AECOM
9 Jonathan Bourne Drive
Pocasset, MA 02559
www.aecom.com

508.833.6950 tel
508.833.6951 fax

Memorandum

To	George Meservey, Director of Planning & Community Development Michael Domenica, PE, Program Manager
CC	Betsy Shreve, AICP, AECOM Project Director Paula Winchell, AECOM
Subject	**Town of Orleans, MA** **Water Quality and Wastewater Planning** **Task Number 7 – Preparation of the Amended CWMP** **Technical Memorandum Outline on Draft Amended CWMP**
Project Number	60476644
From	Thomas Parece, P.E., AECOM Project Manager
Date	02/26/16

1. Executive Summary

2. Glossary and Definitions

3. History of CWMP

a. Summary of what has happened with regard to water quality and nutrient management planning since the CWMP was submitted to MassDEP and CCC. Discussion regarding the current document as an amended CWMP which incorporates by reference relevant aspects of the previous CWMP not modified as a result of the additional planning and engineering effort through the existing scope of work.

b. Provide general discussion of any modifications that may have been in response to comments on previous CWMP. It is not intended that the Amended CWMP will represent a re-issuance of the previously published CWMP. Responses to Comments will be appended to the Amended CWMP.

4. Discussion of the Consensus Plan

a. Overview of the Consensus Plan, including discussion of how the targeted nitrogen load reductions are proposed to be achieved through implementation of traditional and non-traditional technologies. Provide overview of technologies and where they would be applied (traditional in the Downtown and Meetinghouse Pond areas), and PRB, FCW and Shellfish Aquaculture locations.

5. Facilities Engineering

a. The conceptual and preliminary design tasks required to advance the traditional engineering tasks including Disposal Site Investigations, Facilities (Wastewater Treatment and Disposal) Preliminary Design, Downtown Planning and Cost Estimating.

1) **Disposal Site Investigations** - The following sites are evaluated for a new disposal site for the Overland Way (formerly known as Tri-Town) WWTF discharge site: the Cloverleaf Route 6A and Site 1/1A at the Overland Way Site and a new Meetinghouse Pond Watershed Satellite WWTF discharge (223 Beach Road). Details include:

a) Preliminary Site Characterization;

b) Summary of Previously Conducted and New Subsurface investigations (test pit excavations, soil boring and monitoring well investigation, slug testing, etc.);

c) Findings from Previous and New Hydrogeologic Investigations (depth to groundwater, soil classifications, groundwater flow direction, hydraulic conductivity, hydraulic gradient, groundwater velocity, groundwater quality);

d) Summary of Groundwater Mounding Evaluation: details of model and model results;

e) Identification of Impacts: nutrient loading to watersheds, estimated additional nutrient load from groundwater discharge, impacts to receptors from mounding and loading;

f) Estimated Costs: site access, design, construction, O&M; and

g) Conclusion: site recommendation, recommended capacity.

2) **Downtown Planning**

a) Overview of Goals for Downtown Planning: updated economic conditions and market trend analysis, updated build-out analysis for Town Center Study area and scenarios for growth in downtown area to provide basis for developing wastewater flows and loads.

b) Updated Economic Conditions and Market Trend Analysis: real estate and business conditions, the year-round and seasonal retail market, other conditions pertinent to Town Center planning.

c) Updated Town Center Study Area Build-out Analysis: build-out approach and methodology, data collected (land use, zoning, business inventory, etc.), workshop with BOS and other Boards and key stakeholders, develop build-out scenarios, second workshop with BOS and Boards and key stakeholders.

d) Results of Build-out Scenarios:

- Scenario 0 - Full Buildout under Current Zoning with Wastewater Limitation.
- Scenario 1 - Full Buildout under Current Zoning with Wastewater Limitations Removed (sewer provided).
- Scenario 2 - Full Buildout with Land Use Pattern and Zoning Changes.

- Scenario 3 - Planning Horizon 2015 Projections: two scenarios (one using historic growth rates and another using higher growth rates to account for vision, market conditions, and provision of sewer).

e) Projections for Wastewater Flows and Loads, and Projections for Biosolids.

f) Other Potential Impacts Associated with Build-out Scenario Growth.

g) Proposed Zoning and Regulatory Changes to Achieve Strategies and Objectives.

3) **Facilities Preliminary Design**

a) Collection systems:

- Selection criteria (site suitability, environmental considerations, financial considerations, maintenance considerations, and other considerations); and

- Comparison of collection system options (gravity, low pressure sewer, vacuum, and septic tank effluent pumping (STEP), septic tank effluent gravity(STEG); design criteria, site evaluation and screening criteria, analysis, recommendations, system layouts, costs.

b) Wastewater treatment, residuals, septage components, and effluent disposal transmission/pumping.

c) Groundwater disposal.

d) Water reuse systems.

e) Cost Estimating – An update and refining of existing capital (i.e. construction, engineering, legal, Town administration, etc.) and operation and maintenance (i.e. labor, powers, chemicals, etc.) cost estimates for all structural, non-structural and management components of the plan using Town spreadsheet model, supplemented, as required, with new or additional information. These will include estimates for the Non-traditional Demonstration Projects, as well as best estimates for the full-scale implementation projects, assuming the technologies are cost-effective.

6. Tri-Town Transition Requirements

a. Interim Use Options

1) Management and financial options for continued interim use of the facility to allow time for implementation of the Consensus Plan: general overview of facilities and equipment, septage receiving area, solids processing, liquid train system; and

2) Update of cost estimates previously prepared by others; identify safety related repair/replacement actions; recommendations for both keeping the facility operational without interruption through December 2021 and for cost savings opportunities.

b. Potential Cost Savings for Doing Demolition of Existing Facility and Construction of New Facility Together:

   1) Background of Tri-Town District; and

   2) Analysis of Costs to Decommission and Demolish the Facility.

c. Coordination with MassDEP – Discuss coordination efforts taken or necessary with MassDEP for permitting, site assignment and any other needed actions.

d. Design Criteria for Demolition of the Facility – Design criteria for demolition, environmental safety requirements, material disposal plans, site restoration requirements, cost estimates for demolition will all be discussed. Description and Discussion of Options at Tri-Town Facility:

   1) Option 1-partial demolition and mothballing of some structures; and

   2) Option 2-partial demo and convert to septage transfer station.

7. Demonstration Project Design and Implementation

a. Floating Constructed Wetlands – Discussion of site characterization and the site selection process, preliminary engineering designs and work plans (including monitoring) for preferred sites, as well as identification of potential funding sources will be presented.

b. Aquaculture/Shellfish Propagation – Discussion of site characterization and the site selection process, preliminary engineering designs and work plans (including monitoring) for the preferred sites, as well as identification of potential funding sources will be presented.

c. Permeable Reactive Barriers – Discussion of site characterization for as many as four (4) sites, preliminary engineering for up to two sites, preparation of permit application and regulatory coordination, injection test results, monitoring plans, and identification of potential funding sources.

8. Adaptive Management Plan Implementation

a. Identification of adaptive management tasks necessary to support and refine the program moving forward: description of existing data bases, data consolidation process, characterization of existing monitoring stations, reconciliation of current data sets with MEP baseline, recommendations for new sampling stations.

b. Development of long-term water quality monitoring program; gaps in data sets, data set required, recommendations for water quality and benthic conditions monitoring program.

c. Development of water quality monitoring program for demonstration projects to evaluate performance and consideration in light of other system-wide water quality monitoring.

d. Recommendations for MEP study update monitoring: overview of MEP “Linked Watershed Embayment Model”, data requirements of MEP model, additional data needs for model update, recommended action plan. Consideration of stormwater and fertilizer program monitoring. Also includes discussion from coordination with UMass SMAST to update and refine the MEP simulation models.

9. Financial Evaluation – Review and modification to the preliminary financial evaluation completed during FY 15.

a. Revenue Generating Options – continued evaluation of the optimal balance of tax revenue, betterments, connection fees, user fees, and other revenue sources to generate equitable, value-based user rates; description of revenue generating scenarios.

b. Financing Options – Evaluation of MassDEP SRF program as well as other financing options; options to consider different assumptions for percent interest, borrowing term, eligibility requirements, administrative costs and responsibility; development of short-term and long-term loan schedules for different financing options.

c. Program Cost Impact Assessment and Affordability- Continued financial evaluation of changes in program capital and operating cost estimates and potential impact on rates and revenues by user class (commercial, residential (sewered and on-site)). Discussion of how cost changes affect program affordability.

d. Public Private Partnership Options - Identification and development of financial methods for evaluation and implementation of public private financing options including DBO and DBOF options for a WWTF at the current site of the Tri-Town Septage Treatment Facility.

10. Regulatory Review and Coordination – No formal MassDEP or MEPA review required for the Amended CWMP, but coordination efforts with Cape Cod Commission and informal coordination with MassDEP will be required.

a. Cape Cod Commission – Discuss coordination with Cape Cod Commission for nitrogen reduction assumptions of the revised plan; agreement on the DRI conditions; review and concurrence with work plans for demonstration projects; coordination of financial analyses and funding support; define Cape Cod Commission and MEPA requirements for formal submission of Amended CWMP.

b. MassDEP – Discuss informal coordination of review of the Amended CWMP in order to attain compliance with MassDEP regulations, design standards, TMDL requirements and other factors. Discuss coordination efforts regarding demonstration project design and implementation in compliance with MassDEP requirements. Discuss meetings to review the status of Rock Harbor Creek and MassDEP status with regard to water quality conditions and UAA.

Appendices

A. Responses to Comments on 2011 CWMP

B. Consensus Plan