

Memorandum

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Subject **Town of Orleans, MA**
Water Quality and Wastewater Planning
Task Number 5 – Financial Evaluation
Deliverable 5.c.4 – Final Preliminary Technical Memorandum on Program Cost Impact and Affordability Assessment

Project Number 60476644

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1. Background

This Technical Memorandum presents a high-level assessment of program cost and affordability of the water quality and wastewater management program to Orleans residents and businesses. Investment to meet federal and state wastewater and stormwater requirements can impose significant financial hardships on communities. Clean water costs related to wastewater and stormwater management include those mandated under the 1972 Clean Water Act, which outlines responsibilities to meet and maintain water quality standards for marine and fresh water resources. For the residents and businesses in affected communities, the capital and operating expenses associated with regulatory mandates are often reflected in wastewater bills that grow faster than household incomes and the general rate of inflation. The Clean Water Act construction grants program provided 75 to 85 percent grants for wastewater systems through the 1970s and 1980s. The Town of Orleans did not require federal assistance then, but it does now as it considers its water quality and wastewater management program.

2. Introduction

A. Description of Program Cost Impact Assessment and Affordability

The Town is interested in understanding how different financing options and costs offsets, like grants, for example, impact water quality and wastewater management program costs. Assessing the impact of these different options allows the Town to become more educated on which financing options and costs offsets are most beneficial to the success of the program. The Town has updated the Financial Model to provide greater functionality, and expand the model's ability to evaluate program costs and multiple options for financing and revenue generation. The model allows for subsequent assessment of customer affordability.

Affordability for residential households will be evaluated in light of household income, while the cost to non-residential property owners will be evaluated in light of the potential cost to maintain and replace their existing on-lot wastewater treatment systems over time. Wastewater management costs in other communities across the Commonwealth are provided for information purposes, however costs cannot be directly compared among communities because the costs in each community may or may not contain the same components, such as property taxes, connection fees, and user charges for operation and maintenance. Baseline information on affordability factors is provided in preparation for a more detailed assessment that will be completed in fall 2016 as preliminary design data and additional information on cost offsets become available.

B. Definitions

- **Program Cost Impact Assessment** – Program Cost Impact Assessment is the ability to analyze how different financing options and costs offsets impact the costs of the program.
- **Affordability** – Affordability is the financial burden of the cost on both residential and non-residential customers.

C. Program Cost Impact Assessment and Affordability in Existing Financial Model

While the Town's existing financial model does not contain any calculations related to program cost impact, it does contain seven customer rate scenarios that are displayed in an easy-to-compare format. The model shows the different financing options and costs offsets for each scenario, which are identified as "Cases", as well as the total program costs for each. Since costs for each scenario are easy to compare to those for other scenarios, it is straightforward to assess the impact different financing options and different costs offsets have on program costs. The existing financial model does not contain any tests or indicators related to affordability.

D. Program Cost Impact Assessment and Affordability in New Financial Model

The new financial model's Output Cases summary is based on the existing financial model's table containing the seven customer rate scenarios mentioned above. The new financial model provides the same ability as the existing model to assess the impact different financing options and different costs offsets have on total program costs. The program costs used by the model as inputs are found in the Cost Estimates file. The new financial model does not contain any tests or indicators related to affordability. However, the new financial model could be updated to include affordability tests or indicators, as the Town sees fit.

3. Description of Program Cost Impact Assessment

A. Description of Methodology Used to Complete a Program Cost Impact Assessment

The new financial model supports the ability to run scenarios using different financing options. Financing options include conventional financing, United States Department of Agriculture (USDA) financing, and State Revolving Fund (SRF) financing with different terms and interest rates. Similarly, the model supports the ability to run scenarios using different costs offsets. Costs offsets include grants/principal forgiveness, savings from design/build or design/build/operate wastewater treatment facility projects, and local options taxes.

Running a scenario with one financing option and with certain costs offsets produces a certain amount of program costs. Running a second scenario with a different financing option and with the same costs offsets as the other scenario allows for assessment of the impact of the different financing option on the cost of the program. Running a third scenario with the same financing option as another scenario, but with different costs offsets as the other scenario allows for assessment of the impact of the different costs offsets on the cost of the program.

B. Description of Methodology Used to Run Additional Program Cost Impact Assessments

The developer of the new financial model, with assistance from the Town and the engineering team, ran through many different scenarios in the financial model. The scenarios consisted of different combinations of financing options, costs offsets, and revenue options. With the ability to see program costs with each run, assessing the impact financing options and costs offsets have on program costs is straightforward. Having this ability has given the Town a tool to determine the combination of financing options, costs offsets, and revenue options most beneficial to the Town's ability to finance the program.

As noted above, the model is continuing to be refined to reflect potential cost savings related to potential public/private partnership options that would introduce private equity into the financing of the program, and thus reduce total costs to the Town. The Town is also exploring opportunities to extend the length of program implementation from 20 years to 40 years. An extension of the program implementation period would spread out the costs and reduce the annual cost impacts to customers accordingly.

C. Customer Costs

As noted above, the new financial model provides an opportunity to evaluate how costs change depending on how costs are allocated to different groups of users. The Town seeks to fund annual program costs, like those for operating, maintenance, and monitoring, via annual user charges. Users would pay for the annual costs related to the projects in their area only. Property owners with on-site septic systems would pay an annual septic management fee that would fund the replacement and maintenance of their systems.

For capital costs and costs from the financing of those costs through long-term borrowings, the Town has options on how it can spread program costs amongst its property owners and visitors. Options for property owners are property taxes, special assessments, and local option taxes. Funding program costs through property taxes spreads those costs equally among all property owners. Assessing program costs to property owners via special assessments results in property owners paying for the costs of the projects in their area only and not for the costs of the projects in other areas. Financing program costs through local option taxes provides funding from property owners and visitors.

If the Downtown Area Wastewater Treatment Facility is built to treat septage, property owners would benefit as costs the owners would be responsible for would be lower due to septage revenue. Projections show that septage revenue from septage collected and treated at the facility would be greater than the additional costs to build the facility to collect and treat the septage by about \$354,000 annually. If program costs are funded through property taxes, all property owners would benefit from the septage revenue. If program costs are assessed via special assessments, property owners in the Downtown area only would benefit from the septage revenue. Additionally, the Town may realize other program costs savings with the securing of grants, private equity, and/or design/build or design/build/operate procurements. The affordability of the costs for both residential households and businesses is discussed in Section 5 of this Technical Memorandum.

4. Development of Program Cost Impact Assessment

The new financial model has the ability to present program costs in two ways: (1) total program costs together as if the entire project were completed in the first year; and (2) program costs subject to phasing over a 20-year period. Both ways of presenting the costs are shown in this section. However, for phasing, only costs tied to one year are shown; the year is Year 4, when the Downtown Area wastewater treatment facility is proposed to come online. Program costs shown are depicted as annual costs and include capital, financing, operating and maintenance, replacement, and monitoring costs.

A. Case 1

The first case produced by the model includes conventional financing with 20-year terms and a 4 percent interest rate. Program costs for this case are shown in Table 1 below.

Table 1 - Cost Impact Assessment Case 1

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$12,555,346	\$6,247,824

B. Case 2

The second case produced by the model includes SRF financing with 20-year terms and a zero percent interest rate (i.e. assumes program qualifies for an enhanced loan subsidy). Program costs for this case, as well as differences when compared to Case 1, are shown in Table 2 below.

Table 2 - Cost Impact Assessment Case 2

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$10,469,068	\$5,181,138
\$ Difference from Case 1	-\$2,086,278	-\$1,066,686
% Difference from Case 1	-16.62%	-17.07%

SRF financing with a zero percent interest rate saves the Town over \$2 million of all program costs and over \$1 million in Year 4 alone.

C. Case 3

The third case produced by the model includes the same SRF financing option as in Case 2, but includes septage costs and revenue. Program costs for this case, as well as differences when compared to Case 2, are shown in Table 3 below.

Table 3 - Cost Impact Assessment Case 3

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$10,694,650	\$5,410,638
\$ Difference from Case 2	\$225,581	\$229,500
% Difference from Case 2	2.15%	4.43%

Building the Downtown wastewater treatment facility to treat septage is more costly. Estimates are that it would cost the town an additional \$500,000 in capital costs and an additional \$200,000 annually for operating and maintenance. There are also additional financing costs. Although including septage treatment in the Downtown wastewater treatment facility would cost the Town about \$225,000 to \$230,000 more annually, the Town would collect septage revenue estimated at \$584,000 annually, for a net septage revenue amount of at least \$354,000 annually.

D. Case 4

The fourth case produced by the model includes the same SRF financing option and costs offsets as in Case 3, so there is no cost impact assessment to look at for Case 4. The difference between Case 3 and 4 is that the costs in Case 3 are funded through property taxes while costs in Case 4 are funded through special assessments.

E. Case 5

The fifth case produced by the model includes the same SRF financing option as in Cases 2, 3, and 4, as well as the costs for septage in Cases 3 and 4, but includes a grant of 90 percent of the program’s capital costs. While obtaining 90 percent grant funding is extremely unlikely to occur, this scenario provides insight into approximate cost of the program if the grants were still available from the federal government. Program costs for Case 5, as well as differences when compared to Case 3, are shown in Table 4 below.

Table 4 - Cost Impact Assessment Case 5

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$5,829,016	\$2,866,389
\$ Difference from Case 3	-\$4,865,634	-\$2,544,248
% Difference from Case 3	-45.50%	-47.02%

The inclusion of a grant at 90 percent of the program’s capital costs has a significant impact on program costs, as it would cut annual costs almost in half.

F. Case 6

The sixth case produced by the model includes the same costs for septage in Cases 3, 4, and 5, but includes different financing as the terms on the SRF borrowing are 30 years. Additionally, the sixth case includes a grant of 25 percent of the program’s capital costs, 21 percent savings on wastewater treatment facility capital costs for design/build projects, an additional 7 percent savings on wastewater treatment facility operating and maintenance for design/build/operate projects, and 5 percent local options taxes which apply to annual costs like operating and maintenance, replacement, and monitoring. The design/build savings of 21 percent and the design/build/operate savings of 7 percent are based on savings realized from multiple projects managed by AECOM. Program costs for this case, as well as differences when compared to Case 3, are shown in Table 5 below.

**Table 5 - Cost Impact Assessment Case 6
Including all cost offsets**

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$8,395,343	\$2,933,888
\$ Difference from Case 3	-\$2,299,306	-\$2,476,750
% Difference from Case 3	-21.50%	-45.78%

The inclusion of 30-year SRF financing and new costs offsets has a significant impact on program costs, as it would cut annual costs by about 20 percent for the All in Year One scenario and almost in half in Year 4 of the Phasing scenario.

Multiple costs offsets are included in Case 6. The impact of each, in addition to the impact of 30-year SRF zero percent financing, is shown in the next several tables.

Case 6 includes 30-year SRF financing option with a zero percent interest rate. Its impact when compared to Case 3, which is used as the comparison since it has 20-year SRF at zero percent for its financing and has septage, is shown in Table 6 below.

**Table 6 - Cost Impact Assessment Case 6
With 30-year SRF at 0% interest**

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$10,734,275	\$4,740,005
\$ Difference from Case 3	\$39,625	-\$670,633
% Difference from Case 3	0.37%	-12.39%

Financing the program using 30-year SRF financing with a zero percent interest rate has little impact over the entirety of the program, but has a significant impact on a year-to-year basis as the per-year principal payments are lower.

Case 6 includes 30-year SRF financing option with a zero percent interest rate and a grant of 25 percent of the program’s capital costs. The impact when compared to Case 3, which is used as the comparison since it has 20-year SRF at zero percent for its financing and has septage, are shown in Table 7 below.

**Table 7 - Cost Impact Assessment Case 6
 With 30-year SRF, 0% Interest and 25% Grant**

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$9,372,804	\$3,470,357
\$ Difference from Case 3	-\$1,361,471	-\$1,269,649
% Difference from Case 3	-12.68%	-26.79%

Case 6 includes 30-year SRF financing option with a zero percent interest rate and 21 percent savings on wastewater treatment facility capital costs for design/build projects. Their impact when compared to Case 3, which is used as the comparison since it has 20-year SRF at zero percent for its financing and has septage, are shown in Table 8 below.

**Table 8 - Cost Impact Assessment Case 6
 With 30-year SRF at 0% interest and 21% savings on capital cost (D/B procurement)**

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$9,933,195	\$4,377,089
\$ Difference from Case 3	-\$801,080	-\$362,916
% Difference from Case 3	-7.46%	-7.66%

Case 6 includes 30-year SRF financing option with a zero percent interest rate and 7 percent savings on wastewater treatment facility operating and maintenance for design/build/operate projects. Their impact when compared to Case 3, which is used as the comparison since it has 20-year SRF at zero percent for its financing and has septage, are shown in Table 9 below.

**Table 9 - Cost Impact Assessment Case 6
 With 30-year SRF at 0% Interest and 7% O&M savings (D/B/O procurement)**

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$10,616,136	\$4,672,254
\$ Difference from Case 3	-\$118,139	-\$67,751
% Difference from Case 3	-1.10%	-1.43%

Case 6 includes 30-year SRF financing option with a zero percent interest rate and 5 percent local options taxes which apply to annual costs like operating and maintenance, replacement, and monitoring. Their impact when compared to Case 3, which is used as the comparison since it has 20-year SRF at zero percent for its financing and has septage, are shown in Table 10 below.

**Table 10 - Cost Impact Assessment Case 6
With 30-year SRF at 0% interest and 5% local options tax**

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$10,469,856	\$4,596,686
\$ Difference from Case 3	-\$264,420	-\$143,319
% Difference from Case 3	-2.46%	-3.02%

G. Case 7

The seventh case produced by the model includes the same financing options and costs offsets as Case 6, but has the grant money allocated differently. The grant money is used to pay for Meetinghouse Pond wastewater treatment facility capital costs whereas, for Case 6, the grant money is spread equally across all capital costs. Program costs for this case, as well as differences when compared to Case 6, are shown in Table 11 below.

**Table 11 – Cost Impact Assessment Case 7
Similar to Case 6 but with grant funds applied to MHP only capital costs**

Description	All in Year One Scenario	Phasing Scenario
Total Equivalent Annual Cost	\$8,195,073	\$4,137,555
\$ Difference from Case 6	-\$200,270	\$1,203,667
% Difference from Case 6	-2.39%	41.03%

The allocating of grant revenue differently for Case 7 does have a financial impact. The impact is minor for the All in Year One scenario, but is more impactful for Year 4 of the Phasing scenario due to the timing of the Meetinghouse Pond area wastewater treatment facility’s construction and first use.

H. Case Summary

A summary of the Total Equivalent Annual Cost for each of the cases is presented in Table 12 below.

Table 12 - Total Equivalent Annual Cost Case Summary

Case	Description	All in Year One Scenario	Phasing Scenario
1	Conventional Financing; 20-year term; 4 percent interest rate	\$12,555,346	\$6,247,824
2	SRF Financing; 20-year term; 0 percent interest rate	\$10,469,068	\$5,181,138
3	Same financing option as Case 2; plus septage	\$10,694,650	\$5,410,638
4	Same financing option and costs offset as Case 3 since costs are the same	\$10,694,650	\$5,410,638
5	Same financing option and costs offset as Cases 3 and 4; plus a grant at 90 percent of the program's capital costs	\$5,829,016	\$2,866,389
6	SRF Financing; 30-year term; 0 percent interest rate; plus a grant at 25 percent of the program's capital costs; savings on wastewater treatment facility capital costs at 21 percent for design/build; savings on operating and maintenance costs at 7 percent for design/build/operate; and savings on annual costs in the form of 5 percent local options taxes	\$8,395,343	\$2,933,888
7	Same financing option and costs offsets as Case 6; Meetinghouse Pond wastewater treatment facility capital costs funded by grant	\$8,195,073	\$4,137,555

5. Financial Capability and Affordability Assessment

A. Background and Framework for Assessment

This section of the Technical Memorandum assesses the financial capability of the Town of Orleans to support the proposed water quality and wastewater management program and provides background for assessment of affordability to typical households and businesses in the Town. The United States Environmental Protection Agency (EPA) guidance on financial capability and affordability is used as one tool to conduct the analysis because it provides recognized benchmarks for community financial health and residential affordability. The EPA guidance does not address non-residential affordability; thus a separate analysis is provided to evaluate the potential cost to the non-residential users in the Downtown. Finally, this memo also provides a summary of wastewater management costs and wastewater management user charges in several other communities on the Cape that are also undertaking water quality and

wastewater management programs. The comparison is informative, although differences in the various elements and size of programs must be recognized. These three evaluation methods are described below; however, it is important to note that the costs of the Orleans program are still at a planning level at this time. This assessment provides a preliminary insight into the ability of Orleans to pay for the water quality and wastewater management program, but it will be refined as additional design information becomes available, and as discussions with business owners proceed regarding opportunities for P3.

B. EPA Financial Capability and Affordability

EPA has issued guidance to assist communities with assessing the financial capability and affordability of meeting Clean Water program requirements. The guidance was first outlined in *Interim Economic Guidance for Water Quality Standards Workbook* (1995), and then further discussed in the Combined Sewer Overflows-Guidance for Financial Capability Assessment and Schedule Development in 1997, the Integrated Municipal Stormwater and Wastewater Planning Approach Framework in 2012, and most recently in the Financial Capability Assessment Framework for Municipal Clean Water Act Requirements issued by EPA in November 2014. The guidance outlines how to assess the financial health of the community to support water quality efforts as well as the financial burden on households.

In the Commonwealth, groundwater discharge of treated effluent is regulated by the Massachusetts Department of Environmental Protection (MassDEP), not the US EPA. Septic system discharges are considered a non-point source and in the Commonwealth are regulated under Title 5, which is administered by local Boards of Health. Non-point sources are not directly regulated under the Clean Water Act, but are referenced in multiple locations (Sections 208 and 319 for example) related to state responsibilities to maintain water quality. Groundwater flow from septic systems can affect the surface water quality in ponds, estuaries, and embayments. In addition, stormwater point source discharges are regulated by the Clean Water Act and permitted through EPA's National Pollutant Discharge Elimination System (NPDES) program. Thus, the financial capability assessment methodology provided by EPA serves as one tool to assess affordability for Orleans' proposed water quality management program.

The 1997 EPA guidance contains a two-phase approach for assessing a permittee's financial capability to implement current and proposed wastewater management controls. Phase 1 calculates the financial impact of water pollution costs (wastewater and stormwater) on individual households to determine the Residential Indicator (RI), which is defined as the average cost of household water pollution costs relative to a benchmark of 2 percent of the service area median household income. Phase 2 evaluates six Financial Capability Indicators (FCIs) regarding a permittee's (such as the Town of Orleans) debt, socioeconomic, and financial conditions. The FCIs are compared to state or national benchmarks and are used to generate a score that is the average of the six FCI scores. The results of the first and second phases are combined in a Financial Capability Matrix (presented in Table 13) to give an overall assessment of a permittee's financial capability and "affordability" of the proposed program. The financial burden is then categorized as low, medium, or high burden. The Financial Capability determination is often used to help in the development of a reasonable implementation schedule.

Table13 - Financial Capability Matrix

Permittee Financial Capability Indicators Score (Socioeconomic, Debt, and Financial Indicators)	Residential Indicator (Cost Per Household as a % of MHI)		
	Low Impact (Below 1.0%)	Mid-Range (Between 1.0 & 2.0%)	High Impact (Above 2.0%)
Weak (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (Between 1.5 and 2.5)	Low Burden	Medium Burden	High Burden
Strong (Above 2.5)	Low Burden	Low Burden	Medium Burden

As noted in earlier sections of this Technical Memorandum, costs for the various components of the proposed project in the Town of Orleans (non-traditional projects, collection systems, treatment facilities, and groundwater discharge facilities) have been estimated, and the recovery of costs allocated to different revenue mechanisms: property taxes; special assessments charged directly to property owners in the subwatershed areas; septage revenues; and annual user rate charges. Additional revenue sources such as grant funding or new local or regional tax revenues have also been identified. Seven cases composed of different combinations of the above costs and potential revenue sources have been developed and described in preceding sections of this Technical Memorandum. Table 14 provides a simple summary of which assumptions were made for each output case.

The financial model described earlier in this Technical Memorandum focused on wastewater related costs and did not address stormwater management and compliance costs. According to the Town’s Department of Public Works (DPW), the annual costs for stormwater management are approximately \$200,000. This represents approximately \$170,000 for specific stormwater-related projects; these costs are typically approved by warrant articles. The remaining \$30,000 is included in the DPW operating budget. The total cost, whether borrowed or included in the operating budget, is currently accounted for in the property tax, as the Town does not have a separate stormwater utility fee. Additional costs associated with compliance with the newly released updated MS4 General Permit are being evaluated by the DPW. Since the Town has been proactive in addressing stormwater-related concerns, it is expected that additional costs associated with compliance with the new permit will be minimized.

Residential Indicator. One of the benchmarks used in the EPA affordability assessment is the Residential Indicator (RI), which is the cost of the program per residential household expressed as a percentage of median household income. The benchmark used by EPA in its guidance for completing Financial Capability and Affordability Assessments is 2 percent.

Using a median household income for the Town of Orleans of \$58,235 (2010-2014 ACS 5-year Estimate), a 2 percent benchmark would represent an annual charge of \$1,165. This is a benchmark only, and does not serve as an actual mark of affordability, which varies by individual circumstance. It is important to note that the Town has a particularly large share of population over the age of 65 (41.2 percent compared to 14.4 percent for the State of Massachusetts according to recent Census data), many of whom may be on a fixed income and, thus, would face even greater challenges in paying increased wastewater costs. The various scenarios for

allocating costs and revenues will continue to be refined as the project proceeds to design. However, it is recognized that additional sources of revenue or a longer implementation period must be identified to further reduce the burden to all customers. Additional design information will help to reduce contingencies included in the cost estimates and, thus, bring customer costs down.

The second part of the EPA’s two-part assessment is the evaluation of the financial strength of the Town as measured by a number of different factors as described below.

Financial Capability Indicators. This analysis evaluates six financial capability indicators, which provide a snapshot overview of the financial wellbeing of a community. The indicators fall into three major categories: debt, socioeconomic, and financial management. The indicators for a community are categorized as weak, mid-range, or strong, as determined by a comparison to the state or national average for those same indicators. The specific indicators, the relevant information for the Town of Orleans, and resulting categorization of level of strength of those indicators are summarized in Table 15.

Table 15 - Financial Capability Indicators

Indicator	Orleans Data	Indicator Rating
Debt Indicators		
• Bond Rating (GO or RB)	AAA (S&P 2015)	Strong-3 points
• Overall Net Debt as Percent of Full Market Property Value	<2 percent (2010-2014 ACS 5-Year Estimates)	Strong-3 points
Socioeconomic Indicators		
• Unemployment Rate	1.6 percent Orleans; 5.8 percent US More than 1 Percentage Point Below National Average (2010-2014 ACS 5-Year Estimates)	Strong -3 points
• Median Household Income	+/-25 percent of National MHI (2010-2014 ACS 5-Year Estimates)	Mid-Range-2 points
Financial Management Indicators		
• Property Tax Revenues as a Percent of Full Market Property Value	0.6 percent (FY2014 Orleans Annual Town Report)	Strong-3 points
• Property Tax Revenue Collection Rate	98 percent (FY2014 Orleans Annual Town Report)	Mid-Range - 2 points
Average Score		2.6

The scores from the RI and the FCI are combined to provide an overall Financial Capability Score. A final RI will be developed in fall 2016 once additional design information and information on additional sources of revenue become available.

C. Non-Residential Costs and Affordability

Businesses and other non-residential users would be responsible to pay their fair share of the anticipated wastewater management costs. These users would pay any costs allocated through property taxes and would also pay for special assessment charges and annual user fees. Under several of the Cases, the costs of the downtown collection, treatment, and disposal system components of the project would be paid for solely by the downtown businesses.

For the purpose of establishing a baseline for evaluating affordability, the anticipated cost to maintain and/or replace their wastewater management systems was estimated. Restaurants and motels have higher annual water and wastewater use, while the retail stores and offices have lower annual flows. The historic average for all non-residential properties is 367 gpd and 433 gpd for all mixed use properties. The estimated current cost to maintain an on-site wastewater disposal system is approximately \$6,300 per year, assuming that the non-residential establishment is required to pay approximately \$200 to \$400 for annual maintenance, \$500 for each pump out (assumes an average of one pump out every month) and no financing costs.

All septic system owners face the inevitable need to replace their system at some point in time. The replacement cost of a conventional septic system (440 gallons) is estimated to be approximately \$18,000, and \$35,000 for an Innovative/Alternative Technology (I/A) system. The cost would be higher for larger systems that serve the various restaurants and motels in the Downtown Area.

It is important to note that if the Downtown Area is sewered in the future, there will be opportunities for both residences and businesses to change use or increase density of development on their properties, depending on revised zoning regulations approved by the Town. The changed uses and higher densities allowed under revised zoning may provide opportunities for greater revenue generation.

D. Comparison to Wastewater Management Costs in Other Communities

The anticipated costs for wastewater management in the Town of Orleans can be compared to costs in other communities across the Cape and the Commonwealth. One source for comparative wastewater user charges for Massachusetts communities with less than 10,000 population is the Tighe & Bond 2014 Sewer Rate Survey. The costs included in the survey reflect annual user charges and do not specifically reflect additional costs to property owners for debt or other costs covered in the property tax assessments (Telephone communication with Mary Beth Morris, Tighe & Bond, May 26, 2016). The range of costs across the communities included in the survey was the Town of Warren at \$300 per year and Town of Northfield at \$1,854 per average user. The average sewer user charge based on 81 communities with less than 10,000 population was \$797, rounded to \$800 per household. This figure includes wastewater user charges only.

The Towns of Falmouth, Barnstable, and Chatham are included in the Tighe & Bond survey; Provincetown was not. Falmouth (\$732), Barnstable (\$570), and Chatham (\$637) are all below the average of \$800 per user. Again, these amounts do not necessarily include special assessments, property tax, or other financing costs to property owners, nor do they include identified stormwater costs.

E. Implications of Phasing of the Wastewater Management Program

Phasing of the program components is one way to spread out the cost impact to users. However, if the program needs to be implemented in its entirety within a 20 year period, there are still years in which the financing for the different program elements result in very high costs to customers. Phasing the program beyond a 20 year implementation period would help to smooth out the cost increases and result in lesser annual impact to customers.

Analysis of phasing the program over 20 years shows that owners of property in Orleans would pay lower program costs in the initial years of the program, with per property costs ramping up over the remaining years. Property owners in the Downtown area would experience significant jumps in years 4 and 15. Property owners in the Meetinghouse Pond area would see a significant jump in year 9), and a sizeable, but smaller, bump in year 16. Property owners in the non-traditional technology area would see sizeable jumps in years 7 and 8 and 9 but generally see a steady increase across all 20 years. Stretching the program over a longer period of time would cost the Town more money over time, but would lower the per-year cost. Financing the project using 30-year SRF borrowings at zero percent, instead of 20 year SRF borrowings at zero percent adds about \$40,000 in financing cost (due to SRF Origination Fees) to the total program but shows the lower per-year principal payments would save the Town about \$670,000 in financing costs in the fourth year of the program. Cost savings would be reflected in reduced costs to customers.

6. Conclusion

As previously noted, the estimated costs for implementing the program are still at a planning level. In the next year, design work will be completed and at least two of the demonstration projects will be initiated. The additional information gained through these activities will help to further refine project costs and will reduce the contingency amounts that have been incorporated into cost estimates. Further stretching the implementation of the water quality improvement beyond a 20-year time period would also reduce the per year costs to users. In addition, conversations with state and federal regulators and political representatives will continue so as to identify additional sources of revenue, including private equity related to P3 opportunities. The updated information on costs, funding and financing will contribute to more accurate assessment of affordability.