Memorandum

To: *Town of Dennis Wastewater Implementation Committee,*
Town of Harwich Wastewater Implementation Committee,
Town of Yarmouth Wastewater Implementation Committee

From: *David F. Young, P.E.*

Date: *March 7, 2017*

Subject: *Advantages of Wastewater Community Partnership – Dennis, Harwich, and Yarmouth*

The towns of Dennis, Harwich, and Yarmouth are considering evaluating a potential regional wastewater option in order to achieve cost savings through sharing infrastructure. This community partnership option would help achieve nitrogen reduction and improve the water quality on Cape Cod.

In a community partnership, the three towns would form a Wastewater District and share the following infrastructure:

- Pumping Station near the intersection of Route 134 and Route 28 in Dennis;
- Dual force mains from the intersection of Route 134 in Dennis to the Wastewater Treatment Facility (WWTF) at the Dennis DPW;
- WWTF at the Dennis DPW Site;
- Pumping Stations from the WWTF to effluent recharge locations;
- Force main from the WWTF to effluent recharge locations;
- Effluent recharge and permeable reactive barrier (PRB) at potential sites including Dennis Site 1 at the Dennis DPW, Bass River Golf Course in Yarmouth, HR-12 (DPW) in Harwich, Dennis Site 2 off of Bob Crowell Road, Dennis Pines Golf Course, parcels off of Hokum Rock Road in Dennis, and the Dennis Highlands Golf Course.

The sewer collection system within each town would be designed, constructed, and operated by each individual town. A wastewater district agreement would construct and oversee the management of the shared infrastructure described above. Below is a list of advantages for developing a district agreement between the three towns to carry out this regional plan between Dennis, Harwich, and Yarmouth.

Working as a community to:

- Take advantage of economies of scale for construction and operating costs;
- Improve water bodies and overall aesthetics on the Cape;
- Work with regulators to meet Total Maximum Daily Loads (TMDLs) in watersheds;
- Recharge effluent in beneficial locations (i.e., golf courses, washing stations);
- Operate and maintain the treatment facility and shared infrastructure with one staff;
- Address potential future treatment of contaminants of emerging concern (CECs);
- Simplify governance for wastewater management options;
- Construction of sewers in commercial areas to promote economic development and desired smart growth;
- Gain more points for State Revolving Fund (SRF) Loan Program to access low interest rates.

Conceptual Cost Savings

The three communities will save on the design, construction, and operation and maintenance of shared infrastructure. Table 1 compares the total program costs under an individual in-town only scenario and the regional scenario.

Table 1
Regional and Town Scenario Cost Comparison

	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ Mil/year	%
Dennis	$207 M	$170 M	$7.0 M	$4.1 M	$16.3 M	$11.7 M	$4.6 M	28%
Harwich	$251 M	$211 M	$3.4 M	$2.4 M	$14.6 M	$11.8 M	$2.7 M	19%
Yarmouth	$342 M	$325 M	$9 M	$6.3 M	$24.2 M	$20.8 M	$3.4 M	14%

Tables 2 through 4 provides cost saving details for the main components of the wastewater program on an individual town basis.

Table 2
Town of Dennis Wastewater Program - Cost Savings Breakdown Comparison

	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ Mil/year	%
Collection System	$131 M	$122 M	$2.2 M	$2.2 M	$8 M	$7.6 M	$397.6 K	5%
WWTF	$41 M	$24 M	$4.4 M	$1.6 M	$6 M	$2.6 M	$3.7 M	58%
Conveyance to Recharge	$4 M	$6 M	$134.0 K	$136.4 K	$318.5 K	$405.9 K	-$87.4 K	-27%
Effluent Recharge with PRB	$21 M	$10 M	$205.9 K	$157.8 K	$1 M	$582.6 K	$548.0 K	48%
Non-Traditional Technologies	$9 M	$9 M	$86.4 K	$86.4 K	$508.7 K	$470.3 K	$38.4 K	8%
Total	$207 M	$170 M	$7.0 M	$4.1 M	$16 M	$11.7 M	$4.6 M	28%

Table 3
Town of Harwich Wastewater Program - Cost Savings Breakdown Comparison

	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ Mil/year	%
Collection System	$178 M	$175 M	$1.0 M	$1.1 M	$9.0 M	$8.9 M	$127.3 K	1%
WWTF	$56 M	$21 M	$2.1 M	$1.1 M	$5 M	$2.0 M	$2.6 M	56%
Conveyance to Recharge	$523 K	$3 M	$62.6 K	$71.2 K	$85.9 K	$211.7 K	-$125.8 K	-146%
Effluent Recharge with PRB	$9 M	$6 M	$116.7 K	$102.3 K	$533.6 K	$354.1 K	$179.5 K	34%
Non-Traditional Technologies	$6 M	$6 M	$100.0 K	$100.0 K	$383.5 K	$383.5 K	$0	0%
Total	$251 M	$211 M	$3.4 M	$2.4 M	$14.6 M	$11.8 M	$2.7 M	19%

Table 4
Town of Yarmouth Wastewater Program - Cost Savings Breakdown Comparison

	Capital Costs		O&M Costs		Equivalent Annual Costs		Annual Savings	
	Town	Regional	Town	Regional	Town	Regional	$ Mil/year	%
Collection System	$248 M	$253 M	$2.9 M	$2.9 M	$14.0 M	$14.2 M	-$0.2 M	-2%
WWTF	$65 M	$41 M	$5.4 M	$2.7 M	$8.4 M	$4.5 M	$3.9 M	46%
Conveyance to Recharge	$7 M	$10 M	$84.7 K	$233.2 K	$377.6 K	$693.9 K	-$316.3 K	-84%
Effluent Recharge with PRB	$17 M	$16 M	$258.6 K	$269.7 K	$1.0 M	$996.0 K	$27.5 K	3%
Non-Traditional Technologies	$5 M	$5 M	$205.0 K	$205.0 K	$428.3 K	$428.3 K	$0	0%
Total	$342 M	$325 M	$8.9 M	$6.3 M	$24.2 M	$20.8 M	$3.4 M	14%

Summary

Significant cost savings can be achieved in the capital costs at the treatment and effluent recharge facilities due to economy of scale for the community partnership options. Savings are also achieved in the O&M costs of the community partnership option.

cc: Town Administrators of Dennis, Harwich, and Yarmouth