

Memorandum

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

CC Betsy Shreve, AICP, AECOM Project Director
Sia Karplus, Science Wares, Inc.
AECOM PRB Team

Subject **Town of Orleans, MA**
Water Quality and Wastewater Planning
Task Number 3.3 – NT Demonstration Projects
Technical Memorandum on Outline for Site Characterization and Evaluation for
Permeable Reactive Barriers (evaluation criteria and ranking)

Project Number 60476644

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

Date November 20, 2015

1. Background

- a. Purpose of Permeable Reactive Barrier (PRB) Demonstration Site Characterization and Evaluation Technical Memorandum.

2. Introduction

- a. Section 1 Introduction
 - (1) Describe Consensus Plan and target watersheds.
 - (2) Definitions and Design Concepts:
 - Define PRBs for groundwater nitrate remediation; and
 - Process for site selection.

- (3) Define specific objectives for Demonstration Test for PRB for nitrate treatment:
 - Obtain data for engineering evaluations and cost estimating;
 - Proof of nitrogen load reduction to achieve Total Maximum Daily Load (TMDL) targets;
 - Confirmation of time frame for technology performance; and
 - Demonstration of monitoring program for compliance.
- b. Overview of process for site identification Section 2 Site Identification
 - (1) Identify PRB sites that are being considered in Site Characterization and Evaluation:
 - Main Street and Tonset Road -Town Cove Nauset Estuary;
 - Gibson Road - Town Cove Nauset Estuary;
 - Herring Brook Road - Lonnie's Pond Pleasant Bay Estuary;
 - Namequoit Road and Pah Wah Pond - Pleasant Bay Estuary;
 - Rock Harbor Road Area – Rock Harbor Estuary; and
 - Town Landfill - Town Cove Nauset Estuary.

3. Description of Proposed Sites

- a. Introduce and describe the site suitability criteria that will be applied to each site:
 - Site physical characteristics;
 - Permitting;
 - Demonstration project evaluation; and
 - Other overriding considerations.
- b. Provide a synopsis of existing information related to criteria in the above headings for each location (one paragraph description for each site, available maps, and Excel table summarizing data for each site).
- c. Summarize groundwater data collected from initial groundwater screening investigations.
- d. List additional information that would be useful to site evaluations and identify additional data needs as appropriate.

4. Enumerate Site Suitability and Screening Criteria

- a. Create a site evaluation matrix for PRB demonstrations sites (i.e., Excel table presenting matrix, and one paragraph explanation).

5. Analysis: Evaluate and Rate Each Site based on Criteria

- a. Apply evaluation criteria to five sites. In applying each of the criteria to each of the sites, use a consistent three level rating system as follows:
 - (1) Good = 1 point
 - (2) Neutral = 0 points
 - (3) Poor = -1 point
- b. Assign an overall rating to each site based on evaluation findings and rank sites.
- c. Assign weights to the individual criteria based on consensus with the Team and Town and re-rate the sites evaluated in Task 5.a based on the weightings.
- d. Present results of each site ranking (weighted and un-weighted).

6. Findings/Recommendations: Summarize Site Selection Matrix/ PRB Site Screening Results

- a. Prepare a prioritized list of sites for PRB demonstration.
- b. Discuss the implications of the weighting on the list of sites.
- c. Recommend Site(s) for PRB Demonstration.