

History of the Provincetown Municipal Sewer System

Provincetown Department of Public Works

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Phase 1 Downtown Sewer System and Phase 2 Sewer Construction

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History of the Provincetown Municipal Sewer System

Before 2000 to 2003: History of the Provincetown Downtown Sewer System

It took Provincetown officials and voters over 50 years to agree on a plan for dealing with the Town's wastewater needs, culminating in Provincetown's downtown sewer system starting operations in July 2003. While some of the property owners chose voluntarily to connect, the majority of the property and business owners had little choice – they either had a system that had already failed, or they would not be able to comply with the requirements of Title 5 when their system required repairs or replacement in the future. Many of the properties were allowed to delay connecting since they had a working system even though they would not be able to replace it with a new Title 5 system in the future; since they were coded with a red dot on the facilities planning map, they have been referred to as “red-dot delay” properties ever since. Today, fewer than 10 have yet to connect.

The public process that led to the historic Town Meeting votes in 2001 resulted in a number of precedent-setting decisions that were approved by the MassDEP in an April 1999 letter to the Town. These included:

- The “checkerboard” approach, which defines the boundaries of a sewer district and assesses betterments only to those properties that are served by the sewer and not to those adjacent properties that formally “opt-out” of the sewer district – this is still unique in the state as a way for defining a sewer district,
- The assessment of a betterment only when a property connects, and not when the sewer main is constructed, as is the case in other communities in the state, and
- Growth-limiting provisions that limit the allowable flow to the greater of the flow at the time the wastewater plan was finalized or the permitted Title 5 flow for the property. These provisions were needed because of the limited treatment and disposal capacity that was to be available.

These precedents were codified through Special Legislation approved by the Legislature as Chapter 157 of the Acts of 2000. This is the basis for the Water & Sewer Board regulations, including the permitted uses and the management of growth through the provision for municipal and other “public service uses” approved by Town Meeting, or in the case of Economic Development Permits, approved by the Select Board. Additional Special Legislation is the basis for the design-build-operate 20-year agreement with AECOM through April 2021, extendable for another five years. In 2004 the Mass. Municipal Association gave the Town an award for its innovative approach.

2003: Growing Interest in a Sewer Connection as soon as “Phase 1” came on line

Even before construction began on the sewer system, the interest in a sewer connection began to grow and has continued to grow. Provincetown's “no growth” sewer became a “managed growth sewer” and a governed system, leading to several phases involving both optimization of the original vacuum sewer and addition of gravity sewers to serve new areas where there was sufficient interest so that the betterments from new users, often combined with government grants, covered the cost to serve them. The downtown sewer system was originally expected to serve only about 350 properties with 500,000 GPD of Title 5 design flow and there were no plans for expanding the system. The Phase 1 vacuum sewer and subsequent phases now serve more than 1,000 properties with over 1,000,000 GPD of Title 5 design flow, including over 500 properties located in the Phase 1 area.

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2003 to 2005: Studies to Demonstrate Treatment Plant and Disposal Capacity

Following the completion of Phase 1, the Town's engineering firms undertook a number of technical studies to demonstrate that both the Treatment Plant and the effluent beds could handle more capacity than the assumptions that MassDEP required the Town to use for the original Ground Water Discharge Permit. The monitoring studies mandated by the Cape Cod Commission in their Development of Regional Impact approval, combined with the analyses performed by Environmental Partners Group, were sufficient to allow the MassDEP to approve an increase in the allowable leaching capacity of the effluent beds by some 50%.

In parallel with these studies, AECOM and their sewer system operator Woodard & Curran conducted peak season flow analyses and "mass loading" studies which were sufficient to allow the MassDEP to approve a much more liberal "factor" that could be applied to future capacity planning for the Treatment Plant. Instead of requiring the Town to assume that 1,000 GPD of Title 5 design flow would result in 1,000 GPD of permitted maximum daily flow (MDF) observed at the Plant, the actual relationship of 1,000 GPD of Title 5 flow which resulted in 740 GPD of MDF flow (a ratio of nearly 75%) was approved by MassDEP for Phase 2 planning. This factor was later revised to 60% for all future planning, based upon the observed flow during peak days beginning in 2010 after the Phase 2 users connected.

2005 to 2007: Laundromat Sewer Extension and Phase 2 Sewer Construction

AECOM undertook a "needs analysis" for Phase 2 based upon town-wide mailings conducted in both 2005 and again in 2006 that showed that there was considerable interest for additional flows to the downtown collection system. By redirecting several larger properties from a vacuum main on Bradford Street to a new gravity sewer, some of the interest to the west of Lopes Square could be met in Phase 2, but most of the interest to the east of Lopes Square and the remaining interest to the west could not be met until a number of years later during Phase 3, with the redirection of properties served by grinder pumps to new gravity mains.

The only area that was found to be cost-effective to serve in Phase 2 was the Shank Painter Basin, due in part to the commitment of the Town to use some of the capacity for affordable housing to be located at 90 Shank Painter. In addition, a \$900,000 grant from the U.S. Dept. of Agriculture covered the cost for providing the sewer to serve Seashore Point and the adjacent neighborhood. Due to the urgency to have a Laundromat in town, the Laundromat sewer extension was approved and constructed a year prior to the approval and construction of the Phase 2 Shank Painter Basin sewer main. The successful implementation of Phase 2 added nearly 200 more users with almost 150,000 GPD of Title 5 flow.

Several new policies and procedures were put into place as a part of Phase 2, including:

- No delayed connections similar to the Phase 1 "red-dot delay" ones were allowed,
- Property owners were responsible for all connection costs from the property line to their buildings,
- Priorities were established for public service uses and public health needs, and
- More formal policies were established for the Select Board to allocate Growth Management Zoning By-Law allotments and to approve Economic Development Permits, replacing a more complex sewer gallon banking and allocation process.

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2008 Financial Review and User Rate Reduction

As is customary with other sewer systems in Massachusetts, the assumed sewer use and the associated billing are based upon the metered water use. The user rate of \$0.0185/gallon that was originally established was both higher than all other communities in the state, and higher than had been anticipated during the planning period.

The primary reason for the high rate is the very large seasonal variation in the flows to the Treatment Plant and disposal beds; it is hard to find comparable systems in the state, with the possible exception of Martha's Vineyard and Nantucket. Provincetown's wastewater system had to be built to handle peak day flows for the July 4th and Carnival periods that are more than five times the winter day flows. But the operating costs in the winter are a lot more than 1/5th of the operating costs in the summer because of MassDEP requirements for the staffing of operators and because the entire collection, treatment, and disposal system has to be maintained throughout the year. The users must pay to maintain this unusually large peak flow capacity even though it is only needed for a portion of the year.

Following the completion of Phase 2 and the addition of more users and revenues, Financial Consultant Mark Abrahams reviewed the finances for the Wastewater Enterprise Fund, including the preparation of the first 5-year financial forecast, known as a "Pro Forma". Based upon this review, the Department of Public Works recommended to the Water & Sewer Board that the user fees be reduced by 25% from \$0.0185/gallon to \$0.01385 so as to be more in line with the rates charged in other communities in the state. Following approval of this rate reduction by the Select Board, the lower rate went into effect with the billing period beginning in the fall of 2008 and remained unchanged for 10 years.

2008 to 2009: Town-wide planning for Phase 3

Even before the construction for Phase 2 had been completed and all of the interested properties had connected, there was continued interest in additional sewer connections and, in particular, a growing need to redirect the properties served by grinder pumps in the East End so as to relieve the flows to the vacuum sewer and provide for economic development in this area. Therefore, in 2008 at the direction of the Select Board, the Dept. of Public Works undertook another town-wide outreach program. With the need for a sewer connection for the Harbor Hotel, which was under an Administrative Consent Order, and substantial additional interest in the East End, in April 2009 Town Meeting approved the construction of a Phase 3 to serve the East End.

2010 to 2013: USDA "Stimulus" Funding for Phase 3 Sewer System Construction

In January of 2010, the Town received a very important \$12 million award from the U. S. Department of Agriculture (USDA) – 75% in the form of a "Stimulus Grant" and the remainder as a 40-year 2.25% interest loan. This substantial grant made it possible to extend the Phase 3 sewer service area approved at the April 2009 Special Town Meeting all the way to the Truro town line to serve a number of large properties under administrative consent orders (ACOs) to correct their failed or failing septic system, as well as many other properties interested in connecting to the sewer. The loan portion of this project was funded entirely by new users, and as with the earlier phases of the project, no taxpayer funding was required. For the first time, the USDA grant made it possible to install sewer stubs for future users, upgrade water services and provide curb-to-curb paving in many areas where the Phase 3 sewer construction occurred.

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In addition to providing critical public health benefits and meeting the needs of those who wanted to connect to the sewer, the USDA grant funds were used to make improvements to the Central Vacuum System, to free up capacity along the downtown vacuum system for important economic development and other town priorities, and to make other vacuum sewer improvements following the disruptive vacuum sewer event on July 4th, 2009.

Outreach programs were also conducted in 2011 and 2012 to identify areas with sufficient interest to justify serving them. Additional interest throughout the planned Phase 3 service area, as well as from “late-comers” in the downtown vacuum sewer Phase 1 area and the Shank Painter Phase 2 area added substantially more flow and areas to be served, requiring additional borrowing authorization at the April 2011 and April 2012 Special Town Meetings. As with the earlier interest and phases, all of this additional borrowing was covered by betterments from new sewer users. The Cape Cod National Seashore requested a sewer extension to serve a rebuilt Herring Cove bathhouse and the National Park Service provided a lump sum payment to cover all of the costs associated with this sewer extension.

Construction for Phase 3 began in March of 2010 and continued through the spring of 2013 with connections for each segment scheduled at different times based on the availability of Plant capacity as well as the completion of the collection system. When it was completed, Phase 3 served over 250 properties with a Title 5 design flow of about 240,000 GPD. Since over half of the initial interest came from properties that were under an Administrative Consent Order, the implementation of Phase 3 provided important public health benefits.

2012: USDA “Stimulus” Funded Enterprise Fund Analysis and Forecast

The Phase 3 USDA Grant provided funds for an updated financial review of the Wastewater Enterprise Fund (WWEF) by Financial Consultant Mark Abrahams, which included:

- Review of both operating and capital costs and revenues. Up until this time, given all of the financing complexities associated with the start-up of the wastewater system and the addition of the Phase 2 users, there had been no financial analysis that had separated out the capital costs and revenues from the operating costs and revenues.
- An updated 5-year “Pro Forma” for the WWEF, based on the preliminary estimates through 2011 for Phase 3 construction costs, additional flows and users, and additional betterment and user revenues. These preliminary Phase 3 estimates were not updated to take into account the final costs or additional users until after Phase 4 had been completed.

For the capital costs and revenues, the February 2012 report presented to the Select Board said “the additional revenues received from the new Phase 3 users will cover the new debt payments as they come due.” For the operating costs and revenues, the report said “for the first time the additional operating costs associated with bringing a new phase on line may exceed the additional user revenue from the new phase because we are expanding the Treatment Plant. Some of the additional costs at the Treatment Plant must be incurred before we will see the additional user revenue, due in part to requirements in our permits from MassDEP.”

After almost all of the Phase 3 and 4 properties were connected in 2015 and the associated long-term borrowing was completed in 2016, the Department of Public Works initiated a complete financial review of the WWEF by Mr. Abrahams, including an update of all of the capital and operating costs and revenues. The results of this financial review were presented to the Select Board and the Water & Sewer Board in August 2017.

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2013 to 2014: Additional sewer extensions to serve Phase 3 and Phase 4 areas

In August of 2012, well before the construction of Phase 3 was completed, the USDA approached the Town with an offer of additional grant and loan funds to support the construction of a Phase 4 sewer system to serve some of the areas with interest that had not been served during Phase 3. The Town applied for \$2 million (\$600,000 of grant funds and a \$1.4 million low-interest loan) to finance a sewer extension to serve Coastal Acres Campground, which was under an ACO from MassDEP, as well as a Phase 4 sewer extension to serve the area of Bradford Street where there was sufficient interest from the outreach program. Some of the USDA Grant funds were used to pay for stubs for future sewer users and for full-width paving as had been the case with the Phase 3 USDA Grant. Construction of the Phase 4 sewer extension began in the fall of 2013 and was completed during 2014. Phase 4 serves over 60 properties with more than 60,000 GPD of Title 5 design flow.

2011 to 2015: Additional Plant Capacity to serve the Phase 3 and Phase 4 areas

Because more than twice as many property owners as anticipated expressed an interest in connecting during Phase 3 and there was additional interest in sewer extensions to serve the Phase 4 areas, voters at the April 2011 Special Town Meeting were asked to approve a warrant article to increase the capacity at the Treatment Plant to its planned-for 750,000 GPD Maximum Daily Flow (MDF) amount, to be fully-funded by the additional users. The Plant improvements were planned to occur in two stages: (i) A pre-equalization tank to increase the hydraulic flow capacity to 750,000 GPD, and, (ii) Process improvements to increase the treatment capacity to 750,000 GPD. The Ground Water Discharge Permit (GWDP) was amended in 2014 to increase the permitted level to 650,000 GPD MDF after the tank was installed. The Plant process modifications were completed during 2015, and MassDEP approved an amended GWDP in July 2015 to increase the permitted level to 750,000 GPD MDF. Earlier studies that were conducted for MassDEP demonstrated that the existing effluent disposal beds could handle a future flow of 750,000 GPD.

The MassDEP GWDP approvals and AECOM's Plant capacity planning assumed (i) that 10% of the 750,000 GPD maximum day flow (MDF) should be reserved for Plant operations, and (ii) that the MDF flow observed at the Plant would be no more than 60% of the connected Title 5 design flow. Therefore, with this additional permitted Plant capacity, the Town expected to be able to connect up to 1,120,000 GPD of Title 5 design flow.

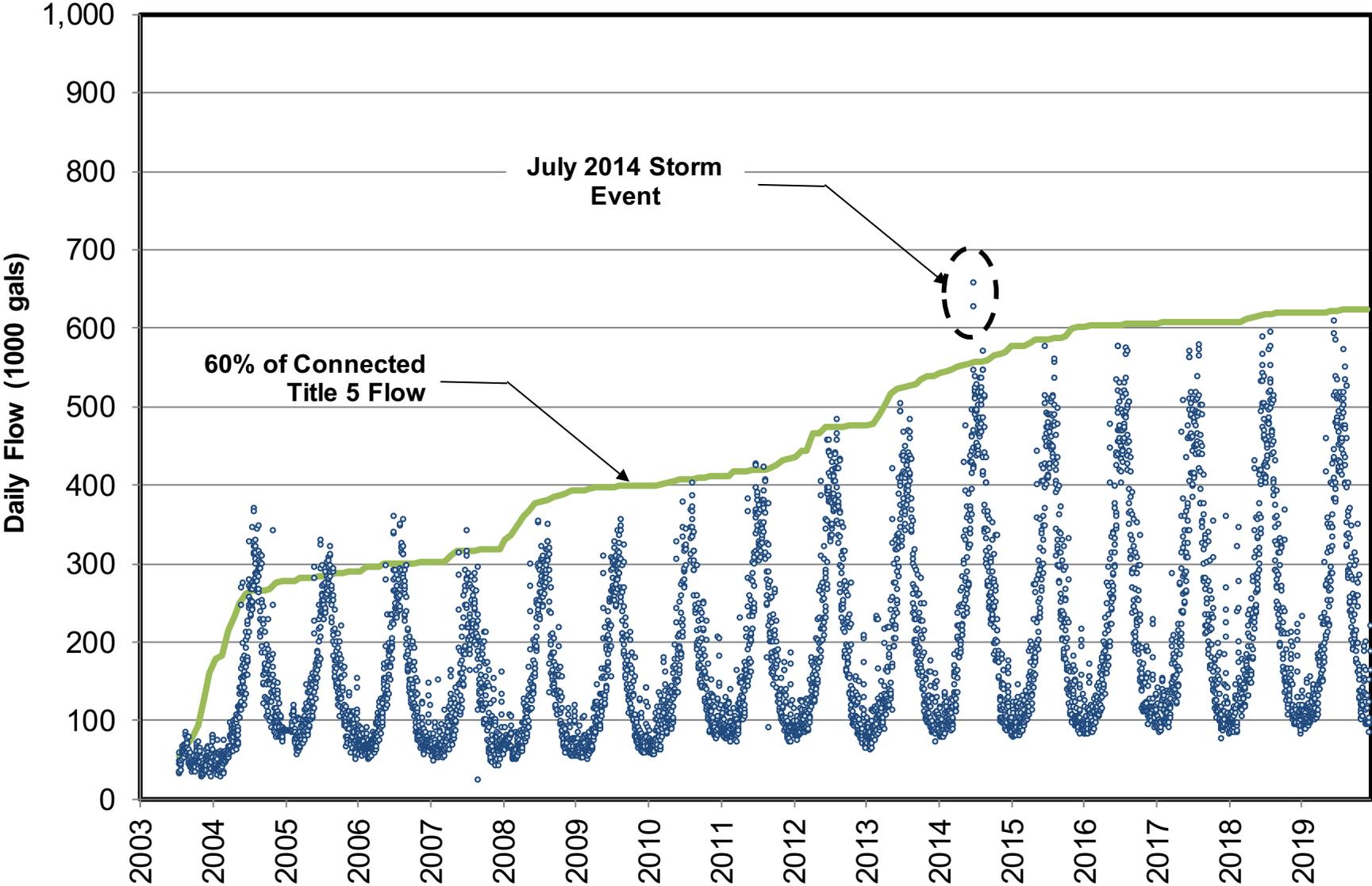
However, the peak flow during the major rain event that occurred on July 4th, 2014 showed that during such an extreme event, a 10% reserve would probably not be adequate. Therefore, as a result of a policy vote by the Select Board in February 2015, an additional 18,000 gallons of MDF flow (equal to 30,000 GPD of Title 5 flow) is held in reserve until the Town can determine that a smaller reserve is sufficient for future peak events. A number of operational modifications were undertaken following the 2014 rain event, and peak flows since 2015 have all been well below the 2014 event. In addition, the Town continues to look at cost-effective sewer system and drainage improvements that can be made to reduce inflow during peak period rain events such as the one that occurred July 4th, 2014.

It is possible that the Town may not need as large a reserve if the peak flows in the future show that a smaller reserve is adequate. In 2017 the Public Policy Center at UMass Dartmouth undertook a study of historical rain events for the Town including the likelihood of major rain events occurring during peak flow days and they recommended that the Town could release some of the reserve based upon the results of their peak event risk modeling.

History of the Provincetown Municipal Sewer System

Seasonal Flow Variation

(thru 31 Dec 19)



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2015 to the Present: Managing the Capacity of the Sewer System for Future Needs

Approximately 300,000 GPD of Title 5 design flow was added during Phases 3 and 4 and this used up all of the increased Plant capacity. Therefore, the limited remaining Plant capacity was about the same at the end of Phase 4 as it had been at the end of Phase 2.

With the completion of Phase 4 and no additional sewer extensions planned in 2015, the remaining Plant capacity needed to be reserved for public health needs, municipal uses, and important public service uses including the Town's affordable housing and economic development priorities. This is because all but about 6% of the available 1,095,000 GPD Title 5 flow capacity had already been committed for the properties served by Phases 1 through 4. As of January 2020, over 1,080,000 GPD of the available Title 5 design flow has been committed to 1,050 properties that have either already connected or are planning to connect to the sewer system and only about 13,000 GPD or 1% is still available for use.

The Town needed to carefully manage this remaining limited resource through both Growth Management and other Town board approvals that may be required before increased flows to the municipal sewer system can be permitted. Beginning with the Annual Growth Management recommendations and Select Board approvals for 2015, procedures were put in place to carefully manage this resource until such time as additional capacity may become available.

In February 2015 at the Public Hearing and Joint Meeting of the Select Board, Board of Health, and Water & Sewer Board held to discuss the status of the Wastewater System, the Department of Public Works presented its recommendations for the implementation of procedures for the management of this limited capacity by the appropriate Town boards. The Select Board implemented a "State of Limited Capacity" policy in February 2015 and the Water & Sewer Board amended its regulations in May 2015 so as to carefully manage this scarce resource. The amended regulations provided procedures for the Administration and Town Boards to recommend and approve additional flow allocations to four priority use categories formalized by the Select Board.

Subsequently, a number of steps were taken to implement the recommended management procedures including more formal approval and documentation steps to be followed prior to allocating any additional flow, particularly for Economic Development Permits and for Growth Management approvals in general. The Select Board's current Economic Development Permit Criteria as established by their Policy Statement was amended in September 2019. The Board of Health grease management regulations were also amended and an updated listing of all ACOs was prepared and is updated regularly.

The four priority categories and their allocations are:

- 15,000 GPD for Public health emergencies – failed systems: Failed systems for properties located on the sewer have the first priority for an immediate connection. Since the policy went into effect in February 2015, 8,354 GPD of Title 5 design flow has been added to the sewer for public health emergencies thru December 2019.
- 17,500 GPD for Affordable Housing requests: They are subject to all of the procedures for Growth Management, Affordable and Community Housing and Water & Sewer Board approvals that are currently in effect. This category includes both the Category 2c deed restricted year-round rental unit provision and any definition changes that have been approved at Town Meetings since February 2015.

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In January 2018, the Select Board approved a recommendation to allocate all workforce housing approvals to this Affordable Housing category instead of to the Economic Development category. To date, 15,251 GPD of Title 5 design flow has been added to the sewer for this category, primarily for workforce housing.

- 12,500 GPD for Economic Development (EDP) requests: (Increased in January 2018 from 12,500 GPD to 19,143 GPD based on a recalculation of the total available flow and the needs for this priority category). For requests that do not currently have a sewer connection, they are subject to the same procedures for Growth Management and EDP approvals as in the past. For requests for properties that are currently connected to the sewer, they will need to follow all of the Growth Management, Select Board EDP and Water & Sewer Board approval processes currently in effect for the State of Limited Capacity. To date, 18,816 GPD of Title 5 flow revisions have been approved for this limited capacity priority use category.
- 5,000 GPD Municipal services requests: Subject to Select Board approval and Water & Sewer Board approval under the priorities established for the State of Limited Capacity. No requests have been made to date, although any new Police Station will be connected to the sewer.
- There is no allocation for other property owners interested in a connection or additional flow. Any property owner that is interested in a connection or additional flow that does not meet the above criteria will continue to be told that there is currently no capacity available and they may place their name on an “on hold” list if they would like to do so. Growth Management Category 3 requests that involve additional flows to the sewer will need to be added to this “on hold” list the same as any other property interested in a connection or additional flows, with the exception of any Category 3A requests, which will be allowed to receive an approved allocation from the “affordable housing” limited use category.

At the time that the “State of Limited Capacity” policy was put into effect in February 2015, it was stated that based upon past trends and currently available forecasts, the Plant capacity should be able to provide for the priority use categories for the next five years. Although through four years less than 30% of the available flow had been used, the demand during 2019 was greatly increased and as of January 2020, only 13,607 GPD or 24% is still available. And, for the economic development category which has had the greatest demand, only 327 gallons remain available to allocate.

The following table summarizes the allocations to date and the remaining gallons for each of the priority categories.

	Allocated to Date	Available to Allocate
Public Health Failures	8,354	6,656
Economic Development Permits	18,816	327
Affordable & Community Housing	15,251	2,249
Municipal Needs	0	5,000
Flow Adjustments (Net)	615	(-615)
State of Limited Capacity Total	43,036	13,607

History of the Provincetown Municipal Sewer System

The relationship of the State of Limited Capacity to other Town By-Laws and Regulations

The State of Limited capacity procedures are closely linked with two other important Town policies and procedures – the Growth Management Zoning By-Law and the Economic Development Permits General By-Law, both of which involve Select Board public hearings – in addition to the Wastewater Regulations established by the Water & Sewer Board.

Over 20 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 also adopted as the allocation criteria for the Town's Growth Management Zoning By-Law.

During the annual Growth Management Review in February, the Select Board may allocate up to a specified number of gallons per day for each of Categories 1, 2, 3, and 4 provided that the Select Board has found that the Town is in compliance with the Water Withdrawal Permit issued by the MassDEP. Although not a formal limiting factor for this annual Growth Management review and approval of allocations, the MassDEP-permitted wastewater treatment capacity required to handle the peak day flow is currently the most important limiting factor for the one-half of properties in town that are served by the sewer, now that meeting the water withdrawal permit is no longer their limiting factor.

The Wastewater System's Special Legislation provides that properties that are served by the sewer are not allowed to increase their flow to an amount greater than what would be allowed for an onsite septic system under Title 5 unless they are a municipal use or are designated a "public service use". The two categories of public service use approved by Town Meeting are (i) affordable and community housing and (ii) economic development. Specific approval procedures apply to all public service uses, including approval by the Water & Sewer Board for the additional flow and betterment assessment once other boards have approved the request.

For economic development, any "public service use" increase in flow to the sewer is further governed by the Economic Development Permit General By-Law. This by-law specifies that the Select Board has the authority to establish criteria and to approve the Economic Development Permits which are required to allocate the Category 4a Growth Management gallons that are needed to be able to add flow to the sewer. The Economic Development Permit Criteria established by the Select Board's Policy Statement was most recently amended in September 2019.

Growth Management Categories 1, 2 and 3a are closely linked to the State of Limited Capacity "Affordable & Community Housing" allocations, while Category 4a is closely linked to the State of Limited Capacity "Economic Development Permits" allocations. There is no State of Limited Capacity allocation currently for Growth Management Categories 3 (Market housing) and 4 (General Commercial Growth). The State of Limited Capacity allocations for the other two priority categories - Public Health Failures and Municipal Needs - are not governed by Growth Management. Historically, most of the Growth Management Category 4 requests have been for downtown or other businesses that are located on the sewer, while many of the Category 1 and 2 and most of the Category 3 housing requests have been for non-sewered properties. For example, 2,395 Growth Management gallons were approved for properties on the sewer in 2018 while 3,190 were approved for properties on septic.

History of the Provincetown Municipal Sewer System

Summary of the Available Treatment Plant Capacity

The following table summarizes the total connected and committed properties and flows to date as of January 2020, available capacity for priorities under the “State of Limited Capacity”, the 10% of the Treatment Plant capacity that is reserved for operations, and the capacity currently held in reserve for major flow events.

	Properties	Title 5 flows Already used	Title 5 flows Potential	Max. Day Flow	Max. Day Flow Sum
Connected 7-5-19	~1,000	1,032,681		609,787	
- Est. not used then				9,822	
- Peak at 60% factor					619,609
Future connections	~50	48,712		29,227	
Committed 1-1-20	~1,050	1,081,393	1,081,393		648,836
Remaining capacity			13,607	8,164	
Approved MDF flow			1,095,000		657,000
Reserves					
- Peak rain events			30,000	18,000	
- Plant operations			125,000	75,000	
- Total in reserve					93,000
PERMIT LIMIT			1,250,000		750,000

Notes to the Available Treatment Plant Capacity table

The MassDEP permit limit is 750,000 gallons for the observed maximum day flow (MDF), which generally occurs on or around July 4th or on or around Carnival each year. For planning purposes based upon historical data and trends, the MassDEP allowable Title 5 design flow is calculated using a planning factor of 60% for the ratio of MDF to Title 5 flow.

Peak day flow of 609,787 at the Treatment Plant on July 5th, 2019 was ~59% of the connected Title 5 flow. The last column shows the MDF amount that this connected flow would represent at the MassDEP-approved 60% planning factor = 619,609. Since several properties including the Surf Club were considered “connected” but were not using all of their flow, the more conservative 619,609 number should continue to be used for planning purposes.

Future connections include those properties that have committed to connect but have not yet connected, including: (i) the remaining red-dot delay properties, (ii) any Phase 1-4 properties that have been bettered but have not yet connected for various reasons, and (iii) recent State of Limited Capacity approvals that had not yet connected as of July 5th, 2019.

The remaining Treatment Plant capacity of 13,607 GPD of Title 5 design flow has been calculated by subtracting the 1,081,393 GPD of committed Title 5 design flow as of January 1st, 2020 and the 30,000 + 125,000 GPD of Title 5 design flow held in reserve from the 1,250,000 GPD calculated Title 5 design flow based upon the 750,000 MDF MassDEP permit limit.

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2015 to 2018: Planning for Future Capacity for the Sewer System

When voters first approved the sewer system nearly 20 years ago, it was expected to serve about 350 properties in the downtown area and any Plant expansion was expected to require more effluent disposal beds. Now, with increased Plant capacity and the expanded collection system, the sewer system can serve more than three times as many properties as originally anticipated and approximately one-half of all of the properties in town.

Through Phase 4, the system has been able to serve more than 50% of the town's buildable lots and almost 60% of the town's estimated Title 5 design-flow at build-out. The collection system now stretches from one end of the town's waterfront to the other, including a majority of the low-lying and waterfront areas from the Cape Cod National Seashore Park to the Truro town line, including the environmentally-sensitive Shank Painter Pond area.

The Town of Provincetown has been able to increase the capacity of its wastewater system over the years through careful tracking of actual operating flow versus Title 5 design flow and through the addition of a flow equalization tank and other wastewater process upgrades at the Plant in 2013. However, there are limits to what technology can do given the constraints of a Plant site and collection system that was envisioned to serve only the critical areas in the downtown area.

Given the continued interest from property and business owners, the Town's longer term public health and other priorities needed to support a year-round community, and the preliminary analysis by the Department of Public Works and AECOM that adding treatment and disposal capacity beyond the currently approved 750,000 GPD MDF limit could take as long as 5 years to implement, the Administration recommended in 2015 that the Select Board seek additional borrowing authorization from Town Meeting. At the April 2015 Town Meeting, voters approved a Warrant Article that provided \$3,000,000 of additional borrowing authorization for the Wastewater Enterprise Fund. In July 2015, the Board of Selectmen approved a contract for \$350,000 for AECOM to undertake preliminary planning and engineering services. The remaining authorization provides for permitting, design and construction of capital improvements that are recommended by the Dept. of Public Works and approved by the Select Board.

The Plant site that was approved by the voters nearly 20 years ago has a very limited footprint and the engineering studies that were undertaken for the Phase 3 system expansion confirmed that it will be very expensive to expand the Plant capacity beyond the currently permitted 750,000 GPD MDF limit on that site. The cost to add Plant capacity for Phase 3 was about \$12.00/GPD of Title 5 design flow, and the least expensive options for adding future capacity could cost more than twice as much.

AECOM evaluated a number of technologies and operating approaches that could be utilized for additional Plant and disposal bed capacity to determine the best ones for the Town to consider. AECOM also evaluated the potential demand for increased flows for the current collection system, any areas where there may be sufficient future demand to consider an expansion of the collection system, and the engineering options and associated costs for meeting this demand, including in the downtown area where the interest in additional flows to support economic development continues to be a high priority.

An updated outreach program will probably be needed at some point in the future to refine the needs and interest for the priority categories, abutters and for the areas not yet served.

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2018: Wastewater Capacity Presentations to Town Boards and the Public

During 2018, several important wastewater capacity planning presentations were made to Town boards and to the public, leading to the approval by the voters at the October 2018 Special Town Meeting to move forward with the Peak Flow Storage Tank project:

- In January 2018 the Dept. of Public Works presented to the Select Board, Water & Sewer Board, and Board of Health the limited amount of capacity 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 a Peak Flow Storage Tank as at least a first step was viewed favorably by board members at that meeting, and the next month the Select Board approved the Dept. of Public Works' request for a Contract Amendment for AECOM to undertake the preliminary engineering for the project.
- In February 2018 the Dept. of Public Works presented a summary of the January presentation to the public at the pre-Annual Town Meeting Town Forum and obtained input during the breakout-group discussion period. Following the Town Forum, the Provincetown community was invited to participate in 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.
- In August 2018, the three Town boards recommended that the Dept. of Public Works move forward with the construction of a Peak Flow Storage Tank and other improvements to the Plant that will allow the Town to use all of the remaining Plant capacity that is currently held in reserve for both Plant operations and peak day rain events.
- In October 2018, the Town submitted a \$6,275,000 million grant and loan application to the USDA for funding to support the Peak Flow Storage Tank Project, another presentation summarizing the proposed project was made at the October pre-Special Town Meeting Town Forum, and the borrowing authorization was subsequently approved by the voters at the October Special Town Meeting.

January 2018 presentation of Town-wide review of needs and costs to serve new areas

At the January 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. 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 through town-wide outreach efforts to not have anywhere near enough interest to fund the collection costs to serve them.

The analysis was broken down by the subareas identified in the 2010 town-wide review shown on the map on page 17 with each subarea requiring its own pump station and gravity flow collection system due to the topography. The review showed that, 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 assessed the betterment rate.

History of the Provincetown Municipal Sewer System

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. The 15 properties under an ACO as of January 2018 that are located outside the current service area are disbursed throughout the town and only account for 3% of the total Title 5 design flow for all of the areas not currently served by sewer.

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

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 additional disposal sites, in addition to the large construction expenditure for increased treatment capacity.

As AECOM has indicated since the planning for Phase 3 was undertaken 10 years ago, 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

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 as shown on pages 17 and 18.

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. Since the tank could be used with the other two options, it was seen as 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.

Option 2:

Option 2 would add smaller standalone treatment plants on the same site, to be used only for the peak summer flows. This capacity could be added in two steps as needed, increasing the capacity by 27% by adding the peak flow storage 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 in January 2018 to total about \$17 million (\$13 million plus the tank cost from Option 1), excluding any collection system costs. For this option, the costs could be incurred in three steps: about \$4 million for the tank, \$6.5 million for one standalone plant, and \$6.5 million for the second standalone plant.

Option 3:

Option 3 would involve a major modification to the Plant. This option would increase 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.

History of the Provincetown Municipal Sewer System

It is not very likely that the Town would ever move ahead with Option 3 unless the voters decided to serve the entire town. The ballpark cost estimated by AECOM for Option 3 was about \$20 million at the Plant, including the cost of the Option 1 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 as of January 2018.

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

The Survey that followed the February 2018 Town Forum presentation was available online for seven weeks and residents were notified by Town email and newsletters, social media postings and a Provincetown Banner article. Approximately 50% of the more than 350 people who responded to the survey were already served by the sewer and 63% were year-round residents. About 30% of the respondents who were not connected to the sewer indicated they would like to be notified whenever sewer is available in their area.

When asked to rank priority for allocating current and future capacity, respondents saw a 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 saw 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 saw these categories as requiring attention either as soon as possible or within five 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 yet connected. Currently, only those abutters that want to connect are assessed a betterment.

August 2018 presentation of the recommended Peak Flow Storage Tank Project

At the multi-board meeting 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 and three options for increasing capacity to meet these needs. Moving forward with a Peak Flow Storage Tank as at least a first step was viewed favorably by board members at the January meeting and a proposed plan to implement this option was subsequently presented to the three boards at the multi-board meeting in August 2018.

The Peak Flow Storage Tank and the associated Treatment Plant improvements shown on the site plan on page 18 are designed to handle the summer peak flow requirements and, thereby, free up the remaining MassDEP permitted capacity for additional flows and connections. This will not only solve the Town's perennial summer peak flow issue, but it will 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 connect or increase their flow.

History of the Provincetown Municipal Sewer System

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. Freeing up the remaining Title 5 design flow capacity that the Plant can treat will allow the Town to (i) reopen the current moratorium on voluntary hook ups, (ii) provide for additional flows for market rate housing and commercial uses for abutters to the existing sewer system, and (iii) provide more flow for Town priorities including economic development, affordable and community housing, and public health needs.

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.

There are three categories of properties within the existing sewer area that can be allocated the additional capacity that this project can provide:

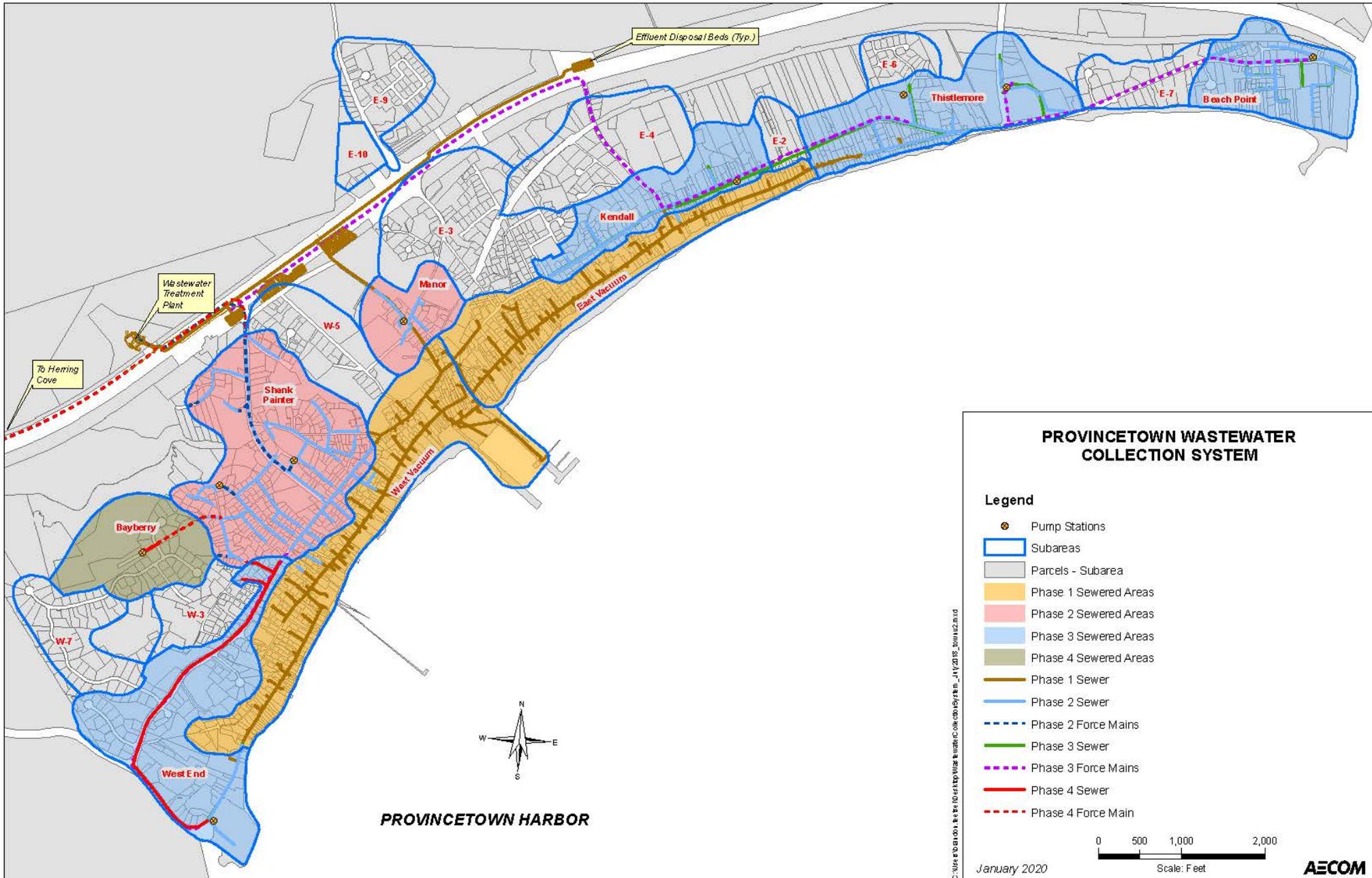
1. Properties with existing sewer stubs that were installed for future connections during Phases 3 and 4 with grant funding from the USDA. There are almost 100 remaining properties that fall into this category.
2. Properties that abut the sewer but do not have a sewer stub or a vacuum structure; most of these properties are located in the Phase 1 and 2 sewer areas. 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.

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 was proposed as a part of this project because there are no additional areas that could be served because the betterment rates would need to be too high, or all abutters would need to pay the betterment, unless new revenue sources can be identified and utilized in the future.

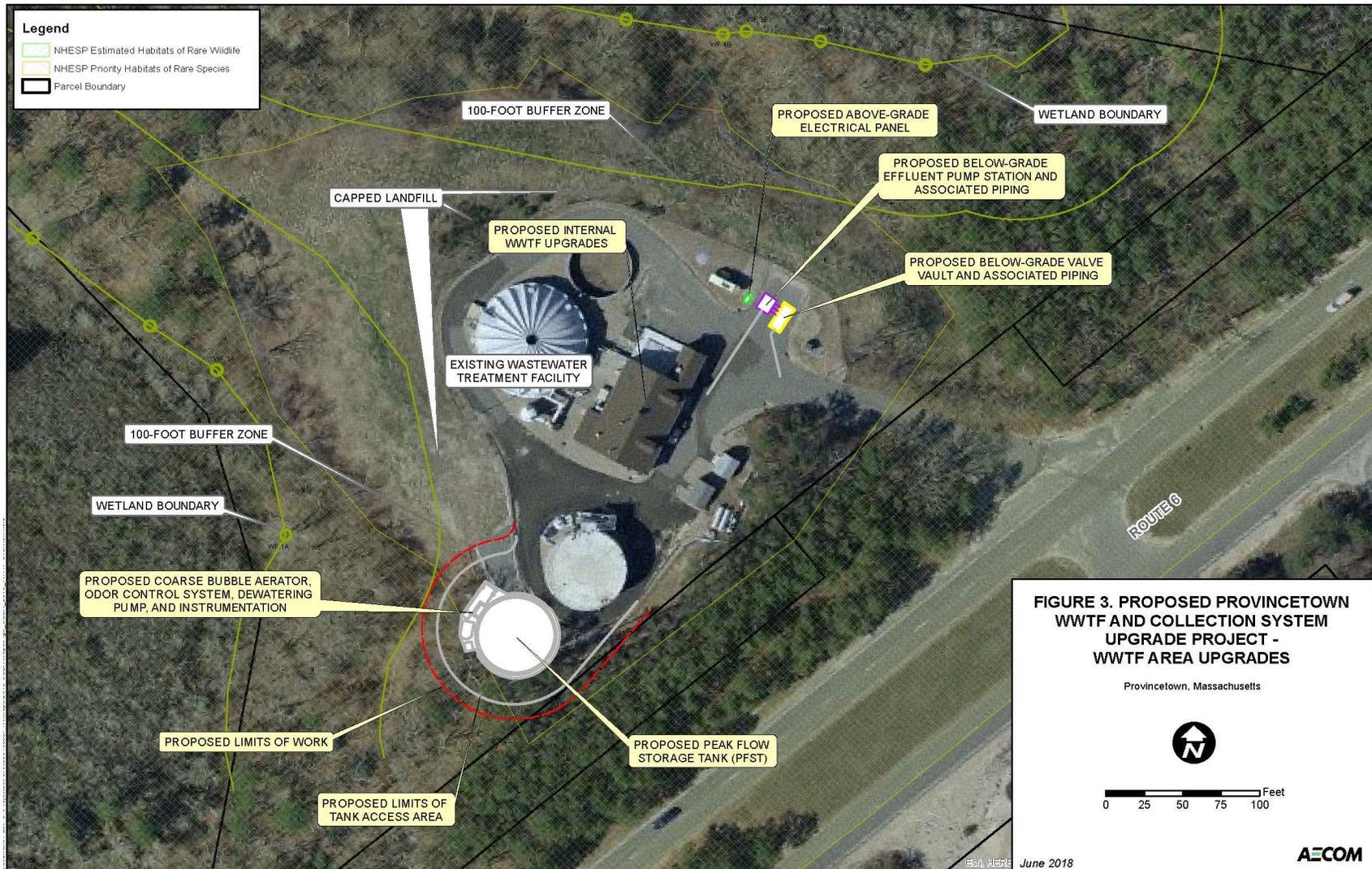
Nearly one-half of the properties that are under an Administrative Consent Order (ACO) from the Board of Health, requiring them to connect to the sewer when available, are located in the area served by the sewer and can be connected with improvements to the collection system that could be funded as a part of the proposed project. The 12 ACO properties that could 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.

The presentation to the Town Boards in August 2018 included a recommendation for a formal 5-year review to include an analysis of the capacity used at that time, the trends for each of the State of Limited Capacity categories, and the needs and interests for the next 5-year planning period. The review could 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.

History of the Provincetown Municipal Sewer System



History of the Provincetown Municipal Sewer System



History of the Provincetown Municipal Sewer System

2018 to 2020: Grant and Loan Applications to the USDA

The available capacity at the Treatment Plant is limited by the amount of flow the Plant can handle on a peak day, which may also include higher “spikes” in flow during certain hours of that peak day, or as was the case in July 2014, a peak flow day may also occur during a major rain event which can substantially increase the flow that the Plant has to handle. Following several years of study and the public presentation of options, Town boards recommended in August 2018 that the Department of Public Works move forward with the construction of a Peak Flow Storage Tank and other improvements to the Plant that will allow the Town to manage the “spikes” in flow during a peak day, particularly when there is also a rain event during that peak day.

The Peak Flow Storage Tank can smooth out the peak flow and thereby allow the Town to use all of the remaining Plant capacity that is currently held in reserve for both Plant operations and peak day rain events. When these improvements are completed, they will provide an additional 155,000 gallons per day of Title 5 design flow, increasing the total available capacity by about 14% to a total of 1,250,000 GPD of Title 5 flow.

In October 2018, the Town submitted a \$6,275,000 million grant and loan application to the USDA for funding to support the Peak Flow Storage Tank Project. The application requested funding to support not only the Peak Flow Storage Tank and the Plant improvements needed to be able to use the remaining 155,000 GPD of capacity but also improvements to the collection system, including new pump stations for the then-proposed Police Station on Jerome Smith Road and for additional flows from business properties in the vicinity of the Municipal Parking Lot, as shown on the map on page 16. Since the application was submitted to USDA in October 2018, there has been a delay in the need for both of the pump stations, and therefore they are no longer being considered for USDA funding. If and when there is a demonstrated need for one or both of these pump stations, they can be funded through market borrowing to be repaid through betterment revenue from additional flows.

First, the impasse over Federal funding for their FY2019 fiscal year and then a longer-than-usual review process by the USDA resulted in a delay for the approval of the Town’s funding request. In September 2019, USDA informed the Town that they would only be able to fund a \$3 million project at this time, which will allow the Town to construct just the Peak Flow Storage Tank. The \$3 million from USDA includes a very generous \$1,324,000 grant with the balance a low-interest loan. The agreement was signed in December 2019, AECOM has started work on the engineering and permitting for the project, and it is anticipated that the work will be completed before the end of 2021.

Once the Tank is online and can be used as needed for any peak day rain event, the Dept. of Public Works anticipates that the Town may be able to use the 30,000 gallons of Title 5 design flow that is currently held in reserve for such a peak day rain event. The additional 125,000 gallons held in reserve for Plant operations cannot be used until the Plant improvements are funded and completed. The Town plans to re-apply to the USDA no later than the Spring of 2020 for an additional \$3 million grant and loan that will include the funding for the additional Plant improvements so as to use this remaining Plant capacity that is currently held in reserve. This second application will also include some funding for connections for abutters and additional flows for the four Town priorities. The Town is hopeful that this second funding application to USDA will be approved during the current fiscal year and that it will also include a similar substantial portion in the form of a grant.

History of the Provincetown Municipal Sewer System

2016 to 2017: Wastewater Enterprise Fund Financial Review

Before the Department of Public Works and AECOM could complete their future capacity planning and present recommendations to the Town Boards, it was important to have an up-to-date analysis of the current system finances as a “baseline” for any future planning since that planning needs to include options for financing additional capacity. The previous financial review that included a five-year forecast for the Wastewater Enterprise Fund was completed in February 2012. Since then there had been a number of significant developments that both necessitated the need for a thorough review and also meant that the financial review would be time-consuming and complex.

In addition to the substantial turnover in the Finance Department since 2012, which made it more difficult to access and reconcile all of the financial records, the significant expansion of the system during Phases 3 and 4 utilized USDA grants and low-interest loans as well as market-rate borrowing. In addition, connections for these phases occurred in stages over almost five years. This resulted in large variations each year for the long-term borrowing, interest payments, receipt of revenues, and audited retained earnings amounts from FY2012 through FY2016, making it difficult to forecast the baseline until 2017.

Capital Expenditures versus Revenues

Since the most expensive part of the Municipal Sewer System is the flow capacity for treatment, disposal and collection, it was decided 20 years ago to base the betterment on a property’s Title 5 design flow number so as to allocate costs in a fair manner between the users. The commitment of the Town since Phase 1 has been that the betterments from new users plus any grant funds received would cover the wastewater system engineering and constructions costs, and that has been the case. Through 2019, in addition to almost \$11 million in Grants, the borrowing for the engineering and construction costs totaled about \$43.5 million and about the same amount in betterments has been assessed to offset this amount of borrowing. Some of the non-construction legal and town-wide planning costs have needed to be covered by Enterprise Fund user revenues.

The betterment rates have changed over time as follows:

- The betterment rate for Phase 1 was \$33.68; however, about 20% of the Phase 1 flow is associated with “red-dot delay” properties that were allowed to delay their betterment payments and connection, and their rate has been either \$39.08, \$45.00 or \$55.00 depending upon when they started paying a betterment. Some of these properties have yet to start paying so the rate could change again before they do.
- The Laundromat Extension betterment rate was \$35.57 and Phase 2 was \$44.84.
- The betterment was set at \$45.00 in May 2007 and this rate applied to all Phase 3 and 4 users since nearly all of them signed up at this rate during the 2011 to 2013 outreach program. Since January 2019, the betterment has been \$55.00.

An important public health objective of Phases 3 and 4 was to serve as many of the properties with ACOs as possible even though they were located from the Truro town line to Province Lands Road. The combination of encouraging more properties to connect with an affordable \$45.00/GPD betterment and the \$9.6 million of USDA grants allowed the Town to meet this objective. Without the large USDA “Stimulus” grant, the betterment rate for Phases 3 would have needed to be over \$70.00, well over twice the rate for Phase 1.

History of the Provincetown Municipal Sewer System

Users can pay their betterment over 20 years, with interest, or all at once at any time during that time period. Any pre-paid betterments have been credited to the “Reserve for Debt” WWF account or to “Retained Earnings” earmarked for future debt payments. Lump sum betterments from large users such as Province Landing, as well as the payments from USDA for the Seashore Point Pump Station Grant and from the National Park Service for the Herring Cove sewer extension have also gone into these accounts, as have all of the ACO escrow payments. The ACO payments for Phase 3 caused very large revenue swings.

The ~\$43.5 million of debt incurred for the wastewater system includes dozens of separate borrowings tied to at least 16 different Town Meeting authorizations between 1997 and 2015. A lot of these involve Mass. Water Pollution Abatement Trust (MWPAT) State Revolving Fund zero or low-interest borrowings through MassDEP, two of them are USDA low-interest loans, and all of the others are market rate borrowings at many different rates.

Most wastewater systems follow the standard practice of charging either 5% interest on betterment balances or 2% above what the Town has to pay, but to lessen the financial burden on property owners, Provincetown received a third Special Legislation approval from the Legislature under Chapter 204 of the Acts of 2002 which says that the Town “may assess interest on apportionments of sewer betterment assessments at a rate equal to the rate of interest chargeable to the town for the betterment project to which the assessments relate.” To date, the Town has chosen to do this for all phases and additional flows.

For Phases 1 and 2, the interest the Town would need to pay was known before the project began and betterments were issued, since the funding was provided through the MassDEP SRF program at either 0% for most of the Phase 1 borrowing and at 2% for the remaining Phase 1 and the Phase 2 borrowing. But, for Phases 3 and 4 where the projects were started before it was known how much additional borrowing would be needed at market rates beyond the \$3 million USDA 2.25% Phase 3 loan (and the later \$1.4 million low-interest loan for Phase 4), the “blended” interest rate that the Town should charge for these phases could not be determined until all of the market rate borrowing was completed later.

Therefore, a policy decision had to be made in 2010 to initially use the USDA rate of 2.25% for all Phase 3 and 4 betterments. After all of the construction work was completed and all of the borrowing undertaken, the correct blended interest rate of 2.87% could be calculated and starting in the Fall of 2017, this interest rate was applied to any outstanding betterment balances from Phases 3 and 4.

When property owners pre-pay their betterment and monies are deposited into the “reserve for debt” or “retained earnings” account, the funds earn little interest. This has not been an issue for the “0%” interest rate borrowings, but it has resulted in an increasing shortfall for pre-paid funds that are meant to pay off market-rate debt with interest charged exceeding 3%, and to a lesser degree for the SRF 2% loans and USDA 2.25% loans. This shortfall may be addressed going forward by using some of the prepaid reserves to either lessen the need for new borrowing, or possibly to reduce the amount of outstanding debt.

In addition to the shortfall associated with the substantial difference between interest received and interest charges paid out, particularly for Phases 3 and 4, there has always been a timing issue associated with receipt of betterment revenues, going all the way back to Phase 1 and the decision to allow the “red-dot delay” properties to wait until they connected to start paying their betterment. In addition, no user revenues are received from them until they connect, and initially they were about 20% of the projected Phase 1 flows.

History of the Provincetown Municipal Sewer System

Although the WWEF has bettered about the same amount as has been borrowed, through the middle of 2009 – after the completion of Phase 2 and prior to Phase 3 – the Town had borrowed more than it had bettered, due primarily to the delayed betterment payments from the “red-dot delay” properties. The resulting shortfall in betterment revenues had to be funded for many years through a combination of (i) borrowing from the pre-paid betterment reserves, (ii) the contribution to the WWEF from the rooms tax, and (iii) user fees up until the rate reduction that went into effect in 2008.

The analysis of all of the betterment accounts in 2017 showed that the “reserve for debt” account should have a current withdrawal rate of about \$365,000 a year, but the actual amount that had been withdrawn varied considerably both above and below the correct amount to make up for operating shortfalls as expenses increased with inflation while user fee rates remained the same, as well as to smooth out variability in capital inflows and outflows during the implementation of Phases 3 and 4 of the sewer system.

The Municipal Management Act enacted in 2017 required that in the future, the prepaid betterments are to be segregated from other accounts and that only the amounts needed to pay the corresponding debt are to be withdrawn from the segregated account. Therefore, going forward it will be important to ensure that these funds are properly managed for their intended purpose and that the funds are no longer used to either smooth out capital flows or to cover any deficit between user fees and operating expenses.

Operating Expenditures Versus Revenues

The user rates were reduced by 25% in the fall of 2008 from \$0.0185/gallon to \$0.01385/gallon of metered water use. There is a small minimum charge for the off peak billing cycle - \$75.00 and \$150.00 for the larger users.

There were no changes in the rates from 2008 to 2017. During that time period, there were significant increases in operating costs, only partly offset by increases in user revenues from the new Phase 3 and 4 users:

- A large increase to the collection system including the addition of numerous pump stations, force mains, and sewer extensions. These require year-round maintenance.
- A nearly 50% increase to the capacity of the Treatment Plant and a number of process changes, necessitating a fourth operator per MassDEP requirements as well as additional operating and maintenance costs associated with increased flows.
- A significant increase in the Town’s Indirect Cost amount assessed to the WWEF.
- Normal cost of living increases for the on-going operations. Most municipal wastewater systems have either annual or regular periodic increases to their user rates to adjust for the normal cost of living increases in their expenditures.

August 2017 Presentation to the Select Board and Water & Sewer Board

In August 2017, Financial Consultant Mark Abrahams completed the Financial Review of the Wastewater Enterprise Fund and the Rate Study which showed that Town Boards should consider increasing the rates to cover the current operating expenditures, as well as to provide for normal cost of living increases for these expenditures in the future and to ensure that there will be sufficient funds to cover all of the future debt payments.

History of the Provincetown Municipal Sewer System

The financial review presentation at the Joint Board Meeting in August 2017 explained that the operating costs already exceeded the user revenues and that the gap would widen in the future. User rates were not keeping up with the increases in expenses because on average the expenses increase with inflation while the rates had remained the same since 2008. The Enterprise Fund had operating shortfalls for the most recent 8 years and Mr. Abrahams analysis forecasted increasing shortfalls for at least the next 10 years.

The Wastewater Enterprise Fund had therefore been drawing down Retained Earnings that will be needed for future debt payments and once the remaining undesignated Retained Earnings were used, a subsidy from the General Fund would be needed if additional revenues were not forthcoming. Since only 6% of the Plant capacity was available to allocate to increased flows that could generate additional user revenues, a rate increase was needed to cover not only the future operating shortfalls but also to ensure that the Wastewater Enterprise Fund will have the reserves needed to pay all of its debt payments.

Based upon the presentation of three rate increase options at the Joint Board Meeting, the consensus of the board members was that the peak season users should pay their fair share of the operating as well as the construction costs and, therefore, the rate increase should be only for the six month peak billing period from mid-April through mid-October.

Sewer Rate Increase Public Hearing

In September 2017, the Water & Sewer Board held a Public Hearing to increase the peak billing period user rates by 3.1% each year for the 10-year period starting with FY2019 thru FY2028 and this rate increase was affirmed by a vote of the Select Board. Starting in mid-April 2018, the peak billing period user rates are shown in the table below; the off-peak billing period rate remained unchanged at \$13.85/1,000 gallons:

Peak Period Rates	
Current Rate	\$13.85/1,000 gallons
April 16, 2018-October 15, 2018	\$14.28/1,000 gallons
April 16, 2019-October 15, 2019	\$14.72/1,000 gallons
April 16, 2020-October 15, 2020	\$15.18/1,000 gallons
April 16, 2021-October 15, 2021	\$15.65/1,000 gallons
April 16, 2022-October 15, 2022	\$16.14/1,000 gallons
April 16, 2023-October 15, 2023	\$16.63/1,000 gallons
April 16, 2024-October 15, 2024	\$17.16/1,000 gallons
April 16, 2025-October 15, 2025	\$17.69/1,000 gallons
April 16, 2026-October 15, 2026	\$18.24/1,000 gallons
April 16, 2027-October 15, 2027	\$18.77/1,000 gallons

History of the Provincetown Municipal Sewer System

2018 to 2019: Betterment Rate Review

In conjunction with the planning for the Peak Flow Storage Tank Project, a careful analysis of the future revenues to cover the borrowing was undertaken including a review of the betterment rate. The Betterment rate had been held constant at a rate of \$45.00/GPD since 2007 even though the cost to provide wastewater system improvements had 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 Tank Project is expected to be completed, the rate should be about \$55.00/GPD and that is the Betterment rate that the Administration recommended 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 the 2017 approval by the Water & Sewer Board, and confirmed by the Select Board, 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.

Therefore, in August 2018, the Administration recommended that the Betterment rate should be increased to \$55.00/GPD and apply to all flows subsequently approved by the Water & Sewer Board. The Water & Sewer Board approved this increase in January 2019.

Apportioning the betterment to treatment capacity versus collection system costs

Each of the four phases and the proposed Peak Flow Storage Tank 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 going forward and to ensure that all new approved flows are paying their fair share of the treatment and disposal costs in addition to the collection system costs needed to serve them.

For the additional capacity that will become available with the Tank Project, a preliminary estimate for the per GPD cost for the Treatment Plant improvements is \$20.00/GPD. 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 the Tank Project capacity is estimated to cost. .

Funding History and Proposed Funding for the Peak Flow Storage Tank Project

The table on the next page summarizes the funding, betterment rates, and properties and flows served to date and for the currently approved and planned funding from the USDA.

History of the Provincetown Municipal Sewer System

Funding History and Proposed Funding for the Peak Flow Storage Tank and 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	~520	~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	~190	~150,000	MA DEP SRF loan USDA grant
Phase 3 & 4 2010-2014	9,600,000	15,000,000	24,600,000	\$45.00	~320	~300,000	USDA Stimulus grant/loan + market debt
State Limited Capacity 2015-2019	0	2,000,000	2,000,000	\$45.00 & \$55.00	~20	~40,000	Market debt
To Date 12-31-2019	10,750,000	43,500,000	54,500,000		~1,050	~1,090,000	
Planned Upgrade Est.	~2,700,000 [see Notes]	~3,300,000 [see Notes]	6,000,000	\$55.00	~200	~160,000	Estimate for 2 USDA grant/loans for \$3 million each

Notes to the Table:

Phases 1 thru 4 were funded with grants and betterments from new users that were committed before construction.

The Planned Upgrade 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 USDA grant that has already been awarded reduces the amount to be borrowed from \$3 million to \$1,650,000 and it is anticipated that if there is a second \$3 million USDA award, the grant amount will be similar.

As additional users and flows are added over time, there will be additional collection system costs requiring market borrowing.