Chapter 11

Summary of Recommended Plan

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SUMMARY OF RECOMMENDED PLAN

11.1 INTRODUCTION

This chapter identifies and presents the Comprehensive Wastewater Management Plan's Recommended Plan. The chapter is a culmination of the findings presented in the previous documents prepared as part of this project, the evaluations included in this Report, and the findings of the MEP work related to the Town of Chatham. This Chapter outlines the recommended plan, mitigation measures necessary as part of the implementation, and a proposed schedule to implement the plan. The Chapter also discusses the financial planning efforts, future work, and other institutional considerations necessary for the plan.

The goals of the recommended plan are to achieve the estuarine nitrogen TMDLs for the Town, address other areas of concern (AOCs) within Town, and provide an adaptive management approach to implementation such that as the plan is executed it can be adjusted based on the environmental and economic impacts that may result during its implementation.

11.2 IDENTIFICATION OF THE RECOMMENDED PLAN

The recommended plan for Chatham would involve the implementation of an adaptive management approach including the following major components:

- Two-phased implementation of WWTF expansion at the existing WWTF site. Phase 1 would treat approximately 1.3 mgd on an average annual basis to meet total nitrogen TMDL requirements in Stage Harbor, Pleasant Bay, Sulphur Springs, and Taylor's Pond watershed areas. Phase 2 would expand this facility to 1.9 mgd on an average annual basis to serve the remaining areas of the Town of Chatham. WWTF flows are summarized on Table 9-5.

- Expansion of the existing collection system to match the two Phases of the WWTF expansion with the possibility of sewering all of the 94 sewersheds identified. Sixty-one (61) of the 94 sewersheds identified would need to be sewered in order to address the TMDL requirements.
- Further evaluation of the freshwater restoration of the upper reaches of Muddy Creek which could provide a quicker remediation of the nitrogen impacts to this waterbody and to Pleasant Bay as a whole.
- Continuation of a modified coastal embayment water quality monitoring program for TMDL compliance and continued groundwater monitoring at the WWTF site.
- Continued public education on fertilizer use and management of other controllable sources of nitrogen within the Town.
- Continued enforcement of the Town of Chatham's Board of Health Nitrogen Loading Regulation in those areas not designated for immediate (next five to ten years) connection to the WWTF as part of addressing the Town's TMDLs.
- Implementation of Article 2 of the Rules and Regulations of the Sewer Department regarding growth-neutral and the new sewer use regulations.
- Continued implementation of storm water improvements and management.

The components of the wastewater collection and treatment systems expansion is summarized below.

A. **WWTF Expansion.** The following wastewater treatment processes have been identified throughout the development of the CWMP. The following list is a summary of the core technologies that will make up the new WWTF's major components.

Preliminary Treatment:

- Pre-engineered system for screening and grit removal.

Secondary Treatment:

- Orbal® process constructed in a modular design to allow Phase 2 expansion as the flow increases.
- Three secondary clarifiers (2 for Phase 1, third for Phase 2).

Filtration:

- Continuous backwash denitrification sand filters.

Disinfection:

- Achieved through filtration in the sand infiltration beds. (An ultraviolet disinfection system is not being proposed at this time)

Sludge Processing:

- System expansion with a 1.0 m Belt Filter Press.

Odor Control:

- Activated Carbon.

Support Facilities:

- Return activated sludge (RAS) and waste activated sludge (WAS) pumping (centrifugal pumps).
- Plant water (pumps and hydropneumatic tank).
- Sodium hypochlorite for nocardia control – chemical tank and pumps.
- Sodium hydroxide for alkalinity addition – chemical tank and pumps.
- Methanol – for supplemental carbon.

Other considerations as requested by the Town for flexible future site operations:

- Provide space for a physical/chemical total phosphorus removal system, and a possible additional anaerobic zone for total phosphorus removal.
- Provide space for return activated sludge (RAS) processing for the possible consideration of a Cannibal® sludge minimization process.
- Provide space for additional expansion to accommodate possible flows from portions of the Town of Harwich. Chatham has begun preliminary discussions with Harwich regarding this possibility; however Harwich is in the early stages of CWMP planning. Initial consideration has been given to accommodating areas of Harwich immediately adjacent to some of the proposed Chatham sewersheds. Chatham will continue to work with neighboring towns to address the issue of a regional solution. Given the time necessary to undertake WWTF final design after completion of the CWMP,

Chatham will continue to explore opportunities to develop/evaluate regional solutions.

Table 9-6 provides a list of proposed Phase 1 equipment.

At the time of the Draft CWMP, disinfection was not being proposed; however, following subsequent discussions and reviews as described in Chapter 1 and 9, UV disinfection will be provided at the proposed facility.

B. **Collection System.** The collection system will be phased in over 30 or more years. The first 20 years will target the expansion of the collection system to address those areas in Town identified as AOCs in order to achieve the total nitrogen TMDLs. This will include the extension of sewers within 61 sewersheds (Phase 1) shown on Figure 9-6, and extension of sewers for the 33 remaining sewersheds over the ten years following the Phase 1 implementation as shown in Figure 9-1. The total length of proposed sewer is approximately 110 miles, 88 miles of which are proposed gravity and 18 miles of which are proposed low pressure, compared to the existing system of approximately 5 miles of gravity mains.

The total number of low pressure grinder pumps is estimated at 1,200. This number is based on one grinder pump per building/property. Though there are grinder pump units suitable for multiple buildings, these installations can become difficult to manage if buildings are owned by different parties; therefore this plan is based on one pump per property.

Of the 1,200 grinder pumps proposed, approximately 530 belong to buildings where a gravity main is installed in the road, but the elevation of the building is lower than the gravity main; therefore a pump is needed to convey the wastewater to the higher elevation in the main. The remaining 670 grinder pumps belong to buildings that have low pressure sewers based on discussions and the cost analysis reviewed with the Town.

A total of 80 new pumping stations are required for this Town-wide sewer master plan.

Approximately ten easements will be needed to implement the collection system as identified during the preliminary design. These easements are identified in Appendix U on Sheets 1

through 15 and are highlighted in yellow. Attaining these easements is a critical next step for the Town in order to implement the collection system within these sewersheds.

Sewersheds along the border of Chatham and Harwich, namely 1, 2, 7 and 58 include provisions to sewer Harwich properties that can be reached by gravity collection systems.

Mitigation measures previously identified in the Chapter 11 of the Draft CWMP/DEIR have been moved to Chapter 12 - MEPA DRAFT SECTION 61 FINDINGS AND MITIGATION MEASURES, of this document.

11.3 PLANNED IMPLEMENTATION TIMING

A critical piece to the facilities planning process is the implementation timing of the recommended plan. The recommended plan is a comprehensive strategy for wastewater and nitrogen management in Chatham for a 20-year period; and with a perspective on the ultimate build-out condition for the Town. The 20-year period is 2010 to 2030, which is the estimated time period for implementation of the wastewater facilities to meet the immediate (TMDL) wastewater needs in Town. The recommended plan also includes the strategy to extend wastewater collection and treatment facilities to the rest of the Town within approximately 10 years of the completion of Phase 1 (from 2030 to 2040).

The Town plans to proceed rapidly with design and construction of new facilities following the approval of the CWMP. Figure 11-1 provides a proposed schedule depicting the completion of the Final CWMP/FEIR and milestones for securing State Revolving Fund (SRF) low-interest loans; design of the first portion of the recommended plan; and expansion and upgrade of the WWTF.

The CWMP approval process is comprised of the Massachusetts Environmental Policy Act (MEPA) and Cape Cod Commission's Development of Regional Impact (DRI) reviews and ultimate compliance with the MassDEP Administrative Consent Order (ACO). The MEPA and DRI processes provide for several public comment periods and public hearings. Once the project moves through this part of the CWMP process, the Town will look to Town meeting to appropriate funds necessary to implement the initial steps in the approved plan. Once funds,

including State Revolving Fund (SRF) loans, are secured the project can move into implementation as shown.

Several alternative timelines were considered for the extension of the future collection system. The Summer Residents Advisory Committee, a Town advocacy group comprised of residents that own summer homes in Chatham, but maintain year-round residency outside of Chatham (and therefore cannot vote at Chatham Town Meetings), expressed the view that they would like to see the entire Town served by a modern wastewater collection and treatment system in a period of 8 to 10 years to deal conclusively with these wastewater and nitrogen problems. Subsequent evaluations by Stearns & Wheler and the Town's Wastewater Planning Technical Advisory Group indicated that the implementation of sewers at this pace would cause major disruptions in Town to traffic, business, etc. during the 8- to 10-year period and could damage the summer-time vacation economy. It would also place a strain on the planning of other capital projects in the Town. After review with the Citizens' Advisory Committee and Board of Selectmen, general consensus indicated that a 20-year implementation was the most practical and feasible for the treatment plant expansion/upgrade and sewer expansion to those portions of Town with critical wastewater nitrogen management needs (i.e., to the areas affected by the nitrogen TMDLs). This 20-year period would be called the Phase 1 implementation and would be followed by a 10-year Phase 2 implementation to further expand the treatment facility and extend the sewers to the remaining portions of Town.

Figure 11-2 provides a preliminary schedule of how wastewater treatment and collection facilities would be implemented over this 30 year period. The schedule is subject to change based on when the Town has completed the MEPA/CCC review process and has the necessary approvals to move forward and begin implementation.

It is noted that the previous completion of the collection system preliminary design and master plan provides much flexibility on how the collection system is implemented. The flexibility of this plan will be used in an adaptive management approach to meet the nitrogen TMDLs, meet other Town wastewater priorities, and take advantage of other priorities (redevelopment, road paving, sidewalk reconstruction, etc.) to efficiently install the sewers.

The Town of Chatham has established several criteria that will be used in the process of prioritizing areas for sewering, as presented in this report. These criteria include:

- High priority watersheds based on total nitrogen TMDLs.
- Related capital projects where projects can be completed with mutual advantage.
- Coordination with other infrastructure projects (roads, water, etc.), including MassHighway Route 28 work.
- Coordination with private development and re-development that offsets some public expense for infrastructure.
- Coordination of infrastructure relay pumping stations.
- Recommendations by TAG and Water and Sewer Advisory Committee.

The recommended plan provides guidance and flexibility on which areas should be addressed in order to achieve the TMDLs; however, it will be the ultimate decision of the Town to identify which areas will be addressed first through this process and prioritize the remaining areas such that the ultimate 20 year plan (Phase 1) can be implemented efficiently.

As discussed in Chapter 1, the Town is working to secure funding from several sources in order to proceed with the implementation of the initial phase of sewer expansion and the upgrade to the WWTF. Figure 1-2 presents the extent of the initial phase of sewer phasing, and Figure 9-3 shows the proposed improvements to the existing WWTF.

11.4 FINANCIAL PLAN

The Town's Technical Advisory Group has been actively evaluating mechanisms on how a collection system expansion and treatment facility upgrade would be financed and implemented in Town. Several scenarios were presented by the Town Manager and Finance Director to the Board of Selectmen to outline the financial options, to develop a capital plan that would allow a sewer expansion and treatment facility upgrade to proceed without jeopardizing other capital projects in Town, and to provide a fair distribution of costs to the Towns people.

The Town has already applied to the USDA Rural Development Program and will apply to the State Revolving Fund (SRF) to fund the WWTF construction project and future sewer projects as applicable. The Town has developed several approaches for funding and debt repayment.

The Town of Chatham adopted a Capital Facilities Plan in Fiscal Year 2003 to address the issue of its aging infrastructure. A portion of this replacement plan is dedicated to the Wastewater Facility Expansion.

A financial plan was developed in 2006 that was aimed at funding the Capital Facilities Plan without increasing the tax rate. This plan includes an infrastructure replacement phase-in schedule of 20 year bond issues (30 years for sewer expansion). To accomplish this goal, the Town stabilized its debt at $4.7 million. A policy was instituted to insure that as the debt is paid off, and therefore reduced each year, the Town would continue to be able to fund the $4.7 million. This policy enables the Town to use the "debt drop-off" to achieve its goal of funding its infrastructure replacement without a tax rate increase. The Town's 2005 fiscal analysis, as presented to the Board of Selectmen, is included in Appendix V.

The program level 2005 fiscal analysis was followed in April 2006 by another fiscal presentation targeted to individual homeowners. This April 2006 presentation, Appendix W, provided examples of the fiscal impacts at the individual property level, based on cost estimates at the time. This presentation also examined various betterment options versus the property tax.

The Wastewater Treatment facility alone is a $35 million capital project that will be funded partly through debt drop-off. The remaining funds will come from the tax rate and other sources as shown below. The Town is proposing the following approach for financing the project:

- Sewer user rates will cover 100 percent of the O&M, and ultimately, 25 percent of the debt (including the collection system);
- Debt drop-off and the tax levy would cover the remaining 75 percent of the debt (50 percent debt drop-off; 25 percent increase levy declining for the duration of the bond).

The Cape Cod Water Protection Collaborative sponsored legislation, passed by the Legislature in August 2009 that would allow Towns with a completed and approved CWMP, and meeting other criteria, to be eligible for SRF funding at zero percent interest, down from the two percent interest for current loans.

The Town's current sewer user rate is not anticipated to increase from those provided in Table 8-1. Seventy-five (75) percent of the current rate goes towards operations and maintenance costs for the existing WWTF. This is expected to continue following the completion of this project.

The Town currently does not have a Debt Service Reserve. The Town does plan on setting up a Short-Lived Asset Reserve as part of a 5-year capital plan once construction starts. A detailed schedule would be developed following final design when the upgrade and expansion is identified in detail.

Table 11-1 provides a summary of the plan costs. This Table shows costs for both Phase 1 and Phase 2 and are based on costs developed and referenced to a date of June 2007. The implementation and phasing of these costs will be spread out over the 30 plus years of implementation.

Fiscal presentations made to the Board of Selectmen and the community have provided information on the expected direct costs to the individual property owner. These costs include:

- One-time Connection Cost – estimated between $3,000 to $10,000 depending on the home/business distance from the street, the need for a grinder pump, and other characteristics of the property.
- Annual User Charge – estimated at $400/year, based on current system users.

The Town has also undertaken a Value Engineering (VE) review of the proposed preliminary design of the wastewater treatment facilities included as part of the recommended plan. Costs have been reduced as part of this process.

As discussed previously, the prioritization of the collection system expansion has not been formalized and will be a function of the criteria established above and the adaptive management process executed during the 20 year planning process. However, the Town of Chatham has determined that based on the Total Capital Costs developed and summarized in Table 11-1, that they will be looking to appropriate $40 million for construction of the proposed Phase 1 wastewater treatment facility. The Town also anticipates appropriating approximately $170 million (2007 dollars) over a 20 year period (2010 to 2030) for the collection system.

Appropriations would likely be in the $15-$20 million range every two years for design and construction of collection systems in order to achieve the TMDLs.

11.5 INSTITUTIONAL CONSIDERATIONS

The following section identifies and discusses several primary institutional considerations related to plan implementation:

- Prioritization
- Proprietary equipment
- Ownership, and operation and maintenance considerations
- Easements
- Monitoring programs

A. **Design and Construction Issues.** As the Town moves forward in implementing the recommended plan, several issues will need to be resolved during design and construction:

- Proprietary equipment / sole sourcing of equipment.
- Standardization of equipment (mainly pump station and grinder pump units).
- Grinder pump unit ownership.

During the evaluation of technologies as part of the preliminary design, interest by the TAG on some specific technologies has been expressed. The Town understands that the Commonwealth of Massachusetts requires projects be open to as many contractors and equipment suppliers/manufacturers as possible to make the process competitive and to encourage fair pricing. The Commonwealth also encourages performance-based specifications in those areas where a particular technology or piece of equipment is sought, however, the Massachusetts General Laws (MGLs) do allow for selection of a specific piece of technology if it is deemed in the best interest of the project and endorsed and documented by the Town.

The recommended plan calls for an Orbal® advanced secondary process which is an oxidation ditch type process. Construction of the concrete tanks will be competitively bid. However, there may be components of the equipment that are provided by the Orbal® process manufacturer in order for them to provide performance guarantees on their process. To the fullest extent

possible, components of the Orbal® process will be specified naming three manufacturers or equal, including: pipes, valves, gates, pumps, motors, etc.

The Town may also wish to standardize around a particular piece of equipment, for example grinder pump units or pumping station equipment, in order to minimize storage of spare parts for several different manufacturers and minimize operational and maintenance issues and training associated with maintaining different manufacturers equipment for the same application. Although grinder pumps are the most common collection system component where this might be applied, the Town may have a desire to standardize around a valve, pump or other equipment manufacturer for other collection system and WWTF components.

In the case of grinder pump units, the Town needs to make decisions prior to collection system design on ownership issues associated with these units. The Town may elect to:

- Purchase, install, own, operate and maintain the equipment.
- Purchase equipment and property owners install, own operate and maintain.
- Let the property owner purchase and install, and the town operate and maintain.
- Let the property owner maintain complete ownership and maintenance requirements.

This issue will be addressed by the Town during final design and implementation.

B. **Embayment Monitoring.** The overriding need to extend sewers is to remediate the current nitrogen loading to coastal estuaries as identified by the nitrogen TMDLs. MassDEP will require embayment monitoring, which may include water quality, eel grass coverage, and benthic infauna habitat, to verify that the sewer extension and nitrogen remediation efforts are effective.

Working with MassDEP, CCC, and SMAST, the Pleasant Bay Alliance has taken the lead in defining the scope and content of a long-term embayment monitoring program to meet nitrogen TMDLs. They have recognized the following key items about such a program:

- The ultimate goal is to restore the marine habitat to the levels that are the basis of the TMDLs.
- The attainment of the threshold nitrogen concentrations at the estuary sentinel stations are an indicator of the condition that habitat can repair itself.

- The implementation of Phase 1 (to remediate watershed nitrogen loadings as the method to meet the TMDLs) will require a period of 20 years. The positive response of the water quality and benthic habitat will require several more years, given the groundwater travel time from the watersheds to the estuaries, and the release and flushing of the stored benthic nitrogen loads.
- Some aspects of habitat restoration, such as re-growth of eel grass, may not be possible due to other factors such as past deposition of organic solids, on-going boat traffic, etc.
- Once the water quality returns to a level near the threshold concentration, active eel grass restoration efforts may be needed.
- The embayment monitoring will be a long-term effort and will need to be a team effort between the communities within the embayment watersheds and MassDEP.

Working with MassDEP, CCC, and SMAST, the Pleasant Bay Alliance is currently working on a pilot project to develop an embayment monitoring program for that water body, with the expectation that its primary monitoring criteria, parameters, and overall structure can be used by communities at other embayment watersheds. The Town of Chatham, represented by Dr. Robert Duncanson, is an active member in this group and will continue to work for the development and implementation of the embayment monitoring program for Pleasant Bay; as well as its application to the Stage Harbor, Sulfur Springs/Bucks Creek, and Taylor Pond/Mill Creek systems.

C. **Groundwater Monitoring.** The current groundwater monitoring program for the treated water recharge at the Chatham WWTF is based on agreements between the Town and MassDEP as guided by the Administrative Consent Order on the WWTF. The current program includes the following components:

- Water level is monitored at approximately 50 monitoring wells (some are screened in the upper aquifer and some are screened in the lower aquifer) as indicated in Appendix X. These levels are monitored three times per year (typically in April, August, and December).
- Water quality is monitored (at the same time periods) from eight of the wells. Two of the wells are directly downgradient of the treated water recharge to measure any elevated nitrogen or conductivity level, and the remaining six wells are outside of the

groundwater affected by the recharge (plume area). The water quality monitoring typically includes field parameters of specific conductance, temperature, and pH; nitrate and nitrite nitrogen; total Kjeldahl nitrogen; and dissolved sodium. In FY 2007, several samples were analyzed for total organic carbon.

This monitoring program is expected to be incorporated into a new groundwater discharge permit after approval of the CWMP. The permit and monitoring program will receive public review at that time. As treated water flows increase, the water level monitoring network may need to be expanded to observe any changes in groundwater elevations as indicated by recent groundwater modeling (Appendix G). These changes are expected to occur over a long period.

Due to the long time period that will occur as recharge flows increase, groundwater level monitoring at the 50 wells should be changed to once per year for two out of every three years, and seasonally (three times per year) every third year. Groundwater quality monitoring for the current monitoring parameters should continue three times per year.

D. **TMDL Compliance and Adaptive Management Plan.** Discussions with MassDEP have indicated that nitrogen TMDL compliance will be met with the restoration of the habitat quality that has been targeted by the MEP. These discussions have identified that this restoration may take several years after new wastewater facilities are installed due to the long groundwater and nitrogen flow travel times. The same discussions have also indicated that steady implementation of the CWMP will demonstrate compliance with the TMDL because the CWMP has been established to meet the TMDLs using the scientific methods supported and approved by MassDEP. The commitment to steady implementation has been stated in the Financial Plan of Section 11.4.

It is understood that ongoing and proposed environmental monitoring activities may observe environmental changes (hopefully for the better, but possibly to the worse) and that mid-course corrections to the plan implementation may be needed. This understanding of possible mid-course correction is called “Adaptive Management”. The following text summarizes the major components of the TMDL compliance and Adaptive Management Plan. It is understood that this plan will be updated as time proceeds in the spirit of Adaptive Management.

1. **Implementation of the CWMP.** The CWMP will be implemented as indicated in the recommended plan portion of this Chapter (Section 11.2). The Phase 1 wastewater facilities will be implemented over a 20-year period (approximately 2010 to 2030) and the Phase 2 wastewater facilities will be implemented in the next 10 years (approximately 2030 to 2040).

The Town has committed to fund the implementation at $15,000,000 to $20,000,000 every two (2) years for the 30-year implementation period. The May 2009 Annual Town Meeting recently approved $59,508,000 for the initial implementation discussed in Section 1.7. This initial appropriation indicates a 6- to 8-year "jump start" on the program.

2. **Documentation of Capital Expenditures.** The primary TMDL compliance tool used by MassDEP will be verifying that the Town has applied to the SRF program for low interest loans in the $15,000,000 to $20,000,000 range per 2-year period committed by the Town. MassDEP's support of the SRF applications will be needed to facilitate implementation.

3. **Compliance with the Groundwater Discharge Permit.** The design for the WWTF upgrade will be accompanied by a MassDEP discharge permit application. MassDEP will review the application information and develop a draft discharge permit for public review. Once the permit is finalized, the Town will need to comply with the various treatment, sampling, and reporting requirements specified in the permit. Compliance with the groundwater discharge permit will be a major component of the TMDL compliance.

4. **Reporting on Groundwater Elevation and Quality Monitoring in the Vicinity of the WWTF.** This monitoring and reporting will be part of the Groundwater Discharge Permit requirements and the Discharge Permit requirements and the Discharge Permit will identify the monitoring plan.

5. **Reporting on Estuarine Water Quality Monitoring.** The Town of Chatham continues to sample and analyze the marine waters in their estuaries even though the MEP Technical Reports and TMDLs are complete. The Town has a large group of volunteers who do this sampling, and the volunteers have been an important support group for the CWMP and the initial implementation of the CWMP. Now that the MEP work is complete, the Town has reduced the monitoring frequency and locations (in consultation with SMAST and MassDEP) from a very analytical strategy (needed to develop the TMDLs) to more of a program to develop

and investigate long-term trends. This monitoring is closely coordinated with the other Pleasant Bay communities through the Pleasant Bay Alliance. As discussed earlier in this chapter, the Town is participating in the MassDEP Pilot Project to develop a standard protocol for long-term monitoring in the estuaries.

6. **Habitat Assessments That May be Completed by the Town, MassDEP, and/or Regional Organizations.** As part of the MassDEP Pilot Project to develop standard protocols for estuarine water quality and habitat monitoring programs, there has been much discussion on who will perform these assessments and who will pay for them. It has been generally agreed:

- The timeline for wastewater infrastructure implementation and the groundwater travel times indicate that the first habitat assessment (that could be correlated to wastewater system improvements) will not be needed for several years; therefore, there is time to develop the program.
- MassDEP will continue its eel grass mapping program (if state funding continues).
- Individual Towns or resource groups such as the Pleasant Bay Alliance will probably be the responsible parties to complete the benthic habitat surveys. The protocols, goals, and reporting procedures for these surveys will be a major focus for the MassDEP Pilot Project.

7. **Continued Coordination with the Pleasant Bay Alliance for Regional Model Runs.** The Town will continue to be an active member of the Pleasant Bay Alliance to develop and support water quality model runs of the Pleasant Bay system. Several model runs have recently been completed to investigate the effects of the new breach (2007). Additional model runs are in the planning stages for a future nitrogen loading scenario based on the developing wastewater plans of the 4 Pleasant Bay Towns.

8. **Periodic Watershed Assessments and Other Evaluations.** Watershed assessments will be completed periodically (every 5 to 10 years) to tabulate water consumption, estimated septic system discharges, WWTF recharge and treatment performance, and nitrogen loadings from the non-wastewater sources to summarize changes of nitrogen loads to the estuaries over time. These nitrogen loading summaries will be compared to the water quality monitoring trends to investigate possible correlations between water quality and nitrogen loading. Other evaluations of nitrogen and/or phosphorus loading will be completed as needed.

9. **Possible Changes to this Plan as Part of Adaptive Management.** This plan is still being developed as evidenced by the ongoing MassDEP Pilot Project. Changes will occur as the Town moves forward with its wastewater implementation program. The WWTF Discharge Permit needs to be renewed every 5 years (by regulatory statute) and will provide a formal opportunity for permitted change.