



Town of *Orleans*
Massachusetts

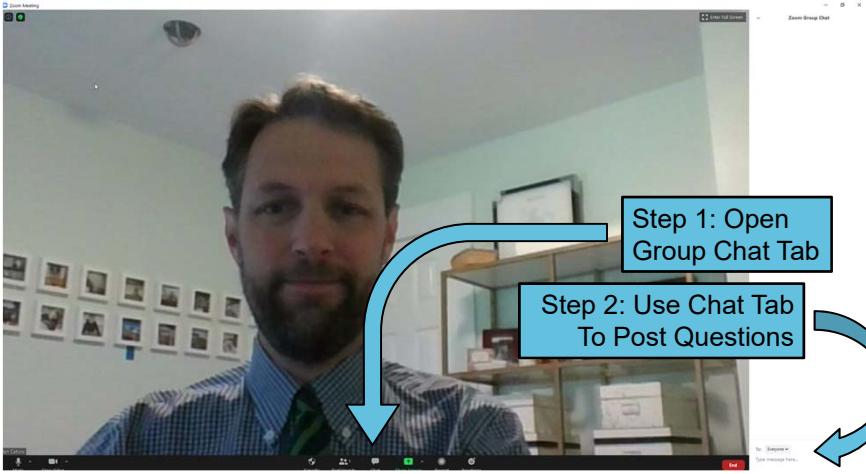
Downtown Area Collection System and Pumping Stations, Wastewater Treatment Facility and Effluent Disposal and Other Wastewater Related Articles

June 2020 Annual Town Meeting Public Forum

June 15, 2020

1

ATM Public Forum Process/Procedures




Step 1: Open Group Chat Tab

Step 2: Use Chat Tab To Post Questions

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 2



2

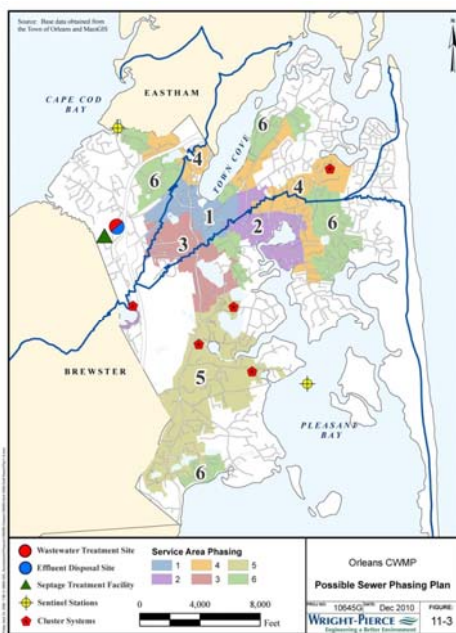
Agenda

- ❖ Water Quality and Wastewater History
- ❖ Article 42 - Fund Additional Cost for Downtown Sewer Project Construction
- ❖ Article 13 - Fund Comprehensive Water Resources Management Plan Implementation
- ❖ Article 14 - Fund Brewster Cross Road and Locust Road Water Quality Projects
- ❖ Article 19 - Fund Replacement of Water Services in Sewer Area
- ❖ Article 20 - Fund Replacement of Canal Road Water Main
- ❖ Questions and Answers

3

Water Quality and Wastewater History

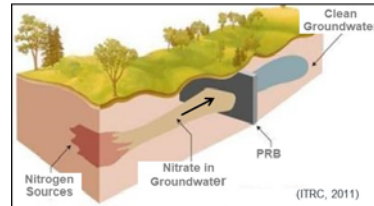
- ❖ Conceptual and Preliminary Design to Update the CWMP (2011) and To Reflect the Consensus Plan (2015)
- ❖ Goal: Minimize Proposed Sewered footprint to the Greatest Extent Possible
- ❖ Maximize Use of Non-traditional Technologies



4

Orleans' Solution

- ❖ **First Project on Cape Cod to Implement a Hybrid Approach**
- ❖ **Combines Traditional and Non-traditional Wastewater Treatments**
 - Sewer Infrastructure in High Density Areas
 - In-situ Groundwater Treatment with Permeable Reactive Barriers (PRBs)
 - Increased Shellfish Aquaculture Operations
 - On-Site System Enhancements
 - Adaptive Management for Course Correction



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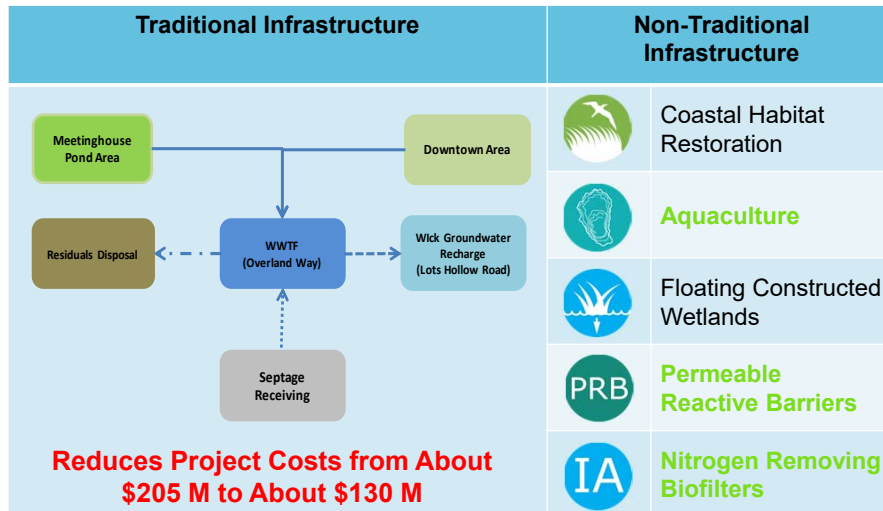
June 15, 2020

Page 5



5

Orleans' Solution (cont.)



Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 6



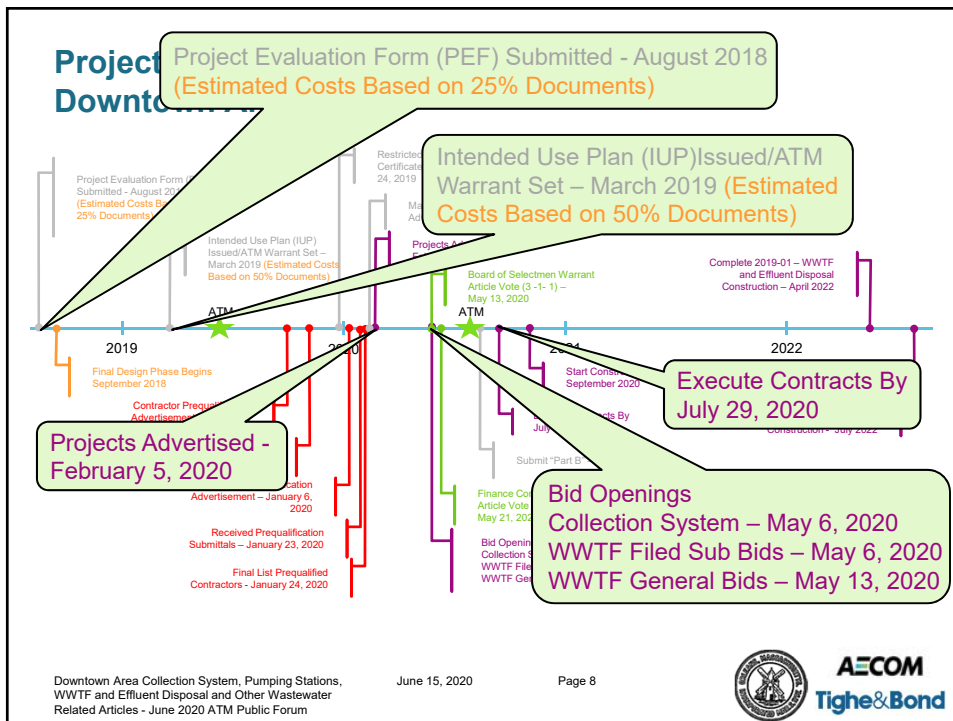
6

Article 42 - Fund Additional Cost for Downtown Sewer Project Construction

- ❖ Funding Requested: \$12,200,000
- ❖ Project Schedule: State Revolving Fund
- ❖ Bidding Climate
- ❖ Award Considerations and Recommendations
- ❖ Financing



7



8

Bidding Climate – Items Impacting Costs

- ❖ **Prior to Covid-19 – Busy Workload / Backlog**
 - Contractors / Subcontractors
 - Suppliers / Manufacturers
- ❖ **During and After Covid-19**
 - Raw Materials
 - Manufacturing Delays
 - Inefficiencies in Construction Operations / Activities
- ❖ **Project Location – Covid-19**
 - Travel
 - Per Diem
- ❖ **Skilled Labor Shortage**
 - Unemployment Benefits Reducing Workforce
- ❖ **Development of Alternatives**
 - Must Accept the Alternates In the Order Presented
 - Possibility to Increase SRF Funding Allocation



Bidding Climate – Items Impacting Costs (cont.)

Contract 2019-01 - Downtown Area Wastewater Treatment Facility and Effluent Disposal

- ❖ **Enhancements**
 - Building Construction Materials
 - Security
 - Future Permit Limits
- ❖ **Equipment Storage Facility**
- ❖ **Old Kings Highway Historic District Requirements**

Contract No. 2019-02 - Downtown Area Collection System and Pumping Stations

- ❖ **Regulatory – State**
 - Pavement: \$120,000
 - Tracer Wire: \$62,000
 - Inspection: \$10,000
- ❖ **Enhancements / Added Items**
 - 10 Added Manholes: \$172,000
 - FM Flushing MH: \$25,000
 - Town Roadway Paving: \$198,000
 - Waterline Stops: \$225,000
 - Leaching Catch Basins: \$24,000
 - Electric Co. Service Fee: \$25,000
 - Property Owner Requirements



Award Considerations and Recommendations

- ❖ **Total Maximum Daily Load Compliance (Nitrogen Removal)**
- ❖ **Owner's Development Costs**
- ❖ **SRF Funding at 0%**
- ❖ **Impacts on Betterments**
- ❖ **Potential for Stimulus Funding (Shovel Ready Projects)**
- ❖ **Impacts on User Fees**
- ❖ **Impacts on Taxes**



Award Considerations and Recommendations (cont.)

Contract No. 2019-01 - Downtown Area Wastewater Treatment Facility and Effluent Disposal

- ❖ Award to: Daniel O'Connell's & Sons, Inc.
- ❖ Base Bid at \$31,141,400
- ❖ Alternatives
 - No. 1 - Equipment Storage Facility: \$1,560,000
 - No. 2 - Fiber Optic Conduits, Handholes and Fiber Optic Cable: \$80,000
 - No. 3 - Tracer Wire: \$4,600
- ❖ Total: \$32,786,000

Contract No. 2019-02 - Downtown Area Collection System and Pumping Stations

- ❖ Award to: Robert B. Our Co., Inc.
- ❖ Base Bid: \$8,989,312.40
- ❖ Alternatives
 - No. 1 - Pavement Restoration: \$1,019,430.00
 - No. 2 - PS No. 3 Tributary Area: \$7,309,506.10
 - No. 3 - Fiber Optic Conduits and Handholes: \$139,110
 - No. 4 - Tracer Wire: \$84,300
- ❖ Total: \$17,741,658 *

* Does not include SRF Ineligible Items



Award Considerations and Recommendations (cont.)

Description	SRF Application	Post Bids
A. Construction		
a. Contract No. 2019-01 - Downtown Area Wastewater Treatment Facility and Effluent Disposal	\$ 23,032,500	\$ 32,786,000
b. Contract No. 2019-02 - Downtown Area Collection System and Pumping Stations	\$ 13,773,200	\$ 17,541,658
c. Construction Contingency (10% pre-bid / 5% post-bid)	\$ 3,680,100	\$ 2,558,142
Sub Total	\$ 40,485,800	\$ 52,885,800
B. Construction Services		
	\$ 5,612,000	\$ 5,612,000
C. Other Costs		
	\$ 1,285,000	\$ 1,085,000
TOTALS	\$ 47,382,800	\$ 59,582,800

Additional Funding Required at Town Meeting - \$12,200,000



Financing

- ❖ **State Revolving Fund (SRF)**
 - 30-Years at 0%
- ❖ **Hotel/Motel Tax**
 - 2% Increase
- ❖ **Short-term Rental Tax**
 - 6% Tax on Short-term Rentals
 - Less than 31 Days
- ❖ **Stabilization Fund**
 - All Wastewater Receipts are Deposited into this Account
 - Funding of Wastewater Projects
 - Expenditures Requires a 2/3rds Vote at Town Meeting
- ❖ **Cape Cod & Islands Water Protection Fund**
 - 2.75% Surtax on All Hotel/Motel and Short-term Rental Taxes Across Cape Cod
 - 25% Funding To Implement Wastewater Projects Across Cape Cod
- ❖ **WWTF and Effluent Disposal Paid Via Local Tax**
- ❖ **Collection System and Pumping Stations Paid Via Betterments Charged to Users**





Article 13 - Fund Comprehensive Water Resources Management Plan Implementation

Article 14 - Fund Brewster Cross Road and Locust Road Water Quality Projects

Article 19 - Fund Replacement of Water Services in Sewer Area

Article 20 - Fund Replacement of Canal Road Water Main

Article 13 - Fund Comprehensive Water Resources Management Plan Implementation

❖ **Funding Requested**

- \$1,700,500

❖ **Components**

- Meetinghouse Pond Area Sewers (\$831,700) and Owner's Project Management Services (\$213,200)
- Permeable Reactive Barrier Demonstration Project Monitoring at Eldredge Park (\$106,600)
- Permeable Reactive Barrier Planning in the Pleasant Bay, Nauset Harbor and Rock Harbor Watersheds (\$549,000)

❖ **Keeps Approved Consensus Plan Moving**

❖ **Regulatory Input Regarding Applicability / Approvals**

❖ **Updates to Capital Improvement Plan**

❖ **SRF Funding Applicability**

❖ **Previous Funding Appropriations Are Specific to Previous Warrant Articles and Cannot Be Utilized to Reduce Funding Requested**



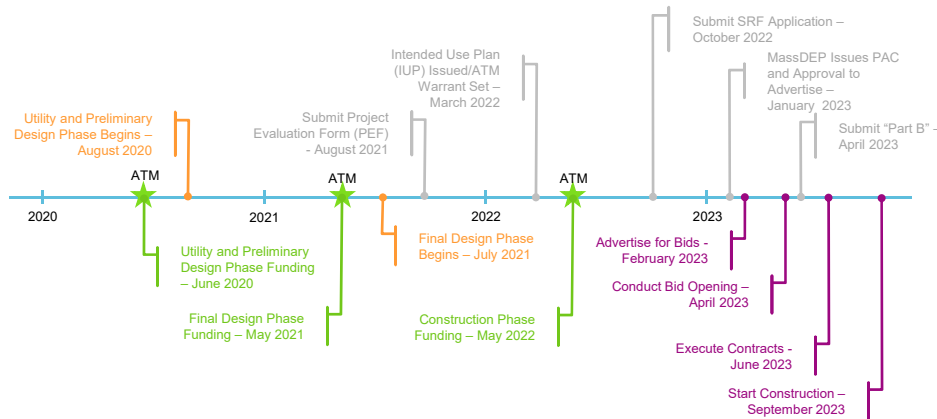
Article 13 - Fund Comprehensive Water Resources Management Plan Implementation (cont.)

Components	Remarks
Meetinghouse Pond Area Preliminary Design and Owner's Project Management Services	<ul style="list-style-type: none"> ➤ Meetinghouse Pond Area Requires 100 Percent Removal of Nitrogen in the Watershed. Funding Delay Impacts the Town's Ability to Meet this Requirement. ➤ Identify Location of On-site Disposal Systems and Utilities ➤ Topographic Survey and Subsurface Explorations ➤ Update Capital Improvement Plan ➤ Maintain SRF Funding Schedule
Permeable Reactive Barrier Demonstration Project Monitoring	<ul style="list-style-type: none"> ➤ Final Year of Monitoring ➤ At Least Three Years of Monitoring Required ➤ Data Used To: <ul style="list-style-type: none"> ▪ Complete Analysis of Removal Efficiencies ▪ Determine Applicability as a SRF Fundable Non-traditional Alternative to Traditional Sewering ▪ Determine Permitting Requirements and Limits
Permeable Reactive Barrier Planning in the Pleasant Bay, Nauset Harbor and Rock Harbor watersheds	<ul style="list-style-type: none"> ➤ Confirm Town-wide Locations ➤ Information Used To: <ul style="list-style-type: none"> ▪ Identify Locations that May be Implemented in the Future to Meet Watershed Permits ▪ Confirm Assumptions and N Removal Values ▪ Update Future Implementation and Replacement Costs



17

Project Schedule: State Revolving Fund Meetinghouse Pond Area



18

Article 14 - Fund Brewster Cross Road and Locust Road Water Quality Projects

❖ Funding Requested

- \$45,000

❖ Location

- Brewster Cross Road
- Locust Road

❖ Objective

- Reduce Nutrient Loading into Boland's Pond and Cedar Pond

❖ Proactive Actions

- Complete with Downtown Area Collection System Construction to Avoid Re-excavation of Roadways and Reduce Construction Costs
- Obtain Economies of Scale Savings
- **\$115,000 Lower Than The 2019 Capital Improvement Plan Estimate**

❖ Cannot be Completed at the Funding Requested Without Passage of Article 42



Article 19 - Fund Replacement of Water Services in Sewer Area

❖ Funding Requested

- \$125,000
- Paid From the Water Special Revenue Fund

❖ Location

- 60 Locations Throughout the Downtown Area Collection System

❖ Objective

- Replace 57-year-old Water Services

❖ Proactive Actions

- Lesson's Learned from Main Street Wastewater System
- Complete with Downtown Area Collection System Construction to Avoid Future System Failures, Re-excavation of Roadways and Reduce Construction Costs
- Obtain Economies of Scale Savings
- **\$88,200 Lower Than The 2019 Capital Improvement Plan Estimate**

❖ Cannot be Completed at the Funding Requested Without Passage of Article 42



Article 20 - Fund Replacement of Canal Road Water Main

❖ Funding Requested

- \$300,000
- Water Asset Management Plan Report Recommendation to Improve Fire Flows in the Area
- Paid From the Water Special Revenue Fund

❖ Location

- Canal Road from Jones Road to Eastham Town Line

❖ Objective

- Replace the Original 1963 Water Main on Canal Road

❖ Proactive Actions

- Complete with Downtown Area Collection System Construction to Improve Safety, Avoid Future System Failures and Re-excavation of Roadways and Reduce Construction Costs
- Obtain Economies of Scale Savings
- **\$46,500 Lower Than The 2019 Capital Improvement Plan Estimate**

❖ Cannot be Completed at the Funding Requested Without Passage of Article 42

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum


June 15, 2020

Page 21



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21



Town of
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Questions and Answers

22



Town of

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Massachusetts

Previously Submitted Questions and Answers

23

Submitted Questions and Answers

- ❖ [Project Cost Breakdown](#)
- ❖ [Equipment Storage Facility - Requirements vs Alternative](#)
- ❖ [Site Overview](#)
- ❖ [WWTF - Plan and Elevations](#)
- ❖ [Equipment Storage Facility - Plan and Elevations](#)
- ❖ [Waterline Industries - Sub-Bids Valid if they are not the General Contractor?](#)
- ❖ [Warranties - Reduced to 1 Year – Why?](#)
- ❖ [MassDOT - Permit Issuance and Impacts](#)
- ❖ [Owner Pre-Selected Equipment - Combined Cost at \\$1.625M - How Reliable / Solid?](#)
- ❖ [System Communications - Base Bid vs. Alternative?](#)
- ❖ [WWTF and Effluent Disposal - Bids Received and Range of Bids](#)
- ❖ [Collection System and Pump Stations - Bids Received and Range of Bids](#)
- ❖ [Supply Chain Update | Lead Times and Prices](#)
- ❖ [SRF Program - Additional Funding and Award Date](#)
- ❖ [Orleans Financing](#)
- ❖ [Anticipation of Cost Increases](#)
- ❖ [Water System Upgrades and Water Quality Improvements Coordination](#)
- ❖ [Town Long-Term Benefit Enhancements](#)
- ❖ [Contract Documents - Clarifications and Adjustments Based on Feedback From Potential Bidders](#)
- ❖ [Permeable Reactive Barriers](#)




24

Description	SRF Application	Post Bid
A. Construction		
a. Contract No. 2019-01 - Downtown Area Wastewater Treatment Facility and Effluent Disposal	\$ 23,032,500	\$ 32,786,000
b. Contract No. 2019-02 - Downtown Area Collection System and Pumping Stations	\$ 13,773,200	\$ 17,541,658
c. Construction Contingency (10% pre-bid / 5% post-bid)	\$ 3,680,100	\$ 2,558,142
Sub Total	\$ 40,485,800	\$ 52,885,800
B. Construction Services		
a. General Supervision	\$ 2,586,635	\$ 2,586,635
b. Resident Engineering	\$ 1,114,765	\$ 1,114,765
c. Testing of Materials	\$ 25,000	\$ 25,000
d. As Built Plans	\$ 260,000	\$ 260,000
e. Operation and Maintenance Manual	\$ 303,600	\$ 303,600
f. Start-up Supervision and Extended Operations	\$ 710,000	\$ 710,000
g. Other: OPM	\$ 612,000	\$ 612,000
Sub Total	\$ 5,612,000	\$ 5,612,000
C. Other Costs		
a. Police – Traffic Detail	\$ 1,000,000	\$ 1,000,000
b. Town Administration	\$ 85,000	\$ 85,000
c. Land / ROW / Easements	\$ 200,000	\$ 0
Sub Total	\$ 1,285,000	\$ 1,085,000
TOTALS	\$ 47,382,800	\$ 59,582,800

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

 June 15, 2020
 Page 25
[Last Viewed](#)
[Q&A](#)



25


Equipment Storage Facility Requirements vs Alternative

- ❖ **Exterior Based on the Requirements of Old Kings Highway Historic District**
- ❖ **Minimum Requirements**
 - Maintenance / Repair Area (Room 202)
 - One Truck Bay
- ❖ **The Building Provides**
 - Maintenance / Repair Area
 - Storage of O&M Equipment
 - Storage of Spare Parts
 - Storage of O&M Vehicles

- ❖ **Alternative**
 - Identified Costs to be Increasing
 - Created Alternatives in an Attempt to be Able to Award the Project Within Existing Funding
- ❖ **If Funding Was Not Available**
 - Two Locations within the WWTF Identified to be Temporarily Repurposed (Room 102) and Basement (Future Chemical Area) for Maintenance / Repair Area; Storage of O&M Equipment; and Storage of Spare Parts
 - Does Not Provide Storage Space for O&M Vehicles

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

 June 15, 2020
 Page 26
[Q&A](#)



26

Site Overview



Downtown Area Collection System, Pumping Stations,
WWTF and Effluent Disposal and Other Wastewater
Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 27

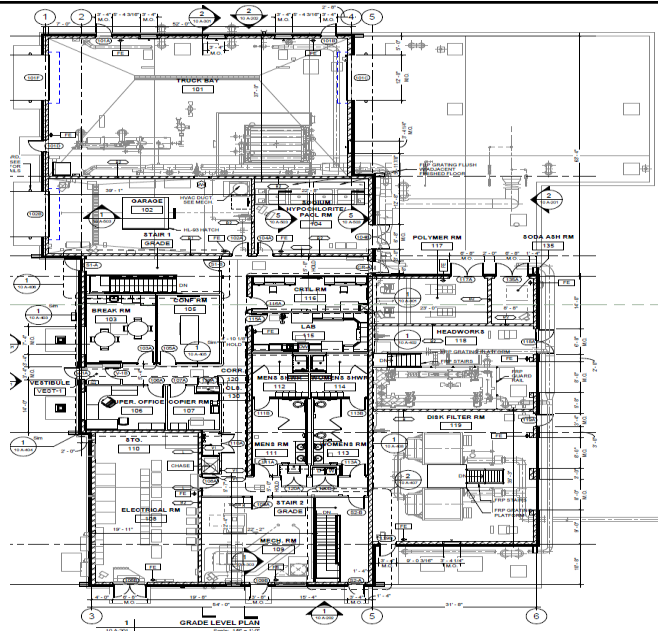
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27

Wastewater Treatment Facility Plan View – Ground Floor



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WWTF and Effluent Disposal and Other Wastewater
Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 28

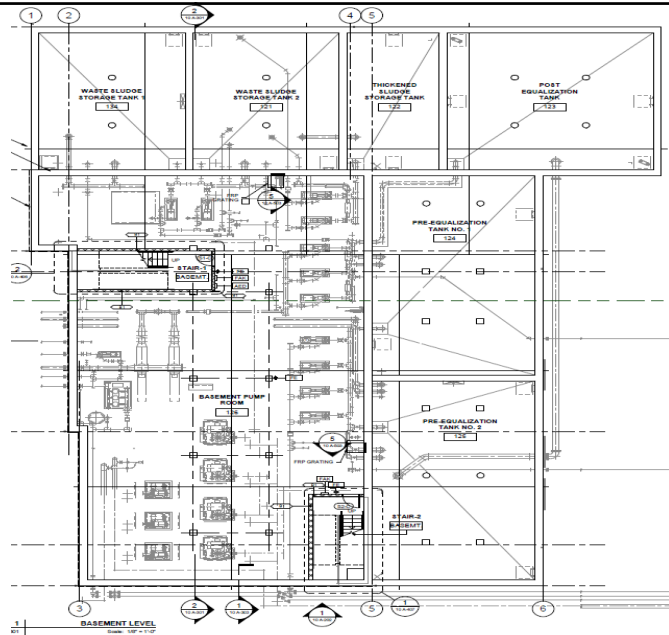
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28

Wastewater Treatment Facility Plan View – Basement



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WWTF and Effluent Disposal and Other Wastewater
Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 29

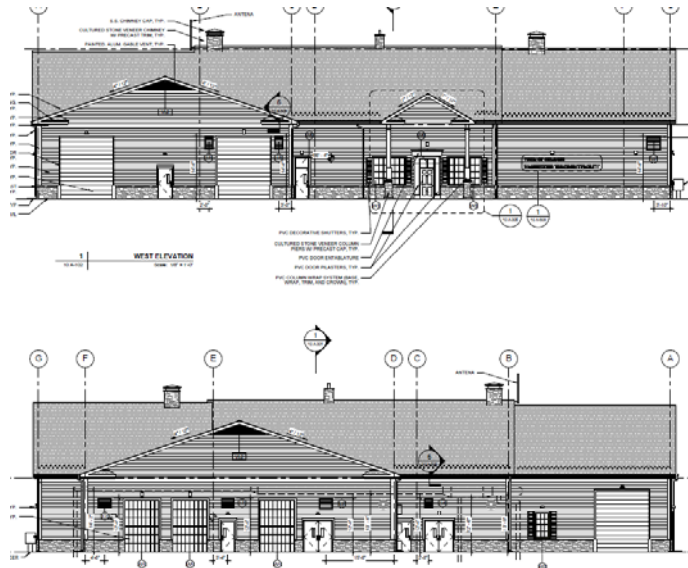
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29

Wastewater Treatment Facility (cont.) Elevations



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WWTF and Effluent Disposal and Other Wastewater
Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 30

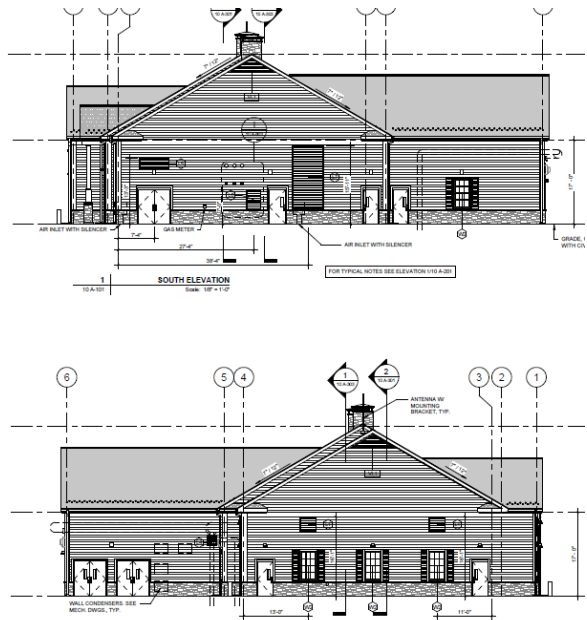
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30

Wastewater Treatment Facility (cont.) Elevations



Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 31

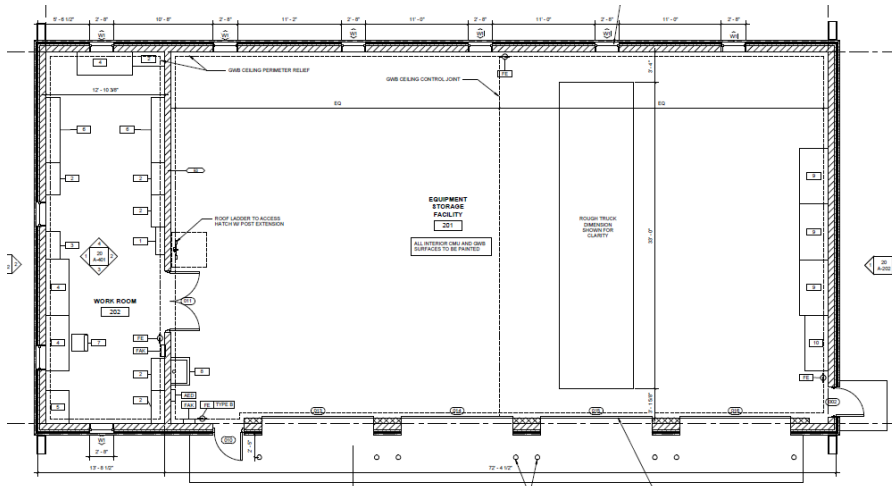
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31

Equipment Storage Facility Plan View



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June 15, 2020

Page 32

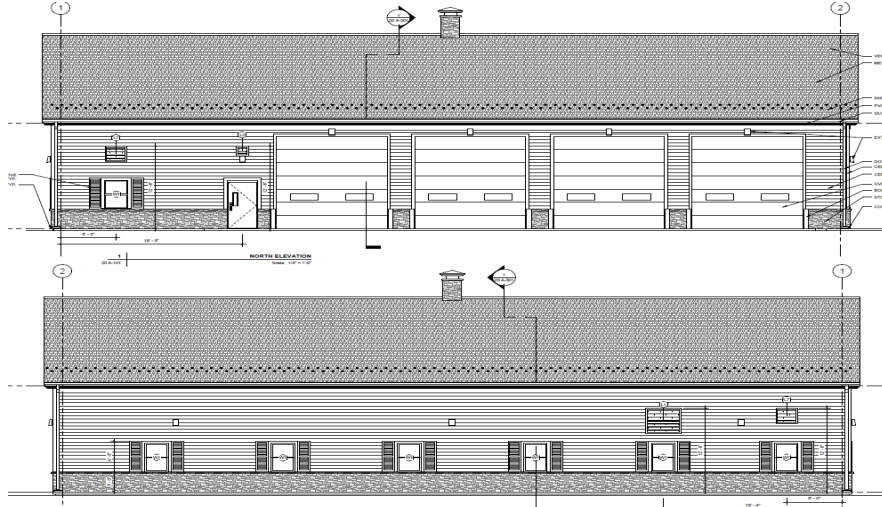
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32

Equipment Storage Facility (cont.) Elevations



Downtown Area Collection System, Pumping Stations,
WWTF and Effluent Disposal and Other Wastewater
Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 33

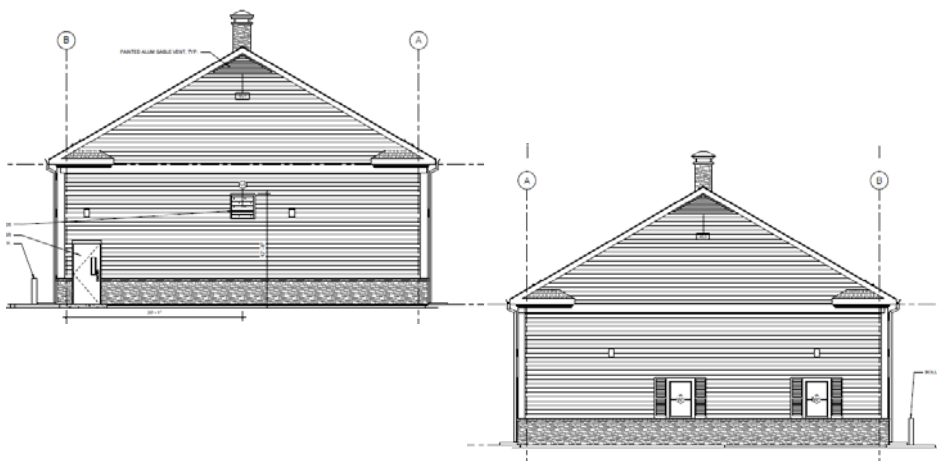
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33

Equipment Storage Facility (cont.) Elevations



Downtown Area Collection System, Pumping Stations,
WWTF and Effluent Disposal and Other Wastewater
Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 34

Q&A



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34

Waterline Industries Sub-Bids Valid if they are not the General Contractor?

- ❖ **Waterline Industries Provides Many of the Sub Trades that go into the Construction of a Wastewater Treatment Facility**
 - Miscellaneous Metals
 - Roofing
 - Plumbing
 - HVAC
 - Electrical
- ❖ **Sub-bids Restricted to Themselves as is Allowed by Mass. General Law.**
- ❖ **Other General Contractors Cannot Use Waterline Industries' Restricted Sub-bids.**
- ❖ **Waterline Industries' Sub-bids are Valid, but only when Paired with their Bid as a General Contractor.**



35

Warranties Reduced to 1 Year – Why?

- ❖ **Initially the Contract Documents Specified a Longer Warranty (4 Years).**
- ❖ **Bidding Phase Concerns Raised About Specific Extended Warranties. Concerns Relate to Warranties Beginning with the Date of Substantial Completion.**
- ❖ **As the Contractor's Demobilize they Lose the Ability to Control / Maintain Equipment. This is Viewed as a Costly Risk.**
- ❖ **Maintaining Longer Warranties Could Stifle Competition or Lead to Holes in Contractor's Bids Filled by a Guess.**
- ❖ **Contractors Increase Bid Costs for These Guesses. Unknown Cost of Risks = High Costs.**
- ❖ **Mass. General Law Allows For/Requires a 1 Year Warranty and This Change Still Reflects this Standard.**



36

MassDOT Permit Issuance and Impacts

- ❖ **MassDOT Permit Application**
 - Submitted in September 2019.
 - Received in March 2020.
- ❖ **MassDOT Meetings**
 - Permit for Route 6A and Route 28 Would Only Take a Few Months.
 - Conditions of the Permit would be Similar to the MassDOT Permit Issued for the Main Street Intersection Project.
 - Therefore, the Contract Documents were Based on the Previously Issued Permit.
- ❖ **Critical Differences Due to MassDOT Requirements**
 - Temporary Trench Pavement Thickness
 - Permanent Trench Pavement Thickness
 - MassDOT inspector at the Route 6 Crossing
 - Utility Tracer Wires
- ❖ **Estimated Cost of \$192,000**



37

Owner Pre-Selected Equipment Combined Cost at \$1.625M - How Reliable / Solid?

- ❖ **An Equipment Preselection Process Completed in Early 2019.**
- ❖ **RFPs were Advertised in COMMBUYS; Central Register; and The Cape Codder Newspaper.**
- ❖ **Two-step Selection Process:**
 - (1) Engineering Evaluation of the Technical Proposals; and (2) Life Cycle Cost Analysis.
 - Selection Based on Proposal with Best Value to Town.
- ❖ **RFPs**
 - Proposal price shall include a guaranteed, Lump Sum price in May 2019 US Dollars based on the mechanical and performance specification and the service requirements specified.
 - Lump Sum Price to be adjusted for inflation by the percent increase in the ENR Construction Cost Index between May 2019 and the month in which the Purchase Order is issued.
 - Current Lump Sum Price = \$1.652M



38

System Communications Base Bid vs. Alternative?

❖ Base Bid

- Radio Communications
- Between the WWTF, Effluent Disposal and the Three Pump Stations.

❖ Bid Alternatives

- Fiber Optic Communications Between the WWTF, Effluent Disposal and Pump Station No. 1 (Old Colony Way).
- Radio Communications Between the WWTF and Pump Station No. 2 (Snow Library) and Pump Station No. 3 (Stop & Shop).



WWTF and Effluent Disposal Bids Received on May 13, 2020 and Range of Bids

Contractor	Range of Base Bids Plus Alternatives A-1 thru A-3	Percent Above Low Bidder
Daniel O'Connell's Sons, Inc.	\$32,786,000.00	---
Waterline Industries Corporation	\$33,350,677.00	1.7%
Methuen Construction Co.	\$36,843,095.00	12.4%
MWH Constructors, Inc.	\$37,172,747.00	13.4%
R.H. White Construction, Co.	\$39,080,000.00	19.2%

Note: Six General Contractors were Prequalified Pursuant to M.G.L. c. 149, § 44D½ and 810 CMR 9.00



Contract No. 2019-01 - Downtown Area Wastewater Treatment Facility and Effluent Disposal

Description	Contractor					
	C.H. Nickerson	Daniel O'Connell's	Methuen Construction	MWH Constructors	R.H. White Construction	Waterline Industries
Base Bid – Basis of Award						
Base Bid	---	\$31,141,400	\$34,911,648	\$35,472,747	\$36,955,000	\$31,465,677
Alternatives						
Equipment Storage Facility	---	\$1,560,000	\$1,824,422	\$1,625,000	\$1,966,000	\$1,700,000
Fiber Optic Conduits	---	\$80,000	\$95,609	\$70,000	\$142,000	\$112,000
Tracer Wire	---	\$4,600	\$11,416	\$5,000	\$17,000	\$73,000
SBR Transfer Pump No. 4	---	\$70,000	\$75,178	\$70,000	\$83,000	\$84,000
SBR Blower No. 4	---	\$55,000	\$69,930	\$92,000	\$77,000	\$120,000
SBR Diffuser Grids	---	\$18,000	\$29,165	\$70,000	\$89,000	\$50,000

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum
 June 15, 2020
Page 41
[Q&A](#)

41

Collection System and Pumping Stations Bids Received on May 6, 2020 and Range of Bids

Contractor	Range of Base Bids - SRF Eligible Items Plus Alternatives A-1 thru A-4	Percent Above Low Bidder
Robert B. Our Co., Inc.	\$17,541,658.50	---
P. Gioioso & Sons, Inc.	\$17,830,016.50	1.6%
Revoli Construction Co., Inc.	\$18,172,123.90	3.6%
RJV Construction Corp.	\$22,345,055.40	27.7%
C.C. Construction, Inc.	\$24,943,152.61	42.2%

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 42

[Q&A](#)



42


Contract No. 2019-02 - Downtown Area Collection System and Pumping Stations

Description	Contractor				
	C.C. Construction	P. Gioioso & Sons	Revoli Construction	Robert B. Our	RJV Construction
Base Bid – Basis of Award					
SRF Eligible Items	\$12,228,109.85	\$9,586,430.92	\$9,738,454.42	\$8,989,312.40	\$11,156,773.32
SRF Ineligible Items	\$425,458.00	\$581,960.40	\$509,060.46	\$404,644.00	\$517,410.40
Totals	\$12,653,567.85	\$10,168,391.32	\$10,247,514.88	\$9,393,956.40	\$11,674,183.72
Alternatives					
Pavement Restoration	\$1,210,410.00	\$1,015,750.00	\$1,071,700.00	\$1,019,430.00	\$1,155,251.00
PS No. 3 Tributary Area	\$11,056,477.76	\$6,971,985.58	\$7,103,469.48	\$7,309,506.10	\$9,662,131.08
Fiber Optic Conduits	\$224,760.00	\$171,550.00	\$230,400.00	\$139,110.00	\$230,400.00
Tracer Wires	\$223,395.00	\$84,300.00	\$28,100.00	\$84,300.00	\$140,500.00
Highway Crossing Using Jacking	\$937,000.00	\$350,000.00	\$875,000.00	\$750,000.00	\$750,000.00

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 43 [Q&A](#)



43

Supply Chain Update | Lead Times and Prices

Gilbane Building Company April 30, 2020

Commodity	Status	Lead Time	Price	Comments
Cast Iron	Consistent	Consistent	Consistent	No disruption – both major foundries operational
Ceiling/Acoustic	Consistent	Consistent	Consistent	No disruption – major plants operational
Flooring - Domestic	Consistent	Consistent	Consistent	No disruption – major plants operational
Flooring - Imported	Delayed	Consistent	Consistent	Watch out – Italy tile
Furniture - Domestic	Delayed	Consistent	Consistent	Watch out – Gunlocke, Herman Miller and Haworth reduced capacities
Furniture - Imported	Delayed	Consistent	Consistent	Watch out – China parts (casters, handles, knobs, etc.)
Glass - Domestic	Consistent	Consistent	Consistent	No disruption – 6 to 8 weeks lead time
Glass - Imported	Delayed	Consistent	Consistent	Watch out – sporadic temporary plant closures
HVAC/MEP - Domestic	Consistent	Consistent	Decreasing	No disruption – some evidence of slight price decrease
HVAC/MEP - Imported	Delayed	Consistent	Consistent	Watch out – Mexico shutdown, Germany, Croatia, China delays
Lighting - Imported	Impact Unclear	Consistent	Consistent	Watch out – China, Mexico
Process Equipment - Imported	Delayed	Consistent	Consistent	Watch out – Germany
PPE/C19-Related Equipment	Delayed	Decreasing	Decreasing	Watch out – slight decrease in spiked prices, availability improving
Pipe, Valves and Fittings	Consistent	Consistent	Consistent	No disruption – slight decrease in distributor inventory levels
Stainless Pipe and Fittings	Consistent	Consistent	Consistent	No disruption
Steel - Domestic	Consistent	Consistent	Consistent	No disruption – manufacturers and mills operational
Steel - Imported	Impact Unclear	Impact Unclear	Impact Unclear	Watch out – weakening demand, reduced plant capacities

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum

June 15, 2020

Page 44 [Q&A](#)



44

SRF Program Additional Funding and Award Date

❖ Additional Funding

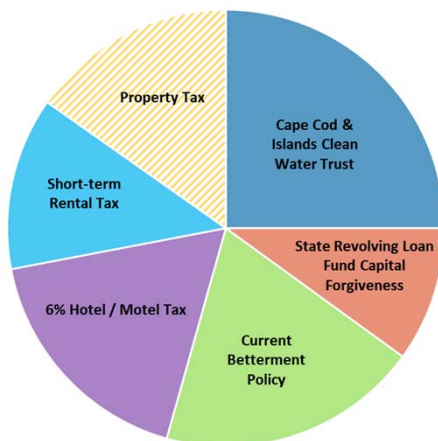
- The Project Team Contacted MassDEP Regarding Additional SRF Funding.
- Message on May 12, 2020 from Steve McCurdy (MassDEP) Stated that the SRF Program has Historically Covered Overages.

❖ Award Date

- The Project Team Contacted MassDEP Regarding Extension of Award Deadline.
- E-Mail on May 19, 2020 from Maria Pinaud (MassDEP Municipal Services) Advising There are Currently No Plans to Further Extend the August 14, 2020 Award Deadline.
- Projects Not Awarded by August 14, 2020 Will Lose SRF Funding and Must Reapply in the Future.



Summary of Wastewater System Funding Sources for Total Cost of \$59,494,200



Description	Estimated Value
Cape Cod & Islands Clean Water Trust	25% = \$14,873,550
State Revolving Loan Fund Capital Forgiveness	10% = \$5,949,420
Current Betterment Policy	19% = \$11,519,882
6% Hotel / Motel Tax	18% = \$10,489,530
Short-term Rental Tax	13% = \$7,606,890
Property Tax	15% = \$9,054,928

Prepared by Alan McClennen
June 12, 2020



Anticipation of Cost Increases

- ❖ The Probability of Costs were Estimated in July 2018 as Part of the SRF Project Evaluation Form
- ❖ The Probability of Cost was Based on Preliminary Design Information and Not Completed Contract Documents.
- ❖ The Development of the Contract Documents Began in September 2018.
- ❖ The Contract Documents were Only 30 Percent Complete and No Updated Cost Information Was Available.
- ❖ Probability of Construction Costs were Used for the May 2019 Town Meeting.



Contract No. 2019-02 - Downtown Area Collection System and Pumping Stations

SRF Ineligible Items		
Description	CIP Estimate December 2019	Robert B. Our Co., Inc.
Replacement of Water Services	\$213,200	\$105,720
Replacement of Canal Road Water Main	\$346,500	\$271,924
Subtotals	\$543,400	\$377,644
Traffic Police and Contingency	Included Above	\$47,356
Totals	\$559,700	\$425,000
Water Quality Improvements	\$160,000	\$27,000
Traffic Police and Contingency	Included Above	\$18,000
Totals	\$160,000	\$45,000

Funding Required at Town Meeting - \$470,000



Water System Upgrades and Water Quality Improvements Coordination

Project	Asset Management Plan - 2020	CIP Estimate December 2019	Robert B. Our Co., Inc. Plus Other Costs	Economies of Scale Savings From CIP	
				Dollars	Percent
Water Services Replacement	\$320,000.00	\$213,200.00	\$125,000.00	\$88,200.00	41.4%
Replacement of Canal Road Water Main (Scheduled for FY2026)	\$293,000.00	\$346,500.00	\$300,000.00	\$46,500.00	13.4%
Water Quality Improvements - Brewster Cross Road and Locust Road	---	\$160,000.00	\$45,000.00	\$115,000.00	71.9%
Reduced CIP Estimate From \$719,700 to \$470,000 =				\$249,700.00	34.7%



Enhancements Provide Long-Term Benefit to Town

- ❖ **Permanent Surfacing of Local Streets (similar to State specs) Including: Center Place, Jones Road, Liberty Lane and Old County Road.**
- ❖ **Addition of More Manholes for Ease of Access / Maintenance / Monitoring to Properties Abutting System Including Condominium Complexes.**
- ❖ **Work to protect Existing Town Water System Including Replacement of Old Water Services and Water Main Crossing Replacements (Saving the Town Future Costly Repairs and Breaks Resulting in Lost Water and Revenue).**



Contract Documents - Clarifications and Adjustments Based on Feedback From Potential Bidders

WWTF and Effluent Disposal

- ❖ Insurance Requirements
- ❖ Facility Start-up and Testing Requirements
- ❖ Equipment Warranty
- ❖ General Contractor and Filed Subcontractor Scope of Work Clarifications
- ❖ Updated Town Standard Details
- ❖ Bid Alternatives
- ❖ Design Clarifications / Adjustments

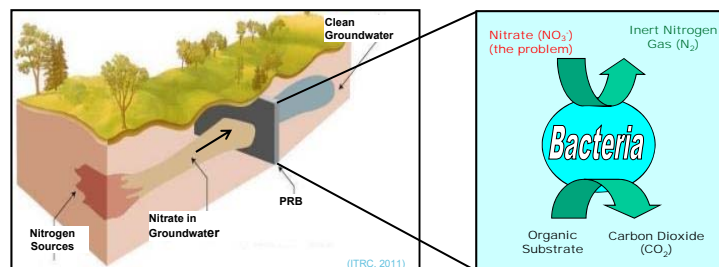
Collection System and Pump Stations

- ❖ Insurance Requirements
- ❖ Permit Requirements
- ❖ Traffic Control Devices
- ❖ Jacking vs. Horizontal Directional Drilling
- ❖ Payment Process
- ❖ Updated Town Standard Details
- ❖ Bid Alternatives
- ❖ Design Clarifications / Adjustments

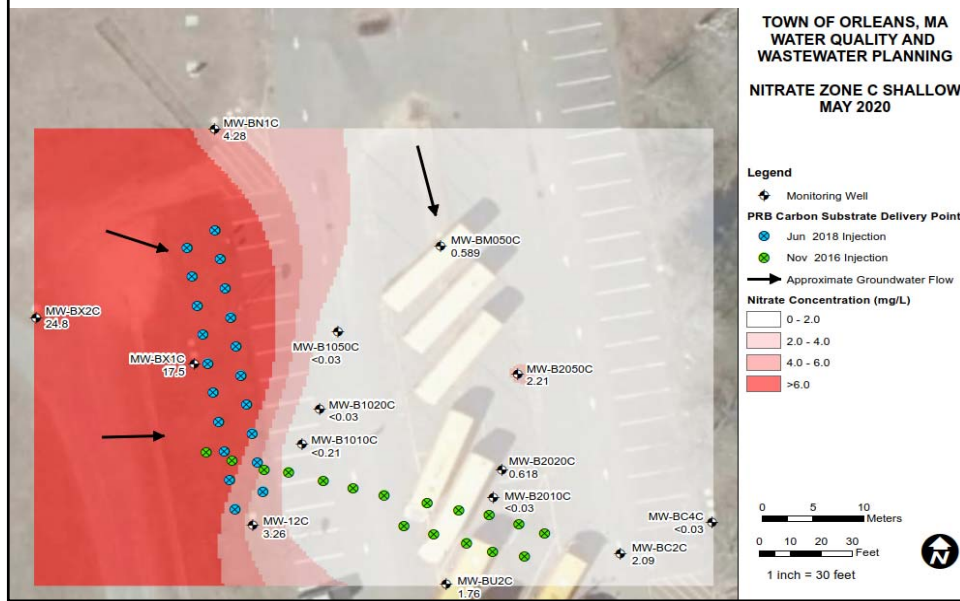


Permeable Reactive Barriers (PRBs)

- ❖ **Permeable** - Groundwater Flows Through (passive)
- ❖ **Reactive** - Promotes Biological Denitrification
- ❖ **Barrier** - Prevents Nitrate Migration to Coastal Embayments



Permeable Reactive Barriers Denitrification Results - Shallow Zone

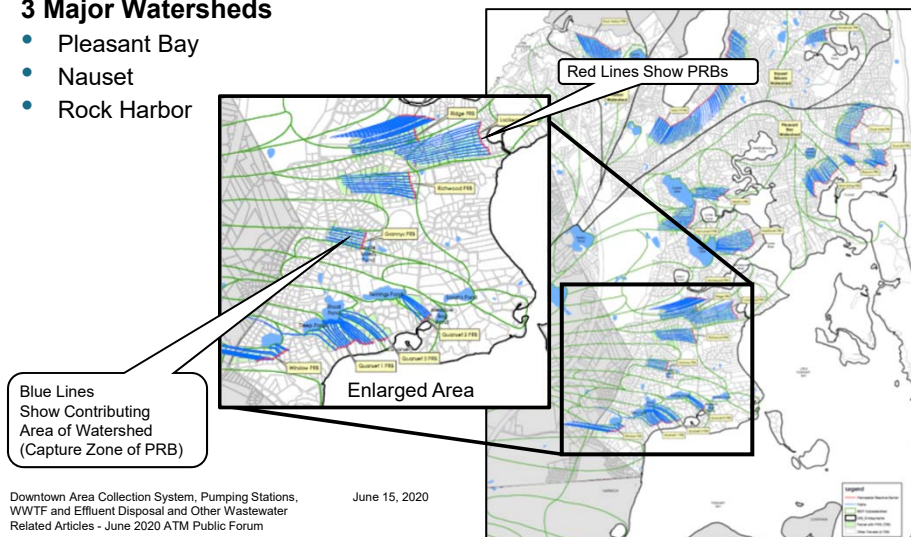


55

Permeable Reactive Barriers Potential Full Scale PRBs

❖ Total of ~34,000 Linear Feet in 3 Major Watersheds

- Pleasant Bay
- Nauset
- Rock Harbor




56

Permeable Reactive Barriers PRBs vs Traditional System - LCCA

PRB Description	Permeable Reactive Barrier			Traditional System		
	Life Cycle Cost	N Removed (kg/yr)	Cost per kg N Removed	Life Cycle Cost	N Removed (kg/yr)	Cost per kg N Removed
Pleasant Bay Estuary						
Blossom	\$ 1,513,400	65	\$ 23,184	\$ 7,749,600	120	\$ 64,756
Briar Spring	\$ 8,168,400	257	\$ 31,814	\$ 14,027,700	354	\$ 39,673
Duck Hole	\$ 11,335,800	296	\$ 38,307	\$ 13,930,300	267	\$ 52,262
Gosnold	\$ 5,966,700	126	\$ 47,279	\$ 10,909,800	234	\$ 46,641
Granny's	\$ 2,174,200	104	\$ 20,817	\$ 10,881,800	185	\$ 58,836
Keziah's	\$ 3,775,700	113	\$ 33,370	\$ 10,035,300	207	\$ 48,548
Mayflower	\$ 4,969,200	152	\$ 32,625	\$ 12,765,500	212	\$ 60,172
Monument	\$ 4,889,900	178	\$ 27,406	\$ 11,229,800	305	\$ 36,864
Namequoit, Ridge & Lockwood	\$ 7,577,200	396	\$ 19,134	\$ 19,643,800	609	\$ 32,242

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum June 15, 2020 Page 57




57

Permeable Reactive Barriers PRBs vs Traditional System - LCCA

PRB Description	Permeable Reactive Barrier			Traditional System		
	Life Cycle Cost	N Removed (kg/yr)	Cost per kg N Removed	Life Cycle Cost	N Removed (kg/yr)	Cost per kg N Removed
Pleasant Bay Estuary (cont.)						
Quonset 1, 2, & 3	\$ 5,071,900	187	\$ 27,104	\$ 15,991,500	261	\$ 61,245
Richwood	\$ 2,805,100	178	\$ 15,722	\$ 11,027,600	310	\$ 35,565
Winslow	\$ 3,496,900	61	\$ 57,397	\$ 8,991,300	180	\$ 50,087
Nauset Estuary						
Norseman	\$ 1,999,700	122	\$ 16,411	\$ 12,338,300	201	\$ 61,302
Tonset Road and Main Street	\$ 22,059,000	744	\$ 29,643	\$ 38,691,600	1,246	\$ 31,060
Rock Harbor Estuary						
Rock Harbor	\$ 10,896,700	305	\$ 35,771	\$ 10,994,600	441	\$ 24,953

Downtown Area Collection System, Pumping Stations, WWTF and Effluent Disposal and Other Wastewater Related Articles - June 2020 ATM Public Forum June 15, 2020 Page 58



58

Permeable Reactive Barriers Next Steps

❖ Current Phase

- Run Scenarios through Updated MEP Model via SMAST
- Identify Recommended PRB Locations
- Finalize Technical Memorandum

❖ Next Phase

- Conduct Field Investigations
- Modify Assumptions Based on Information Obtained During Investigations
- Modify Recommended PRB Locations

- Re-Run Scenarios through Updated MEP Model
- CWMP Notice of Project Change
- Obtain Regulatory Approvals
- Develop Implementation Technical Memorandum
 - Scope of Work
 - Schedule
 - Costs

❖ Future Phases over 10 Years

- Preliminary Design
- Final Design
- Implementation



Permeable Reactive Barriers Other Potential Applications

❖ On-Site Wastewater Disposal Systems

❖ WWTF Groundwater Discharge Site vs Upgrades at WWTF

