constant through the study period years, with the following line item deviations:

- Gasoline/Engine Fuel and Telephone (internet) line items were expected to increase by one percent annually based on historical trends.
- Postage and Chemicals line items were expected to increase by two percent annually based on historical trends.
- Printing and Computer/Copier Supplies line items were increased by \$1,000 from FY19 to FY20 to account for the additional printing supplies expected to be needed by the Water Department to change from annual to bi-annual billing. A one percent annual increase was projected for the remaining study period years.
- Office Supplies line item was projected to gradually increase to \$1,000 in FY24.
- The Truck Repair line item remained constant through FY20, and includes an annual \$500 increase starting in FY21 after a new truck is purchased.
- The rate of increase for the Electricity line item was based upon the estimated pumping volumes for the water system in future years in accordance with the Water Management Act and water demand projections.
- The rate of increase for the Consumption Assessment line item was based upon \$8.50 per million gallons of water produced by the Water Department. The future cost in FY20 was based upon the finished water reported in the 2017 Annual Statistical Report (ASR), and the future cost in FY21 through FY24 was based upon the Department of Conservation and Recreation Office of Water Resources (DCR) future water consumption projections.
- The Conservation line item was projected to increase by \$100 annually.
- Future Water Department miscellaneous expenses were projected to remain constant through the study period years.

**Table No. 3**  
**Water Department Operation and Maintenance Budget**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<u>Salaries &amp; Wages</u>						
Superintendent	\$97,000	\$99,910	\$102,907	\$105,995	\$109,174	\$112,450
Assistant Superintendent	\$0	\$0	\$0	\$0	\$0	\$0
Senior Operator	\$69,070	\$71,142	\$73,276	\$75,475	\$77,739	\$80,071
Operator B	\$47,000	\$48,410	\$49,862	\$55,000	\$56,650	\$58,350
Operator A	\$47,000	\$48,410	\$49,862	\$55,000	\$56,650	\$58,350
Office Manager	\$54,000	\$58,000	\$59,740	\$61,532	\$63,378	\$65,280
Overtime	\$24,500	\$24,874	\$25,259	\$26,213	\$26,638	\$27,076
Subtotal:	\$338,570	\$350,746	\$360,908	\$379,214	\$390,230	\$401,576

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<b><u>Maintenance</u></b>						
Water Mains	\$13,500	\$13,500	\$13,500	\$13,500	\$13,500	\$13,500
Stations/Tanks	\$52,688	\$53,419	\$54,163	\$54,810	\$55,580	\$56,364
Grounds	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
Water Testing	\$8,000	\$8,240	\$8,487	\$8,742	\$9,004	\$9,274
Building repair	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Meter Replacement	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Subtotal:	\$93,188	\$94,159	\$95,151	\$96,052	\$97,084	\$98,139
<b><u>Operation</u></b>						
Advertising	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000
Postage	\$3,800	\$3,876	\$3,954	\$4,033	\$4,113	\$4,196
Printing	\$4,000	\$5,000	\$5,050	\$5,101	\$5,152	\$5,203
Computer/Copier Supplies	\$4,800	\$5,800	\$5,858	\$5,917	\$5,976	\$6,036
Building Supplies	\$500	\$500	\$500	\$500	\$500	\$500
Office Supplies	\$800	\$840	\$880	\$920	\$960	\$1,000
Uniforms	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Dues/Licenses	\$2,650	\$2,650	\$2,650	\$2,650	\$2,650	\$2,650
Gasoline/Engine Fuel	\$10,100	\$10,201	\$10,303	\$10,406	\$10,510	\$10,615
Truck Repair	\$3,000	\$3,000	\$3,500	\$4,000	\$4,500	\$5,000
Tools/Hardware	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Chemicals	\$24,000	\$24,480	\$24,970	\$25,469	\$25,978	\$26,498
Telephone (Internet)	\$3,200	\$3,232	\$3,264	\$3,297	\$3,330	\$3,363
Electricity	\$74,000	\$82,866	\$85,352	\$87,912	\$90,550	\$93,266
Heating	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500
Consumption Assessment	\$2,261	\$1,731	\$1,986	\$1,986	\$2,079	\$2,079
Conservation	\$1,500	\$1,600	\$1,700	\$1,800	\$1,900	\$2,000
Subtotal:	\$145,611	\$156,776	\$160,966	\$164,989	\$169,197	\$173,405
<b><u>Miscellaneous</u></b>						
Legal/Engineering	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000
Training/Education	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
Service Connects (Replacement)	\$26,000	\$26,000	\$26,000	\$26,000	\$26,000	\$26,000
Subtotal:	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000	\$80,000
Operation and Maintenance Total:	\$657,370	\$681,681	\$697,024	\$720,256	\$736,511	\$753,119

As previously noted, the Water Department provides potable water and fire protection services to the residents and businesses in Cotuit. The portion of the Water Department operations and maintenance budget associated with fire protection should be funded by the District taxes and not the water rates. To determine the percentage of the annual Water Department operations and maintenance budget that is associated with fire protection services, the ratio of annual fire

protection expenses to the total Water Department expenses for specific budget line items with known fire protection costs was calculated. Annual expenses associated with fire protection include Water Department labor for flushing the distribution system, hydrant and tank maintenance, materials for hydrant replacement and painting, generator maintenance, tank inspection and maintenance, and water usage for hydrant flushing and Fire Department training. The Water Department's operations and maintenance costs associated with fire protection are summarized in Table No. 4. The annual rate increases applied to each budget line item used to determine the cost in future years in Table No. 4 were the same as those projected in the complete Water Department operations and maintenance budget in Table No. 3.

**Table No. 4**  
**Water Department Operation and Maintenance Costs for Fire Protection**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<b>Annual Water Dept. Fire Protection Services</b>						
Labor (Flushing, Hydrant & Tank Maintenance)	\$22,782	\$23,465	\$24,169	\$26,001	\$26,781	\$27,584
Materials (Hydrant Replacement & Painting)	\$2,600	\$2,652	\$2,944	\$2,759	\$2,814	\$3,124
Generator Maintenance	\$1,642	\$1,672	\$1,702	\$1,732	\$1,763	\$1,795
Tank Inspection & Maintenance	\$3,144	\$3,238	\$3,336	\$10,388	\$3,696	\$3,807
Water Usage (Hydrant Flushing & FD Training)	\$913	\$940	\$968	\$997	\$1,026	\$1,057
<b>Subtotal:</b>	<b>\$31,081</b>	<b>\$31,967</b>	<b>\$33,118</b>	<b>\$41,877</b>	<b>\$36,080</b>	<b>\$37,367</b>
<b>Total Water Dept. Costs for Budget Line Items in Which Fire Protection Services Above Are a Portion of the Cost</b>	<b>\$361,758</b>	<b>\$376,967</b>	<b>\$385,973</b>	<b>\$402,408</b>	<b>\$412,151</b>	<b>\$422,173</b>
<b>Percentage of Annual Water Department Budget Used for Fire Protection Services</b>	<b>8.6%</b>	<b>8.5%</b>	<b>8.6%</b>	<b>10.4%</b>	<b>8.8%</b>	<b>8.9%</b>
<b>FY19 - FY24 AVERAGE:</b>	<b>9.0%</b>					

Approximately 10-percent of the Water Department's annual operations and maintenance budget is associated with fire protection, and therefore should be funded by District taxes. This 10-percent District tax subsidy was applied to the Water Department Operation and Maintenance Budget for the study period years as shown in Table No. 5 to determine the annual value of the Water Department's Operations and Maintenance Budget to be funded by the water rates.

**Table No. 5**  
**Total Water Department Operation and Maintenance Costs Less 10% District Taxes**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<b>Total Water Department O&amp;M Costs</b>	<b>\$657,370</b>	<b>\$681,681</b>	<b>\$697,024</b>	<b>\$720,256</b>	<b>\$736,511</b>	<b>\$753,119</b>
<b>10% District Tax Subsidy (Fire Protection)</b>	<b>\$65,737</b>	<b>\$68,168</b>	<b>\$69,702</b>	<b>\$72,026</b>	<b>\$73,651</b>	<b>\$75,312</b>
<b>Total O&amp;M Less 10% District Tax Subsidy:</b>	<b>\$591,633</b>	<b>\$613,513</b>	<b>\$627,322</b>	<b>\$648,230</b>	<b>\$662,860</b>	<b>\$677,807</b>

### Capital Plan Improvements

New infrastructure, equipment, or improvements to existing water mains, sources, treatment facilities, pumping stations, and storage facilities allow the Water Department to provide reliable service and high-quality water to consumers. In some cases, upgrades to the existing facilities and distribution system are required to meet new, more stringent guidelines and regulations set forth by state and federal authorities.

The Water Department has identified funding needs through the Capital Plan over the next five years including a pilot study for treatment alternatives to address increasing levels of manganese in the source water, a new truck purchase in FY23 so that the operators have the proper vehicle for operating and maintaining the system, and water system security equipment upgrades in FY24. The Capital Plan and associated costs are summarized for the study period in Table No. 6.

**Table No. 6**  
**Water Department Capital Plan**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<b><u>Capital Plan</u></b>						
Pilot Study (100K)	\$0	\$0	\$23,740	\$23,740	\$23,740	\$23,740
Vehicle Purchase	\$0	\$0	\$0	\$0	\$45,000	\$0
Security Equipment Upgrades and Maintenance	\$0	\$0	\$0	\$0	\$0	\$32,000
<i>Tax Allocation (50%)</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$16,000</i>
<i>Water System Allocation (50%)</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$0</i>	<i>\$16,000</i>
Basic Use (New Service Credit)	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000
<b>Capital Plan Total:</b>	<b>-\$3,000</b>	<b>-\$3,000</b>	<b>\$20,740</b>	<b>\$20,740</b>	<b>\$65,740</b>	<b>\$52,740</b>
<b>District Tax Total:</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$16,000</b>
<b>Water System Total:</b>	<b>-\$3,000</b>	<b>-\$3,000</b>	<b>\$20,740</b>	<b>\$20,740</b>	<b>\$65,740</b>	<b>\$36,740</b>

Both the pilot study and vehicle purchase are strictly water system related improvements. These Capital items will be fully funded by revenue collected through the water rates. The security equipment upgrades and maintenance are required for overall protection of the water supply, and therefore benefits the potable water supply and fire protection infrastructure. The costs for the security equipment upgrades will be split and equally allocated to the water system and fire protection services. Water rates and District taxes will each fund 50-percent of the security upgrades costs. The Basic Use is a non-rate revenue fee paid by customers for new service installations at homes built after 1973. Five new services at a cost of \$600 per service are included in Table No. 6 based on the number of new services required over recent years. The new service fees result in a Basic Use credit applied as a capital expense credit in the District's budget. The full Basic Use revenue is used to fund and support the potable water system without any fire protection (District tax) allocation. Table No. 6 summarizes the total Capital Plan costs, the costs to be funded by District taxes, and the water system costs to be funded by water rates.



Projected Debt Service

The District Treasurer provided information and payment schedules on the debt service for existing and future water system related projects. For the purpose of this study, the future debt service and planned payment schedules for the next five years were evaluated. The Debt Service summary for the study period is included in Table No. 7, including the total project cost, the percentage for each loan allocated to the potable water system to be funded by the water rates, and the percentage of each loan allocated to the District and fire protection infrastructure to be funded by the District taxes.

**Table No. 7  
Water System Debt Service**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<u>Debt Service</u>						
Santuit-Newtown Road Tank (\$2.035M)	\$148,000	\$143,000	\$139,750	\$136,000	\$132,250	\$128,250
<i>Tax Allocation (67.5%)</i>	\$99,900	\$96,525	\$94,331	\$91,800	\$89,269	\$86,569
<i>Water System Allocation (32.5%)</i>	\$48,100	\$46,475	\$45,419	\$44,200	\$42,981	\$41,681
USDA Loan West Street Tank (\$2.0M)	\$96,448	\$95,264	\$94,079	\$92,895	\$91,711	\$90,527
<i>Tax Allocation (67.5%)</i>	\$65,102	\$64,303	\$63,503	\$62,704	\$61,905	\$61,106
<i>Water System Allocation (32.5%)</i>	\$31,346	\$30,961	\$30,576	\$30,191	\$29,806	\$29,421
Chemical Upgrades (\$500K)	\$0	\$134,479	\$112,000	\$59,000	\$49,167	\$47,917
Water System Security Upgrades (\$470K)	\$0	\$85,718	\$72,300	\$70,500	\$57,033	\$55,583
<i>Tax Allocation (50%)</i>	\$0	\$42,859	\$36,150	\$35,250	\$28,517	\$27,792
<i>Water System Allocation (50%)</i>	\$0	\$42,859	\$36,150	\$35,250	\$28,517	\$27,792
Truck (\$60K)	\$0	\$43,283	\$20,600	\$0	\$0	\$0
Short Term Debt	\$180,000	\$0	\$0	\$0	\$0	\$0
Short Term Interest	\$3,052	\$0	\$0	\$0	\$0	\$0
Short Term Interest (Abatements)	\$50	\$0	\$0	\$0	\$0	\$0
<b>Debt Service Total:</b>	<b>\$427,550</b>	<b>\$501,745</b>	<b>\$438,729</b>	<b>\$358,395</b>	<b>\$330,161</b>	<b>\$322,277</b>
<b>District Tax Total:</b>	<b>\$165,002</b>	<b>\$203,687</b>	<b>\$193,985</b>	<b>\$189,754</b>	<b>\$179,690</b>	<b>\$175,466</b>
<b>Water System Total:</b>	<b>\$262,548</b>	<b>\$298,057</b>	<b>\$244,744</b>	<b>\$168,641</b>	<b>\$150,470</b>	<b>\$146,811</b>

The Water Department has two completed projects listed under the debt services, including the construction of the new Santuit-Newtown Road Tank and the new West Street Tank (funded through a USDA Loan). The tank projects benefit both the potable water supply and fire protection services. Therefore, a fair allocation of expense costs between the water system (funded by the water rates) and fire protection (funded by District taxes) had to be determined. Typical fire flow requirements in the District include a fire flow rate of 3,000 gallons per minute (gpm) for a 3-hour duration for a total fire flow storage volume of 540,000 gallons. The total storage volume between the two tanks is 800,000 gallons. The ratio of fire flow storage volume to the total system storage volume was 0.675, meaning 67.5-percent of the District's water storage is associated with fire protection storage. Based on the storage volume calculation, 67.5-

percent of the tank project costs were allocated to fire protection services to be funded by District taxes and 32.5-percent of the tank project costs were allocated to the potable water system to be funded by the water rates as shown by the cost breakdown in Table No. 7.

Payments for the chemical upgrades, water system security upgrades, and new Water Department truck are expected to begin in FY20. The chemical upgrades project and new Water Department truck are allocated to the potable water system to be fully funded by the water rates. The water system security upgrades project will benefit both the potable water supply and fire protection infrastructure. The costs for the security equipment upgrades will be split and equally allocated to the water system and fire protection services. Water rates and District taxes will each fund 50-percent of the security upgrades costs. All short term debt will be paid in FY19.

#### Projected Employee Benefits

Employee benefit expenses associated with the potable water system include dental, health, and life insurance costs for current and retired Water Department employees, a portion of dental, health, and life insurance for the current and retired Prudential Committee employees, payment to the Retirement Assessment, and payment to the Other Post Employee Benefits (OPEB) Trust Fund. It was determined that a portion of the Prudential Committee employee benefit costs were to be allocated to the water system due to the fact that the Prudential Committee performs administrative tasks for the Water Department associated with payroll, insurance, benefits, retirement, etc. All employee benefits and their associated costs, the percentage for each benefit expense allocated to the potable water system to be funded by the water rates, and the percentage of each benefit expense allocated to the District to be funded by the District taxes are presented in Table No. 8.

Costs of benefits for current and retired Water Department employees are fully funded by the water system through the water rates. The FY19 Water Department employee benefit costs were used as a baseline to estimate annual employee benefit expenses through FY24. Future costs of Water Department life insurance was increased by two percent annually, and all other Water Department benefits were increased by seven percent annually.

Similar to the Water Department employee benefits, the FY19 Prudential Committee benefit costs for current and retired employees were used as a baseline to estimate annual employee benefit expenses through FY24. Future costs of Prudential Committee health and dental insurance were increased by seven percent annually. Life insurance benefits were not provided for the Prudential Committee.

Benefit costs for current and retired Prudential Committee employees are funded by both the water system through the water rates and the District through taxes. The percentage of current and retired Prudential Committee benefit costs allocated to the water system was based upon the ratio of total Water Department salaries and wages to the total District salaries and wages. Based on this ratio, 19-percent of current and retired Prudential Committee benefit costs were allocated to the potable water system, and 81-percent of the costs were allocated to the District. The same allocation percentages were applied to the costs associated with the Retirement Assessment and Transfer to OPEB Trust Fund budget line items.

**Table No. 8**  
**Employee Benefits**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<b><u>Employee Benefits</u></b>						
WD Employee Benefits - Dental	\$2,214	\$2,367	\$2,530	\$2,705	\$2,891	\$3,091
WD Employee Benefits - Health	\$59,823	\$63,951	\$68,363	\$73,080	\$78,123	\$83,514
WD Employee Benefits - Life	\$133	\$136	\$139	\$141	\$144	\$147
Prudential Committee Employee Benefits	\$8,775	\$9,380	\$10,028	\$10,720	\$11,459	\$12,250
<i>Tax Allocation (81%)</i>	\$7,108	\$7,598	\$8,123	\$8,683	\$9,282	\$9,923
<i>Water System Allocation (19%)</i>	\$1,667	\$1,782	\$1,905	\$2,037	\$2,177	\$2,328
WD Retired Employee Benefits - Dental	\$927	\$991	\$1,059	\$1,132	\$1,211	\$1,294
WD Retired Employee Benefits - Health	\$9,612	\$10,275	\$10,984	\$11,742	\$12,552	\$13,418
WD Retired Employee Benefits - Life	\$44	\$45	\$46	\$47	\$48	\$49
Prudential Committee Retired Employee Benefits	\$14,670	\$15,682	\$16,764	\$17,921	\$19,158	\$20,479
<i>Tax Allocation (81%)</i>	\$11,883	\$12,702	\$13,579	\$14,516	\$15,518	\$16,588
<i>Water System Allocation (19%)</i>	\$2,787	\$2,980	\$3,185	\$3,405	\$3,640	\$3,891
Retirement Assessment	\$299,765	\$320,449	\$342,560	\$366,196	\$391,464	\$418,475
<i>Tax Allocation (81%)</i>	\$242,810	\$259,564	\$277,474	\$296,619	\$317,086	\$338,965
<i>Water System Allocation (19%)</i>	\$56,955	\$60,885	\$65,086	\$69,577	\$74,378	\$79,510
Transfer to OPEB Trust Fund	\$375,000	\$237,000	\$237,000	\$237,000	\$237,000	\$237,000
<i>Tax Allocation (81%)</i>	\$303,750	\$191,970	\$191,970	\$191,970	\$191,970	\$191,970
<i>Water System Allocation (19%)</i>	\$71,250	\$45,030	\$45,030	\$45,030	\$45,030	\$45,030
<b>Employee Benefits Total:</b>	<b>\$770,964</b>	<b>\$660,276</b>	<b>\$689,474</b>	<b>\$720,685</b>	<b>\$754,050</b>	<b>\$789,717</b>
<b>District Tax Total:</b>	<b>\$565,550</b>	<b>\$471,834</b>	<b>\$491,145</b>	<b>\$511,788</b>	<b>\$533,856</b>	<b>\$557,445</b>
<b>Water System Total:</b>	<b>\$205,414</b>	<b>\$188,442</b>	<b>\$198,329</b>	<b>\$208,897</b>	<b>\$220,195</b>	<b>\$232,272</b>

**Projected District Administrative Costs (Prudential Committee)**

The District Treasurer provided information on the FY19 District and Prudential Committee administrative costs. The administrative costs include District staff salaries, expenses for daily operations of the District and the Prudential Committee, property insurance, vehicle insurance, and workers compensation insurance for the District, and payroll taxes for the District. The FY19 District administrative costs were used as a baseline to estimate annual administrative expenses through FY24. Generally, historical trends were evaluated to determine if budget expenses were expected to increase in future years, as well as the estimated rate of these increases. The projected rate increases applied to each budget line item to determine the cost in future years are discussed herein. The District administrative costs for the study period are summarized in Table No. 9. The following is a list of assumptions made in projecting administrative costs for future years based on information provided by and reviewed with the District Treasurer:

- Future salaries and wages for the District and Prudential Committee staff were projected as follows: Elected Officials were increased by \$500 in FY21 and remained constant through FY24, District Clerk increased by \$50 every two years beginning in FY21, Treasury was increased by two percent annually, and Prudential Committee staff increased by \$250 in FY20 and then remained constant through FY24.
- Future administrative expenses were generally estimated to remain constant through the study period years, with the following line item deviations:
  - Telephone expenses increased by \$25 annually and office supplies increased by \$50 annually.
  - Payroll services increased by 4.5-percent annually.
  - Legal services increased by 20-percent annually.
  - Accounting services and postage increased by two percent annually.
  - Computer/copy expenses increased by ten percent annually.
  - Bond transfer agent includes one bond for the CIP pilot study project in FY20.
  - There are no planned costs for treasury services, stenographer services, bond transfer agent costs other than in FY20, election ballot costs, or miscellaneous expenses. The budget line items were used in previous years, but expenses are not expected in these line items during the study period through FY24.
- Future property/liability and vehicle insurance increased by five percent annually.
- Future workers compensation insurance increased by seven percent annually.
- Unemployment insurance costs remained constant through FY24.
- Future payroll taxes increased by two percent annually.

**Table No. 9**  
**District (Prudential Committee) Administrative Costs**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<u>Salaries &amp; Wages</u>						
Elected Officials	\$12,500	\$12,500	\$13,000	\$13,000	\$13,000	\$13,000
District Clerk	\$2,800	\$2,850	\$2,850	\$2,900	\$2,900	\$2,950
Treasury	\$59,000	\$60,180	\$61,384	\$62,611	\$63,863	\$65,141
Prudential Committee Staff	\$8,250	\$8,500	\$8,500	\$8,500	\$8,500	\$8,500
Subtotal:	\$82,550	\$84,030	\$85,734	\$87,011	\$88,263	\$89,591
Tax Allocation (66%)	\$54,483	\$55,460	\$56,584	\$57,427	\$58,254	\$59,130
Water System Allocation (34%)	\$28,067	\$28,570	\$29,150	\$29,584	\$30,009	\$30,461
<u>Expenses</u>						
Telephone	\$850	\$875	\$900	\$925	\$950	\$975
Payroll Services	\$12,455	\$13,261	\$13,846	\$14,457	\$15,096	\$15,762
Legal Services	\$6,000	\$7,200	\$8,640	\$10,368	\$12,442	\$14,930
Accounting Services	\$14,000	\$14,280	\$14,566	\$14,857	\$15,154	\$15,457
Treasury Services	-	-	-	-	-	-
Stenographer Services	-	-	-	-	-	-
Bond Transfer Agent	-	\$1,300	-	-	-	-

Fiscal Year	FY19 Baseline	FY20	FY21	FY22 Projected	FY23	FY24
Web Site Services	\$600	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Banking Fees	\$50	\$50	\$50	\$50	\$50	\$50
Bond Transfer Agent Cost	-	-	-	-	-	-
Legal Advertisement	\$1,750	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000
Postage	\$750	\$765	\$780	\$796	\$812	\$828
Office Supplies	\$1,750	\$1,800	\$1,850	\$1,900	\$1,950	\$2,000
Computer/Copy Expense	\$6,000	\$6,600	\$7,260	\$7,986	\$8,785	\$9,663
Dues & Memberships	\$150	\$150	\$150	\$150	\$150	\$150
Employee Assistance Program	\$3,950	\$3,950	\$3,950	\$3,950	\$3,950	\$3,950
Town Admin. Services Assessment	\$6,800	\$6,800	\$6,800	\$6,800	\$6,800	\$6,800
Annual Report	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100	\$1,100
Election Ballot Cost	-	-	-	-	-	-
Election Cost	\$700	\$700	\$700	\$700	\$700	\$700
Miscellaneous Expense	-	-	-	-	-	-
<b>Subtotal:</b>	<b>\$56,905</b>	<b>\$64,101</b>	<b>\$63,330</b>	<b>\$66,768</b>	<b>\$70,658</b>	<b>\$75,075</b>
<i>Tax Allocation (66%)</i>	<i>\$37,557</i>	<i>\$42,307</i>	<i>\$41,798</i>	<i>\$44,067</i>	<i>\$46,634</i>	<i>\$49,550</i>
<i>Water System Allocation (34%)</i>	<i>\$19,348</i>	<i>\$21,794</i>	<i>\$21,532</i>	<i>\$22,701</i>	<i>\$24,024</i>	<i>\$25,526</i>
<b><u>Insurance &amp; Taxes</u></b>						
Insurance - Property & Liability/Auto	\$105,000	\$110,250	\$115,763	\$121,551	\$127,628	\$134,010
<i>Tax Allocation (11%/96%)</i>	<i>\$38,699</i>	<i>\$40,634</i>	<i>\$42,665</i>	<i>\$44,799</i>	<i>\$47,039</i>	<i>\$49,391</i>
<i>Water System Allocation (89%/4%)</i>	<i>\$66,301</i>	<i>\$69,616</i>	<i>\$73,097</i>	<i>\$76,752</i>	<i>\$80,590</i>	<i>\$84,619</i>
Insurance - Workers Compensation	\$47,700	\$51,039	\$54,612	\$58,435	\$62,525	\$66,902
<i>Tax Allocation (81%)</i>	<i>\$38,637</i>	<i>\$41,342</i>	<i>\$44,236</i>	<i>\$47,332</i>	<i>\$50,645</i>	<i>\$54,190</i>
<i>Water System Allocation (19%)</i>	<i>\$9,063</i>	<i>\$9,697</i>	<i>\$10,376</i>	<i>\$11,103</i>	<i>\$11,880</i>	<i>\$12,711</i>
Unemployment Insurance	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<i>Tax Allocation (81%)</i>	<i>\$810</i>	<i>\$810</i>	<i>\$810</i>	<i>\$810</i>	<i>\$810</i>	<i>\$810</i>
<i>Water System Allocation (19%)</i>	<i>\$190</i>	<i>\$190</i>	<i>\$190</i>	<i>\$190</i>	<i>\$190</i>	<i>\$190</i>
Payroll Taxes	\$40,000	\$40,800	\$41,616	\$42,448	\$43,297	\$44,163
<i>Tax Allocation (81%)</i>	<i>\$32,400</i>	<i>\$33,048</i>	<i>\$33,709</i>	<i>\$34,383</i>	<i>\$35,071</i>	<i>\$35,772</i>
<i>Water System Allocation (19%)</i>	<i>\$7,600</i>	<i>\$7,752</i>	<i>\$7,907</i>	<i>\$8,065</i>	<i>\$8,226</i>	<i>\$8,391</i>
<b>Subtotal:</b>	<b>\$193,700</b>	<b>\$203,089</b>	<b>\$212,991</b>	<b>\$223,434</b>	<b>\$234,450</b>	<b>\$246,075</b>
<i>Tax Allocation</i>	<i>\$110,546</i>	<i>\$115,834</i>	<i>\$121,420</i>	<i>\$127,324</i>	<i>\$133,565</i>	<i>\$140,163</i>
<i>Water System Allocation</i>	<i>\$83,154</i>	<i>\$87,255</i>	<i>\$91,570</i>	<i>\$96,110</i>	<i>\$100,886</i>	<i>\$105,911</i>
<b>Administrative Cost Total:</b>	<b>\$333,155</b>	<b>\$351,220</b>	<b>\$362,055</b>	<b>\$377,213</b>	<b>\$393,371</b>	<b>\$410,741</b>
<b>District Tax Total:</b>	<b>\$202,586</b>	<b>\$213,601</b>	<b>\$219,802</b>	<b>\$228,818</b>	<b>\$238,453</b>	<b>\$248,843</b>
<b>Water System Total:</b>	<b>\$130,569</b>	<b>\$137,619</b>	<b>\$142,253</b>	<b>\$148,395</b>	<b>\$154,918</b>	<b>\$161,898</b>

The District and Prudential Committee administrative costs were allocated to both the water system to be funded by the water rates and to the District to be funded through District taxes as indicated in Table No. 9. The percentage of the District's Administration salaries and wages and

expense costs allocated to the water system was based on the ratio of the number of Water Department employees to the total District employees. The Water Department staff accounts for 34-percent of total number of District employees, and therefore 34-percent of the District's administrative salaries and wages and expense costs were allocated to the potable water system. The costs for property, liability, and auto insurance listed in Table No. 9 represent the total cost for these insurance policies. The cost allocations for these insurance policies were based on the property asset values and the vehicle asset values. According to the asset summary provided by the District, 89-percent of the property owned by the District (based on property value) was associated with the Water Department or the water system. The remaining 11-percent was District owned property not associated with the water system. Based on these property asset values, 89-percent of the property and liability insurance policy costs were allocated to the water system to be funded by the water rates with 11-percent to be funded through District taxes. On the contrary, only four percent of the vehicle assets owned by the District (based on vehicle value) are utilized by the Water Department with 96-percent of the vehicle assets utilized by other departments and staff within the District, primarily including the Fire Department. Based on these vehicle asset values, four percent of the auto insurance policy costs were allocated to the water system to be funded by the water rates with 96-percent to be funded through District taxes.

Workers compensation insurance costs allocated to the water system were based on the ratio of total Water Department salaries and wages to the total District salaries and wages. Therefore, 19-percent of the workers compensation insurance costs were allocated to the water system to be funded by the water rates and 81-percent of the costs were allocated to the District to be funded by District taxes. The same allocation percentage was applied to the costs for unemployment insurance and payroll taxes.

### **Water System Cost of Service Summary**

The initial focus of this evaluation was to determine the true cost of service to fully support the potable water system in the District. The expenses reviewed included the Water Department's operations and maintenance budget, the Water Department's capital plan, the District's debt service for water related projects, District employee benefits, and District administrative costs. These expenses were evaluated in the previous sections of this report to identify which costs should be allocated to the water system to be funded by the water rates and which costs should be allocated to the District to be funded by District taxes. District expenses determined to represent the actual cost of service for the potable water system are summarized in Table No. 10.

**Table No. 10**  
**Water System Cost of Service Summary**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
Operation & Maintenance	\$591,633	\$613,513	\$627,322	\$648,230	\$662,860	\$677,807
Capital Plan	-\$3,000	-\$3,000	\$20,740	\$20,740	\$65,740	\$36,740
Debt Service	\$262,548	\$298,057	\$244,745	\$168,641	\$150,471	\$146,811
Employee Benefits	\$205,414	\$188,442	\$198,329	\$208,897	\$220,195	\$232,272
Administrative Costs	\$130,569	\$137,620	\$142,252	\$148,395	\$154,919	\$161,898
<b>Total Cost of Service:</b>	<b>\$1,187,163</b>	<b>\$1,234,633</b>	<b>\$1,233,386</b>	<b>\$1,194,903</b>	<b>\$1,254,184</b>	<b>\$1,255,527</b>

### Water System Non-Rate Revenue

The Water Department collects non-rate revenue through a variety of fees for services provided to consumers. This non-rate revenue contributes to the overall revenue collected by the Water Department to support the water system. A summary of the existing non-rate revenue service fees were previously presented in Table No. 2. In addition to these service fees, the Water Department collects non-rate revenue for lease agreements associated with cellular antennas and for solar credits under the Cape and Vineyard Electric Cooperative (CVEC). The Water Department provided information on the historical non-rate revenue collected and future changes to the cellular antenna lease agreements. The historical trends and information provided by the Water Department were utilized to estimate the FY19 baseline, as detailed below, along with projections for future years in the study period to FY24. The Water Department's non-rate revenue projections for the study period based on the existing service fees are summarized in Table No. 11.

- The FY19 baseline service connection fees are based on the existing fee of \$550 per service connection and 5 new connections per year.
- Actual revenue collected for FY16, FY17, and FY18 for turn on/off fees and penalties were averaged and used to determine the FY19 baseline.
- The actual revenue collected in FY18 for other fees and CVEC revenue were utilized as the FY19 baseline.
- The FY19 baseline revenue associated with the antenna lease agreements was determined based on the actual revenue for FY18. The actual revenue collected in FY18 over a 10-month period was \$115,288.79, which equals monthly payments of \$11,528.90. The lease structure was changed in FY19, and the new annual revenue was adjusted to \$42,000. However, the new lease structure did not start at the beginning of FY19, and the Water Department estimated three months of revenue at the old monthly rate would be collected in addition to the \$42,000. The expected antenna revenue for FY19 was \$76,587.

The projected non-rate revenue was generally estimated to remain constant in future years except for the antenna lease and CVEC revenue. A three percent annual increase was applied to the FY19 \$42,000 annual antenna lease revenue. A five percent annual electricity escalator was applied to the CVEC revenue for future years to account for the estimated increase in electric

rates and additional electric usage required by the water system for the projected increase in water production.

**Table No. 11**  
**Water Department Non-Rate Revenue**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
<b><u>Non-Rate Revenue</u></b>						
Service Connection Fees	\$2,750	\$2,750	\$2,750	\$2,750	\$2,750	\$2,750
Turn On/Off Fees	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000	\$8,000
Other Fees	\$4,285	\$4,285	\$4,285	\$4,285	\$4,285	\$4,285
Penalties	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000	\$4,000
Antenna Lease	\$76,587	\$43,260	\$44,558	\$45,895	\$47,271	\$48,690
CVEC	\$17,847	\$18,740	\$19,677	\$20,660	\$21,693	\$22,778
<b>Total Non-Rate Revenue<sup>1</sup>:</b>	<b>\$113,469</b>	<b>\$81,034</b>	<b>\$83,269</b>	<b>\$85,590</b>	<b>\$87,999</b>	<b>\$90,502</b>

1. The revenue collected for FY19 through FY24 is based on the existing service fees.

### Balance of Revenue Needed

The total cost of service for the potable water system was summarized in Table No. 10. The projected non-rate revenue collected by the Water Department using existing service fees was summarized in Table No. 11. The difference between the total cost of service and the non-rate revenue collected is the balance of revenue needed to be generated by the water rates to fully support the water system and cover all financial costs on an annual basis. The balance of revenue that needs to be collected through the water rates for each fiscal year in the study period through FY24 is presented in Table No. 12.

**Table No. 12**  
**Balance of Revenue Needed with Existing Non-Rate Revenue Fees**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
Total Cost of Service	\$1,187,163	\$1,234,633	\$1,233,386	\$1,194,903	\$1,254,184	\$1,255,527
Total Non-Rate Revenue <sup>1</sup>	\$113,469	\$81,034	\$83,269	\$85,590	\$87,999	\$90,502
<b>Balance of Revenue Needed:</b>	<b>\$1,073,694</b>	<b>\$1,153,599</b>	<b>\$1,150,118</b>	<b>\$1,109,313</b>	<b>\$1,166,184</b>	<b>\$1,165,025</b>

1. The total non-rate revenue collected for FY19 through FY24 is based on the existing service fees.

### Current Rates and Projected Revenue Evaluation

To determine the adequacy of the existing water rates to fully support the future costs of the water system, the existing rates were applied to projected water usage to determine the estimated revenue for future years in the study period. To project future water demands, annual water usage by account was obtained from the Water Department for FY17 and used as a baseline for each water service account. The historical finished water production from the District's water



sources are tabulated in the annual statistical report (ASRs) for each year. The ASRs for the past five years, 2013 through 2017, were obtained from the Water Department and evaluated to determine the average annual pumping volume over the past five years. The 2016 finished water production volume was not included in this evaluation due to the drought in the summer of 2016 which significantly increased water usage and was not representative of most years in the District. Including 2016 water usage in the analysis would inflate demand and revenue projections and would not represent a conservative estimate for proper planning.

The average annual pumping volume for the past five years was compared to the 2017 annual pumping volume. The average annual pumping volume between 2013 and 2017, not including 2016, was 7.67-percent greater than the pumping volume recorded in 2017. Since actual water consumption data by account was obtained for FY17, the 7.67-percent increase was applied to the FY17 data to estimate the average annual water usage per account starting with the FY18 projected usage. The average annual water usage for each account was expected to remain consistent in future years and was held constant for each account in the study period. The existing water rates were then applied to the FY18 annual water usage for each account to determine the annual revenue that would be generated under the existing water rates structure through FY24.

Following discussions with the Water Department, it is anticipated that five new residential services will connect to the water system each year. The estimated water usage for each new service connection was determined using the Water Department's 2017 ASR. The ASR reported 2,212 residential service connections in the distribution system, which consumed approximately 170.5 million gallons of water in 2017. This was equivalent to approximately 77,076 gallons of water usage per residential service connection for the year. The Water Department's existing rate structure bills customers a flat minimum use charge of \$36.00 for the first 20,000 gallons of water usage. Therefore, the total excess annual water usage estimated for each new residential account is approximately 57,076 gallons. The existing tiered water rates were applied to the excess usage to obtain a total annual excess usage cost per new service connection. The estimated annual excess use revenue for each new residential service is \$126.80, or approximately \$634 for a total of five new residential services per year. Similarly, the estimated annual minimum use base charge revenue for each new residential service is \$36, or \$180 for a total of five new residential services per year.

The estimated annual water rate revenue through FY24 is presented in Table No. 13. The total annual water rate revenue is based on the sum of the minimum use base charge and excess usage for all existing customers plus the minimum use base charge and excess usage for the five new residential services per year. The revenue projections in Table No. 13 are based on the District's existing minimum use base charge and existing tiered water rate structure with one annual bill for the minimum use base charge and one annual bill for the excess usage. This total annual water rate revenue is identified as Total Billed Revenue in Table No. 13. The balance of revenue needed from water rate revenue as shown at the top of Table No. 13 was compared to the Total Billed Revenue near the bottom of Table No. 13. The Balance shown at the bottom of Table No. 13 indicates the total water rate revenue generated by the current rates will not support the water system's cost of service in FY19 through FY24, and a deficit of \$600,000 to \$700,000 will occur

depending on the fiscal year. The deficit will have to be funded through the District taxes unless changes to the water rates are implemented.

**Table No. 13**  
**Projected Revenue Using Existing Water Rate Structure**

Year	FY19	FY20	FY21	FY22	FY23	FY24
Balance of Revenue Needed to be Covered by the Water Rates and Fees:	\$1,073,694	\$1,153,599	\$1,150,118	\$1,109,313	\$1,166,184	\$1,165,025
<b>Excess Use Rates (\$/1,000 Gal.)</b>						
20,001 - 40,000	\$1.80	\$1.80	\$1.80	\$1.80	\$1.80	\$1.80
40,001 - 80,000	\$2.45	\$2.45	\$2.45	\$2.45	\$2.45	\$2.45
80,001 - 120,000	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70	\$2.70
120,001 & Greater	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00	\$3.00
Existing Services Excess Use Revenue:	\$372,763	\$373,398	\$374,032	\$374,666	\$375,300	\$375,934
Existing Minimum Base Use (<20,000 Gal.) Revenue:	\$81,432	\$81,612	\$81,792	\$81,972	\$82,152	\$82,332
<b>Annual New Services</b>	5	5	5	5	5	5
New Services Excess Use Revenue:	\$634	\$634	\$634	\$634	\$634	\$634
New Services Minimum Base Use (<20,000 Gal.) Revenue:	\$180	\$180	\$180	\$180	\$180	\$180
Total Excess Use Revenue:	\$373,398	\$374,032	\$374,666	\$375,300	\$375,934	\$376,569
Total Minimum Base Use Revenue:	\$81,612	\$81,792	\$81,972	\$82,152	\$82,332	\$82,512
Total Billed Revenue:	\$455,010	\$455,824	\$456,638	\$457,452	\$458,266	\$459,081
<b>Balance:</b>	<b>(\$618,684)</b>	<b>(\$697,775)</b>	<b>(\$693,480)</b>	<b>(\$651,861)</b>	<b>(\$707,918)</b>	<b>(\$705,945)</b>

### Adjustments to the Water System Non-Rate Revenue Fees

As previously discussed, the Water Department charges for a variety of fees for services requested or required by customers that contribute to the overall revenue collected by the Water Department to support the water system. As part of this study, the existing non-rate revenue fees were reviewed, and adjustments to these non-rate revenue fees were proposed. The proposed adjustments were made to cover the actual costs incurred by the Water Department for these services based on current materials and labor costs compared to the costs years ago when these fees were last updated. The proposed fee adjustments will assist the Water Department to collect some additional non-rate revenue for the typical services they provide. Table No. 14 presents the existing and proposed non-rate revenue fees.

**Table No. 14**  
**Existing and Proposed Non-Rate Revenue Fees**

Water Department Service	Existing Fee	Proposed Fee
Service Connection		Per Meter Size <sup>4</sup>
5/8-Inch	\$550	\$600
3/4-Inch	\$550	\$700
1-Inch	\$550 Plus Cost of Meter	\$800
2-Inch	\$550 Plus Cost of Meter	\$1,200
Other Meter	\$550 Plus Cost of Meter	\$600 Plus Cost of Meter
Basic Use <sup>1</sup>	\$600	\$600
Turn On/Off	\$35	\$50
Other		
Regular Hourly Rate <sup>2</sup>	\$35	\$50
After Hours Rate <sup>3</sup>		\$75
Meter Readings	\$15	\$25
Repairs	Materials Cost Plus Hourly Rate (1-Hour Minimum)	Materials Cost Plus Hourly Rate (1-Hour Minimum)
Backflow/Cross Connection	\$30	\$50
Hydrant Meter	\$35 Plus Usage (Billed at Highest Tier Rate)	\$50 Plus Usage (Billed at Highest Tier Rate)
Penalties	10% of Past Due Bill	10% of Past Due Bill

1. The Basic Use fee is applied to new service connections at homes built after 1973.
2. The Regular Hourly Rate is applied to any other service not specifically identified in Table No. 14.
3. The After Hours Rate for services provided after regular working hours is 1.5 times the Regular Hourly Rate.
4. Meter cost is included in the Service Connection Fee for meters ranging in size from 5/8-inch through 2-inch.

The Basic Use fee and Penalties are the only fees that remained unchanged from the existing non-rate revenue fees. The proposed non-rate revenue fees produce approximately \$5,266 in additional annual revenue. The revised balance of revenue that needs to be collected through the water rates for each fiscal year in the study period through FY24 is presented in Table No. 15 with the implementation of the proposed non-rate revenue fees. Table No. 15 is similar to Table No. 12 except that total non-rate revenue is based on the proposed fees instead of existing fees.

**Table No. 15**  
**Balance of Revenue Needed with Proposed Non-Rate Revenue Fees**

Fiscal Year	FY19	FY20	FY21	FY22	FY23	FY24
	Baseline	Projected				
Total Cost of Service	\$1,187,163	\$1,234,633	\$1,233,386	\$1,194,903	\$1,254,184	\$1,255,527
Total Non-Rate Revenue <sup>1</sup>	\$113,469	\$86,300	\$88,534	\$90,855	\$93,265	\$95,768
<b>Balance of Revenue Needed:</b>	<b>\$1,073,694</b>	<b>\$1,148,333</b>	<b>\$1,144,852</b>	<b>\$1,104,048</b>	<b>\$1,160,919</b>	<b>\$1,159,760</b>

1. The total non-rate revenue collected for FY19 through FY24 is based on the proposed service fees.

### **Proposed Rate Scenario with Proposed Non-Rate Revenue Fees**

The Water Department currently bills all customers on an annual basis, including one flat minimum use bill of \$36 for the first 20,000 gallons of water usage, and one excess use bill for water usage beyond the first 20,000 gallons using the existing ascending block rate structure as shown in Table No. 13. The current water rates are not adequate to support the cost of service for the water system's current and future expenses, as shown in Table No. 12. The current rate structure, associated excess use rates, and minimum use base charge were evaluated to determine a rate scenario that would generate sufficient funds to fully support the costs of the water system through FY24.

The proposed rate scenario is shown in Table No. 16 and is based on a biannual billing cycle. The biannual billing periods include January through June and July through December. Implementing biannual billing will improve revenue collection with more frequent bills and will help to capture revenue from large water consumers at the higher tiers of the ascending block structure, even if a customer is a seasonal customer who may not physically live in Cotuit all year round. Capturing revenue at the higher tiers from large water users, such as those who routinely use water for lawn irrigation purposes, will encourage water conservation within the District as recommended by the MassDEP.

To accurately project future water usage under a biannual billing cycle scenario, the monthly finished water production volumes from the 2017 ASR were evaluated. Approximately 41-percent of water usage occurred during the first billing cycle (January through June), and 59-percent of water usage occurred during the second billing cycle (July through December) in 2017. These seasonal factors were applied to the projected annual water usage previously estimated for each account to determine the biannual water usage for each account. The water usage for each account was expected to remain consistent in future years and was held constant for each account in the study period.

The proposed water rates include a revised minimum use base charge, modifications to the rate structure, and increases to associated rates. The proposed minimum use base charge is \$40 per billing cycle for the first 10,000 gallons of usage. The minimum use base charge of \$40 would be billed two times each year, at the end of September and March. The proposed excess use tiers and associated rates per billing cycle are shown in Table No. 16 and include the following (all rates are cost per 1,000 gallons of usage): \$4.00 for 10,001 – 20,000 gallons, \$5.50 for 20,001 – 40,000 gallons, \$7.15 for 40,001 – 60,000 gallons, \$8.55 for 60,001 – 100,000 gallons, and \$9.70 for 100,001 and greater gallons. The proposed rate structure includes an additional fifth tier in an effort to increase the cost of water when it is routinely used for non-essential purposes, promoting conservation in accordance with MassDEP recommendations. The two excess use water bills for water usage greater than the first 10,000 gallons would be generated using the proposed rates in Table No. 16 and would be issued at the end of June and December each year.

As previously discussed, it is anticipated that five new residential services will connect to the water system each year. The estimated annual water usage for each new service connection was previously determined to be approximately 77,076 gallons per residential service connection. To account for the proposed biannual billing cycle, the billing cycle factors were applied to the total

usage to determine the water usage per billing cycle for these new accounts. The estimated usage for each new service connection is 45,583 gallons for the first billing cycle (July through December) and 31,493 gallons for the second billing cycle (January through June). Therefore, the total excess use biannual water consumption per billing cycle is estimated at 35,583 gallons and 21,493 gallons for each new residential service connection when you subtract out the 10,000 gallons included in the minimum use base charge for each biannual billing cycle.

**Table No. 16**  
**Proposed Water Rates Scenario with Proposed Non-Rate Revenue Fees**

Year	FY19	FY20	FY21	FY22	FY23	FY24
Balance of Revenue Needed to be Covered by the Water Rates:	\$1,073,694	\$1,148,333	\$1,144,852	\$1,104,048	\$1,160,919	\$1,159,760
<b>Excess Use Rates (\$/1,000 Gal.)</b>						
10,001 - 20,000	Existing Rate and Tier Schedule	\$4.00	\$4.00	\$4.00	\$4.00	\$4.00
20,001 - 40,000		\$5.50	\$5.50	\$5.50	\$5.50	\$5.50
40,001 - 60,000		\$7.15	\$7.15	\$7.15	\$7.15	\$7.15
60,001 - 100,000		\$8.55	\$8.55	\$8.55	\$8.55	\$8.55
100,001 & Greater		\$9.70	\$9.70	\$9.70	\$9.70	\$9.70
<b>Annual Existing Services</b>						
Existing Services Excess Use Revenue:	\$372,763	\$972,406	\$973,872	\$975,338	\$976,803	\$978,269
Existing Minimum Base Use (<10,000 Gal.) Revenue:	\$81,432	\$181,360	\$181,760	\$182,160	\$182,560	\$182,960
<b>Annual New Services</b>	5	5	5	5	5	5
New Services Excess Use Revenue:	\$634	\$1,466	\$1,466	\$1,466	\$1,466	\$1,466
New Services Minimum Base Use (<10,000 Gal.) Revenue:	\$180	\$400	\$400	\$400	\$400	\$400
<b>Total Excess Use Revenue:</b>	<b>\$373,398</b>	<b>\$973,872</b>	<b>\$975,338</b>	<b>\$976,803</b>	<b>\$978,269</b>	<b>\$979,735</b>
<b>Total Minimum Base Use Revenue:</b>	<b>\$81,612</b>	<b>\$181,760</b>	<b>\$182,160</b>	<b>\$182,560</b>	<b>\$182,960</b>	<b>\$183,360</b>
<b>Total Billed Revenue:</b>	<b>\$455,010</b>	<b>\$1,155,632</b>	<b>\$1,157,498</b>	<b>\$1,159,363</b>	<b>\$1,161,229</b>	<b>\$1,163,095</b>
<b>Balance:</b>	<b>(\$618,684)</b>	<b>\$7,299</b>	<b>\$12,646</b>	<b>\$55,316</b>	<b>\$310</b>	<b>\$3,335</b>

For each new service, the proposed rate scenario includes the minimum use base charge of \$40 billed twice each year. The estimated annual minimum use base charge revenue for each new residential service is \$80, or \$400 total for the five new residential services per year. The proposed water rates are applied to the excess usage for each new account to determine the total estimated annual excess use revenue for each new service connection. The estimated annual excess use revenue for each new residential service is just greater than \$293, or approximately \$1,466 total for the five new residential services per year.

Table No. 16 presents the estimated annual water rate revenue through FY24 based on implementing the proposed minimum use base charge and the proposed tiered water rate structure in FY20. FY19 includes the existing rate structure, rates, and fees. The proposed scenario includes biannual billing for the minimum use base charge and biannual billing for the excess usage starting in FY20. This total annual water rate revenue is identified as Total Billed Revenue in Table No. 16. The balance of revenue needed from water rate revenue as shown at the top of Table No. 16 was compared to the Total Billed Revenue near the bottom of Table No. 16. The Balance shown at the bottom of Table No. 16 indicates the total water rate revenue generated by the proposed rates starting in FY20 will be sufficient to fully support the water system's cost of service through FY24. With the implementation of the water rate changes, additional funds through a District tax subsidy will not be needed to fund the water system's costs.

### Flat Meter Charge Summary

Per discussions with the Water Department, an additional water meter charge was established to collect additional revenue to be set aside in the Stabilization Fund. The proposed meter charge is a flat rate of \$10 per meter billed biannually with the minimum use base charge. Assuming 5 new meters per year, it is expected that the Water Department will serve 2,267 metered accounts in FY19 and then five additional metered accounts each year thereafter. The proposed meter charge will be implemented in FY20 in conjunction with the changes to the water rates. Table No. 17 presents the annual revenue generated from the flat meter charge for the study period years. Approximately \$45,000 will be collected for the Stabilization Fund on an annual basis.

**Table No. 17**  
**Proposed Flat Meter Charge Summary**

Year	FY19	FY20	FY21	FY22	FY23	FY24
<b>Flat Meter Base Rate (\$10/Meter per Bi-Annual Billing Cycle)</b>						
Annual Existing Meters	2,262	2,267	2,272	2,277	2,282	2,287
Annual New Meters	5	5	5	5	5	5
Total Meters	2,267	2,272	2,277	2,282	2,287	2,292
<b>Total Flat Meter Charge Revenue:</b>	<b>\$0</b>	<b>\$45,440</b>	<b>\$45,540</b>	<b>\$45,640</b>	<b>\$45,740</b>	<b>\$45,840</b>

### Impacts of Rate Changes on Customers

As part of this study, the impacts of the proposed rate changes on customers were evaluated. The average residential usage is 77,076 gallons per year. The annual costs for the average residential user under the existing tiered rate structure and rates includes \$36 for the minimum use base charge and \$127 for the excess usage for a total of \$163. The annual costs for this same average residential user under the proposed tiered rate structure and rates include \$80 for the minimum use base charge and \$293 for the excess usage for a total of \$373. The proposed tiered rate structure and rates will increase the annual cost of the average residential customer by \$210.

Table No. 18 presents the total annual costs under the existing rates and the proposed rate scenario for various annual water usages. The annual costs utilizing the existing rates include the minimum use base charge of \$36 and the excess use costs based on the existing tier structure and associated rates with each billed once annually. The annual costs utilizing the proposed rate scenario includes the proposed minimum use base charge of \$40 billed biannually for a total of \$80, the flat meter charge of \$10 billed biannually for a total of \$20, and the excess use costs based on the proposed tier rate structure and associated rates billed biannually.

**Table No. 18**  
**Existing and Proposed Water Rate and Charge Comparison**

<b>Annual Usage (Gallons)</b>	<b>Existing Rates Annual Cost</b>	<b>Proposed Rates &amp; Meter Charge Annual Cost</b>
10,000	\$36	\$100
20,000	\$36	\$108
40,000	\$72	\$186
60,000	\$121	\$290
80,000	\$170	\$412
100,000	\$224	\$543
120,000	\$278	\$701
240,000	\$638	\$1,760

#### **Rate Comparison to Surrounding Communities**

A comparison of the proposed rates and charges for the water system in the District to the rates and costs of surrounding communities was completed. The communities selected for comparison purposes included the Mashpee Water District, Harwich Water Department, Eastham Municipal Water System, Barnstable Fire District, Centerville-Osterville-Marston's Mills Fire District (COMMFD), and the Hyannis Water System. Attachment No. 1 presents the proposed rate scenario for the District and the rate structures for the surrounding communities.

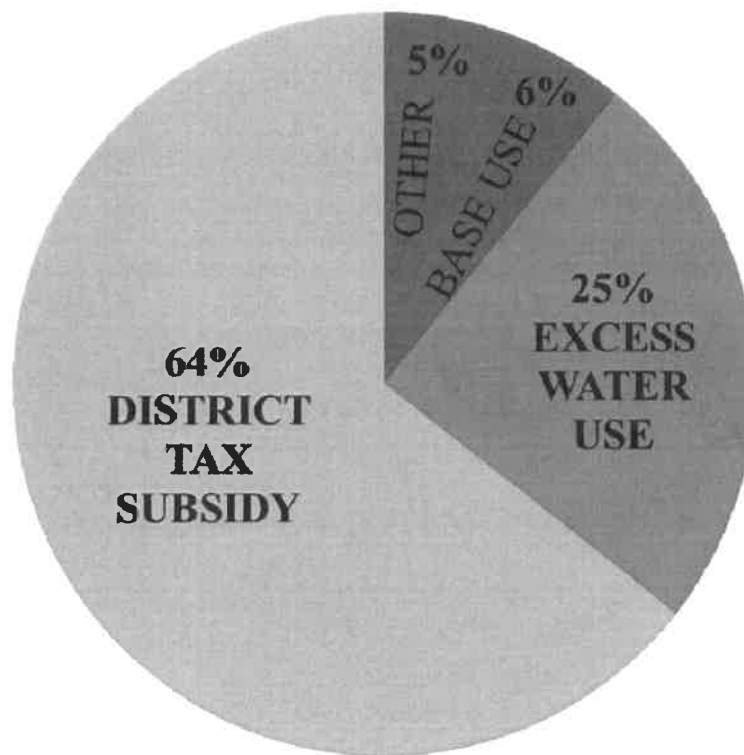
Attachment No. 1 estimates the annual cost for potable water service to the average customer for each of the selected communities based upon the District's average biannual residential water usage of 38,538 gallons. The biannual billing cycle factors were not included in this analysis to simplify the comparison process since the communities had various billing cycles including monthly, quarterly, and biannually. The average annual cost per residential customer ranges from \$207 (COMMFD) to \$492 (Eastham Municipal Water System). The District's average annual residential customer cost for potable water supply under the proposed rate scenario is \$384.

## Conclusions and Recommendations

Prior to this evaluation, water rates had not been reviewed or adjusted since 2005. The District collects annual revenue from its water customers based on these old rates and fees which do not generate sufficient funds to pay for the true cost of service for the potable water system. The revenue collected through water rates is supplemented by District taxes, referred to as a District tax subsidy, to help fund the water system expenses not covered by the existing rate revenue.

The District's water system is operated and maintained to provide fire protection to all areas within the District and potable water to greater than 95-percent of the District's population. There are some residents in the District who receive their potable water supply through private wells. The annual costs to operate and maintain all water system infrastructure for potable water and fire protection purposes are funded in accordance with the Current Revenue Structure in Figure No. 1. The District tax subsidy currently funds approximately 64-percent of the annual costs of the water system. A portion of the water system should be funded by a District tax subsidy to support the water system infrastructure and operations and maintenance costs associated with providing fire protection to the District. The initial phase of this evaluation was to determine the true cost of service for the potable water system which should be fully funded through the water rates. The remaining water system costs associated with fire protection and not directly associated with the potable water supply should be funded by the District tax subsidy.

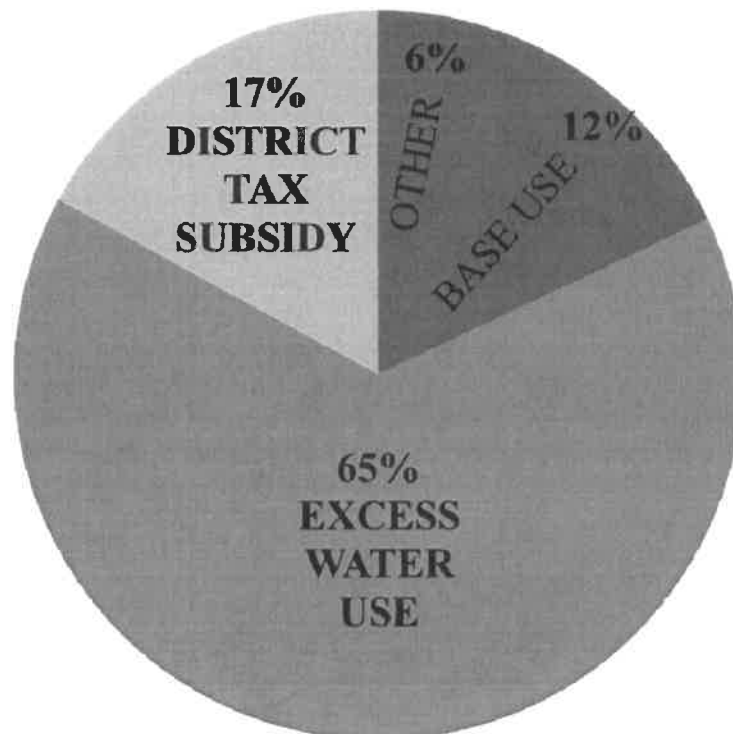
**Figure No. 1**  
**Current Revenue Structure**





After a full review and evaluation of the District finances and budget was completed, the true annual cost of service for sustaining the potable water system was determined for the years included in the study period through FY24. Based on the cost of service associated with the potable water system, a revised, proposed revenue structure was prepared to demonstrate the appropriate funding structure necessary to fairly fund and support the water system. The proposed revenue structure is shown in Figure No. 2. The District tax subsidy under the proposed revenue structure is 17-percent, representing the annual percentage of water system costs associated with fire protection. The minimum base use and excess water use percentages increased from 6-percent to 12-percent and 25-percent to 65-percent, respectively, when comparing the current revenue structure to the proposed revenue structure. The total revenue value required for the water system would not increase, but would shift away from major reliance on taxes paid by District households and move towards self-funding from water use.

**Figure No. 2**  
**Proposed Revenue Structure**



To fully support the cost of service for the potable water system and shift towards self-funding of the potable water system from revenue collected through the water rates, the following changes to the current billing rate structure are recommended.

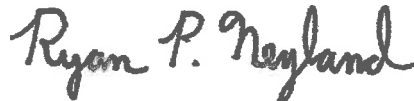
- Implement the proposed non-rate revenue fees in FY20 as presented in Table No. 14.
- Implement the proposed rate scenario in FY20 as identified in Table No. 16, including changes from annual to biannual billing and adjustments to the minimum use base charge and excess use water rates.

- Implement the proposed flat meter base charge in FY20 as presented in Table No. 17 to collect revenue for the Stabilization Fund.
- Monitor and evaluate expenses, Capital Plan costs, debt service costs, employee benefits costs, and revenue routinely throughout the upcoming years, and in detail annually, to confirm additional changes to the rates are not needed to sustain the cost of service for the potable water supply.
- Conduct a detailed review of all operation and maintenance expenditures to determine if these costs can be decreased in the future.

We appreciate the opportunity to assist the Cotuit Fire District Water Department on this important study. At this time, we wish to express our appreciation to the Water Department and the District for their participation in this study and for their help collecting information and data. This letter report was prepared by Ms. Meghan Davis, Project Engineer, and the undersigned. Mr. Patrick O'Neale provided the project technical review. If you have any questions regarding this letter report, please do not hesitate to contact our office.

Sincerely,

TATA & HOWARD, INC.



Ryan P. Neyland, P.E.  
Associate

Attachment

**Cost of Service and Water Rate Study  
Cotuit Fire District Water Department  
Attachment No. 1  
Surrounding Communities Rate/Fee Comparison**

<u>Cotuit Fire District (Proposed Rate Scenario)</u>		
Population:	4,953 (Summer)	
Billing Cycle:	Biannual	
Billing Cycle Average Usage:	38,538 Gal.	
Base Charge (10,000 Gallons)	\$50.00	
Plus Meter Charge:		
Block (Gallons)	Rate (\$/1,000 Gallons)	
10,001 - 20,000	\$4.00	
20,001 - 40,000	\$5.50	
40,001 - 60,000	\$7.15	
60,001 - 100,000	\$8.55	
100,001 & Greater	\$9.70	
Biannual Usage	\$141.96	
Total Annual Usage	\$283.92	
<b>Total Annual &amp; Base Charge</b>	<b>\$383.92</b>	

<u>Mashpee Water District</u>		
Population:	34,000 (Summer)	
Billing Cycle:	Biannual	
Billing Cycle Average Usage:	38,538 Gal.	
Base Charge (15,000 Gallons):	\$50.00	
Block (Gallons)	Rate (\$/1,000 Gallons)	
15,001 - 25,000	\$2.50	
25,001 - 35,000	\$3.00	
35,001 and Greater	\$3.50	
Biannual Usage	\$67.38	
Total Annual Usage	\$134.77	
<b>Total Annual &amp; Base Charge</b>	<b>\$234.77</b>	
<b>Percentage Less than CFD</b>	<b>-39%</b>	

<u>Harwich Water Department</u>		
Population:	12,243	
Billing Cycle:	Quarterly	
Billing Cycle Average Usage:	19,269 Gal.	
Base Charge (1,000 Gallons):	\$35.00	
Block (Gallons)	Rate (\$/1,000 Gallons)	
1,001 - 8,000	\$1.29	
8,001 - 15,000	\$2.65	
15,001 - 40,000	\$3.95	
40,001 & Greater	\$5.72	
Quarterly Usage	\$44.44	
Total Annual Usage	\$177.77	
<b>Total annual &amp; Base Charge</b>	<b>\$317.77</b>	
<b>Percentage Less than CFD</b>	<b>-17%</b>	

<u>Eastham Municipal Water System</u>		
Population:	4,956	
Billing Cycle:	Biannual	
Billing Cycle Average Usage:	38,538 Gal.	
Base Charge (0 Gallons):	\$96.00	
Block (Gallons)	Rate (\$/1,000 Gallons)	
0 - 15,000	\$1.80	
15,001 - 30,000	\$4.75	
30,001 - 50,000	\$6.10	
50,001 and Greater	\$7.50	
Biannual Usage	\$150.33	
Total Annual Usage	\$300.66	
<b>Total Annual &amp; Base Charge</b>	<b>\$492.66</b>	
<b>Percentage Greater than CFD</b>	<b>28%</b>	

**Cost of Service and Water Rate Study  
Cotuit Fire District Water Department  
Attachment No. 1  
Surrounding Communities Rate/Fee Comparison**

<b><u>Barnstable Fire District</u></b>		
Population:	Not Available	
Billing Cycle:	Biannual	
Billing Cycle Average Usage:	38,538 Gal.	
Base Charge (1,000 Gallons):	\$45.00 Quarterly	
Block (Gallons)	Rate (\$/1,000 Gallons)	
1,000 - 45,000	\$3.45	
45,001 - 200,000	\$4.77	
200,001 and Greater	\$7.61	
Biannual Usage	\$129.51	
Total Annual Usage	\$259.01	
Total Annual & Base Charge	\$439.01	
Percentage Greater than CFD	14%	

<b><u>Centerville-Osterville-Marston's Mills Fire District</u></b>		
Population:	Not Available	
Billing Cycle:	Biannual	
Billing Cycle Average Usage:	38,538 Gal.	
Base Charge (0 Gallons):	\$30.00	
Block (Gallons)	Rate (\$/1,000 Gallons)	
0 - 20,000	\$1.00	
20,001 - 200,000	\$2.90	
200,001 and Greater	\$3.95	
Biannual Usage	\$73.76	
Total Annual Usage	\$147.52	
Total Annual & Base Charge	\$207.52	
Percentage Less than CFD	-46%	

<b><u>Hyannis Water System</u></b>		
Population:	Not Available	
Billing Cycle:	Monthly	
Billing Cycle Average Usage:	6,423 Gal.	
Base Charge (0 Gallons):	\$12.91 Monthly	
Block (Gallons)	Rate (\$/1,000 Gallons)	
0 - 4,488	\$3.91	
4,488 - 14,960	\$4.49	
14,960 & Greater	\$5.09	
Monthly Usage	\$26.22	
Total Annual Usage	\$314.58	
Total Annual & Base Charge	\$469.50	
Percentage Greater than CFD	22%	