TOWN OF YARMOUTH

PROPOSED WASTEWATER PHASE 1 DEBT SERVICE FUNDING PLAN

WATER RESOURCE ADVISORY COMMITTEE
11-4-2019

INTRODUCTION

Throughout 2019 the Water Resource Advisory Committee (WRAC) has spent considerable time and effort in reviewing various aspects of potential wastewater collection, treatment and recharge infrastructure to address the Town's nitrogen issue, water quality and drinking water concerns. This work has included considering the most cost-effective ways to address these concerns with a focus on minimizing costs to our residents and community.

The Town is currently considering two options to complete this important work:

1) A "Yarmouth Only" option in which Yarmouth alone implements and operates the required infrastructure; and
2) A "DHY" option, in which the Town of Yarmouth participates in a regional partnership with the Towns of Dennis and Harwich to build wastewater treatment and effluent recharge facilities, while retaining control of its own collection system (which represents about 70% of total costs).

The Town of Yarmouth implemented town-wide water infrastructure over many years. Implementation of wastewater infrastructure is no different, and the WRAC is confident Yarmouth can successfully implement this plan. Phase 1 of the wastewater plan is where we start.

The WRAC has created educational materials on various aspects of its work to help explain the issues, concerns and considerations of the Town's wastewater planning efforts. This document supplements other existing material and provides a road map of how to pay for the debt service associated with the costs of Phase 1 without increasing the general property tax burden to our homeowners. This plan is focused on Phase 1 efforts and describes current assumptions and estimates, understanding that as more information becomes available, the funding plan will be adjusted.

COSTS

Costs for Yarmouth's wastewater infrastructure stem from two sources – Capital construction costs associated with the actual building of the system and financing costs associated with the borrowing of funds to cover the Town's immediate costs.

Capital Construction Costs - for the collection, conveyance, effluent recharge and wastewater treatment facility, including use of non-traditional technologies have been estimated utilizing the Engineering News Record (ENR). The ENR is an industry standard index for tracking costs over time. All costs have been projected to the year 2022, the estimated start date of construction. Cost estimates include factors for inflation, construction contingency and for engineering, permitting, and planning.

Current estimates for construction costs associated with the Yarmouth Only and the DHY options are below:

	Yarmouth Only	DHY	Difference
Construction Cost	$ 132,510,063	$ 126,785,972	$ 5,724,091
Annual Debt Service*	$ 4,417,002	$ 4,226,199	$ 190,803

*Total capital costs have been assumed to qualify for a 30 year, 0% subsidized loan through the State Revolving Fund (SRF) Loan Program, resulting in an annual debt service cost of $4,417,002 and $4,226,199, respectively.

Financing Costs – The current wastewater financing plan assumes debt service financing through the above mentioned SRF subsidized loan program. This assumption is an extremely important aspect of maintaining affordability given that additional interest cost associated with financing capital infrastructure of this magnitude would increase annual debt service costs beyond currently identified funding sources.

- 1% interest would add approximately $20 million in additional interest costs and over $1 million in annual debt service, on average over the first 15 years.
- 2% interest would add approximately $40 million in additional interest costs and over $2 million in annual debt service, on average over the first 15 years.

Participation in a regional approach to wastewater infrastructure provides a greater chance for an SRF-eligible project to be ranked and prioritized higher than other competing projects. The SRF Loan Program does not have unlimited resources and the amount of loans offered at a zero percent rate are capped, which necessitates a ranking process that is subject not only to the SRF criteria, but also dependent upon the number, type and character of other projects also being submitted at the time of our project submission. Finally, the SRF loan program has the potential to offer a debt forgiveness subsidy, the amount of which varies from year to year. As such, this financing and cost-recovery plan does not anticipate any project or debt-forgiveness subsidies to project costs.

FUNDING SOURCES

A menu of options have been developed from which to fund the addition of the annual debt service required to implement this project. The following sources have been included in this cost recovery plan:

Water Infrastructure & Investment Fund (WIIF) – Massachusetts General Law Chapter 40, Section 39M provides a local option for communities to raise additional revenue restricted for and dedicated to water resources. This local option allows for up to a 3% property tax surcharge on the real estate tax levy. The Water Resource Advisory Committee has recommended adopting this local option surcharge in the amount of 1.5%, effective for July 1, 2020 (Fiscal Year 2021). This would generate approximately $1,450,000 per year which could be dedicated to paying for the project debt service. This source of funding is restricted for water infrastructure, predictable, and stable.

User Generated Revenues – would provide funding, by those property owners who are connecting to the proposed system, through a betterment program and capital charges on operating rates. Currently, the cost-recovery program anticipates a significant contribution from Phase 1 participants through the use of a 25% Capital charge on operating rates and through the use of a betterment program

> ***Betterment Program*** – this financing plan calls for a 20% betterment on the collection system for all Phase 1 participants resulting in a recovery of $10.5 and 9.5 million for the DHY and Yarmouth options respectively. Given the various elements under consideration in the betterment program, it is likely Special Legislation would be required to set all the terms of the program. However, once established, betterment proceeds are reliable, predictable, stable, and collected through the real-estate tax collection process.
>
> Currently, the planned betterment program anticipates a flow-based apportionment (based on water flows) so that the highest volume water users pay more than those who use less water. In addition, the program excludes the first 90,000 gallons of annual use, which will significantly minimize impact to most residential and small-user participants. (Average residential use approximates 70,000, annually). Implementing this exclusion also has the effect of shifting the overall betterment assessment to higher volume water and higher impact users.
>
> Betterments would be collected over a period of up to 30 years, and would be charged a nominal interest rate (1% used in this planning document), which provides additional annual funding. Betterment collections may be restricted to pay for the debt service for which they support.
>
> ***Capital charge on operating rates*** – The capital charge represents a percentage added to each users' sewer rate to be set-aside to pay for Phase 1 debt service. This model provides for a 25% capital charge on operating rates. Under the Yarmouth Only option, annual operating costs are estimated at $2,850,000. The DHY option estimates annual operating costs at $1,950,000. A 25% capital charge on these amounts would generate $712,500 and $487,500, under the Yarmouth Only and DHY options, respectively. These amounts would change each year as costs increase (or decrease). Amounts collected through this surcharge are reliable and predictable, but are more variable due to changes in operating costs and rate structures. Generally, these charges are relatively easy to collect as part of a water/sewer billing process, however, we need to ensure that the additional capital charge added to the apportioned sewer operating costs do not make our sewer rates unaffordable.

Dedicated local receipts – represent new revenues available to the town which may be earmarked or dedicated to paying for wastewater project debt service. The primary piece of this funding source is additional receipts from short-term rental taxes being collected effective July 1, 2019. Yarmouth's 6% local option short-term rental tax, previously charged only to hotels and motels, are now also being charged to private rentals. The new revenue estimated to be collected from these rentals is $570,000, annually. This funding plan commits this total amount to paying for wastewater debt service.

In addition, the Town has several energy related projects in development that are expected to come on-line over the next two fiscal years. These include solar pv installations on municipal facilities, a ground-mount solar pv installation at 50 Workshop Road (septage facility) site, as well as revenue from a potential anaerobic digester as part of the Cape Cod Energy Park effort. This funding plan estimates either receipts, or budgetary savings, related to these energy projects of $125,000, beginning in FY 2023 and dedicates this funding in whole to wastewater debt service.

Overall, dedicated local receipts are anticipated to contribute $695,000 annually to the debt service funding plan during the first 15 years of debt service. Once established, revenues from dedicated local receipts are predictable and reliable, however are subject to a degree of variability from economic conditions. Both short-term rental receipts and energy receipts/savings are considered highly collectible.

Cape & Islands Water Protection Trust (WPT) – the Town currently participates in the WPT, created in 2019 and funded by a 2.75% tax on all short-term rentals. The program is administered by the Massachusetts Department of Revenue and once fully implemented will be considered reliable, predictable and stable, although subject to some variability due to economic conditions. Current estimates are that Yarmouth property owners generate nearly $1.6 million for this portion of the short-term rental tax. However, these receipts are restricted by legislation, and belong to the WPT. (See separate information regarding the WPT). The WPT board, comprised of one member from each participating community, has been formed and is currently working to develop the rules, regulations and procedures they will adopt to "equitably distribute" proceeds from the WPT to each community.

Given the currently undefined process of how WPT proceeds will be allocated, apportioned and distributed to each community this funding source is considered uncertain at this time. A planning estimate of 25% of project costs, consistent with estimates used in other communities, has been used as a place holder in this funding plan. This results in funding of $1,104,251 and $1,056,550 for the Yarmouth Only and DHY options, respectively. Both of these estimated amounts are less than the estimated annual contribution from the Yarmouth community to the WPT.

Anticipated "New Growth" in property tax levy – based upon work done by the UMASS Donahue Institute, and supported by local knowledge of development opportunities in Yarmouth, the WRAC acknowledges the likely generation of significant new growth in our property tax base. The Donahue Institute conservatively estimated pent up demand of $100 million in new commercial development which could be realized as a result of implementing wastewater infrastructure. This $100 million of new development has been estimated to generate $1 million in new property tax revenue, annually.

This anticipated increase doesn't include many smaller improvements in commercial and residential properties that would likely increase Yarmouth's average "new growth" rate of less than 1% (among the lowest in the region) to a rate at or around 1%. Increasing our annually, recurring new growth rate to 1% would have a cumulative effect on Yarmouth's property tax base that would result in significant new

property tax revenues that would recur and increase annually over time. This funding plan conservatively assumes the new growth from pent-up demand only, and phases that growth in over an eleven year period.

These New Growth revenues are considered stable, predictable and recurring, however, the certainty and timing of realizing these receipts is variable and less certain. However, assuming an eleven year period for implementation should minimize any reliance on this revenue as a primary funding source of the debt-service funding plan. By default, new growth becomes available as part of the General Fund tax levy. Segregating some of this new growth for wastewater debt service would require an internal earmarking during the budgetary process, or could be accomplished through a District Improvement Financing arrangement (DIF). (See separate information regarding DIF).

SUMMARY OF DEBT SERVICE FUNDING PLAN

Given each of the cost and funding elements described above, the following chart illustrates how Yarmouth can achieve funding its debt service without reliance on a general property tax increase.

Annual amounts for each of the funding sources are variable, but for simplicity, planning and illustrative purposes, a rounded, annual amount over the first 15 years of the plan has been used. (See the attached appendices for a more detailed look.) The more detailed level of analysis also illustrates the annual funding vs. the annual costs on a year by year basis. All surpluses are expected to be segregated in a separate fund and maintained as "Retained Earnings" in order to be used to offset years in which there is an anticipated shortfall.

As indicated in the below table, funding the expected debt service in either the Yarmouth or DHY option is feasible if the plan can be executed and estimates are attained. In both cases, expected new property tax growth serves only as a "backstop" to any shortfalls in the funding plan. This new growth could be applied as part of the annual budget process, included as part of budget policy, or restricted as part of a DIF arrangement.

	Yarmouth Option	DHY Option
Total Estimated Capital Cost	$ 132,510,063	$ 126,785,972
Annual debt service cost (30 years, 0% interest)	**4,417,002**	**4,226,199**
Less: Estimated Funding:		
Water Infrastructure & Investment Fund 1.5% WIIF Surcharge	1,450,000	1,450,000
User Generated Revenues Septage Plant Funding, 25% capital charge on sewer rates, and betterment program	1,200,000	1,100,000
Dedicated Local Receipts New ST rental tax revenues and estimated savings on energy projects	695,000	695,000
Cape & Islands Water Protection Trust Estimate of 25% of project costs funded – represents about 2/3rds of TOY contribution	1,104,251	1,056,550
Subtotal estimated annual funding	**4,449,251**	**4,301,550**
Estimated annual surplus (deficit)	**32,249**	**75,351**
Range of annual surplus (deficit) year 1 to 15	(15,507) to 405,292	(55,382) to 308,712
Anticipated "New Growth" to property tax levy (total of $1m planned)	700,000	700,000
Estimated annual surplus (deficit) incl. new growth	**732,249**	**775,351**
Range of annual surplus (deficit) year 1 to 15	84,493 to 1,405,292	44,618 to 1,308,712

OTHER CONSIDERATIONS

In arriving at this debt service funding plan, the WRAC considered several options and scenarios. The following matters were considered in arriving at this recommendation.

Pre-funding – Beginning funding with some of the elements of the funding plan, namely the WIIF and phasing in of local receipts is a crucial element of ensuring the viability of the debt service funding plan. Projections indicate that with pre-funding in FY 2021, several million dollars would be "banked" and made available to subsequently carry through debt service funding in those years where a short-fall is reasonably anticipated. The pre-funding can also be utilized to "back-stop" our plan in the event one of the anticipated receipts is short, or timing is delayed. Alternatively, pre-funded receipts could also be used to pay for upfront financing, or project costs, ineligible costs or to buy-down the cost of the project.

Water Resource Enterprise Fund – in order to accumulate various funding sources and segregate them from the General Fund, the WRAC is recommending creation of a Water Resource Enterprise Fund. The fund structure currently under consideration would consolidate water, storm-water, septage, and wastewater activities into one fund for financial reporting purposes and maintain a separately restricted Retained Earnings. Rate setting to recover operating costs for each element of the consolidated fund would be performed independently of the other as required by law (i.e. water rates set based on water only costs), but would allow for an allocation of costs among the various operations as appropriate, generally done through a cost allocation plan.

Grant funding – It is difficult to plan for federal or state grants to finance the capital costs of the proposed project without an approved project in place. With an approved project in place (i.e. a project that is shovel ready) the WRAC feels there are several grant opportunities available to pursue which could reduce the final scope of project costs to be financed. Town staff and outside consultants have been monitoring opportunities for additional funding and are prepared to submit funding applications when they become available.

Other funding sources – the WRAC will continue to work with Town staff and outside consultants in evaluating additional revenue opportunities as they become available. This includes:

- New local receipts, including potential re-use of Buck Island Road site under the DHY option;
- Local option Community Impact Fee (administered through DOR);
- Potential for SRF program loan subsidies;
- Additional local option revenues if created (i.e. Real Estate Transfer Tax).
- Connection fees are very likely to become a component of future revenue structure, but have not been included in this model.
- Debt drop-off from currently approved town projects is also available as a back-stop to maintain a level tax burden, but has not been included in this plan.

APPENDIX 1

ANNUAL CASH FLOW SUMMARIES

A. Yarmouth Only Option
B. DHY Option

TOWN OF YARMOUTH, MASSACHUSETTS

Yarmouth Only Option

Appendix 1a

SUMMARY OF WASTEWATER CAPITAL COSTS & FUNDING

		TAX RATE			TAX SURCHARGE	USER GENERATED REVENUE			CC Water Prot. Trust	TOTALS	
Fiscal Year	COSTS	Addl New Growth	Dedicated Local Receipts	Subtotal Tax Rate	1.5% WIF	Septage Plant Funding	Betterments	O&M Cap Surcharge	Portion of 2.75%	Annual Net Funding Surplus (Shortfall)	Cumulative Funding Surplus (Shortfall)
2021	-		250,000	250,000	961,208	-	-			1,211,208	1,211,208
2022	-		500,000	500,000	1,079,872	-	-			1,579,872	2,791,079
2023	-		695,000	695,000	1,112,075	-	-			1,807,075	4,598,154
2024	-	50,000	695,000	745,000	1,145,238	-	-			1,890,238	6,488,392
2025	4,417,002	100,000	695,000	795,000	1,179,390	300,000	410,354	712,500	1,104,251	84,493	6,572,884
2026	4,417,002	200,000	695,000	895,000	1,214,560	300,000	407,173	723,188	1,104,251	227,170	6,800,054
2027	4,417,002	300,000	695,000	995,000	1,250,780	250,000	403,992	734,035	1,104,251	321,056	7,121,110
2028	4,417,002	400,000	695,000	1,095,000	1,288,079	225,000	400,811	745,046	1,104,251	441,185	7,562,295
2029	4,417,002	500,000	695,000	1,195,000	1,326,491	200,000	397,630	756,222	1,104,251	562,591	8,124,886
2030	4,417,002	600,000	695,000	1,295,000	1,366,048	100,000	394,449	767,565	1,104,251	610,311	8,735,197
2031	4,417,002	700,000	695,000	1,395,000	1,406,785	50,000	391,268	779,078	1,104,251	709,380	9,444,577
2032	4,417,002	800,000	695,000	1,495,000	1,448,737	-	388,087	790,765	1,104,251	809,837	10,254,414
2033	4,417,002	900,000	695,000	1,595,000	1,491,940	-	384,906	802,626	1,104,251	961,720	11,216,135
2034	4,417,002	1,000,000	695,000	1,695,000	1,536,431	-	381,725	814,665	1,104,251	1,115,070	12,331,205
2035	4,417,002	1,000,000	695,000	1,695,000	1,582,249	-	378,544	826,885	1,104,251	1,169,927	13,501,131
2036	4,417,002	1,000,000	695,000	1,695,000	1,629,433	-	375,363	839,289	1,104,251	1,226,333	14,727,465
2037	4,417,002	1,000,000	695,000	1,695,000	1,678,025	-	372,182	851,878	1,104,251	1,284,333	16,011,797
2038	4,417,002	1,000,000	695,000	1,695,000	1,728,065	-	369,001	864,656	1,104,251	1,343,970	17,355,768
2039	4,417,002	1,000,000	695,000	1,695,000	1,779,598	-	365,820	877,626	1,104,251	1,405,292	18,761,060
2040	4,417,002	1,000,000	695,000	1,695,000	1,832,667	-	362,639	890,790	1,104,251	1,468,344	20,229,404
2041	4,417,002	1,000,000	695,000	1,695,000	1,887,319	-	359,458	904,152	1,104,251	1,533,177	21,762,581
2042	4,417,002	1,000,000	570,000	1,570,000	1,943,601	-	356,277	917,714	1,104,251	1,474,840	23,237,422
2043	4,417,002	1,000,000	570,000	1,570,000	2,001,561	-	353,096	931,480	1,104,251	1,543,385	24,780,807
2044	4,417,002	1,000,000	570,000	1,570,000	2,061,249	-	349,915	945,452	1,104,251	1,613,865	26,394,671
2045	4,417,002	1,000,000	570,000	1,570,000	2,122,718	-	346,734	959,634	1,104,251	1,686,334	28,081,005
2046	4,417,002	1,000,000	570,000	1,570,000	2,186,019	-	343,553	974,029	1,104,251	1,760,849	29,841,854
2047	4,417,002	1,000,000	570,000	1,570,000	2,251,209	-	340,371	988,639	1,104,251	1,837,468	31,679,322
2048	4,417,002	1,000,000	570,000	1,570,000	2,318,342	-	337,190	1,003,469	1,104,251	1,916,250	33,595,572
2049	4,417,002	1,000,000	570,000	1,570,000	2,387,477	-	334,009	1,018,521	1,104,251	1,997,256	35,592,827
2050	4,417,002	1,000,000	570,000	1,570,000	2,458,674	-	330,828	1,033,799	1,104,251	2,080,550	37,673,377
2051	4,417,002	1,000,000	570,000	1,570,000	2,531,994	-	327,647	1,049,306	1,104,251	2,166,196	39,839,572
2052	4,417,002	1,000,000	570,000	1,570,000	2,607,501	-	324,466	1,065,045	1,104,251	2,254,261	42,093,833
2053	4,417,002	1,000,000	570,000	1,570,000	2,685,259	-	321,285	1,081,021	1,104,251	2,344,814	44,438,647
2054	4,417,002	1,000,000	570,000	1,570,000	2,765,336	-	318,104	1,097,236	1,104,251	2,437,925	46,876,572

TOWN OF YARMOUTH, MASSACHUSETTS **DHY Option**

SUMMARY OF WASTEWATER CAPITAL COSTS & FUNDING

		TAX RATE			TAX SURCHARGE	USER GENERATED REVENUE			CC Water Prot. Trust	TOTALS	
Fiscal Year	COSTS	Addl New Growth	Dedicated Local Receipts	Subtotal Tax Rate	1.5% WIF	Septage Plant Funding	Betterments	O&M Cap Surcharge	Portion of 2.75%	Annual Net Funding Surplus (Shortfall)	Cumulative Funding Surplus (Shortfall)
2021	-		695,000	695,000	961,208	-	-			1,656,208	1,656,208
2022	-		695,000	695,000	1,079,872	-	-			1,774,872	3,431,079
2023	-		695,000	695,000	1,112,075	-	-			1,807,075	5,238,154
2024	-		695,000	695,000	1,145,238	-	-			1,840,238	7,078,392
2025	4,226,199		695,000	695,000	1,179,390	300,000	452,378	487,500	1,056,550	(55,382)	7,023,010
2026	4,226,199		695,000	695,000	1,214,560	300,000	448,871	494,813	1,056,550	(16,405)	7,006,604
2027	4,226,199		695,000	695,000	1,250,780	250,000	445,364	502,235	1,056,550	(26,271)	6,980,334
2028	4,226,199		695,000	695,000	1,288,079	225,000	441,857	509,768	1,056,550	(9,944)	6,970,389
2029	4,226,199		695,000	695,000	1,326,491	200,000	438,350	517,415	1,056,550	7,607	6,977,996
2030	4,226,199		695,000	695,000	1,366,048	100,000	434,844	525,176	1,056,550	(48,581)	6,929,415
2031	4,226,199		695,000	695,000	1,406,785	50,000	431,337	533,054	1,056,550	(53,473)	6,875,941
2032	4,226,199		695,000	695,000	1,448,737	-	427,830	541,049	1,056,550	(57,033)	6,818,909
2033	4,226,199		695,000	695,000	1,491,940	-	424,323	549,165	1,056,550	(9,221)	6,809,688
2034	4,226,199		695,000	695,000	1,536,431	-	420,816	557,403	1,056,550	40,001	6,849,689
2035	4,226,199		695,000	695,000	1,582,249	-	417,310	565,764	1,056,550	90,673	6,940,361
2036	4,226,199		695,000	695,000	1,629,433	-	413,803	574,250	1,056,550	142,837	7,083,198
2037	4,226,199		695,000	695,000	1,678,025	-	410,296	582,864	1,056,550	196,535	7,279,734
2038	4,226,199		695,000	695,000	1,728,065	-	406,789	591,607	1,056,550	251,812	7,531,545
2039	4,226,199		695,000	695,000	1,779,598	-	403,282	600,481	1,056,550	308,712	7,840,257
2040	4,226,199		695,000	695,000	1,832,667	-	399,776	609,488	1,056,550	367,281	8,207,538
2041	4,226,199		695,000	695,000	1,887,319	-	396,269	618,630	1,056,550	427,569	8,635,107
2042	4,226,199		570,000	570,000	1,943,601	-	392,762	627,910	1,056,550	364,623	8,999,730
2043	4,226,199		570,000	570,000	2,001,561	-	389,255	637,329	1,056,550	428,495	9,428,225
2044	4,226,199		570,000	570,000	2,061,249	-	385,748	646,888	1,056,550	494,237	9,922,462
2045	4,226,199		570,000	570,000	2,122,718	-	382,242	656,592	1,056,550	561,902	10,484,364
2046	4,226,199		570,000	570,000	2,186,019	-	378,735	666,441	1,056,550	631,546	11,115,910
2047	4,226,199		570,000	570,000	2,251,209	-	375,228	676,437	1,056,550	703,225	11,819,135
2048	4,226,199		570,000	570,000	2,318,342	-	371,721	686,584	1,056,550	776,998	12,596,132
2049	4,226,199		570,000	570,000	2,387,477	-	368,214	696,883	1,056,550	852,925	13,449,057
2050	4,226,199		570,000	570,000	2,458,674	-	364,708	707,336	1,056,550	931,068	14,380,125
2051	4,226,199		570,000	570,000	2,531,994	-	361,201	717,946	1,056,550	1,011,492	15,391,617
2052	4,226,199		570,000	570,000	2,607,501	-	357,694	728,715	1,056,550	1,094,261	16,485,878
2053	4,226,199		570,000	570,000	2,685,259	-	354,187	739,646	1,056,550	1,179,443	17,665,321
2054	4,226,199		570,000	570,000	2,765,336	-	350,680	750,740	1,056,550	1,267,108	18,932,429

APPENDIX 2

COST SUMMARIES

A. Summary of Costs at Build-out, by Community
B. Summary of Costs by Phase, by Community
C. Summary of Flows by Phase, by Community

Summary of Costs
DHY Clean Waters Community Partnership
2022 Costs with Projected ENR of 12,400
(Draft as of 8/29/2019)

Appendix 2a

Wastewater Program Cost Comparisons	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ / year	%
Dennis	$313 M	$282 M	$6.9 M	$4.7 M	$20.8 M	$17.3 M	$3.5 M	17%
Harwich	$314 M	$289 M	$4.6 M	$4.6 M	$18.6 M	$17.5 M	$1.1 M	6%
Yarmouth	$456 M	$450 M	$12.6 M	$8.5 M	$33.0 M	$28.6 M	$4.4 M	13%
Total	**$1083 M**	**$1020 M**	**$24.1 M**	**$17.8 M**	**$72.4 M**	**$63.4 M**	**$9.0 M**	**12%**

DHY Shared Conveyance, WWTF, and Effluent Recharge Cost Comparison	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ / year	%
Dennis	$90 M	$64 M	$4.5 M	$2.6 M	$8.5 M	$5.5 M	$3.0 M	36%
Harwich	$68 M	$33 M	$2.1 M	$1.5 M	$5.1 M	$3.0 M	$2.2 M	41%
Yarmouth	$132 M	$116 M	$8.9 M	$4.8 M	$14.8 M	$9.9 M	$4.8 M	33%
Total	**$290 M**	**$213 M**	**$15.5 M**	**$9.0 M**	**$28.4 M**	**$18.4 M**	**$10.0 M**	**35%**

Dennis	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ / year	%
Collection System[8]	$213.2 M	$208 M	$2.3 M	$2.0 M	$11.8 M	$11.3 M	$509,685	4.3%
Shared Conveyance to WWTF	$0.0 M	$5 M	$0 M	$0.1 M	$0.0 M	$0.3 M	-$331,043	-
WWTF	$65.0 M	$45 M	$4.3 M	$2.3 M	$7.2 M	$4.3 M	$2.9 M	40%
Effluent Recharge with PRB	$24.6 M	$15 M	$0.2 M	$0.2 M	$1.3 M	$0.8 M	$0.5 M	37%
Non-Traditional Technologies	$9.7 M	$10 M	$ 86,400	$ 86,400	$519,594	$519,594	$0	0%
Total	**$313 M**	**$282 M**	**$6.9 M**	**$4.7 M**	**$20.8 M**	**$17.3 M**	**$3.6 M**	**17%**

Harwich	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ / year	%
Collection System[8]	$235.2 M	$245 M	$2.4 M	$3.0 M	$12.9 M	$13.9 M	-$1.0 M	-8%
Shared Conveyance to WWTF	$0.0 M	$2 M	$0.0 M	$0.01 M	$0.0 M	$0.1 M	-$0.1 M	-
WWTF	$68.4 M	$28 M	$2.0 M	$1.4 M	$5.0 M	$2.6 M	$2.4 M	48%
Effluent Recharge with PRB	$6.6 M	$9.1 M	$0.1 M	$0.1 M	$0.4 M	$0.6 M	-$0.2 M	-48%
Non-Traditional Technologies	$4.1 M	$4.1 M	$0.1 M	$0.1 M	$0.3 M	$0.3 M	$0	0%
Total	**$314 M**	**$288 M**	**$4.6 M**	**$4.6 M**	**$18.6 M**	**$17.5 M**	**$1.1 M**	**6%**

Yarmouth	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ / year	%
Collection System[8]	$324 M	$334 M	$3.7 M	$3.7 M	$18.2 M	$18.6 M	-$435,978	-2%
Shared Conveyance to WWTF	$0 M	$8 M	$0.0 M	$0.2 M	$0.0 M	$0.6 M	-$598,277	-
WWTF	$105 M	$81 M	$8.6 M	$4.2 M	$13.3 M	$7.8 M	$5.5 M	41%
Effluent Recharge with PRB	$26 M	$27 M	$0.3 M	$0.3 M	$1.4 M	$1.5 M	-$60,559	-4%
Non-Traditional Technologies	$224,000	$ 224,000	$ 11,400	$ 11,400	$21,402	$21,402	$0	0%
Total	**$456 M**	**$450 M**	**$12.6 M**	**$8.5 M**	**$33.0 M**	**$28.6 M**	**$4.4 M**	**13%**

Source of Town Costs: Dennis- Water Quality Evaluation and Mitigation Alternative Study (July 2018), **Harwich-** CWMP Cost Update (October 2018), **Yarmouth-** CWMP Cost Update (January 2019)

Flow: Dennis 1.96 MGD / 30%; **Harwich** 0.9 MGD / 15%; **Yarmouth** 3.5 MGD / 55%

Notes:
1. Shared effluent recharge includes PSs and force main to each site. Shared PRBs are included at Dennis Site 1 and Dennis Site 2.
2. Town-only effluent recharge costs include a PRB at Dennis Site 1, Dennis Site 2, and Yarmouth Buck Island Road.
3. Collection System costs include wastewater conveyance between communities.
4. Equivalent Annual Costs assume a 30 year loan at 2% interest.
5. Effluent recharge costs include infiltration basins at all sites, and a PRB at Sites 1 and 2 in Dennis, and Site HR-12. Costs associated with golf course upgrades are not included.
6. 2022 Costs with Projected ENR of 12,400.
7. Town collection and conveyance systems include additional 10% increase to reflect recent costs.

Summary of Costs
DHY Clean Waters Community Partnership
2022 Costs with Projected ENR of 12,400
(Draft as of 8/29/2019)

Appendix 2b

Capital Cost Comparison Breakdown by Phase

Dennis	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		Phase 6		Phase 7		Phase 8		Total	
	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional
Collection System[8]	$35.4 M	$30.1 M	$31.9 M	$31.9 M	$19.9 M	$19.9 M	$13.0 M	$13.0 M	$31.8 M	$31.8 M	$26.3 M	$26.3 M	$31.2 M	$31.2 M	$23.9 M	$23.9 M	$213.2 M	$208.0 M
Shared Conveyance to WWTF	$0.0 M	$4.7 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$4.7 M
WWTF	$49.3 M	$30.1 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$15.7 M	$14.4 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$65.0 M	$44.6 M
Effluent Recharge with PRB	$17.2 M	$6.2 M	$0.0 M	$0.0 M	$0.0 M	$1.0 M	$7.4 M	$3.0 M	$0.0 M	$1.4 M	$0.0 M	$3.0 M	$0.0 M	$0.3 M	$0.0 M	$0.0 M	$24.6 M	$14.8 M
Non-Traditional Technologies	$1.39 M	$1.21 M	$1.39 M	$1.21 M	$1.16 M	$1.21 M	$1.16 M	$1.21 M	$1.16 M	$1.21 M	$1.16 M	$1.21 M	$1.16 M	$1.21 M	$1.16 M	$1.21 M	$9.7 M	$9.7 M
Total	**$103.2 M**	**$72.3 M**	**$33.2 M**	**$33.1 M**	**$21.0 M**	**$22.0 M**	**$37.3 M**	**$31.6 M**	**$32.9 M**	**$34.3 M**	**$27.5 M**	**$30.5 M**	**$32.4 M**	**$32.7 M**	**$25.1 M**	**$25.1 M**	**$313 M**	**$282 M**

Harwich	Phase H1		Phase H2		Phase DHY1		Phase DHY2		Phase DHY3		Phase DHY4		Phase DHY5		Phase DHY6		Total	
	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional
Collection System[8]	$0.0 M	$0.0 M	$34.2 M	$34.2 M	$19.5 M	$9.4 M	$33.2 M	$43.2 M	$33.7 M	$43.6 M	$30.1 M	$36.1 M	$35.1 M	$34.9 M	$49.3 M	$43.5 M	$235.2 M	$244.9 M
Shared Conveyance to WWTF	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$2.2 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$2.2 M
WWTF	0	$0.0 M	$6.8 M	$6.8 M	$0.0 M	$14.4 M	$41.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$6.9 M	$20.6 M	$0.0 M	$0.0 M	$0.0 M	$68.4 M	$28.0 M
Effluent Recharge	$0.0 M	$0.0 M	$0.4 M	$0.0 M	$0.1 M	$3.0 M	$4.0 M	$2.0 M	$0.7 M	$0.5 M	$0.5 M	$1.4 M	$0.4 M	$0.7 M	$0.4 M	$1.6 M	$6.6 M	$9.1 M
Non-Traditional Technologies	$1.00 M	$1.0 M	$2.00 M	$2.0 M	$0.40 M	$0.40 M	$0.00 M	$0.00 M	$0.00 M	$0.00 M	$0.66 M	$0.7 M	$0.00 M	$0.00 M	$0.00 M	$0.00 M	$4.1 M	$4.1 M
Total	**$1.0 M**	**$1.0 M**	**$43.4 M**	**$43.0 M**	**$20.0 M**	**$29.3 M**	**$78.3 M**	**$45.2 M**	**$34.4 M**	**$44.1 M**	**$31.2 M**	**$45.0 M**	**$56.1 M**	**$35.6 M**	**$49.7 M**	**$45.1 M**	**$314 M**	**$288 M**

Yarmouth	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		Phase 6		Phase 7		Phase 8		Total	
	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional	Town	Regional
Collection System[8]	$47.7 M	$52.4 M	$51.5 M	$51.5 M	$45.4 M	$45.7 M	$36.3 M	$36.3 M	$27.6 M	$27.6 M	$49.5 M	$54.1 M	$21.3 M	$21.3 M	$45.2 M	$45.2 M	$324.5 M	$334.0 M
Shared Conveyance to WWTF	$0.0 M	$8.4 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$8.4 M
WWTF	$74.2 M	$54.5 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$30.8 M	$26.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$0.0 M	$105.0 M	$80.5 M
Effluent Recharge with PRB	$10.5 M	$11.3 M	$0.0 M	$0.0 M	$0.0 M	$1.8 M	$15.8 M	$5.4 M	$0.0 M	$2.5 M	$0.0 M	$5.4 M	$0.0 M	$0.6 M	$0.0 M	$0.0 M	$26.3 M	$26.8 M
Non-Traditional Technologies	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.03 M	$0.2 M	$0.2 M
Total	**$132.5 M**	**$126.6 M**	**$51.5 M**	**$51.5 M**	**$45.5 M**	**$47.5 M**	**$82.9 M**	**$67.8 M**	**$27.6 M**	**$30.1 M**	**$49.5 M**	**$59.5 M**	**$21.3 M**	**$21.9 M**	**$45.2 M**	**$45.2 M**	**$456 M**	**$450 M**

Appendix 2c

Build-out Annual Average Wastewater Use With I/I (ADF, gpd)					
Phase	Dennis @ DHY WWTF	Harwich @ DHY WWTF	Harwich @ Chatham WWTF	Yarmouth @ DHY WWTF	Total @ DHY WWTF
H1	-	-	0	0	
H2	-	-	168,788	0	
1/H3	304,375	42,500	0	909,147	1,256,021
2/H4	670,889	203,000	86,230	485,258	2,615,168
3/H5	204,841	264,000	0	434,409	3,518,418
4/H6	66,426	179,000	-	289,658	4,053,502
5/H7	346,778	160,000	0	279,776	4,840,056
6/H8	98,538	84,000	80,764	481,109	5,503,703
7	119,859	-	0	225,868	5,849,430
8	145,212	-	0	431,413	6,426,055
Total *(Rounded)*	**1,956,917**	**932,500**	**335,782**	**3,536,638**	**6,426,055**
% of DHY after 8 phases	**30%**	**15%**	**0%**	**55%**	**100%**
% of DHY after 4 phases	**31%**	**17%**	**-**	**52%**	**100%**

DHY WWTF Costs			
Average Daily Flow (ADF) at DHY WWTF (gpd)	Peak Flow (2.2*ADF)	Unit Cost per Cape Cod Commission Cost Guidance Document	DHY WWTF Total Cost
6,426,055	14,137,321	$ 10.35	$ 146,311,362

Effluent Recharge Sites						
DHY Phase Implemented	Town	Description	Effluent Recharge Capacity Range (GPD)		Cumulative Capacity (GPD) *(Conservative)*	PRB Included
1	Dennis	DHY WWTF	336,000		336,000	Yes
1	Yarmouth	Bass River Golf Course	2,000,000	3,000,000	2,336,000	No
3	Harwich	Proposed Location of Harwich WWTF (Queen Anne Road)	1,200,000		3,536,000	No
4	Dennis	2nd Recharge Site Identified in Dennis CWMP	410,000		3,946,000	Yes
5	Dennis	Northern Section of Highland Golf Course	250,000	4,000,000	4,196,000	No
5	Dennis	Parcels North and South of Hokum Rock Road	300,000	2,100,000	4,496,000	No
6	Dennis	Northern Section of Dennis Pines Golf Course	1,400,000	4,000,000	6,426,055	No
Total		**Total**	**5,896,000**	**15,046,000**		

APPENDIX 3

OPERATING COST SUMMARIES

A. Yarmouth Only Option, by Phase
B. DHY Option, by Phase, by Community

Yarmouth, MA
Town-only Solution
Operations and Maintenance Costs by Phase

Appendix 3a

Scenario	Unit	Unit Cost	Phase 1		Phase 2		Phase 3		Phase 4		Phase 5		Phase 6		Phase 7		Phase 8	
Stormwater BMPs O&M	lump sum	$6,400	1	$6,400	0	$6,400	0	$6,400	0	$6,400	0	$6,400	0	$6,400	$0	$6,400	0	$6,400
Fertilizer O&M	lump sum	$5,000	1	$5,000	0	$5,000	0	$5,000	0	$5,000	0	$5,000	0	$5,000	0	$5,000	0	$5,000
Gravity Sewer O&M	linear foot	$2.00	56,957	$113,913	51,477	$216,868	46,736	$310,339	21,055	$352,449	20,370	$393,189	101,496	$596,180	62,111	$720,402	148,278	$1,016,959
Pressure Sewer O&M	linear foot	$3.42	1,057	$3,616	15,188	$55,559	9,469	$87,943	3,777	$100,859	44,382	$252,646	0	$252,646	0	$252,646	0	$252,646
Vacuum Sewer O&M	linear foot	$3.42	0	$0	89,779	$307,045	81,590	$586,082	77,988	$852,799	15,518	$905,871	52,350	$1,084,908	8,972	$1,115,593	1,985	$1,122,381
Force Main O&M ($1/LF)	linear foot	$1.00	13,067	$13,067	614	$13,681	1,316	$14,997	16,167	$31,164	1,749	$32,913	1,442	$34,355	622	$34,977	1,334	$36,311
Pump Station O&M ($62,500)	each	$62,500	6	$375,000	2	$500,000	1	$562,500	2	$687,500	1	$750,000	3	$937,500	2	$1,062,500	3	$1,250,000
O&M Dollars Per gpd of Flow at WWTP #1	gpd	$1.11	2,000,123	$2,220,136	3,067,689	$3,405,135	4,023,390	$4,465,962	4,660,637	$5,173,307	5,276,144	$5,856,520	6,334,585	$7,031,389	6,831,494	$7,582,958	7,780,603	$8,636,469
Effluent Recharge O&M	square foot	$0.17	330,020	$56,103	176,149	$86,049	157,691	$112,856	105,146	$130,731	101,559	$147,996	174,643	$177,685	81,990	$191,623	156,603	$218,246
PRB O&M	each	$55,000	1	$55,000	0	$55,000	0	$55,000	0	$55,000	0	$55,000	0	$55,000	0	$55,000	0	$55,000
Aquaculture ($5,500/acre or $75,000 Minimum)	lump sum	$75,000	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0	0	$0
Total Annual O&M				**$2,848,236**		**$4,650,737**		**$6,207,079**		**$7,395,210**		**$8,405,534**		**$10,181,063**		**$11,027,100**		**$12,599,412**

Draft Operations and Maintenance Costs
2022 Costs with Projected ENR of 12,400
(As of 8/30/2019)

Appendix 3b

DHY Community O&M Costs

	Unit	Unit Cost	Quantity	Total Cost for all Phases (2022)	Phase 1 Quantity	Phase 1 Cost	Phase 2 Quantity	Phase 2 Cost	Phase 3 Quantity	Phase 3 Cost	Phase 4 Quantity	Phase 4 Cost	Phase 5 Quantity	Phase 5 Cost	Phase 6 Quantity	Phase 6 Cost	Phase 7 Quantity	Phase 7 Cost	Phase 8 Quantity	Phase 8 Cost
Force Main to WWTF O&M ($1/LF)	linear foot	$ 1.00	29,568	$ 29,568	29,568	$ 29,568	29,568	$ 29,568	29,568	$ 29,568	29,568	$ 29,568	29,568	$ 29,568	29,568	$ 29,568	29,568	$ 29,568	29,568	$ 29,568
Force Main to Recharge O&M ($1/LF)	linear foot	$ 1.00	60,667	$ 60,667	17,635	$ 17,635	17,635	$ 17,635	17,635	$ 17,635	33,950	$ 33,950	38,914	$ 38,914	54,595	$ 54,595	60,667	$ 60,667	60,667	$ 60,667
Pump Station O&M ($62,500)	each	$ 62,500	6	$ 375,000	3	$187,500	3	$ 187,500	3	$ 187,500	4	$ 250,000	5	$ 312,500	6	$ 375,000	6	$ 375,000	6	$ 375,000
O&M Dollars per gpd of flow at DHY WWTF	gpd	$ 1.20	6,426,055	$ 7,711,266	1,256,021	$ 1,507,226	2,615,168	$ 3,138,202	3,518,418	$ 4,222,101	4,053,502	$ 4,864,202	4,840,056	$ 5,808,067	5,503,703	$ 6,604,444	5,849,430	$ 7,019,316	6,426,055	$ 7,711,266
Effluent Recharge O&M	square foot	$ 0.17	2,332,658	$ 396,552	847,968	$ 144,154.56	847,968	$ 144,155	1,283,568	$ 218,207	1,432,398	$ 243,508	1,632,048	$ 277,448	2,332,658	$ 396,552	2,332,658	$ 396,552	2,332,658	$ 396,552
PRB O&M	each	$ 55,000	2	$ 110,000	1	$55,000	1	$ 55,000	1	$ 55,000	1	$ 55,000	2	$ 110,000	2	$ 110,000	2	$ 110,000	2	$ 110,000
Total Annual O&M				**$ 8,683,053**		**$ 1,941,083**		**$ 3,572,059**		**$ 4,730,011**		**$ 5,476,228**		**$ 6,576,497**		**$ 7,570,159**		**$ 7,991,103**		**$ 8,683,053**

Dennis O&M Costs for Collection and Conveyance, and Non-Traditional Technologies

			Dennis Collection System		DHY															
	Unit	Unit Cost	Quantity (Dennis Only)	Total Cost (Dennis Only)	Phase 1 Quantity	Phase 1 Cost	Phase 2 Quantity	Phase 2 Cost	Phase 3 Quantity	Phase 3 Cost	Phase 4 Quantity	Phase 4 Cost	Phase 5 Quantity	Phase 5 Cost	Phase 6 Quantity	Phase 6 Cost	Phase 7 Quantity	Phase 7 Cost	Phase 8 Quantity	Phase 8 Cost
Stormwater BMPs O&M	lump sum	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400
Fertilizer O&M	lump sum	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000
Gravity Sewer O&M	linear foot	$ 2.00	240,426	$ 480,852	64,608	$ 129,216	37,446	$ 204,107	45,218	$ 294,544	25,586	$ 345,716	0	$ 345,716	4,615	$ 354,946	0	$ 354,946	62,953	$ 480,852
Pressure Sewer O&M	connection	$ 50	1,984	$ 99,200	145	$ 7,250	366	$ 25,550	-	$ 25,550	-	$ 25,550	-	$ 25,550	644	$ 57,750	829	$ 99,200	-	$ 99,200
Vacuum Sewer O&M	lump sum	$ 80,774	1	$ 80,774	-	$ -	-	$ -	-	$ -	-	$ -	1	$ 80,774	0	$ 80,774	0	$ 80,774	-	$ 80,774
Force Main O&M ($1/LF)	linear foot	$ 1.00	46,541	$ 35,981	1,784	$ 1,784	4,861	$ 6,645	6,110	$ 12,755	2,871	$ 15,627	4,964	$ 20,590	0	$ 20,590	0	$ 20,590	1,093	$ 21,684
Pump Station O&M ($62,500)	each	$ 62,500	25	$ 1,562,500	6	$ 375,000	3	$ 562,500	6	$ 937,500	3	$ 1,125,000	0	$ 1,125,000	0	$ 1,125,000	0	$ 1,125,000	3	$ 1,312,500
Aquaculture ($5,500/acre or $75,000 Minimum]	lump sum	$ 75,000	1	$ 75,000	1	$ 75,000	1	$ 75,000	1	$ 75,000	1	$ 75,000	1	$ 75,000	1	$ 75,000	1	$ 75,000	1	$ 75,000
Total O&M Costs for Dennis's Collection, Conveyance, and Non-traditional Technologies						$ 599,650		$ 885,202		$ 1,356,749		$ 1,598,293		$ 1,684,030		$ 1,725,461		$ 1,766,911		$ 2,081,410
Dennis's Portion of DHY O&M Costs						$ 470,388		$ 1,332,113		$ 1,586,482		$ 1,684,047		$ 2,164,931		$ 2,327,078		$ 2,475,032		$ 2,644,238
Dennis's Total O&M with DHY						$ 1,070,037		$ 2,217,315		$ 2,943,231		$ 3,282,339		$ 3,848,962		$ 4,052,539		$ 4,241,942		$ 4,725,648

Harwich O&M Costs for Collection and Conveyance, and Non-Traditional Technologies

			Harwich Collection System		Under DHY															
	Unit Cost	Unit Cost	Quantity (Harwich Only)	Total Cost (Harwich Only)	Phase 1 Quantity	Phase 1 Cost	Phase 2 Quantity	Phase 2 Cost	Phase 3 Quantity	Phase 3 Cost	Phase 4 Quantity	Phase 4 Cost	Phase 5 Quantity	Phase 5 Cost	Phase 6 Quantity	Phase 6 Cost	Phase 7 Quantity	Phase 7 Cost	Phase 8 Quantity	Phase 8 Cost
Pump Stations	each	$ 62,500	33	$ 2,062,500	0	$ -	7	$ 437,500	1	$ 500,000	6	$ 875,000	2	$ 1,000,000	5	$ 1,312,500	6	$ 1,687,500	6	$ 2,062,500
Non-Traditional Projects	lump sum	$ 100,000	1	$ 100,000	0	$ -	0.1	$ 10,000	0.9	$ 100,000	0	$ 100,000	0	$ 100,000	0	$ 100,000	0	$ 100,000	0	$ 100,000
Treatment O&M at Chatham WWTF	lump sum	$ 260,000	1	$ 260,000	0	$ -	1	$ 260,000	0	$ 260,000	0	$ 260,000	0	$ 260,000	0	$ 260,000	0	$ 260,000	0	$ 260,000
Effluent Recharge from Chatham WWTF	square foot	$ 0.17	121,889	$ 20,721	0	$ -	121,889	$ 20,721	0	$ 20,721	0	$ 20,721	0	$ 20,721	0	$ 20,721	0	$ 20,721	0	$ 20,721
Force Main O&M ($1/lf)	linear foot	$ 1.00	58,681	$ 58,681	0	$ -	17,664	$ 17,664	11,405	$ 29,068	14,788	$ 43,856	2,305	$ 46,161	28,271	$ 74,433	10,024	$ 84,457	8,965	$ 93,422
Pressure Sewer ($/lf)	linear foot	$ 3.42	107,273	$ 366,874	0	$ -	2,823	$ 9,655	0	$ 9,655	5,825	$ 29,577	52,361	$ 208,651	17,750	$ 269,356	12,947	$ 313,634	15,567	$ 366,874
Gravity Sewer ($/lf)	linear foot	$ 2.00	235,027	$ 470,054	0	$ -	42,730	$ 85,460	3,315	$ 92,090	43,994	$ 180,078	36,401	$ 252,880	34,633	$ 322,146	34,679	$ 391,504	39,274	$ 470,052
Total O&M Costs for Harwich's Collection, Conveyance, and Non-traditional Technologies						$ -		$ 841,000		$ 1,011,535		$ 1,509,232		$ 1,888,414		$ 2,359,156		$ 2,857,816		$ 3,373,569
Harwich's Portion of DHY O&M Costs						$ -		$ -		$ 65,680		$ 335,329		$ 684,950		$ 930,155		$ 1,152,912		$ 1,282,622
Harwich's Total O&M with DHY						$ -		$ 841,000		$ 1,077,215		$ 1,844,561		$ 2,573,364		$ 3,289,311		$ 4,010,728		$ 4,656,191

Yarmouth O&M Costs

			Yarmouth Collection System		Under DHY															
Collection and Conveyance, and Non-Traditional Technologies	Unit	Unit Cost	Quantity (Yarmouth Only)	Total Cost (Yarmouth Only)	Phase 1 Quantity	Phase 1 Cost	Phase 2 Quantity	Phase 2 Cost	Phase 3 Quantity	Phase 3 Cost	Phase 4 Quantity	Phase 4 Cost	Phase 5 Quantity	Phase 5 Cost	Phase 6 Quantity	Phase 6 Cost	Phase 7 Quantity	Phase 7 Cost	Phase 8 Quantity	Phase 8 Cost
Stormwater BMPs O&M	lump sum	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400	1	$ 6,400
Fertilizer O&M	lump sum	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000	1	$ 5,000
Gravity Sewer O&M	linear foot	$ 2.00	508,480	$ 1,016,959	55,531	$ 111,062	51,477	$ 214,017	44,782	$ 303,581	21,055	$ 345,691	20,370	$ 386,430	101,496	$ 589,422	62,111	$ 713,644	148,278	$ 1,010,201
Pressure Sewer O&M	linear foot	$ 3.42	73,873	$ 252,646	1,057	$ 3,616	15,188	$ 55,559.26	9,469	$ 87,943	3,777	$ 100,859	44,382	$ 252,646	-	$ 252,646	-	$ 252,646	-	$ 252,646
Vacuum Sewer O&M	linear foot	$ 3.42	328,181	$ 1,122,381	-	$ -	89,779	$ 307,045	81,590	$ 586,082	77,988	$ 852,799	15,518	$ 905,871	52,350	$ 1,084,908	8,972	$ 1,115,593	1,985	$ 1,122,381
Force Main O&M ($1/LF)	linear foot	$ 1.00	43,803	$ 43,803	24,947	$ 24,947	614	$ 25,561	3,270	$ 28,831	16,167	$ 44,998	1,749	$ 46,747	4,082	$ 50,829	622	$ 51,451	1,334	$ 52,785
Pump Station O&M ($62,500)	each	$ 62,500	22	$ 1,375,000	6	$ 375,000	2	$ 500,000	2	$ 625,000	1	$ 687,500	1	$ 750,000	3	$ 937,500	2	$ 1,062,500	3	$ 1,250,000
Aquaculture ($5,500/acre or $75,000 Minimum]	lump sum	$ 75,000	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -	0	$ -
Total O&M Costs for Yarmouth's Collection, Conveyance, and Non-traditional Technologies						$ 526,025		$ 1,113,582		$ 1,642,836		$ 2,043,247		$ 2,353,093		$ 2,926,704		$ 3,207,234		$ 3,699,412
Yarmouth's Portion of DHY O&M Costs						$ 1,405,015		$ 1,904,618		$ 2,458,579		$ 2,862,027		$ 3,258,654		$ 3,960,458		$ 4,242,152		$ 4,778,797
Yarmouth's Total O&M with DHY						$ 1,931,041		$ 3,018,200		$ 4,101,415		$ 4,905,274		$ 5,611,747		$ 6,887,163		$ 7,449,385		$ 8,478,209