

## Local Projects Funded by FY16 State 208 Implementation Funds

The following is a list of local projects funded with implementation funds received from the Commonwealth of Massachusetts in May 2016.

### BARNSTABLE

*Ropes Beach (Cotuit) Stormwater Retrofit* - \$9,250. To improve landscaping and replace plants for improved stormwater remediation and valve and pipe repair to facilitate sampling.

Budget:

Landscaping/plant replacement	\$7,500
Valve/pipe work for sampling	\$1,750
Total Project Cost	\$9,250

*Cordwood Landing (Cotuit) Stormwater Retrofit* - \$14,600. To improve landscaping, replace plants and improve grading for improved stormwater remediation.

Budget:

Landscaping/plant replacement	\$7,500
Grading swales waterways into system	\$7,100
Total Project Cost	\$14,600

*Route 149/28 (Marstons Mills) Stormwater Retrofit* - \$5,000. For line flushing and plant replacement to improve stormwater remediation.

### FALMOUTH

Two demonstration projects that are part of the town's effort to develop alternative nitrogen reduction methods for implementation in the town's impaired estuaries to meet the TMDL's set by the Massachusetts Estuaries Project were funded. These demonstrations will provide critical information on the performance of non-traditional technologies to support the Cape Cod Commission 208 Plan's Technology Matrix.

*Bournes Pond Oyster Propagation*

The Falmouth Department of Marine and Environmental Services 2016 plan for oyster propagation in Bournes Pond is to grow 500,000 oysters from seed, with the goal of growing 3 million oysters annually by the second or third year of operation. It is important to begin with a smaller amount of seed in a new growing location to enable viability and optimization to occur incrementally. At the end of the first growing season, approximately half of the seed will be bottom planted for commercial and recreational harvest the following year in Bournes Pond, and the other half will be overwintered for sale in the spring.

Shellfish propagation is a key element, along with inlet widening and installation of a Permeable Reactive Barrier, in meeting the TMDL for Bourne’s Pond without sewerage.

Another key goal of this project is to assess the regulatory, financial and administrative issues involved in creating a budget-neutral, self-sustaining public/private shellfish propagation partnership. Bournes Pond serves as an ideal model estuary, where the town can demonstrate shellfish growing that is self-sustaining from a town budgeting perspective, and address neighborhood concerns such as aesthetics and access. This demonstration project also provides local economic benefits and jobs creation as well as local food production. The shellfish propagation approach taken in Bournes Pond can serve as a model for towns across the Cape, where there are limited financial resources and many competing community needs.

**Budget:**

Funding in the amount of \$17,299 supported the purchase of seed and equipment and labor (4 week x \$20/hour x 35 hours) for the month of June.

<b>Bournes Pond Shellfish Budget</b>	<b>2016 TOTAL</b>
Seed (million)	0.5
Seed	\$ 6,250
Equipment (400 bags, floats, ties, clips, cinder blocks, line)	\$ 6,627
Labor	\$ 2,800
Patrol	\$ 1,622
<b>TOTAL</b>	<b>\$ 17,299</b>

**Sediment Aeration**

The Town of Falmouth Department of Marine and Environmental Services (DMES) and its partner the Marine Biological Laboratory are pilot testing and validating an innovative, in-situ, diffuser technology designed to increase ambient dissolved oxygen, (DO), improve sediment quality and reduce nutrient fluxes from bottom sediments. This technology provides

significantly more oxygen to the sediments than other aeration systems because of the unique delivery system. Although widely successful in freshwaters, this technique has only been tried in two marine locations, one short term test in the Chesapeake (Harris et al. 2015) and a longer test in a deep fjord in the Baltic (unpublished). Both of these tests were very encouraging. This project is necessary to test whether this technology can be effective in fostering recovery of eutropic estuarine ecosystems. If successful, this technical approach is applicable to impaired estuaries throughout the Cape, where anoxic bottom conditions and accumulation of nitrogen rich sediments contribute nitrogen load to the water column. Anoxic sediment also inhibits the growth of eelgrass and precludes bottom planting of shellfish.

The funding request of \$7,000 enhanced monitoring capabilities and overall evaluation of the dissolved oxygen delivery system, enabling more accurate determination of when and where oxygen is transported by the installed equipment. This information will help optimize the treatment protocol during the trial period. For example, the minimum compressor run time required to maintain the desired oxygen level at the sediment interface can be studied. The results should indicate whether a fixed duty cycle is adequate, or an active feedback loop is required. This understanding will facilitate planning cost effective deployment of equipment on a larger scale.

## DENNIS

*Evaluation of additional Dennis effluent recharge sites for future Dennis use and or potential community partnership use - \$15,000.* The Dennis Comprehensive Wastewater Management Task Force has requested a re-review of other potential sites in town beyond the two currently proposed. This evaluation would consider those previously identified by verifying screening criteria used previously to rate potential sites identified, by discussing sites with local staff, by visually reviewing sites in the field and by considering potential groundwater flow impacts using the existing USGS groundwater flow figures. The town has an active contract with CDM Smith and could expand the scope to include the above mentioned project.

## MASHPEE

*Acquisition of upwellers to support implementation of shellfish propagation program - \$14,600.* The Town of Mashpee requests \$14,600 funding for construction of a floating shellfish seed upweller system to grow quahog seed for initial implementation of the shellfish restoration component of The Mashpee Comprehensive Watershed Nitrogen Management Plan ([http://www.mashpeewaters.com/project.html#draft\\_impact](http://www.mashpeewaters.com/project.html#draft_impact)), and the Barnstable County “208” Water Quality Restoration plan. Mashpee has 10 million small (2 mm) quahog seed on order from the ARC hatchery in Dennis through the Barnstable County Cooperative Extension bid for delivery in June. This seed will be grown to a large size (up to 1”) before planting for good survival. Mashpee does not have the floating upwellers needed for this purpose at this time. A

report will be submitted with the system design and the results of seed growth through the end of June.

Budget:

1	Upweller Float (8' x 24')	\$8,000
16	Upweller Silos (2' x 2') @ \$250	\$4,000
2	Upweller Drain Systems @ \$800	\$1,600
2	Pumps @ \$500	\$1,000
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	Total	\$14,600

## ORLEANS

*Acquisition of gear for implementation of shellfish/aquaculture demonstration project - \$15,000.* The Town of Orleans developed a work plan and associated design to implement a shellfish/aquaculture demonstration project. The project, which is proposed to be implemented this year prior to June 30, 2016, will provide an opportunity to monitor the effectiveness of shellfish to remove nitrogen. Approximately 200,000 2-inch oysters will be planted in Lonnie's Pond, one of several terminal ponds in Orleans experiencing water quality degradation due to nitrogen loads. Orleans must purchase gear (bags) for the oyster installation. A grant of \$15,000 from the Cape Cod Commission would go directly to the purchase of the gear, which is expected to have a total cost of \$20,000.

## TRURO

*Stormwater rain gardens at Truro Library - \$9,400.* The basic services proposed as Tasks 1 and 2 below are for the design of stormwater rain gardens adjacent to the Truro Library, located at 7 Standish Way, Truro Massachusetts. For the purposes of this proposal it is assumed that the work will be completed by town personnel or that the town will select a contractor to do the work using an informal solicitation process.

### Task 1: Site Survey, \$4,200

Contractor will conduct a site visit and perform a topographic survey of the project area. The survey will enable us to map the location and elevation of existing site features including pavement, vegetation and other manmade structures visible from the surface. Any manholes and catch basins within the project area will be opened for identification of sewer and drain, and

the depth and diameter of existing pipes will be verified. Survey will be limited to locating features visible from the surface.

**Task 2: Design Services, \$5,200**

Contractor will prepare a project basemap of the site based on the topographic survey and will prepare plans showing the layout and grading of two stormwater rain garden features on the site. The plans will include a typical cross section for the rain gardens and technical specifications for the grading, soils and planting for the rain garden features. Preparation of full contract documents for formal bid solicitation is not included.

## YARMOUTH

*Regional wastewater facility cost study for Dennis, Harwich, Yarmouth - \$35,000.*

1. Using individual community Waste Water cost estimates take a deep dive into the regional costs to have a Waste Water facility shared by Dennis, Harwich and Yarmouth. The individual Municipal costs must be updated to include the synergies related to a plant located in Dennis. This should include as much recharge in Dennis and Harwich as possible. Recharge to Yarmouth would involve the amount Dennis and Harwich cannot accept. The Yarmouth recharge should be at the Bass River Golf Course. This eliminates the need for the Buck Island recharge site shortening the effluent transmission distance and costs. This also reduces the amount of sewerage needed in Yarmouth for Lewis Bay. This will add to the significant savings estimates that Dennis and Harwich enjoy in the current high level estimate with the benefit of Yarmouth's flow. These adjustments should help to move the Yarmouth savings percentages to a more acceptable level making the regional option also acceptable to Yarmouth. Dennis hosts the plant, Harwich host recharge for Yarmouth and Yarmouth provides the largest flows lowering the O&M and construction costs dramatically for Dennis and Harwich. 2. Update the individual Dennis and Harwich construction and O&M costs related to the handling of Title 5 septage and grease trap waste. Identify the construction and O&M savings related to continuing the operation of the current Regional Septage Facility. This increases Dennis and Harwich savings percentages. 3. Consolidate phasing options for Dennis, Harwich and Yarmouth to provide an optimized joint timeline that will have the most beneficial costs savings to the communities. 4. Give waste reduction cost ranges if a regional anaerobic digester is available to Cape Cod. What will this do to yearly O&M costs of the joint facility?