TOWN OF PROVINCETOWN

DEPARTMENT OF PUBLIC WORKS

PEAK FLOW STORAGE TANK PROJECT

REPORT FOR THE 4:30PM AUGUST 13, 2018 MULTI-BOARD MEETING

SELECT BOARD, BOARD OF HEALTH, WATER and SEWER BOARD

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   Placement on Special Town Meeting

1. OVERVIEW

- At the multi-board meeting on January 22nd, 2018, the Dept. of Public Works presented to the Board of Selectmen, Water & Sewer Board, and Board of Health the limited amount of capacity currently available, the known and potential needs for additional capacity and options for increasing capacity to meet these needs, including the possibility that some form of Town subsidy might be required to provide any additional capacity.

- Moving forward with a Peak Flow Storage Tank as at least a first step was viewed favorably by board members at the January 22nd meeting. At the February 26th, 2018 Board of Selectmen Meeting, the Board approved the Dept. of Public Works' request for a Contract Amendment for AECOM to undertake the preliminary engineering for this Upgrade Project.

- The proposed Wastewater Tank Project includes the addition of the Peak Flow Storage Tank, designed to handle the summer peak flow requirements and, thereby, free up the remaining MassDEP permitted capacity for additional flows and connections. Addition of this tank can provide a 15% increase in the useable capacity of the Plant.

- This project will not only solve the Town's perennial summer peak flow issue, but it can also provide additional capacity that could be used for Town priorities for failed septic systems, other public health emergencies, business improvements that create jobs or housing that support the year-round community, and abutters to the sewer that would like to be able to connect. Although over time, the Town would like to serve as many properties with a need or interest as possible, no expansion of the collection system is proposed as a part of this project because there are no additional areas that can be served at this time because the betterment rates would need to be too high, or all abutters would need to pay the betterment, or new revenue sources would be needed.

Proposed Wastewater Tank Project and potential funding sources

- The Wastewater Tank Project can be funded through grant funds and betterments from new users as in the past because of the potential to receive another substantial grant and low-interest loan from the USDA and the request from a number of downtown businesses to add additional flow that can provide betterment revenue for the project to be financially feasible. This funding approach was favored by 90% of the people who responded to the online town-wide survey earlier this year. The highlights from the survey are discussed in the next section.

- Based upon the Town's discussions with USDA, we anticipate that about $2 million of the requested $6 million will be a grant with the remaining $4 million in the form of a low-interest 30 or 40-year loan similar to the funding that the Town received five years ago for Phase 4. An application will need to be submitted to the USDA by the end of September in order to request the funding that will cover the cost of

  (i) A Peak Flow Storage Tank and other associated capacity improvements at the Wastewater Treatment Facility,

  (ii) Two new pump stations designed to handle town priority needs for economic development along the waterfront, the new Police Station on Jerome Smith Road, and affordable housing at the former VFW site, and

  (iii) Improvements to the existing collection system so that a number of properties that the Board of Health considers a public health priority can be connected to the sewer.

1. OVERVIEW

- The proposed Peak Flow Storage Tank will be used only during the summer to handle the peak period flows and thereby allow the Town to free up the remaining permitted capacity which can't be used now because of the large spikes in peak flow. This reserve tank can free up all of the remaining capacity that the Plant is permitted to handle based on an approved ratio for the observed "maximum day flow" (MDF) as compared to the total Title 5 design flow gallons per day that are connected on that maximum day. Using this ratio, 155,000 GPD is the amount of additional Title 5 gallons that will be available by freeing up the current capacity reserved for Plant operations (125,000 GPD) and peak rain events (30,000 GPD). Currently, the Town has only about 40,000 Title 5 GPD remaining that can be allocated to town priorities under the State of Limited Capacity.

Downtown economic development flow requests help to fund the additional capacity

- The betterment revenue from the additional sewer flow requested by a number of downtown businesses including the Provincetown Marina and the Surf Club is an important component of the funding for this project because it can provide a large portion of the committed funding needed for the Wastewater Project to go forward at this time. As with the earlier phases, additional flow and users can then be added over time to ensure that there will be adequate revenue to pay off the debt that has been incurred to serve them. Without these larger users who are interested in additional flow, this project could not proceed at this time without a General Fund or other funding subsidy. Large users ready to connect were needed in the past for each phase of the sewer system to be financially feasible.

- It can allow the Surf Club to receive the additional flow they have requested so that they can rebuild their facility with additional seating on the second level. The new pump station to be located at the Municipal Parking Lot will serve both the Provincetown Marina and the Surf Club and will be funded in large part by the betterment from the Marina.

- The existing vacuum structure that serves the Surf Club and the Lobster Pot does not have sufficient capacity to handle the additional flow requested by the Surf Club, and to build a new pump station for the Surf Club's needs would require a betterment rate more than twice the current rate. Therefore, it would be difficult to add more flow for the Surf Club without the flow and funding from the Marina, or a subsidy from the General Fund or another funding source such as the Rooms Tax. The new pump station will allow the Town to take the existing flow from both the Surf Club and the Lobster Pot off of the vacuum system, thereby freeing up additional capacity in this downtown area for future economic development and other uses.

- By committing less than 20% of the additional capacity that can be made available with the construction of the Peak Flow Storage Tank to the requested needs of a number of downtown businesses, the Town will increase by almost 400% the available capacity that it can then use for its future public health, economic development, housing and municipal needs.

Grant funding for a sewer connection for potential housing at the former VFW site

- A big benefit of the USDA grant which can subsidize infrastructure that is funded through this project is that it can reduce the cost of providing sewer for housing on the former VFW site by sizing the collection system and pump station so it can handle the flow for both the new Police Station and for the housing. Without the USDA grant funds for this Project, there would only be enough funding from the $8.6 million Town Meeting approved Police Station article to pay for a smaller pump station that would serve the needs of only the Police Station, and the Town would need to subsidize the cost of the sewer for the VFW site housing.

1. OVERVIEW

Properties under an Administrative Consent Order will be served by this project

- Nearly one-half of the 27 properties that are under an ACO from the Board of Health are located in the area served by the sewer and can be connected with improvements to the collection system that will be funded as a part of this project. The 12 ACO properties that can be served by this project are about 2% of the nearly 600 remaining properties in the area served by the sewer that are not already connected or committed to connect. Only 3% of the 500 properties that are outside the area served by the sewer are under an ACO.

Capacity can be available again for voluntary connections and flows from abutters

- The funding for the Peak Flow Storage Tank that frees up the remaining Title 5 design flow capacity that the Plant can treat will also allow the Town to reopen the current moratorium on voluntary hook ups and flows for market rate housing for abutters to the existing sewer system in addition to providing more flow for Town priorities. Depending upon the future needs for Town priorities, an estimated 20 to 25% of the nearly 600 properties located in the existing sewer area that are not currently connected will be able to hook up in the future once this additional capacity is made available. Including the remaining abutter properties, about 77% of all of the properties in town are located in areas served by the sewer.

Betterment rate for new users and flows to be increased to adjust for inflation

- If the betterment rate that was first assessed in 2001 had been increased with the rate of inflation, it would be approximately $55 per gallon per day of Title 5 design flow by Memorial Day 2021 when the additional capacity will be available, and that is the rate that the Administration is recommending be charged for the capacity from this Project. The current $45/GPD rate was set more than 10 years ago, and the betterment rate for Phases 3 and 4 would have needed to be at least $55/GPD if the Town had not received substantial grants from USDA that were used to maintain the rate at $45 for those phases.

USDA grant and low-interest rate loan funding is available for this Upgrade Project

- Provincetown is in an excellent position to receive an estimated $6 million grant and low-interest loan award from USDA for FED FY2019 that begins October 1st. Very few communities can meet their new criteria for the award of a grant but Provincetown does meet the criteria based upon our relatively high sewer user fees. For financial planning purposes, we are estimating that the grant will be $2 million and the loan will be $4 million.

- The loan portion can be either for 30 years or for 40 years, which was the loan period for our $2 million grant/loan award five years ago for Phase 4. A 30-year loan period will result in the least amount of interest to be paid, while either a 40-year loan period paid thru the entire term or paid off after 20 years would provide more flexibility for allocating the available gallons over time, since early year payments would be less. Because the interest savings for a 30-year loan are substantial, this is the funding option recommended by the Administration.

- The proposed allocation of the 155,000 GPD of additional capacity that the Upgrade Project will make available is based on the best scenario for ensuring positive cash flow each year throughout the 30-year pay back period for the USDA loan from a combination of initial flow commitments and forecast Town priority allocations over the next 10 years. No decisions are required at this time for how this capacity will be allocated. The earlier phases also relied on initial committed flows plus "late comer" flows, and although there have been wide swings in the revenues, over time the revenues have or are forecast to cover the costs.

2. A BRIEF HISTORY

- This Report has been prepared to provide an update to Town boards and the voters concerning the development of plans for upgrading the Town's sewer system as directed by the vote of Town Meeting at the 2015 Special Town Meeting and the approval of the Board of Selectmen in February 2018 for the Dept. of Public Works to expend planning and engineering funds authorized by that vote.

- The Town and its engineers and sewer system operators have worked over the years to address the increased demand, both from those business and property owners already served by the sewer and by those who wished to be served by the sewer, and Town Meeting voters have consistently approved each request to add more flow, more users and the capacity needed to serve additional flow, always funded by those users and wherever possible by grants.

- With the completion of Phase 4 in 2015, the sewer system serves twice the amount of flow anticipated when first approved by the voters more than 15 years ago and approximately one-half of the properties in town. As shown in Figure 1, the sewer system now serves all of the downtown area, the waterfront from the Truro town line to the National Seashore Park, and the important low-lying areas in the Shank Painter basin.

Dealing with the problem of limited capacity for the Town's future needs

- Following Phase 4, it became clear that the capacity of the Plant during peak flow periods was very limited, as has been the case repeatedly in the past. Every year there is a substantial increase in flow during the summer as shown on page 7, particularly for July 4th and Carnival. In addition, each phase has only added the capacity needed to serve the new users and flows that would fund it, since only users rather than all abutters are assessed a betterment and only when they connect. As a result, in 2015 Town boards implemented the "State of Limited Capacity" which established four priority categories for the allocation of the remaining capacity and a moratorium on additional flow from other properties that abut the sewer.

- In January, 2018 the Dept. of Public Works presented to the Board of Selectmen, Water & Sewer Board, and Board of Health the limited amount of capacity currently available, the known and potential needs for additional capacity for town priorities and property owners who are not currently served by the sewer, and options for increasing capacity to meet these needs.

- Moving forward with the option of installing the Peak Flow Storage Tank was viewed favorably by board members at the January 22nd meeting as at least a "first step" that can allow for other options in the future. The participants in the discussion group at the February 3rd Town Forum as well as the Forum participants who responded to a survey concerning wastewater needs also viewed it positively.

- Following a summary of the three options and the results of the recent town-wide opinion survey, the remaining sections of this report describe:

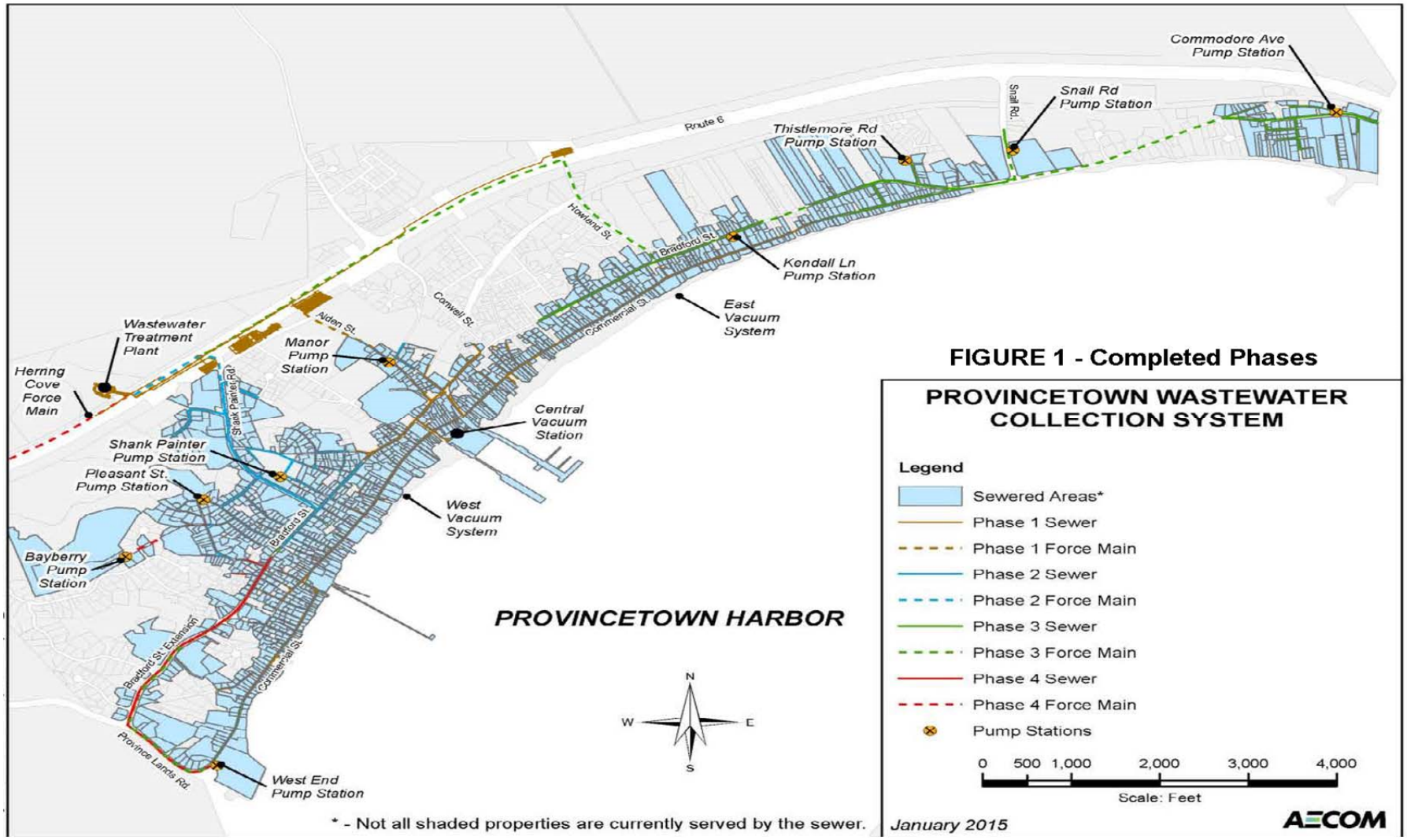
  The proposed upgrade project,

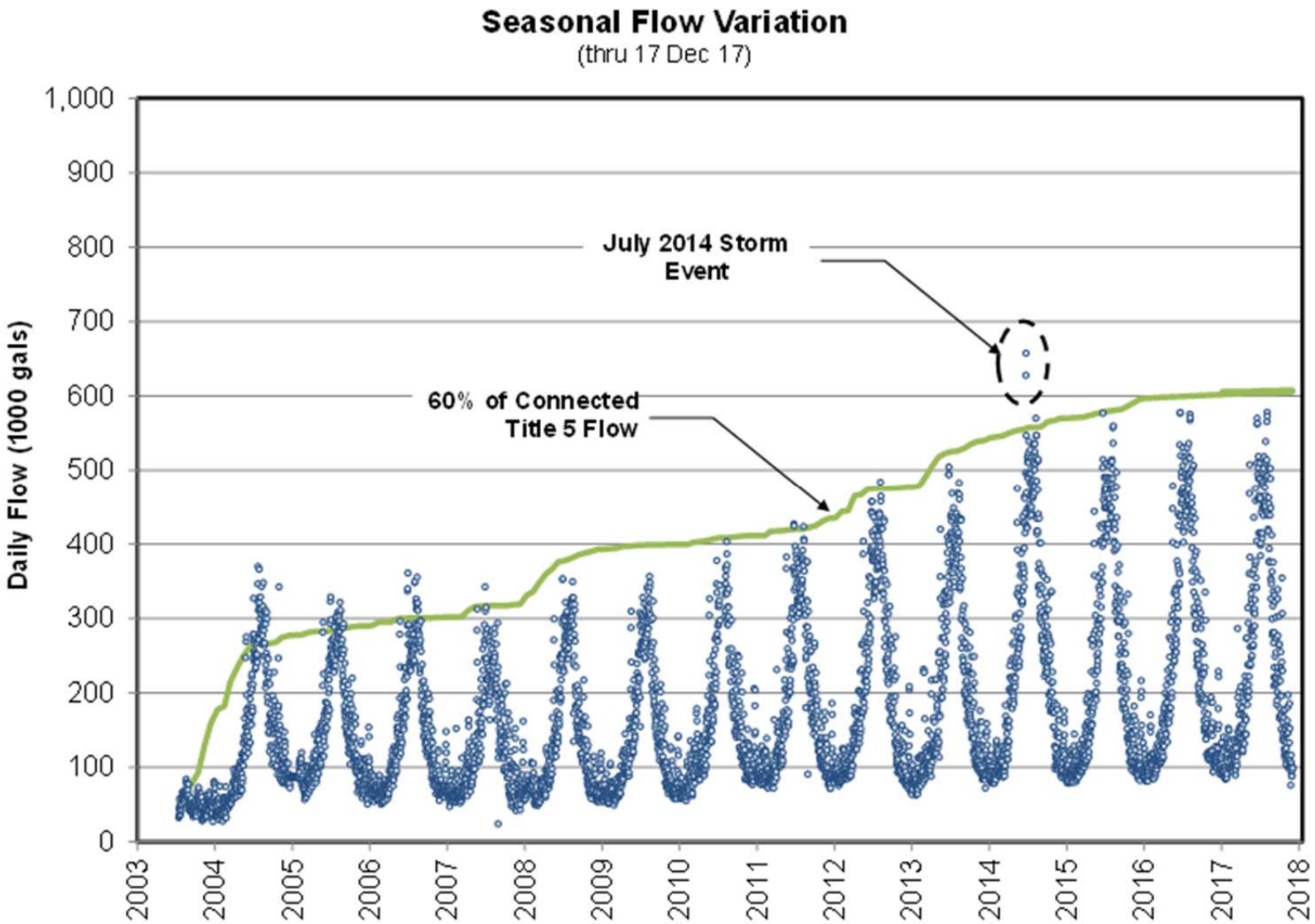
  The area to be served and recommended allocations for the additional capacity,

  The USDA funding opportunity, servicing the debt and the required betterment rate,

  Future planning, and

  A recommended article to be placed on a Fall Special Town Meeting warrant.


Commodore Ave Pump Station
Snall Rd Pump Station
Snall Rd.
Route 6
Thistlemore Rd Pump Station
Howland St.
Bradford St.
Kendall Ln Pump Station
Commercial St.
East Vacuum System
Cornell St.
Alden St.
Wastewater Treatment Plant
Manor Pump Station
Herring Cove Force Main
Shank Painter Rd.
Central Vacuum Station
Shank Painter Pump Station
Pleasant St. Pump Station
West Vacuum System
Bayberry Pump Station
PROVINCETOWN HARBOR
Bradford St. Extension
Province Lands Rd.
West End Pump Station
N
W
E
S
* - Not all shaded properties are currently served by the sewer.
FIGURE 1 - Completed Phases
PROVINCETOWN WASTEWATER COLLECTION SYSTEM
Legend
Sewered Areas*
Phase 1 Sewer
Phase 1 Force Main
Phase 2 Sewer
Phase 2 Force Main
Phase 3 Sewer
Phase 3 Force Main
Phase 4 Sewer
Phase 4 Force Main
Pump Stations
0 500 1,000 2,000 3,000 4,000
Scale: Feet
January 2015
AECOM


Seasonal Flow Variation
(thru 17 Dec 17)
Daily Flow (1000 gals)
1,000
900
800
700
600
500
400
300
200
100
0
July 2014 Storm Event
60% of Connected Title 5 Flow
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018

2. A BRIEF HISTORY

Options for increasing capacity presented to the Town boards in January 2018

- The feasibility study undertaken by Town staff and their engineers from AECOM included looking at three options for adding capacity at the existing Treatment Plant located off of Route 6 near the intersection with Shank Painter Road.

- In addition, AECOM worked with the Town to forecast the potential needs for additional sewer capacity over the next 20 years, both for areas currently served by the sewer and for those areas of town that have been found in the past to not have anywhere near enough interest to fund the collection costs to serve them. The subareas studied and the result of AECOM's needs and cost analysis is shown in Section 4.

Option 1:

- Option 1 would add the peak flow storage tank that would allow the Town to use all of the remaining permitted Plant capacity and would increase the useable capacity by almost 15%. Since the tank could be used with the other two options, it can be a good first step.

- AECOM's analysis showed that Option 1 could serve the 20-year forecast for Town priorities, or a combination of the Town priorities for a shorter time period plus some of the abutters. For Option 1, the estimate presented in January was $4 million for the work at the Plant site plus whatever collection system costs are needed to serve the needs or abutters. These costs have been updated by AECOM and are shown in the next section of the report.

Option 2:

- Option 2 would add smaller standalone treatment plants on the same site, to be used only for the peak summer flows. The capacity can be added in two steps as needed, increasing the capacity by 27% by adding the peak flow tank and the first standalone plant, and ultimately by a total of 40%, which could meet the needs of all abutters as well as managed growth for Town priorities.

- For Option 2, the Plant costs for both standalone plants and the peak flow storage tank were estimated to total about $17 million ($13 million plus the tank cost from Option 1), excluding any collection system costs. For this option, the costs can be incurred in three steps: $4 million for the tank, $6.5 million for one standalone plant, and $6.5 million for the second.

Option 3:

- Option 3 involves a major modification to the Plant. This option increases capacity by more than 80% and could serve the entire town and its future needs for 20 years. Nearly all of this increased capacity would be used by properties that are not currently connected to the sewer, with a smaller amount needed for the 20 year forecast for managed growth for Town priorities.

- It is not very likely that the Town would move ahead with Option 3 unless the voters decide to serve the entire town. The ballpark cost estimated by AECOM for Option 3 was about $20 million at the Plant (including the $4 million for the tank), and $35 million for the collection system to serve the rest of the town, or a total cost that would exceed all of the investment in the system to date over the past 20 years.

2. A BRIEF HISTORY

Summary of findings from the 2018 Online Survey about Future Sewer Capacity

- Following the February Town Forum, the Provincetown community was invited to provide their input to an online survey designed to understand residents' opinions about (i) allocating current and future sewer capacity, (ii) funding future increased sewer capacity, (iii) allocating town-funded sewer capacity, and (iv) the interest from non-connected residents who would like to connect to the sewer system. This was the first online town-wide opinion survey concerning future sewer capacity.

- The Survey was available online for 7 weeks starting Feb. 23rd and residents were notified by Town email and newsletters, social media postings and a Provincetown Banner article.

- The responses were analyzed as a whole and comparisons were made of responses by year-round vs. part-time residents and residents who are connected to the sewer vs. non-connected. 354 people took the survey and 223 of the respondents are year-round residents. Approximately 50% of all respondents are connected to the sewer. Fifty of the respondents are business owners and 62 are multi-property owners.

- When asked to rank priority for allocating current and future capacity, respondents see an immediate or near-term future need for a diverse range of priorities, with ~75% seeing protecting beaches, ocean water quality, and wetlands as well as connecting failed septic systems as very important. More than 50% also see as very important to have sewer capacity for ensuring that how we handle our wastewater is adaptable to climate change and sea level rise, as well as providing housing for year-round residents (including rental units), conserving water on busy days, and supporting local businesses and non-profits in creating jobs and employee housing. A majority of respondents see these categories as requiring attention either as soon as possible or within 5 years.

- When asked about ways to fund increased capacity in the future, 90% of respondents would like to see funding through grants and new users' revenue. This is how all of the phases to date have been funded.

- About 60% of respondents also approved of funding increased sewer capacity through an assessment of all abutters in any new areas to be served by the sewer, whether they choose to connect or not. More of the respondents who are currently connected approved of this funding mechanism than those who are not connected.

- When asked if all taxpayers should help to fund future capacity if revenue from residents and businesses isn't sufficient to cover the costs, 62% approved of this funding approach, with more of the respondents who are currently connected approving than those who are not connected.

- The majority of respondents answered that any taxpayer or town-funded capacity should be used for serving municipal buildings (85%) or addressing environmental and public health concerns, including protecting beaches, ocean water quality and wetlands (83%), ensuring how we handle our wastewater is adaptable to climate change and sea level rise (76%), and connecting failed septic systems (63%).

- About 30% of the respondents who are not connected to the sewer indicated they wanted to be notified when sewer is available in their area.

3. PROPOSED WASTEWATER PROJECT

- The proposed project consists of upgrades at the Wastewater Treatment Facility (WWTF), as well as work within the sewer collection system as shown in Figure 2. The proposed upgrades at the WWTF include the addition of a peak flow storage tank, an effluent pump station and other miscellaneous process modifications within the Plant.

- The proposed changes will not result in any change to the MassDEP Ground Water Discharge Permit (GWDP) or to the Cape Cod Commission's Development of Regional Impact (DRI) permit limit since the disposal beds as well as the WWTF are already approved to treat up to 750,000 gpd of maximum day flow(MDF).

- While these proposed changes will not result in an increase in the WWTF's permitted treatment capacity at this time, it will allow the Town to serve additional flows and users. It is anticipated that these upgrades will allow the Town to connect an additional 93,000 gpd of maximum day flow (MDF), which is an increase of almost 15% in the allowable flow to the WWTF.

- The proposed modifications to the WWTF are shown in Figure 3. The peak flow storage tank will have a capacity of approximately 350,000 gallons, it will help to "shave" the peaks by temporarily storing flow on maximum flow days, and therefore, it will only need to be used in the summer months. It will essentially be used as an overflow tank in the event that the levels in the existing influent flow equalization tank get too high during peak flow periods. The peak flow tank will have an odor control system and a dewatering pump for draining. Other upgrades will include the installation of an effluent pump station to allow for better distribution of treated wastewater effluent to the disposal beds during the summer months.

- The proposed Project also includes two new pump stations in the collection system. These new pump stations will be designed to handle additional State of Limited Capacity priority needs for economic development along the waterfront, the new Police Station on Jerome Smith Road, and affordable housing at the former VFW site.

    1. A submersible below-grade pump station with a below grade valve vault will be located at the MacMillan Pier parking lot. Above grade structures will include a small electrical building, generator, an odor control system and a propane tank. A possible alternative for some of the above grade structures would be the addition of a 2nd floor to the nearby Central Vacuum Station building.

    2. A second pump station On Jerome Smith Road will be designed to serve both the new Police Station and potential housing on the former VFW parcel, with adequate capacity to serve the surrounding residential area should the collection system be extended into this area.

- It is expected that the environmental review process will be similar in depth to the one that was required for the Phase 3 addition of the pre-equalization tank at the Plant and the collection system expansion for Phase 4. Although detailed and time consuming, all environmental approvals were received as expected for Phase 3, and subsequently for Phase 4, and on the schedule that was anticipated.

- As discussed in the following sections, the proposed Project provides sufficient capacity to serve additional flows and connections to the existing sewer system. There are three categories of properties that have the potential to be served by this proposed project:

1. Properties with existing sewer stubs that were installed for future connections.

2. Properties that abut the sewer but do not have an existing sewer stub or a vacuum structure; either sewer stubs or vacuum structures will need to be installed to serve these properties.

3. Short extensions to sewer mains to serve additional properties located within one of the existing sewer areas.

Estimated Cost of the Proposed Project

- Preliminary costing by AECOM for the proposed $6 million project is as follows:

WWTF Upgrade Construction	$4,000,000
Collection system construction	$1,425,000
Engineering and permitting	$ 400,000
3rd party review, police, legal	$ 175,000

- Based upon the preliminary engineering to date, the estimated costs for the Project are shown in Table 1. These costs will be further refined during the permitting and final design phase of the project once the funding from USDA is approved and the Town has approved a contract amendment with AECOM for the implementation of the project.

Required Steps and Estimated Timeline for the Proposed Project

- Assuming approval by Town boards and Town Meeting by the end of October and an award by USDA soon thereafter, AECOM has estimated that the additional capacity at the Treatment Plant can be available by Memorial Day 2021, including the completion of the two pump stations and associated collection system modifications. Collection system work associated with additional flows and connections requiring stubs, vacuum structures or short sewer extensions may extend beyond this timeframe.

- The critical milestones are as follows:

September 2018	Submit USDA Application Package
October 2018	Special Town Meeting Approval of Borrowing Authorization
November 2018	AECOM Contract Amendment for Final Design & Permitting
August 2019	Final Design Complete & Permits/Regulatory Approvals
September 2019	AECOM Contract Amendment for Construction
June 2020	Pump Station for new Police Station Completed
Memorial Day 2021	Plant & Collection System Upgrade Construction Completed including the MacMillan Pier Parking Lot Pump Station

3. PROPOSED WASTEWATER PROJECT

Table 1: AECOM PRELIMINARY COST ESTIMATE

Provincetown Design-Build-Operate
Wastewater Collection System, Treatment Plant, & Disposal System

DESCRIPTION OF WORK	QTY	UNIT	UNIT PRICE	AMOUNT
GENERAL ITEMS				
Bonds & Insurance	1	LS	$60,000.00	$60,000.00
General Conditions	1	LS	$220,000.00	$220,000.00
Project Mgmt, Admin, & Field Services	1	LS	$540,000.00	$540,000.00
SUBTOTAL - GENERAL ITEMS				**$820,000.00**
WWTF PEAK FLOW STORAGE TANK				
Borings/Site Prep	1	LS	$60,000.00	$60,000.00
Pre-purchase Major Equipment	1	LS	$260,000.00	$260,000.00
Timber Piles	1	LS	$250,000.00	$250,000.00
Concrete Tank	1	LS	$1,000,000.00	$1,000,000.00
Misc Equip/Materials	1	LS	$175,000.00	$175,000.00
Civil Site Work	1	LS	$270,000.00	$270,000.00
Mechanical Work	1	LS	$240,000.00	$240,000.00
Electrical Work	1	LS	$220,000.00	$220,000.00
Instrumentation & SCADA	1	LS	$135,000.00	$135,000.00
SUBTOTAL - PEAK FLOW STORAGE TANK				**$2,610,000.00**
WWTF EFFLUENT PUMP STATION				
Wet Well	1	LS	$50,000.00	$50,000.00
Pumps & Piping	1	LS	$75,000.00	$75,000.00
Instrumentation & SCADA	1	LS	$20,000.00	$20,000.00
Electrical	1	LS	$30,000.00	$30,000.00
Force Main/Connections	1	EA	$10,000.00	$10,000.00
Pavement Restoration	1	LS	$15,000.00	$15,000.00
SUBTOTAL - EFFLUENT PUMP STATION				**$200,000.00**
WWTF FILTRATION & DISENFECTION UPGRADES				
Equipment	1	LS	$500,000.00	$500,000.00
Mechanical Work	1	LS	$50,000.00	$50,000.00
Electrical Work	1	LS	$25,000.00	$25,000.00
Instrumentation & SCADA	1	LS	$10,000.00	$10,000.00
SUBTOTAL - FILTRATION/DISENFECTION UPGRADE				**$585,000.00**

Table 1 cont. AECOM PRELIMINARY COST ESTIMATE

Provincetown Design-Build-Operate
Wastewater Collection System, Treatment Plant, & Disposal System

DESCRIPTION OF WORK	QTY	UNIT	UNIT PRICE	AMOUNT
MPL PUMP STATION - COLLECTION SYSTEM				
Sheeting	1	LS	$100,000.00	$100,000.00
Dewatering	1	LS	$50,000.00	$50,000.00
Wet Well & Valve Vault	1	LS	$100,000.00	$100,000.00
Electrical Shed	1	LS	$30,000.00	$30,000.00
Pumps & Piping	1	LS	$75,000.00	$75,000.00
Instrumentation & SCADA	1	LS	$40,000.00	$40,000.00
Electrical	1	LS	$125,000.00	$125,000.00
Generator	1	LS	$35,000.00	$35,000.00
Force Main	1	LS	$10,000.00	$10,000.00
Re-connect Existing Force Mains	1	LS	$20,000.00	$20,000.00
Upgrade Existing Grinder Pumps	1	LS	$45,000.00	$45,000.00
Pavement Restoration	1	LS	$45,000.00	$45,000.00
SUBTOTAL - MPL PUMP STATION				**$675,000.00**
JEROME SMITH PUMP STATION - COLLECTION SYSTEM				
Sheeting	1	LS	$50,000.00	$50,000.00
Dewatering	1	LS	$25,000.00	$25,000.00
Wet Well & Valve Vault	1	LS	$100,000.00	$100,000.00
Pumps & Piping	1	LS	$75,000.00	$75,000.00
Instrumentation & SCADA	1	LS	$25,000.00	$25,000.00
Electrical	1	LS	$90,000.00	$90,000.00
Gravity Sewers	1	LS	$43,400.00	$43,400.00
Force Main	1	EA	$25,000.00	$25,000.00
Pavement Restoration	1	LS	$46,600.00	$46,600.00
SUBTOTAL - JEROME SMITH PUMP STATION				**$480,000.00**
ADDITIONAL SEWER STUBS	10	EA	$5,500.00	$55,000.00
TOTAL				**$5,425,000.00**

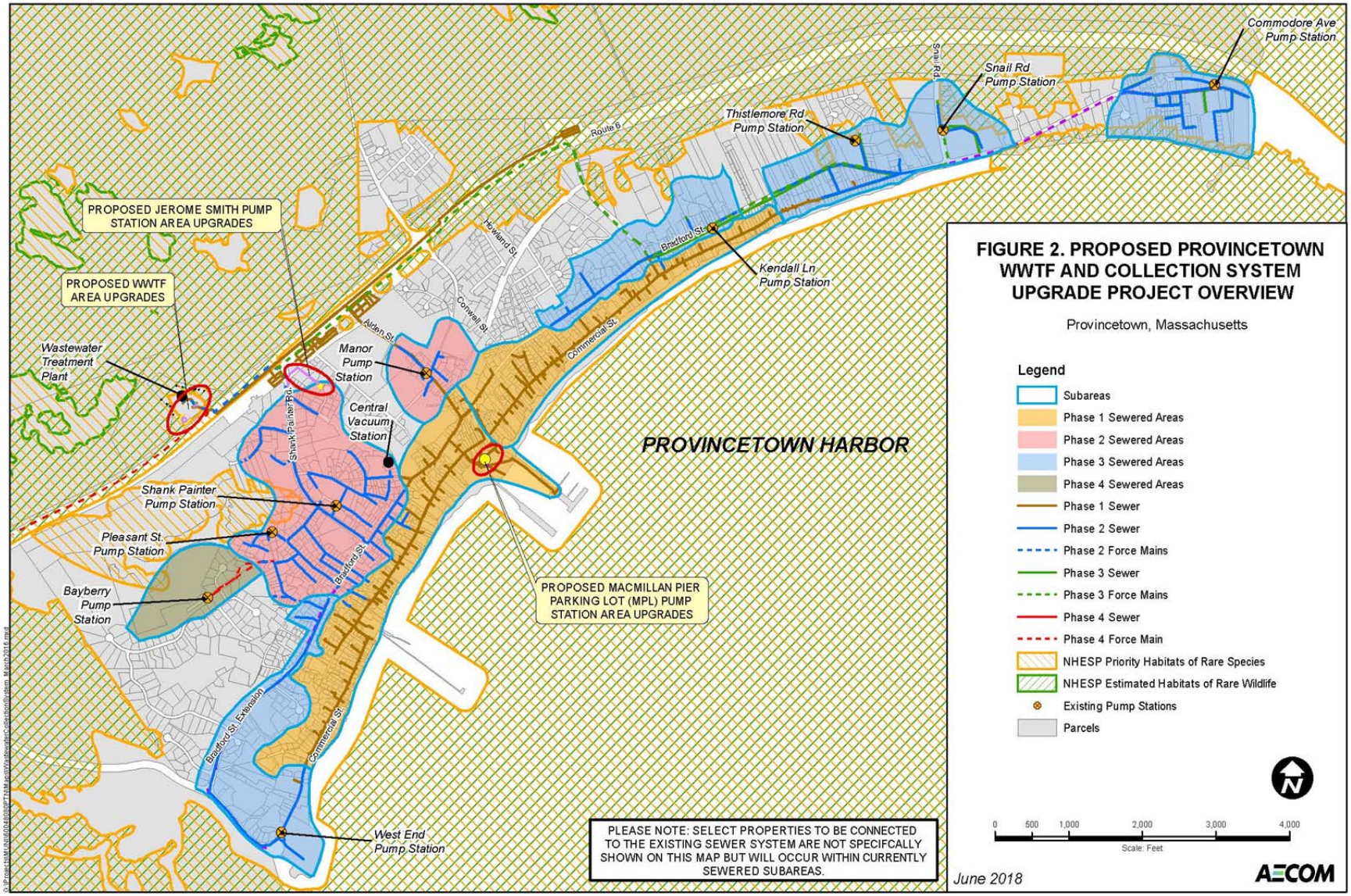
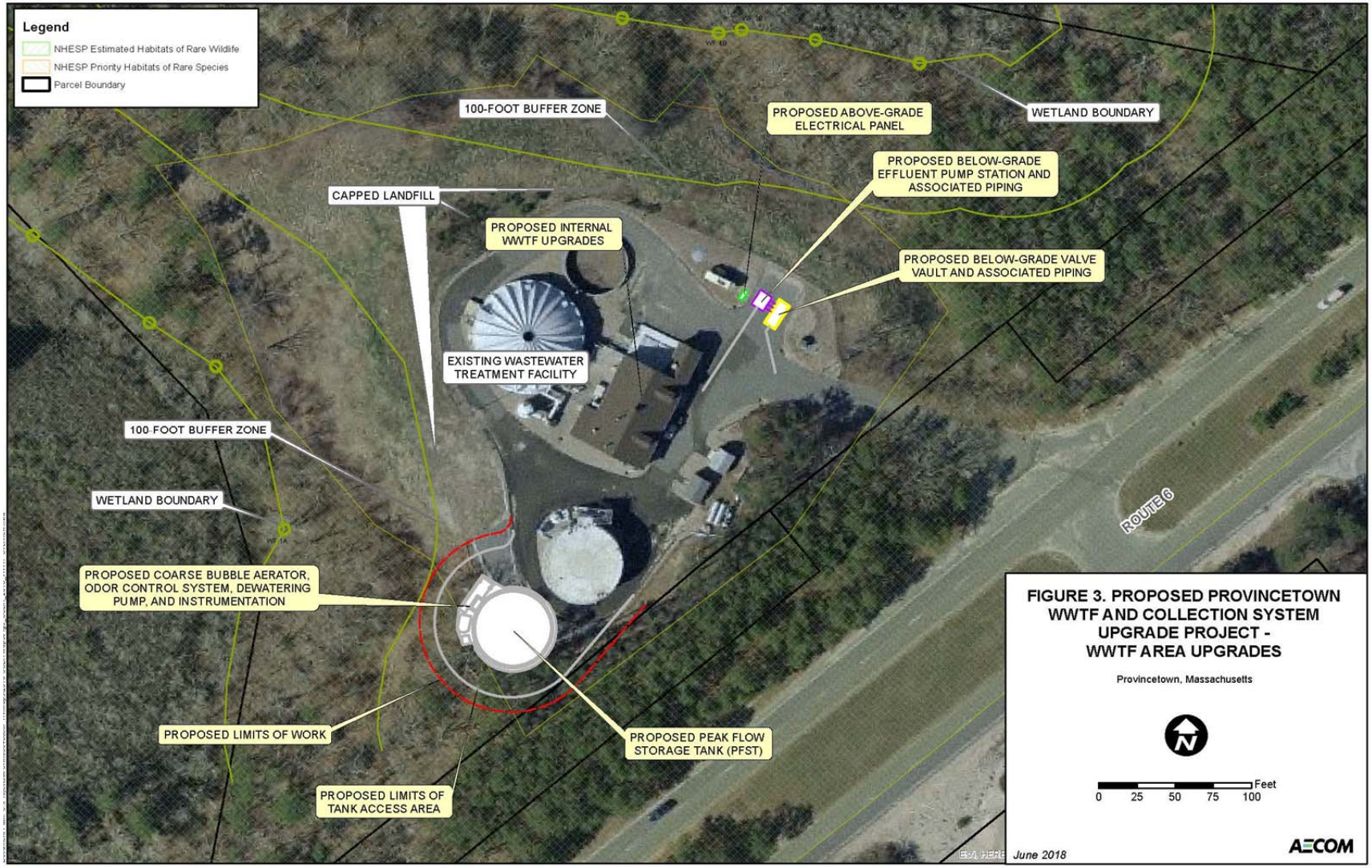


FIGURE 2. PROPOSED PROVINCETOWN WWTF AND COLLECTION SYSTEM UPGRADE PROJECT OVERVIEW
Provincetown, Massachusetts
Legend
Subareas
Phase 1 Sewered Areas
Phase 2 Sewered Areas
Phase 3 Sewered Areas
Phase 4 Sewered Areas
Phase 1 Sewer
Phase 2 Sewer
Phase 2 Force Mains
Phase 3 Sewer
Phase 3 Force Mains
Phase 4 Sewer
Phase 4 Force Main
NHESP Priority Habitats of Rare Species
NHESP Estimated Habitats of Rare Wildlife
Existing Pump Stations
Parcels
0 500 1,000 2,000 3,000 4,000
Scale: Feet
June 2018
AECOM
PROVINCETOWN HARBOR
PROPOSED JEROME SMITH PUMP STATION AREA UPGRADES
PROPOSED WWTF AREA UPGRADES
PROPOSED MACMILLAN PIER PARKING LOT (MPL) PUMP STATION AREA UPGRADES
PLEASE NOTE: SELECT PROPERTIES TO BE CONNECTED TO THE EXISTING SEWER SYSTEM ARE NOT SPECIFCALLY SHOWN ON THIS MAP BUT WILL OCCUR WITHIN CURRENTLY SEWERED SUBAREAS.
Commodore Ave Pump Station
Snail Rd Pump Station
Thistlemore Rd Pump Station
Kendall Ln Pump Station
Manor Pump Station
Central Vacuum Station
Shank Painter Pump Station
Pleasant St. Pump Station
Bayberry Pump Station
West End Pump Station
Wastewater Treatment Plant
Route 6
Howland St.
Cornell St.
Alden St.
Commercial St.
Bradford St.
Shank Painter Rd.
Bradford St. Extension
Snail Rd

3. PROPOSED WASTEWATER PROJECT



4. AREA TO BE SERVED

- The addition of the Peak Flow Storage Tank will provide more capacity that can be used to serve additional flows and connections to the existing sewer system. There are three categories of properties within the existing sewer area shown on the map on the following page that can be allocated the additional capacity:

    1. Properties with existing sewer stubs that were installed for future connections during Phases 3 and 4 with grant funding from the USDA. There are almost 100 remaining properties that fall into this category.

    2. Properties that abut the sewer but do not have a sewer stub or a vacuum structure; most of these properties are located in the Phase 1 and 2 sewer areas shown on the map. Either sewer stubs or vacuum structures will need to be installed to serve any of the nearly 300 properties in this category.

    3. Short extensions to sewer mains to serve additional properties located within one of the existing sewer areas, with a priority given to any public health needs, particularly those under an Administrative Consent Order. There are another 200 remaining properties that fall into this category.

- The additional capacity can serve a portion of these ~600 properties but not all of them. The proposed collection system improvements will not increase the area served by the sewer, with the exception of the Jerome Smith pump station that will make sewer available to the former VFW site for future housing use, as well as to the new Police Station.

Town-wide review of future needs and costs to serve new areas

- At the January 22nd multi-board meeting, the Dept. of Public Works reviewed the town-wide future wastewater needs analysis that was done by AECOM in 2015 and 2016. The analysis was broken down by the subareas identified in the 2010 town-wide review as shown on the map on the following page, with each subarea requiring its own pump station and gravity flow collection system due to the topography.

- AECOM's analysis is summarized in Table 2 for each area. The table shows for the existing sewer area and for each of the planning subareas:

    (i) The number of properties that are not currently served by the sewer

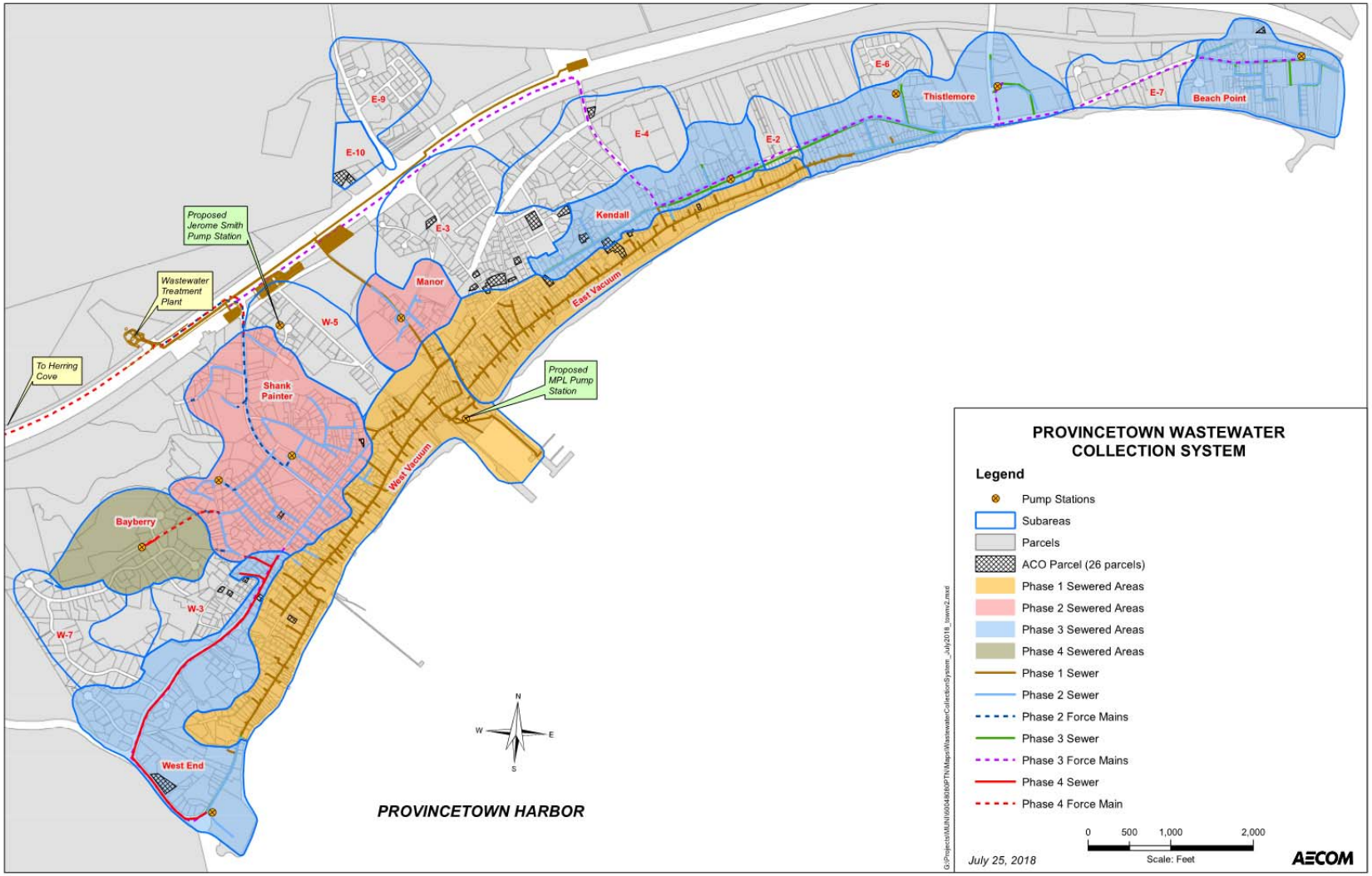
    (ii) Their Title 5 gallons per day (GPD) design flow

    (iii) The estimated collection system cost to serve all the remaining properties in the area, shown in 2018 dollars

    (iv) The cost per GPD if all of the remaining properties in that area were to be assessed a betterment, which would require a change in the policy that has been in effect for nearly 20 years. The areas have been ranked from least expensive to most expensive.

- As explained in the notes to Table 1 the cost per GPD shown in the last column would need to be increased to take into account each property owner's share of the Treatment Plant capacity costs. Without revenue from other sources, none of the areas outside the current sewer area could be served for an affordable betterment rate even if all property owners were to be assessed the betterment rate,.

4. AREA TO BE SERVED



4. AREA TO BE SERVED

Table 2
Provincetown Wastewater Collection System
Summary of Future Planning Areas – July 2018

Rank	Future Planning Areas	No. of Props	Title 5 (gpd)	Collection System Estimated Cost	Cost/T5 GPD
1	Existing Sewer w/ stub	95	70,047	$0	$0
2	Existing Sewer w/o stub/vac	293	161,514	$4,300,000	$27
3	Extension w/in Exist Subareas	199	102,801	$4,600,000	$45
4	E3	176	105,023	$7,100,000	$68
5	E9	65	50,014	$3,400,000	$68
6	W5	38	23,570	$2,400,000	$102
7	E2	20	11,220	$1,800,000	$160
8	W3	40	17,600	$2,900,000	$165
9	W7	51	17,820	$3,000,000	$168
12	E6	28	9,900	$1,700,000	$172
10	E7	27	11,330	$2,200,000	$194
11	E4	49	22,529	$4,800,000	$213
13	E10	6	4,005	$1,000,000	$250
		1,087	**607,373**	**$39,200,000**	

- The Cost per GPD of Title 5 design flow column assumes that all abutters in each area either connect or pay the betterment, which is currently not the procedure under the "checkerboard" approach.

- The Cost/T5 GPD numbers in the last column would need to be increased to take into account their fair share of the Treatment Plant capacity costs.

- None of the subareas shown in lines 4 thru 13 can be served at an affordable betterment rate even if all property owners are assessed the betterment unless there is revenue from other sources to subsidize serving the area.

5. ALLOCATING THE ADDITIONAL CAPACITY

Why does the Town use two different sets of data for sewer system planning? Here's why:

- The MassDEP permitted capacity is for the actual flow in gallons on the maximum day of the year, referred to as GPD MDF. The permit limit is 750,000 GPD MDF. The data that the Plant operators compile on a regular basis is also for actual flow in gallons, including for the peak flow days of July 4th and Carnival. On July 4th, 2018 the peak day flow was 589,502 gallons or nearly 80% of the permitted limit.

- Based upon the state regulation often referred to as "Title 5", MassDEP requires that onsite septic systems be designed conservatively to handle flow during peak use and they have published a table with gallons per day for different uses, such as 110 GPD for a bedroom and 35 GPD for a restaurant seat.

- Twenty years ago, the Town decided to use Title 5 design flow gallons for sewer planning so that there would be an apples-to-apples comparison for the gallons allowed to be discharged to the sewer and to an onsite system. Using Title 5 also allows an apples-to-apples gallon comparison for different uses and that's one of the reasons that it was adopted as the allocation criteria for the Town's Growth Management Zoning By-Law.

- Finally, since the most expensive part of the Municipal Sewer System is the flow capacity for treatment, disposal and collection, it was also decided 20 years ago to base the betterment on a property's Title 5 design flow number so to allocate costs in a fair manner between the users.

- It can get complicated when you try to compare the two sets of data. Over the years, the Town has carefully analyzed the actual maximum day flow gallons compared to the total Title design flow gallons from the properties that were connected on the day that the MDF was observed. Based upon the observed data, the agreed upon ratio of MDF to Title 5 gallons that has been used for planning purposes for the past 10 years is 60%.

Summary of capacity used, available for use, and additional capacity from this Project

- Table 3 summarizes the Title 5 design flow and associated calculated MDF use for the connected properties, those that are committed to connect but haven't done so yet, the existing remaining capacity that can be allocated under the State of Limited Capacity, and the additional flow that can be made available by installing the Peak Flow Storage Tank.

- The sewer system currently serves 1,045 of the 2,133 properties in town, or almost 50%, with a combined Title 5 flow of 1,056,795 GPD or about 63.5% of the estimated total flow for all of the properties. This includes 993 properties that are already connected and 52 that are committed to connect but have not yet done so, 10 of them being so-called "red-dot delay" properties from Phase 1 that were allowed to delay connecting until their system fails.

- The Town currently has 40,358 GPD of Title 5 design flow capacity available to allocate under the State of Limited Capacity that went into effect in February 2015. Over the past three years, a total of 16,285 GPD have been allocated, with 5,824 GPD for public health failures, 8,822 GPD for economic development, and 1,639 for housing for economic development.

5. ALLOCATING THE ADDITIONAL CAPACITY

Table 3: ALREADY USED, CURRENTLY AVAILABLE and POTENTIAL TREATMENT PLANT CAPACITY

		A	B	C	D	E	F	
		PROPERTIES	TITLE 5 FLOW Already Used	TITLE 5 FLOW Use with Tank	TITLE 5 FLOW Potential Use	MDF	MDF	Ratio MDF/T5
1	CONNECTED 07-04-18							
	- Observed peak 07-04-18	993	1,022,412			589,502		
	- Est. not used 2018 peak					23,945		NOTE 1
	- Total for connected						613,477	60% planning
2	COMMITTED to connect							
	- Red dot delay	10	6,600					Connecting
	- Phase 1 property - Laundromat extension - Phase 2 properties - Phase 3 properties - Phase 4 properties	1 1 7 15 18	7,220 3,080 2,530 5,437 9,516					Uninhabited Silva property 5 are lots [Incl. ones in Phase 1 area]
	- Total not yet connected	52	34,383			20,630		60% planning
3	COMMITTED 07-02-18	1,045	1,056,795				634,077	60% planning
4	REMAINING CAPACITY			40,358			22,923	NOTE 2
5	APPROVED MDF FLOW				1,097,153		657,000	60% planning
6	CURRENT RESERVES							
	- For peak day rain events			30,000		18,000		60% planning
	- For Plant Operations			125,000		75,000		10% of permit
	- Total held in reserve				155,000		93,000	NOTE 3
7	PERMIT LIMIT		1,056,795	195,358	1,252,153		750,000	60% planning

- Lines 1 & 2, Columns A & B show the number of properties and Title 5 design flow already used for both the connected peak day flow as of July 4th, 2018 and the committed properties that have not yet connected. Columns E & F show the actual "maximum day flow" (MDF) for July 4th and the estimated committed MDF flow of 634,077 shown in line 3, Column F based upon the current 60% MassDEP-approved planning ratio of MDF to Title 5.

NOTE 1: Estimate for additional flow from Surf Club, Coastal Acres Campground, and other properties not using all of their allowable flow is calculated by assuming that the ratio of observed peak day flow to connected Title 5 design flow will be 60% when they do use all of their flow.

NOTE 2: Line 4, Columns C & F show the remaining Title 5 and MDF capacity to be allocated under the State of Limited Capacity as shown in Table 4.

NOTE 3: As shown in line 6, Columns C thru F, adding a 2nd Tank to handle the peak day flow and Plant operation needs frees up the remaining 93,000 MDF of capacity held in reserve so as to allow an additional 155,000 of Title 5 flow to be connected at the 60% MDF/Title 5 planning factor.

5. ALLOCATING THE ADDITIONAL CAPACITY

Forecasting future allocations needed for the Town's priority needs

- As shown in Table 4 the State of Limited Capacity gallons used to date total 16,285 GPD of Title 5 design flow, all from either public health or economic development (EDP) needs including gallons for housing for approved EDPs. This is an average of ~5,500 GPD/year over a little more than 3 years.

- A more conservative forecast for the 5 year period from 2015 to 2020 would be that the Town will have used a total of 45,000 GPD or an average of ~9,000 GPD/year. This forecast is based on past trends plus the potential requests from downtown businesses, the new Police Station, and potential housing at the former VFW site.

- 9,000 is probably a more realistic per year forecast number to use for the needs of the four priority categories rather than the ~5,500 average for the past three years, since there were no new housing projects or municipal connections during the first three years of the State of Limited Capacity but these are included in this more conservative forecast.

Recommendations for allocating the additional capacity in the future

- Table 4 shows the 155,000 GPD of additional capacity that can be available to allocate after the completion of the Upgrade Project:

  - <u>45,000 GPD</u> from the 155,000 GPD capacity provided by the Peak Flow Tank to be used as an initial allocation to provide the necessary funding for the Upgrade Project to proceed. The allocations shown in Columns B are:

    1. 27,500 for pending economic development requests in the downtown area, including from the Provincetown Marina and the Surf Club. A new pump station is required to serve this additional flow.

    2. 2,000 for the new Police Station on Jerome Smith Road.

    3. 5,500 for future housing at the former VFW site. The USDA grant will allow the new pump station on Jerome Smith Road to be sized to handle the flow from the housing.

    4. 10,000 for 9 public health priority properties that are under an Administrative Consent Order and will require either a vacuum structure, a sewer stub, or a short extension to serve them. These properties are located on Commercial, Cottage, Bangs, Bradford, Conant and Cook Streets, and on Province Lands Road. There are 3 other ACO properties with about 1,500 GPD of Title 5 flow that can also be served if the property owners install a private pump.

  - <u>110,000 GPD</u> remaining balance from the 155,000 GPD that the installation of the Peak Flow Storage Tank will make available is recommended to be allocated as shown in Column D of Table 4:

    1. Allocate 70,000 gallons for use during the 5-year period from 2021 thru 2025 as shown in Column C.

    2. Allocate the remaining 40,000 gallons following a 5-year review

3. Of the 50,000 GPD allocated to the 4 categories for the first 5-year period, it is recommended that the category allocations should be 17,500 for public health given the priority given to this category, 12,500 for economic development, 15,000 for housing, and 5,000 for municipal needs based on past use, trends and forecasts. No decision on the allocations is needed by the responsible Town boards at this time.

4. The ability to allocate gallons for the 5th category in Table 4 was included in the Water & Sewer Board's State of Limited Capacity regulations, but no gallons have been allocated to this category to date. It is recommended that 20,000 should be allocated to abutters for the first 5-year period. The Water & Sewer Board will need to approve each new connection or additional flows for category 5 based upon their regulations. Allocations for this category may also require other approvals primarily from the Community Development department.

- In addition to the 155,000 GPD of additional capacity, we currently have 40,358 GPD of Existing Capacity as shown in Column B. Therefore, after the Upgrade Project is completed the total available capacity as shown in Column H will be ~195,000 GPD. Some of this existing capacity may be used before the additional capacity is available.

- Since the 155,000 GPD of additional capacity is sufficient to meet the forecast needs for the next 10 years and to provide the cash flow needed to cover the 30-year loan USDA debt payments as discussed in Section 7, it is recommended that an amount equivalent to the ~40,000 GPD of Existing Capacity should be held in reserve to provide for:

1. Additional allocations beyond the 10 year period to cover the remaining USDA debt payments should the Town decide, as discussed in Section 7, to continue to pay off a USDA loan through the entire 40 year period rather than prepay it in 20 years or close on a 30-year loan.

2. Large unanticipated requests for priority uses or other important town needs. or with Board approval, additional allocations prior to the 5-year review for any category that has used all of its initial 4-year allocation.

3. Allocation beyond the time period when all of the additional capacity provided by the Peak Flow Storage Tank has been used up. Based upon the current Town priority trends, this amount would be used in about 5 years.

- The capacity to be allocated for the 5th category will be for abutters with and without stubs and for properties to be served by short sewer extensions as discussed in other sections of this report. As has always been the case, these voluntary connections will need to have met all other Town requirements before the flows can be approved by the Water & Sewer Board.

- First priority for the addition of stubs, vacuum structures or affordable short sewer extensions will continue to be for the pubic health priority category for any onsite system failures and properties in the sewer service area that are under an Administrative Consent Order (ACO).

- The financing forecasts shown in Section 7 assume allocating an initial 45,000 GPD and then the remaining 110,000 GPD in equal amounts over the first 10 years.

5. ALLOCATING THE ADDITIONAL CAPACITY

Table 4. SUMMARY OF STATE OF LIMITED CAPACITY ALLOCATIONS AND RECOMMENDED FUTURE ALLOCATIONS

	A	B	C	D	E	F	G	H
				D= GPD for C			D+E+F=G	G+B=H
	Used to Date 2015 -2018	Existing Capacity		Initial Commitments	Allocated to Category for first 5 years	Allocated to Category for years 5-10	Total Additional Capacity	Total Available Capacity
1.Public Health	5,824	9,176	Sewer area ACOs	10,000	17,500	7,500	35,000	~44,000
2.Economic develop.	8,822	10,321	Pending request incl. Surf Club & Marina	27,500	12,500	12,500	52,500	~63,000
3.Housing	1,639	15,861	VFW site	5,500	15,000	5,000	25,500	~41,500
4.Municipal	0	5,000	Police Station	2,000	5,000	0	7,000	~12,000
5.Abutters to sewer	0	0		0	20,000	15,000	35,000	~35,000
TOTALs	16,285	40,358		45,000	70,000	40,000	155,000	~195,500

1. Based upon recent trends, it is estimated that at least 5,000 of the 40,358 Existing Capacity (column B) will be used in 2019 and the rest of 2018 for category 1 thru 3 approvals under the State of Limited Capacity prior to the additional capacity from the peak flow tank becoming available in 2020. Therefore, the remaining balance for the Existing Capacity is estimated to be ~35,000 or less in 2020.

2. Category 5 is for voluntary connection requests from abutters to the sewer system, including Growth Management Category 3 additional flows. Public health failures for abutter properties are included in the public health category. This 5th category already exists in the Water & Sewer Board regulations as amended for the State of Limited Capacity, but no gallons have been allocated yet to the category.

5. ALLOCATING THE ADDITIONAL CAPACITY

Recommended modifications to the State of Limited Capacity allocation procedures

- So as to reduce the requests for flow that need to come before the Board of Selectmen but continue to ensure that the approval procedures are clear as to requirements and timelines, as well as fair to all applicants, the following two policy modifications to the State of Limited Capacity and associated Growth Management approvals and procedures are recommended.

- These recommendations are proposed with the intent of making the procedures not only clearer and fair to all applicants, but also less time-consuming.

Policy Recommendation #1:

The Administration should bring forward current year forecasts for the economic development, housing and municipal categories annually at the time in February that the Board of Selectmen reviews the Annual Growth Management Report and approves any allocations for Growth Management gallons. The reporting can be included as an appendix to the Annual Growth Management Report, and can include any recommendations to transfer gallons between Limited Capacity categories or to add gallons to any category.

Based upon the Administration's report and recommendations, the Board of Selectmen approve, as permitted by the Economic Development General By-Law and their own implementing policies, an annual allocation of EDP gallons and then delegate to the Administration the approval process for the individual requests that meet the current criteria and EDP approval policy subject to the limitations of this annual allocation.

No action on this recommendation is needed at this time.

Policy Recommendation #2:

The Water & Sewer Board and the Board of Health should bring forward current year forecasts for public health and abutter allocations based upon requests known at that time and to report on prior year allocations that were used. The reporting can be included as an appendix to the Annual Growth Management Report, and include any recommendations that may require policy changes or votes.

No approval by the Board of Selectmen is required when the allocations would not exceed what has already been approved for the 5-year period for their respective use category since both the Board of Health and the Water and Sewer Board have published clear regulations and procedures governing these allocations, following a Public Hearing, and will do so as needed in the future should their regulations require amending.

No action on this recommendation is needed at this time.

6. FUNDING OPPORTUNITY, DEBT SERVICE AND BETTERMENT RATE

USDA Funding Opportunity and Financing Procedures

- Provincetown is in an excellent position to receive an estimated $6 million grant and low-interest loan award from USDA for FED FY2019 that begins October 1st. Very few communities can meet their new criteria for the award of a grant but Provincetown does meet the criteria based upon our relatively high sewer user fees.

- The current criteria for an average residential property is $700/year, and the estimated FY2018 cost for an average 3 bedroom sewer user in Provincetown based upon the 2017 financial review is about $1,232/year assuming an average residential use of 38,400 gallons, user fees of $532, and betterment payments of $750/year plus any interest, spread over 20 years.

- Since not many communities are interested in just a loan award, we should be in a very good position to receive the maximum grant of 35% of the total grant and low-interest loan award. USDA only awards grant funds if the community also borrows the loan portion. For financial planning purposes, we are estimating that the grant will be $2 million and the loan will be $4 million. The loan portion can be either for 30 years or for 40 years, which was the loan period for our $2 million grant/loan award five years ago for Phase 4.

- The current interest rate is 3.125% but will not be finalized until the loan is closed, which is anticipated to be about 2 years following award. Therefore, the estimated interest rate used in the financial forecasts has been increased by inflation to 3.25%. Procedurally, the Town borrows short-term for the costs up to the loan amount, the loan is closed, and then costs to be funded by the grant are reimbursed when submitted so that no short-term borrowing will be required for the grant portion.

- Although applications are accepted at any time, the Town should plan on submitting an application by the end of September and approve funding authorization for the loan amount soon thereafter in the Fall so as to be in the queue to receive an award. USDA cannot make the award to the Town until Town Meeting has approved borrowing authorization for the loan portion, but they can begin processing the application before the Town Meeting.

Historical and proposed funding of the Provincetown Municipal Sewer System

- As shown in Table 5, Phases 1 thru 4 were funded almost entirely with grants and betterments from new users that were committed before construction began. Revenue from the rooms tax covered the town-wide planning and non-construction costs not covered by betterments as well as the costs associated with deferring connections and flow for the Phase 1"red-dot delay" properties. All other properties in all four phases have been required to start paying their betterment immediately and to connect as soon as possible.

- The proposed Project will be funded by a grant from USDA and betterments from new users or additional flows from existing users, as was the case with the four phases. The anticipated ~$2 million USDA grant reduces the amount to be borrowed with a low-interest rate USDA loan to ~$4 million, to be borrowed over either 30 or 40 years.

- A 30-year loan period will result in the least amount of interest to be paid, while either a 40-year loan period paid thru the entire term or paid off after 20 years would provide more flexibility for allocating the available gallons over time, since early year payments would be less.

6. FUNDING OPPORTUNITY, DEBT SERVICE AND BETTERMENT RATE

Table 5: Funding History and Proposed Plan for the Upgrade Project

	Grants	Betterments	Total Cost	Betterment rate	Properties served today	Title 5 GPD served	Notes	
Phase 1-2000-2003	250,000	19,500,000	19,750,000	$33.68	~525	~600,000	MA DEP SRF loan CZM & MA Transp. grants	
Phase 2 & Laundromat 2006-2008	900,000	7,000,000	7,900,000	$44.84	~195	~150,000	MA DEP SRF loan USDA grant	
Phase 3 & 4 2010-2014	9,600,000	15,000,000	24,600,000	$45.00	~325	~300,000	USDA Stimulus grant/loan + market debt	
To Date 2000-2018	10,750,000	41,500,000	52,500,000		1,045	~1,050,000		
Proposed Upgrade	~2,000,000	~4,000,000	6,000,000+	Proposed $55.00			USDA grant/loan + market debt for add'l connections & flows	

1. Phases 1 thru 4 were funded with grants and betterments from new users that were committed before construction. Debt to date exceeds betterments to date by about $500,000 attributable to planning and legal costs for Phase 1 and town-wide planning prior to Phase 2. Revenue from the rooms tax covered these costs and the cost of deferring connections and flow for "red-dot delay" properties.

2. The Wastewater Project will be funded with grants and betterments from new users and additional flows from existing users, as was the case with the four phases to date. The anticipated USDA grant reduces the amount to be borrowed to ~$4 million. As additional users and flows are added over time, there will be additional collection system costs requiring market borrowing.

3. If the Phase 1 betterment rate of $33.68 had been increased with inflation, the rate would be $51.25 today and $55.00 in 2021.

6. FUNDING OPPORTUNITY, DEBT SERVICE AND BETTERMENT RATE

Adjusting the Betterment rate to account for inflation

- The Betterment rate has been held constant at $45.00/GPD since 2007 even though the cost to provide the requested Plant and collection system improvements has been increasing at least with the rate of inflation over the past 10+ years.

- In 2000 the Betterment rate for Phase 1 was set at $33.68/GPD based upon the costs known at that time, although additional costs had to be incurred later to provide some of the vacuum structures for the "red-dot delay" properties that had not yet connected.

- If the Betterment had been increased with a 2.5% rate of inflation, the rate would have been $45.00/GPD ten years later in 2010 and that was the rate that all of the Phase 3 and 4 properties were assessed starting in 2010. Without the substantial grants from USDA, the rate that the Town would have needed to charge for Phase 4 would have been at least $55.00/GPD, and more than $70.00/GPD for Phase 3.

- Forecasting a 2.5% adjustment for inflation forward from 2000 to 2021 when the proposed Project will be completed, the rate should be set at $55.00/GPD and that is the Betterment rate that the Administration recommends be used for allocating the additional capacity that the Peak Flow Storage Tank will make available.

- Adjusting the Betterment rate to take into account the inflationary increases in capital expenditures is consistent with last Fall's approval by the Water & Sewer Board, confirmed by the Board of Selectmen, that the peak billing period user fees needed to be increased with the rate of inflation starting this fiscal year so as to properly cover the operating costs.

- The Administration recommends that the new Betterment rate should be increased following Town Meeting approval of the borrowing authorization for the Project and then apply to all flows approved by the Water & Sewer Board after that time.

Apportioning the betterment to treatment capacity versus collection system costs

- Each of the phases to date and this proposed Project have had costs associated with both treatment and disposal capacity and the collection system.

- Although the Town has not apportioned these costs in the past, it will be important to estimate the per GPD cost of adding treatment capacity for this Wastewater Project, and to ensure that all new approved flows are paying their fair share of those costs in addition to the collection system costs needed to serve them.

- For the additional capacity that will become available with this Project, a fair estimate for the per GPD cost is $20.00, based upon: (i) a net project cost estimate of $4 million that will need to be financed, (ii) approximately ¾ of the costs associated with work at the Plant to provide the additional capacity, and (iii) 155,000 GPD of Title 5 design flow capacity that will be made available.

- For this Wastewater Project and for any future treatment capacity increase, the Town will not be able to enjoy the same economies of scale as with the original Plant construction nor the Phase 3 modifications to the Plant. Adjusting for inflation, those costs would be about $16/GPD in today's dollars, less than the $20/GPD that this Project capacity will cost.

6. FUNDING OPPORTUNITY, DEBT SERVICE AND BETTERMENT RATE

Ensuring that the betterment revenue will provide the revenue for the USDA debt

- Based upon the recommended allocations discussed in Section 5 and the betterment rates discussed above, the Administration has looked at several scenarios to ensure that the revenue received will be sufficient to pay the borrowing costs, and that the cumulative cash flow can be positive each year for each financing option.

- The principal and interest payments for the estimated $4 million 3.25% 30-year loan from the USDA are shown in Table 6. Short-term interest totaling $70,000 will be due in FY2020 and FY2021 with loan closing in FY2022. This is the financing option with the least amount of interest to be paid. The total borrowing costs that need to be covered by new user flow revenue is $5,955,726.71 for the 30-year loan and $6,605,978.61 for the full 40-year loan period. If the 40-year loan is paid off in FY2042, the total borrowing costs will be $6,082,353.71 or a savings of $523,624.90 in interest costs. The savings for the 30-year loan are even greater: $650,251.85.

- The assumptions included in the financial forecasts include the following:

1. $2,475,000 to be bettered starting in FY2021 at $55.00/GPD for the 45,000 GPD for the initial commitments from the properties listed in Column D of Table 4 in Section 5. As has been the case in the past, one-half of the betterment will be issued when construction begins with the final betterment issued when construction is completed. Interest charged over the 20 years that they may pay their betterment is the same as the Town pays on the associated debt, per the Town's Special Legislation, and in this case forecast to be 3.25%.

2. $2,200,000 to be bettered as additional flow is allocated each year to the five categories under the State of Limited Capacity as shown in Columns E & F of Table 4. Only $20/GPD of the $55 betterment is allocated to paying off the debt from this project – the fair share of the additional Plant capacity costs – with the remainder available to cover the collection system costs associated with these future flow additions. These collection system costs are unknown at this time, requests will only be approved if the revenue covers their costs as in the past, and the funding authorized by Town Meeting in 2015 was meant for this purpose.

3. The financial analysis assumes that this flow will be allocated in equal amounts over a 10-year period starting in FY2022 and ending in FY2031. Given the demand particularly for economic development gallons, as well as the priority that the Board of Health has to serve as many properties with failing systems and abutters as soon as possible, the connections will probably occur sooner than this conservative assumption. The allocations over the next 10+ years to new users in the areas served by the sewer will probably serve 20 to 25% of the need.

4. At the time of the annual review for the State of Limited Capacity in conjunction with the Annual Growth Management Report, should the allocations to date fall below the amount needed for positive cash flow, the Administration will work with Town boards to ensure that the cash flow can be positive going forward.

5. A formal review will be conducted following the first 5 years to recommend any adjustments based upon the gallons used to date, the trends and the anticipated needs for each of the categories. Another formal review will be conducted after the second 5-year period and a recommendation made as to whether the remaining capacity should also be allocated to ensure adequate funds for the rest of the 40-year loan if this option is chosen. It is estimated that no more than 17,500 GPD would be needed to cover all of the remaining borrowing costs through the end of the 40 years. These additional gallons would not be needed to finance the debt if the loan is paid off at the end of 20 years nor if the loan period is for 30 years.

30 YEARS @ 3.25% **EQUAL PRINCIPAL PAYMENTS PER HISTORY**

Table 6. USDA BORROWING - BAN 15 MONTHS & CLOSE LOAN IN FISCAL YEAR 2021

Borrowing Type	Assumed Rate	FY Paid	Beginning Balance	Principal Payment	Interest Payment	Total Payment
BAN 1 Year	2%	**2020**	$2,000,000.00	$-	$40,000.00	**$40,000.00**
BAN 3 Months	3%	**2021**	$4,000,000.00	$-	$30,000.00	**$30,000.00**
USDA Loan	3.25%	**2022**	$4,000,000.00	$142,857.00	$130,050.00	**$272,907.00**
USDA Loan	3.25%	**2023**	$3,857,143.00	$142,857.00	$125,405.36	**$268,262.36**
USDA Loan	3.25%	**2024**	$3,714,286.00	$142,857.00	$120,760.72	**$263,617.72**
USDA Loan	3.25%	**2025**	$3,571,429.00	$142,857.00	$116,116.09	**$258,973.09**
USDA Loan	3.25%	**2026**	$3,428,572.00	$142,857.00	$111,471.45	**$254,328.45**
USDA Loan	3.25%	**2027**	$3,285,715.00	$142,857.00	$106,826.81	**$249,683.81**
USDA Loan	3.25%	**2028**	$3,142,858.00	$142,857.00	$102,182.17	**$245,039.17**
USDA Loan	3.25%	**2029**	$3,000,001.00	$142,857.00	$97,537.53	**$240,394.53**
USDA Loan	3.25%	**2030**	$2,857,144.00	$142,857.00	$92,892.89	**$235,749.89**
USDA Loan	3.25%	**2031**	$2,714,287.00	$142,857.00	$88,248.26	**$231,105.26**
USDA Loan	3.25%	**2032**	$2,571,430.00	$142,857.00	$83,603.62	**$226,460.62**
USDA Loan	3.25%	**2033**	$2,428,573.00	$142,857.00	$78,958.98	**$221,815.98**
USDA Loan	3.25%	**2034**	$2,285,716.00	$142,857.00	$74,314.34	**$217,171.34**
USDA Loan	3.25%	**2035**	$2,142,859.00	$142,857.00	$69,669.70	**$212,526.70**
USDA Loan	3.25%	**2036**	$2,000,002.00	$142,857.00	$65,025.07	**$207,882.07**
USDA Loan	3.25%	**2037**	$1,857,145.00	$142,857.00	$60,380.43	**$203,237.43**
USDA Loan	3.25%	**2038**	$1,714,288.00	$142,857.00	$55,735.79	**$198,592.79**
USDA Loan	3.25%	**2039**	$1,571,431.00	$142,857.00	$51,091.15	**$193,948.15**

USDA Loan	3.25%	**2040**	$1,428,574.00	$142,857.00	$46,446.51	**$189,303.51**
USDA Loan	3.25%	**2041**	$1,285,717.00	$142,857.00	$41,801.87	**$184,658.87**
USDA Loan	3.25%	**2042**	$1,142,860.00	$142,857.00	$37,157.24	**$180,014.24**
USDA Loan	3.25%	**2043**	$1,000,003.00	$142,857.00	$32,512.60	**$175,369.60**
USDA Loan	3.25%	**2044**	$857,146.00	$142,857.00	$27,867.96	**$170,724.96**
USDA Loan	3.25%	**2045**	$714,289.00	$142,857.00	$23,223.32	**$166,080.32**
USDA Loan	3.25%	**2046**	$571,432.00	$142,857.00	$18,578.68	**$161,435.68**
USDA Loan	3.25%	**2047**	$428,575.00	$142,857.00	$13,934.04	**$156,791.04**
USDA Loan	3.25%	**2048**	$285,718.00	$142,857.00	$9,289.41	**$152,146.41**
USDA Loan	3.25%	**2049**	$142,861.00	$142,861.00	$4,644.77	**$147,505.77**
					Total Cost of Borrowing:	**$5,955,726.76**

7. FUTURE PLANNING

Environmental considerations

- Septic systems and cesspools are not climate change adaptable – rising sea level and groundwater and rising temperatures adversely affect the ability to treat wastewater effectively on site in the future. Recent winter storms flooded over 50 low-lying homes and businesses and over 500 buildings in Provincetown listed on the National Register of Historic Places are located within the FEMA special flood hazard area.

- While many of these buildings are located in areas that are currently served by the sewer, a lot of them are not, including quite a few historic buildings that are located in the "E-3" area between Howland and Bradford Street.

- As a part of the ongoing Municipal Vulnerability Preparedness (MVP) study funded by the $27,500 grant from the state's Executive Office of Energy and Environmental Affairs, the Town will identify through the community resiliency planning process which areas of town should be a priority for infrastructure "hardening", including providing sewer service where it is not currently available, and then avail itself of any future federal, state, or regional grant funding that may be allocated for this resiliency purpose once the Town has been certified as an "MVP community".

- Identifying the areas of town that are not currently served by the sewer but would benefit from sewer service for a number of reasons outside of property owner interest may provide the Town Meeting voter support and new funding sources necessary for overcoming the cost issues that have been an insurmountable hurdle in the past.

- The future planning should address all of these long-term environmental considerations as well as the needs and interest from property and business owners that may require an expansion of the collection system and additional treatment and disposal capacity. The proposed Wastewater Project will meet the immediate needs, while the future planning will need to address the long-term needs.

Future expansion of the collection system

- As discussed in previous sections of this report, the proposed Wastewater Project is designed to provide for the Town's public health, economic development, housing and municipal priority category needs for the next 10 years through a managed process, as well as allow some of the abutters to the existing sewer system to be able to connect or to add flow.

- As explained in Section 4, and previously at the January 22nd multi-board meeting and at the February 3rd Town Forum, in 2010 and 2015 AECOM reviewed each subarea not currently served and found that the cost of serving those areas would exceed an affordable betterment rate. Therefore, serving new sub-areas will require new sources of funding.

- Possible new funding sources might include assessing a betterment to <u>all abutters</u> to the sewer in new areas, as is the practice in most other communities, or drawing on revenues from additional room tax receipts or from other sources, such as participation in the new Cape and Islands Water Protection Fund.

7. FUTURE PLANNING

- Most of the remaining unsewered areas of town lack large potential users or known properties with failed or failing systems, which have been the driving factors for sewer expansion in the past. Of the 27 properties that are currently under an Administrative Consent Order (ACO), 12 properties with a combined Title 5 design flow of 11,330 GPD can be served by the proposed project.

- The remaining 15 ACOs outside the current sewer area have a combined Title 5 design flow of 12,686 GPD. Ten of those ACOs with a total flow of 9,386 GPD are located in the "E-3" subarea shown on the map in Section 4. As shown in the table in Section 4, although requiring an unaffordable betterment to serve it now, "E-3" would be the least expensive unserved subarea to serve and, therefore, could be a town priority for future expansion of the sewer system beyond this proposed project. The other 5 ACO properties with a total of 3,300 GPD are located in 3 other subareas, including 2,310 GPD for two residential properties on Sandy Hill Lane. Sandy Hill Lane is an environmentally sensitive area that may be sewered in the future if the Dept. of Public Works moves its office to the location of the existing highway garage.

- There will be a formal 5-year review that will include an analysis of the capacity used to date, the trends for each of the State of Limited Capacity categories, and the needs and interests for the remaining five years of the 10 year planning period. The review will include the needs and interests of property and business owners located outside the sewer district to determine priorities and financial feasibility for any further expansion of the collection system to serve new areas.

- Serving any new areas in the future will most likely also require additional expenditures to increase the treatment and disposal capacity beyond its permitted 750,000 GPD maximum day flow limit. This would require a significant engineering and permitting effort, and possibly the need for additional disposal sites, in addition to the large construction expenditure for increased treatment capacity.

- As AECOM has indicated for some time, adding more capacity at the Plant in the future will be more expensive than in the past because of the constraints of the site. Any future expansion would require either major modifications to the facility or the addition of a smaller parallel treatment plant capacity to be used during the summer months. Both of these options are summarized in Section 2 and were presented in more detail at the January 22nd multi-board meeting and at the February Town Forum.

PLACEMENT ON SPECIAL TOWN MEETING

Town Meeting Authorization for the USDA Loan Borrowing

- As has been the case with previous USDA grant and loan applications, the Town will need to confirm that Town Meeting has authorized at least the amount that would be borrowed through the low-interest loan portion of any award.

- The Administration has prepared a draft Warrant Article for the October 29th, 2018 Special Town Meeting. The language is exactly the same as the 2015 Article prepared by Town Counsel except for the dollar amount. Of the $6 million to be requested in the USDA application, the Town anticipates that the loan portion will be $4 million and at least this amount of borrowing authorization will need to be requested at Town Meeting.

- The Administration will work with Bond Counsel to determine the appropriate amount to include in the Warrant Article. Should Bond Counsel advises that the Town authorize the entire $6 million amount that will be applied for, it will be made clear that any funds to be expended from the article will be net of the grant amount that is received.

- As was the case with previous Town Meeting approved borrowing authorizations, no funds will be expended unless the Town receives the USDA grant and loan award and has sufficient commitments so that forecast betterment revenue will cover the debt payments.

Article "x". Wastewater Optimization and Expansion – Borrowing Authorization.

To see if the Town will vote to appropriate and borrow the sum of $___ million to be expended under the direction of the Town Manager and the Board of Selectmen, for the development of plans and specifications and for construction, optimization and expansion of the Town's sewer system including the expansion of the treatment capacity of the wastewater treatment plant and further extensions of the Town's sewer system, including without limitation all costs defined under Chapter 29C, Section1 of the General Laws and all other costs incidental and related thereto; and to raise said appropriation the Town Treasurer, with the approval of the Board of Selectmen, is authorized to borrow said sum of money under and pursuant to Chapter 44, Section7(1) and/or Chapter 29C of the General Laws, or any other enabling authority, and to issue bonds or notes of the Town therefor; and that to the extent that any State, Federal or other funds are or become available for the purposes set forth above, the Board of Selectmen is authorized to apply for and accept such funds; and, further, the Town votes to authorize the Water and Sewer Board to assess one hundred percent of the project cost to the Town upon those who benefit from the project, such assessments to be made by the Uniform Unit method as provided by General Laws Chapter 83, Section 15; or to take any other action relative thereto.

[Requested by the Board of Selectmen and the Town Manager]

Town Meeting Authorization for Additional Growth Management Allocation

- Betterment revenue from the additional flow that is requested from several downtown businesses, including the Provincetown Marina and the Surf Club, will be an important part of the funding needed for this Wastewater Project to proceed. Since there may not currently be enough Category 4 or 4a Growth Management gallons available to meet their requests, Town Meeting may need to authorize the addition of more gallons for economic development use, as has been done in the past.