

Memorandum

To George Meservey, Director of Planning & Community Development
Michael Domenica, PE, Program Manager

CC Betsy Shreve, AICP, AECOM Project Director
Terry Doss, Biohabitats
Pete Munoz, Biohabitats

Subject **Town of Orleans, MA**
Water Quality and Wastewater Planning
Task Number 3.a – Floating Constructed Wetland NT Demonstration Project
Work Plan Outline

Project Number 60476644

From Thomas Parece, P.E., AECOM Project Manager

Date January 8, 2016

1. Introduction

- a. Describe Purpose of Floating Constructed Wetland Demonstration Project.
- b. Describe Purpose of Floating Constructed Wetland Work Plan.

2. Background

- a. Describe recommended site location and summarize why this site was selected.
- b. Describe Floating Constructed Wetland attributes.
- c. Identify any information gaps that will need to be supplemented with confirmatory investigations in spring/summer 2016 prior to full scale implementation.

3. Site Specific Assessment for Preliminary Design

- a. Describe recommended site for the Floating Constructed Wetland demonstration project to review site specific conditions related to the preliminary design, which may include water depth at a number of locations, benthic conditions, and utility and infrastructure positions.
- b. Describe any assumptions made about site due to information gaps requiring confirmation.

4. Preliminary Design

- a. Describe site configuration – one to three sites within pond, number of units, shape, and size.

- b. Discuss potential combination of the Floating Constructed Wetland technology with other technologies to generate potential for maximizing nitrogen removal rates.
- c. Identify project components – island unit, planting substrate, number of plants, anchoring, cabling, type of plants, and planting medium.
- d. Identify sequencing of subtasks – anchoring, unit assembly, planting, cabling, and connecting.
- e. Describe equipment and supplies needed to install the Floating Constructed Wetland demonstration project, and whether the units will be acquired from Floating International as pre-cast modular units or hand-built custom units specifically developed for this demonstration project. Identify anchors & cables needed and plant source.
- f. Identify labor resources needed to install the Floating Constructed Wetland demonstration project.
- g. Identify and discuss issues considered during preliminary design.
 - o In-situ versus Laboratory monitoring of nitrogen removal;
 - o Lower DO in area around Floating Constructed Wetland;
 - o Excessive organic loadings from detritus;
 - o Concentrations of metals or other contaminants;
 - o Attraction of waterfowl that could add to the loadings;
 - o Invasion by weeds from islands;
 - o Long-term buoyancy; and
 - o Overall durability.
- h. Develop and include conceptual layout plan, profile sketch and preliminary specifications.

5. Monitoring and Maintenance

- a. Describe monitoring approach
 - o In-situ versus Lab;
 - o Criteria;
 - o Frequency;
 - o Seasonality; and
 - o Resources required.

- b. Describe maintenance requirements of Floating Constructed Wetland demonstration project, which is anticipated to include:
 - o Periodic inspection to confirm integrity of all submerged hardware and anchor and above water tethering;
 - o Health of plants and replanting where necessary;
 - o Removal of debris both man-made and natural; and
 - o Periodic inspection for signs of degradation of base material, mechanical (tearing) or UV damage (discoloration).

6. Project Cost Estimate

- a. Mobilization and Demobilization
- b. Fabrication (base material, anchoring, cabling)
- c. Plants and planting medium
- d. Installation
- e. Maintenance
 - o Periodic inspection to confirm integrity of all submerged hardware and anchor and above water tethering;
 - o Health of plants and replanting where necessary;
 - o Removal of debris both man-made and natural; and
 - o Periodic inspection for signs of degradation of base material, mechanical (tearing) or UV damage (discoloration).
- f. Monitoring
- g. Contingency
- h. Town Administration and Engineering

7. Regulatory Considerations

8. Potential Funding Sources

9. Projected Full Scale Approach

10. Summary and Next Steps