

## Memorandum

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

CC Betsy Shreve, AICP, AECOM Project Director  
Ronald Mastrogiacomo, PE, AECOM Cost Estimating Task lead

Subject **Town of Orleans, MA**  
**Water Quality and Wastewater Planning**  
**Task 2.a. Tri-Town Transition Requirements, Interim Use Options**  
**Deliverable 2.2 - Potential Cost Savings for Doing Demolition of Existing Facility**  
**and Construction of New Facility Together**

Project Number TBD

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

Date 10/22/15

### 1. Executive Summary

AECOM's estimated cost to decommission and demolish the Tri-Town Septage Treatment Facility including demolition, site restoration, engineering and contingencies is estimated at \$2,025,000. The results are shown in the attachment that follows this narrative. AECOM estimates that a savings of 10 to 20 percent (\$200,000 to \$400,000) can be realized if the decommissioning and demolition of the Tri-Town Septage Treatment Facility is included as part of the construction of a new Wastewater Treatment Facility at the site. The potential cost savings does not include the potential additional cost savings that might be achieved through repurposing some of the existing facility (e.g. – administration building) as part of the new Wastewater Treatment Facility. These potential cost savings will be considered as the concept for the proposed new Wastewater Treatment Facility developed as part of Task No. 1 – Facilities Engineering, subtask c Facilities Preliminary Design.

### 2. Introduction

This Technical Memorandum presents our findings regarding the Potential Cost Savings for Doing Demolition of Existing Facility and Construction of New Facility Together.

### 3. Background

The Orleans-Brewster-Eastham Groundwater Protection District (Tri-Town District) owns and operates the Tri-Town Septage Treatment Facility, located on Overland Road in Orleans, MA. The Facility was constructed over 30 years ago and is designed to treat up to 45,000 gallons per day of septage and grease. A document entitled "Tri-Town Septage Treatment Facility Decommissioning Action Plan", dated October 18, 2013 was prepared by Stantec Consulting Services Inc. for the Tri-Town District. The purpose of the report was to develop an action plan to decommission and demolish the Tri-Town Septage Treatment Facility prior to May 30, 2015 (expiration date of the agreement). Following the preparation of the report, the Tri-Town District agreement and the Facility's MassDEP Groundwater Discharge Permit were extended until December 2016.

#### 4. Analysis

AECOM reviewed the Tri-Town Septage Treatment Facility Decommissioning Action Plan which presented an estimated cost of \$1,500,000 to decommission and demolish the Facility. The estimated cost included a credit allowance of \$70,000 for equipment and metals salvage; a credit for using the processed concrete material (approximately \$120,000); and a credit for lowering the site grade to reduce the amount of new material to be brought to the site (approximately \$130,000). At the time of this Memorandum, the ENR Construction Cost Index has increased approximately 4 percent from the original estimate date therefore, the estimated cost to decommission and demolish the Facility increase by \$70,000 to \$1,570,000 (October 2015 Cost).

AECOM toured the Facility on October 7, 2015 with Mr. Jay Burgess, Chief Operator, reviewed the existing documents and developed an independent assessment of the structures and equipment at the Facility and the associated removal/demolition costs.

AECOM used unit costs determined by historical data as well as published data.

AECOM used wage rates established by using a blended union rate of equipment operators and laborers regionalized to the area.

#### 5. Results

AECOM's estimated cost to decommission and demolish the Tri-Town Septage Treatment Facility including demolition, site restoration, engineering and contingencies is \$2,025,000 (ENR = 10065 for October 2015). It should be noted that AECOM used the existing equipment and metals salvage credit (approximately \$70,000); processed concrete material credit (approximately \$120,000); and site grade credit (approximately \$130,000) as presented in the Tri-Town Septage Treatment Facility Decommissioning Action Plan. The analysis are shown in the attachment that follows this narrative.

AECOM estimates that a savings of 10 to 20 percent (\$200,000 to \$400,000) can be realized if the decommissioning and demolishing of the Tri-Town Septage Treatment Facility is included as part of the construction of a new Wastewater Treatment Facility at the site. This savings includes, but is not limited to items such as sharing the preparation of Contract Documents (drawings and specifications), single site mobilization and demobilization, sharing of labor and construction equipment, and simultaneous operations. The potential cost savings does not include additional potential cost savings that may be achieved through repurposing some of the existing facility (e.g. – administration building) as part of the new Wastewater Treatment Facility. These potential cost savings will be considered as the concept for a proposed new Wastewater Treatment Facility developed as part of Task No. 1 – Facilities Engineering, subtask c Facilities Preliminary Design.

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**AECOM**  
**Construction Cost Estimate**  
**10% Design Estimate**  
**Demolition**

JOB NO : 04103133.Barnstable  
 DATE : October 20, 2015  
 LOCATION : Orleans, MA  
 PREPARED BY: R. Mastrogiacomo

CLIENT : Orleans, MA  
 PROJECT : Tri-City STP  
 ACCURACY: ± 30 %  
 ENR INDEX: 10065

**GRAND SUMMARY**

ACCOUNT	DESCRIPTION	MANHOURS	MATERIAL	LABOR	EQUIPMENT	TOTAL
1	GENERAL	545	\$43,654	\$43,654	\$0	\$87,307
2	SITE WORK	10,893	\$203,107	\$873,073	\$168,108	\$1,244,289
	SUBTOTAL DIRECT COSTS	11,438	\$246,761	\$916,727	\$168,108	\$1,331,596
	GENERAL CONTRACTOR OVERHEAD&PROFIT	17.00%				\$226,371
	SUBTOTAL GENERAL CONTRACTOR					\$1,558,000
	CONTINGENCY	30.00%				\$467,400
	<b>SUB TOTAL CONSTRUCTION COST</b>					<b>\$2,025,400</b>
	ESCALATION TO MID-POINT OF CONSTRUCTION**	3.5%	-	-		\$0
	ASSUMED AT: October 20, 2015	PER YEAR	YEARS	NON-COMPOUNDED RATE		
	<b>TOTAL CONSTRUCTION COST</b>					<b>\$2,025,400</b>

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AECOM

10% Design Estimate

CLIENT : Orleans, MA

PROJECT : Tri-City STP

ACCURACY: ± 30 %

ENR INDEX: 10065

ACCOUNT NO.	DESCRIPTION	QUANTITY	UN	MAN HOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MHR/UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
	THIS CONSTRUCTION COST IS BASED ON:											
	1. INFORMATION PROVIDED IN THE 10% DESIGN											
	2. ASSUMED NO DEWATERING.											
	3. PRICING IS BASED ON FOURTH QUARTER 2015											
	4. PRICING DOES NOT INCLUDE CONSIDERATIONS FOR HAZARDOUS MATERIALS OR CONTAMINATED GROUNDWATER											
	5. CONTINGENCY SHOWN IS CONTRACTOR CONTINGENCY BASED ON LEVEL OF DESIGN, OWNER CONTINGENCY NOT INCLUDED											
	6. IN PROVIDING OPINION OF PROBABLE CONSTRUCTION COST, THE CLIENT UNDERSTANDS THAT AECOM HAS NO CONTROL OVER THE COST OR AVAILABILITY OF LABOR, EQUIPMENT OR MATERIALS OR OVER MARKET CONDITIONS OR THE CONTRACTOR'S METHOD OF PRICING. AECOM MAKES NO WARRANTY, EXPRESS OR IMPLIED THAT THE BIDS WILL NOT VARY FROM THIS ESTIMATE.											
	7. Average wage rate calculated from 2013 Means Average Labor rates for Construction Industry (laborers, equip opers) (ENR 9412). Used Brockton, MA (\$59.00) escalated at to time of estimate and added 27% for:											6.9%
	SS Tax	7.65%										\$118
	Workers Comp Ins	12.70%										\$59
	Builders Risk	0.44%										
	Other Negotiated fringe	1.60%										
	Federal UnEmployment Ins	0.14%										
	State UnEmployment Ins	2.93%										
	General Liability Insurance	1.57%										
	TOTAL	27.0%										
	UNION AVERAGE WAGE RATE ---->	<b>\$80.15</b>										
												<----USED THIS RATE

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Construction Cost Estimate

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ACCOUNT NO.	DESCRIPTION	QUANTITY	UN	MAN HOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MHR/UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
-1-	<b><u>GENERAL</u></b>											
	General Contractor Mobilization	3	%	10,893	327	873,073	26,192	\$80.15	26,192	0	0	\$52,384
	Insurance/Bonds	1	%	10,893	109	873,073	8,731	\$80.15	8,731	0	0	\$17,461
	Permits	1	%	10,893	109	873,073	8,731	\$80.15	8,731	0	0	\$17,461
	Surveys (Roadway/Structures)	0	HRs	1.00	0	0.00	0	\$100.00	0	0.00	0	\$0
	Photos	0	MO	5.00	0	50.00	0	\$80.15	0	0.00	0	\$0
	Project Signs	0	EA	8.00	0	2,500.00	0	\$80.15	0	0.00	0	\$0
	Site Supervision (Working Foreman)	0	MO	176.00	0	0.00	0	\$100.18	0	0.00	0	\$0
	Travel	0	TPS	8.00	0	0.00	0	\$80.15	0	1,000.00	0	\$0
	Office Trailer	0	MO	0.00	0	0.00	0	\$80.15	0	500.00	0	\$0
	Utilites	0	MO	0.00	0	0.00	0	\$80.15	0	750.00	0	\$0
	Security		AL	288.00	0	0.00	0	\$80.15	0	0.00	0	\$0
	Project Clean up	0	AL	40.00	0	0.00	0	\$80.15	0	2,000.00	0	\$0
	Snow Removal	0	MO	24.00	0	0.00	0	\$80.15	0	1,000.00	0	\$0
	Winter Heating Equip (1 Winter)	0	AL	24.00	0	0.00	0	\$100.00	0	0.00	0	\$0
	Demonstration	0	AL	24.00	0	0.00	0	\$100.00	0	0.00	0	\$0
	O&M Manuals	0	AL	40.00	0	500.00	0	\$100.00	0	0.00	0	\$0
	<b>SUBTOTAL DIRECT COSTS</b>				545		43,654		43,654		0	\$87,307

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				MHR/UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
-2-	SITE WORK											
	<b><u>Septage Receiving Building (40' x 52')</u></b>											
	Demo Masonry Wall	552.0	SF	0.10	55	0.00	0	\$80.15	4,424	1.00	552	\$4,976
	Demo Wood Structure (1.5 storys)	2,080.0	SF	0.04	83	0.00	0	\$80.15	6,668	4.00	8,320	\$14,988
	Demo/Dispose Odor Control Tanks	2.0	EA	80.00	160	0.00	0	\$80.15	12,824	500.00	1,000	\$13,824
	Remove Concrete Slab	400.0	SF	0.25	100	0.00	0	\$80.15	8,015	1.50	600	\$8,615
	Remove Odor Control Piping	1.0	AL	40.00	40	0.00	0	\$80.15	3,206	100.00	100	\$3,306
	<b><u>Filtrate &amp; Receiving Tanks</u></b>											
	Remove Filtrate Storage Tanks (80,000 gal)	2.0	EA	96.00	192	0.00	0	\$80.15	15,388	12,000.00	24,000	\$39,388
	Remove Septage Equalization Tanks (135,000 gal)	2.0	EA	162.00	324	0.00	0	\$80.15	25,968	20,250.00	40,500	\$66,468
	Remove Filtrate Storage Tanks (200,000 gal)	1.0	EA	240.00	240	0.00	0	\$80.15	19,235	30,000.00	30,000	\$49,235
	<b><u>Operation &amp; Process Building (105' x 98', 2 story)</u></b>											
	Demo Masonry Wall	1,218.0	SF	0.10	122	0.00	0	\$80.15	9,762	1.00	1,218	\$10,980
	Demo Wood Structure (2 storys)	10,290.0	SF	0.05	515	0.00	0	\$80.15	41,236	4.00	41,160	\$82,396
	Remove Concrete Slab	10,290.0	SF	0.14	1,441	0.00	0	\$80.15	115,461	1.00	10,290	\$125,751
	Dispose Concrete Slab	381.1	CY	0.10	38	0.00	0	\$80.15	3,055	11.00	4,192	\$7,247
	Equipment Removal Allowance	1.0	AL	500.00	500	0.00	0	\$80.15	40,074	5,000.00	5,000	\$45,074
	<b><u>Control Building Addition (57' x 94')</u></b>											
	Demo Masonry Wall	906.0	SF	0.10	91	0.00	0	\$80.15	7,261	1.00	906	\$8,167
	Demo Wood Structure (1.5 storys)	5,358.0	SF	0.04	214	0.00	0	\$80.15	17,177	4.00	21,432	\$38,609
	Equipment Removal Allowance	1.0	AL	80.00	80	0.00	0	\$80.15	6,412	1,000.00	1,000	\$7,412
	<b><u>Septage Receiving &amp; Mixing Building (41' x 34')</u></b>											
	Demo Masonry Wall	450.0	SF	0.10	45	0.00	0	\$80.15	3,607	1.00	450	\$4,057
	Demo Wood Structure (1 story)	1,394.0	SF	0.03	42	0.00	0	\$80.15	3,352	3.00	4,182	\$7,534
	Remove Concrete Slab	1,394.0	SF	0.25	349	0.00	0	\$80.15	27,931	1.50	2,091	\$30,022
	Dispose Concrete Slab	51.6	CY	0.10	5	0.00	0	\$80.15	414	11.00	568	\$982
	Equipment Removal Allowance	1.0	AL	350.00	350	0.00	0	\$80.15	28,052	4,000.00	4,000	\$32,052
	<b><u>Standby Outdoor Generators</u></b>											
	Remove Concrete Slab	154.0	SF	0.25	39	0.00	0	\$80.15	3,086	1.50	231	\$3,317
	Remove 400 KW Generator & Slab	1.0	EA	100.00	100	0.00	0	\$80.15	8,015	750.00	750	\$8,765
	Remove 110 KW Generator & Slab	1.0	EA	68.00	68	0.00	0	\$80.15	5,450	1,000.00	1,000	\$6,450
	<b><u>Grease Holding Tank (12' x 19')</u></b>											
	Remove Grease Storage Tanks (30,000 gal)	2.0	EA	78.00	156	0.00	0	\$80.15	12,503	9,000.00	18,000	\$30,503

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PROJECT : Tri-City STP

ACCURACY: ± 30 %

ENR INDEX: 10065

ACCOUNT NO.	DESCRIPTION	QUANTITY	UN	MAN HOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MHR/UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
	<b><u>Underground Fuel Oil Tank</u></b>											
	Remove Underground 500 gal FRP Tank	1.0	EA	40.00	40	0.00	0	\$80.15	3,206	300.00	300	\$3,506
	Dispose Concrete Wall	4.4	CY	1.00	4	0.00	0	\$80.15	356	100.00	444	\$801
	<b><u>Chemical Feed Building (34' x 29')</u></b>											
	Demo Masonry Wall	378.0	SF	0.10	38	0.00	0	\$80.15	3,030	1.00	378	\$3,408
	Demo Wood Structure (1 story)	986.0	SF	0.03	30	0.00	0	\$80.15	2,371	3.00	2,958	\$5,329
	Remove Concrete Slab	986.0	SF	0.25	247	0.00	0	\$80.15	19,756	1.50	1,479	\$21,235
	Dispose Concrete Slab	36.5	CY	0.10	4	0.00	0	\$80.15	293	11.00	402	\$694
	Equipment Removal Allowance	1.0	AL	300.00	300	0.00	0	\$80.15	24,044	3,000.00	3,000	\$27,044
	<b><u>Primary Clarifiers (2 @ 16' dia/ea)</u></b>											
	Remove Concrete Wall (5' high, 10" Thick)	502.4	SF	0.25	126	0.00	0	\$80.15	10,067	1.50	754	\$10,820
	Dispose Concrete Wall	22.3	CY	0.10	2	0.00	0	\$80.15	179	11.00	246	\$425
	Remove/Dispose Kal-wall and Roof	2.0	EA	60.00	120	0.00	0	\$80.15	9,618	250.00	500	\$10,118
	Remove/Dispose Mechanism/gratings/rails	2.0	EA	120.00	240	0.00	0	\$80.15	19,235	500.00	1,000	\$20,235
	<b><u>RBC's (4 @ 27' x 13'/ea)</u></b>											
	Remove Concrete Slab	1,404.0	SF	0.25	351	0.00	0	\$80.15	28,132	1.50	2,106	\$30,238
	Dispose Concrete Slab	52.0	CY	0.10	5	0.00	0	\$80.15	417	11.00	572	\$989
	Remove Arched Covers	4.0	EA	40.00	160	0.00	0	\$80.15	12,824	100.00	400	\$13,224
	Remove RBC's	4.0	EA	60.00	240	0.00	0	\$80.15	19,235	500.00	2,000	\$21,235
	Remove RBC's Distribution box & Gate	1.0	EA	120.00	120	0.00	0	\$80.15	9,618	500.00	500	\$10,118
	<b><u>Pump Station (35' x 24')</u></b>											
	Remove Concrete Slab	840.0	SF	0.25	210	0.00	0	\$80.15	16,831	1.50	1,260	\$18,091
	Dispose Concrete Slab	31.1	CY	0.10	3	0.00	0	\$80.15	249	11.00	342	\$592
	Remove Superstructure	840.0	SF	0.03	25	0.00	0	\$80.15	2,020	3.00	2,520	\$4,540
	Remove Equipment	1.0	AL	120.00	120	0.00	0	\$80.15	9,618	500.00	500	\$10,118
	<b><u>Secondary Clarifier (2 @ 20' dia/ea)</u></b>											
	Remove Concrete Wall (5' high, 10" Thick)	628.0	SF	0.25	157	0.00	0	\$80.15	12,583	1.50	942	\$13,525
	Dispose Concrete Wall	27.9	CY	0.10	3	0.00	0	\$80.15	224	11.00	307	\$531
	Remove/Dispose Kal-wall and Roof	2.0	EA	60.00	120	0.00	0	\$80.15	9,618	250.00	500	\$10,118
	Remove/Dispose Mechanism/gratings/rails	2.0	EA	120.00	240	0.00	0	\$80.15	19,235	500.00	1,000	\$20,235
	<b><u>Disinfection Building (24' x 22')</u></b>											
	Demo Masonry Wall	276.0	SF	0.10	28	0.00	0	\$80.15	2,212	1.00	276	\$2,488
	Demo Wood Structure (1 story)	528.0	SF	0.03	16	0.00	0	\$80.15	1,270	3.00	1,584	\$2,854
	Remove Concrete Slab	528.0	SF	0.25	132	0.00	0	\$80.15	10,579	1.50	792	\$11,371

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**10% Design Estimate**

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ACCURACY: ± 30 %

ENR INDEX: 10065

ACCOUNT NO.	DESCRIPTION	QUANTITY	UN	MAN HOURS		MATERIAL		LABOR		EQUIPMENT		TOTAL DIRECT COST
				MHR/UNIT	TOTAL MH	UNIT COST	TOTAL MATL	WAGE RATE	TOTAL LABOR	UNIT RATE	TOTAL EQUIP	
	Dispose Concrete Slab	19.6	CY	0.10	2	0.00	0	\$80.15	157	11.00	215	\$372
	Equipment Removal Allowance	1.0	AL	200.00	200	0.00	0	\$80.15	16,030	2,000.00	2,000	\$18,030
	<b><u>Disinfection Building Addition (28.50' x 24')</u></b>											
	Demo Masonry Wall	315.0	SF	0.10	32	0.00	0	\$80.15	2,525	1.00	315	\$2,840
	Demo Wood Structure (1 story)	684.0	SF	0.03	21	0.00	0	\$80.15	1,645	3.00	2,052	\$3,697
	Remove Concrete Slab	684.0	SF	0.25	171	0.00	0	\$80.15	13,705	1.50	1,026	\$14,731
	Dispose Concrete Slab	25.3	CY	0.10	3	0.00	0	\$80.15	203	11.00	279	\$482
	Equipment Removal Allowance	1.0	AL	100.00	100	0.00	0	\$80.15	8,015	1,000.00	1,000	\$9,015
	<b><u>Infiltration Basins (8 covering 46' x 46')</u></b>											
	Remove Mechanisms	8.0	EA	16.00	128	0.00	0	\$80.15	10,259	100.00	800	\$11,059
	<b><u>Roadway/Walkway</u></b>											
	Demo Asphalt (assume 18'w)	2,794.1	SY	0.10	279	0.00	0	\$80.15	22,394	3.50	9,779	\$32,174
	Concrete Walkways	5,160.0	SF	0.10	516	0.00	0	\$80.15	41,356	0.50	2,580	\$43,936
	<b><u>Landfill Disposal Fee</u></b>											
	Debris to be Disposed of											
	Concrete (4,050 lbs/cy) (Assumed 1/2 re-used)	1,320,186	LBS	0.00	0	0.00	0	\$80.15	0	0.045	59,408	\$59,408
	Interior Block Walls (8" = 55 lbs /sf)	135,465	LBS	0.00	0	0.00	0	\$80.15	0	0.045	6,096	\$6,096
	Roof (4,050 lbs/cy)	267,300	LBS	0.00	0	0.00	0	\$80.15	0	0.045	12,029	\$12,029
	<b><u>Site Restoration</u></b>											
	Landscape & Restore Site (includes 3' fill brought in)	3.4	AC	300.00	1,016	60,000.00	203,107	\$80.15	81,393	5,000.00	16,926	\$301,426
	<b><u>Credit (Stantec Estimate)</u></b>											
	Equipment & Salvage Value	(1.0)	AL	0.00	0	0.00	0	\$80.15	0	75,000.00	(75,000)	(\$75,000)
	Processed Concrete used as fill	(1.0)	AL	0.00	0	0.00	0	\$80.15	0	120,000.00	(120,000)	(\$120,000)
	<b><u>Compost Shed</u></b>											
	Not Demolished											
	<b>SUBTOTAL DIRECT COSTS</b>				10,893		203,107		873,073		168,108	\$1,244,289