



Town of

Orleans
Massachusetts

Orleans Water Quality Advisory Panel

Water Quality and Wastewater Planning

Program Status Update

January 18, 2017

Agenda

- ❖ **Approval of Meeting Minutes of 10/19/16, 11/09/16, and 12/14/16**
- ❖ **Public Comment**
- ❖ **Tri-Town STP Decommissioning and Demolition Update**
- ❖ **NT Technology Demonstration Project Status**
- ❖ **Downtown 25% Design Update**
- ❖ **Monitoring and Modeling Plan (AMP) Update**
- Break**
- ❖ **Freshwater Ponds Planning Update**
- ❖ **Amended CWMP Document: Next Steps**
- ❖ **Update on Financial Analyses**
- ❖ **Design-Build and Design-Build-Operate Delivery Option Evaluation Process**
- ❖ **Other Items & Public Comment**



Tri-Town Septage Treatment Facility Decommissioning and Demolition Update

❖ Decommissioning Plan and Design Phase

- Completed

❖ Schedule

- Bid Advertisement: December 7, 2016
- Mandatory Pre-Bid Conference: January 11, 2017 at 10:00 am with seven general contractors in attendance.
- Bid Opening: February 8, 2017 at 9:00 am
- Town Meeting Appropriations (Brewster, Eastham & Orleans) – May 2017
- Demolition – September 2017 thru April 2018

❖ Estimated Construction Costs

- Tri-Town Septage Treatment Facility: \$2,300,000
- Compost Shelter: \$450,000



NT Technology Demonstration Projects

Aquaculture

❖ **Lonnies Pond Project**

- 10 metric tons of biomass overwintered
- Seven emails detailing milestones sent over the project period to a broad stakeholder group including Friends of Lonnie's Pond
- Outline of Year 1 Final Report submitted to Town
- SMAST Monitoring Report due January 31, 2017
- Year 1 Final Report following receipt of SMAST Monitoring Report - Early February 2017

❖ **Kent's Point Oyster Bed Propagation**

- Conservation Commission Request for Determination Applicability (RDA) Hearing held on December 20, 2016
- Project approved with conditions focusing on public outreach and monitoring
- Remote sets being ordered



NT Technology Demonstration Projects

Aquaculture (cont.)

❖ **Enhanced Aquaculture in Pleasant Bay and Town Cove**

- Questionnaire distributed to growers by Shellfish Constable
- Response rate was 75% - Non-respondents were contacted again
- Meetings with growers to discuss responses and gain additional insights were held. Technical Team and Shellfish Constable met at Harbormaster's Office.
- Preparing Enhanced Aquaculture TM that summarizes the findings of this research and recommends a program for working with growers to enhance Pleasant Bay grants shellfish production - Early February 2017

❖ **Town Cove Project**

- Prepared Letter to be mailed the week of January 9, 2017 to approximately 180 waterfront residents along Town Cove
- SMAST preparing to work with local commercial harvesters to conduct survey in the spring



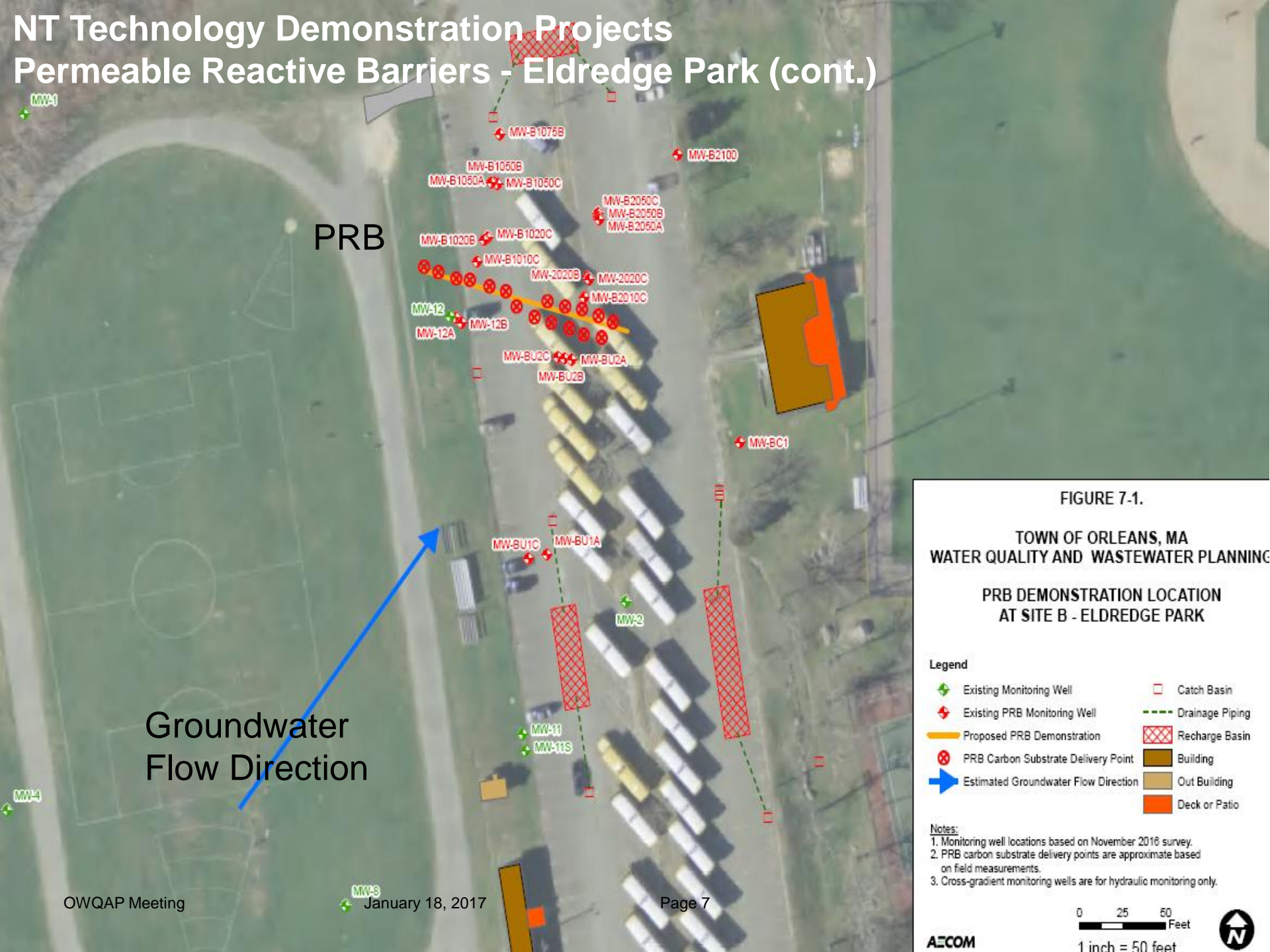
NT Technology Demonstration Projects

Permeable Reactive Barriers - Eldredge Park

- ❖ **Baseline concentrations measured as high as 35 mg/L nitrate-nitrogen**
- ❖ **No migration of EVO detected during injection (monitoring turbidity and dissolved organic carbon at 10, 20, 50 and 100 feet downgradient)**
- ❖ **Next round of sampling being conduct next week with analysis results to follow**



NT Technology Demonstration Projects Permeable Reactive Barriers - Eldredge Park (cont.)



PRB

Groundwater
Flow Direction

FIGURE 7-1.
TOWN OF ORLEANS, MA
WATER QUALITY AND WASTEWATER PLANNING

PRB DEMONSTRATION LOCATION
AT SITE B - ELDREDGE PARK

Legend

Existing Monitoring Well	Catch Basin
Existing PRB Monitoring Well	Drainage Piping
Proposed PRB Demonstration	Recharge Basin
PRB Carbon Substrate Delivery Point	Building
Estimated Groundwater Flow Direction	Out Building
	Deck or Patio

Notes:

- Monitoring well locations based on November 2016 survey.
- PRB carbon substrate delivery points are approximate based on field measurements.
- Cross-gradient monitoring wells are for hydraulic monitoring only.

Scale: 0 25 50 Feet
1 inch = 50 feet

AECOM

NT Technology Demonstration Projects

Permeable Reactive Barriers - Landfill Site

❖ **Assessment Plan**

- Install new monitoring wells and analyze groundwater samples from new and existing monitoring wells
- Define sources, concentration and the horizontal and vertical extent of nitrogen compounds and 1,4-dioxane in groundwater
- Evaluate landfill cap drainage design and stormwater management systems in the transfer station and material composting areas
- Assess groundwater hydrogeology and groundwater flow

❖ **Develop a comprehensive project base map**

❖ **Analyze water samples - downgradient private wells**

❖ **Analyze soil samples - former septage lagoon area**

❖ **Evaluate data and develop the recommended plan for FY18 Warrant**



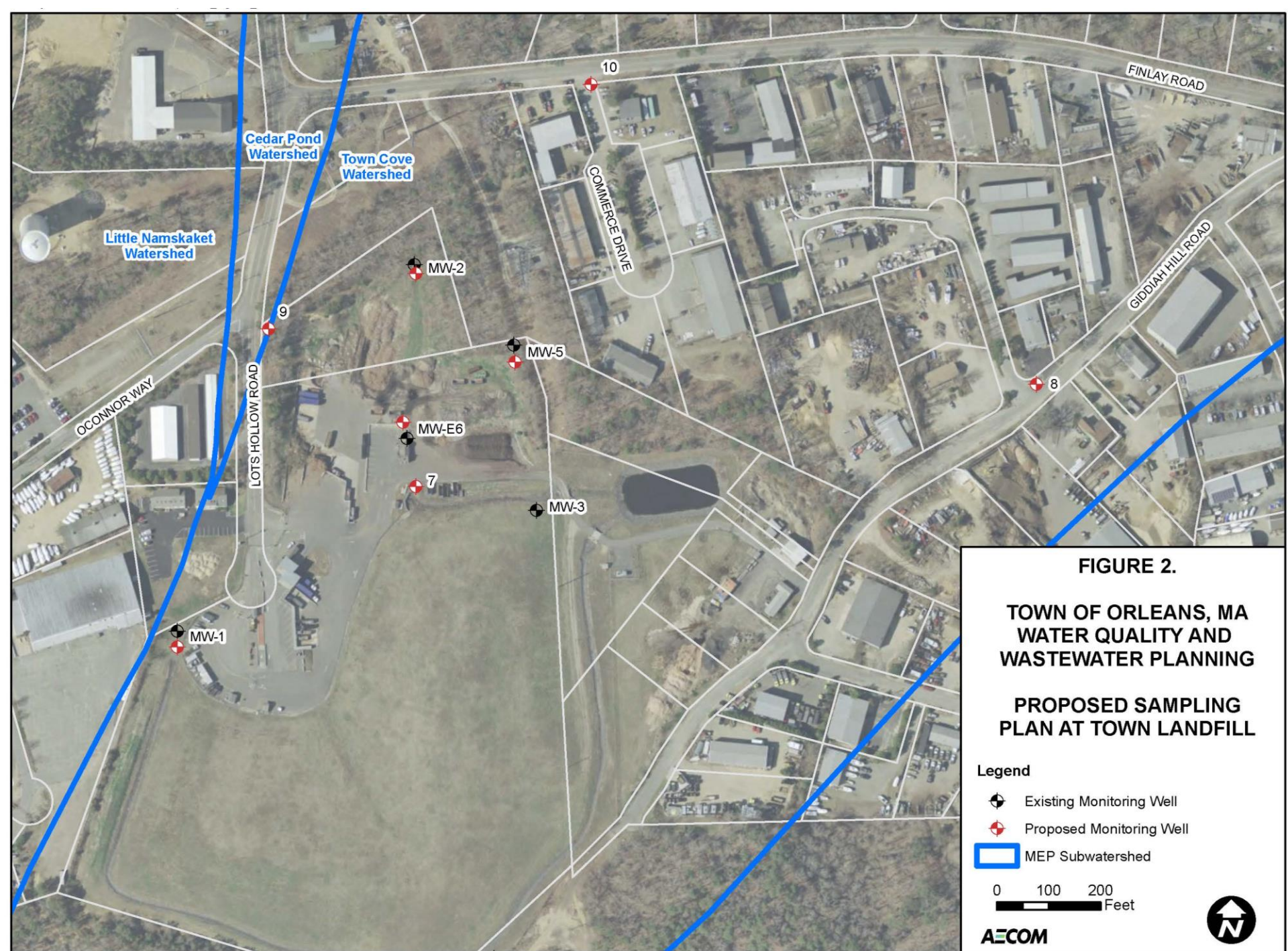



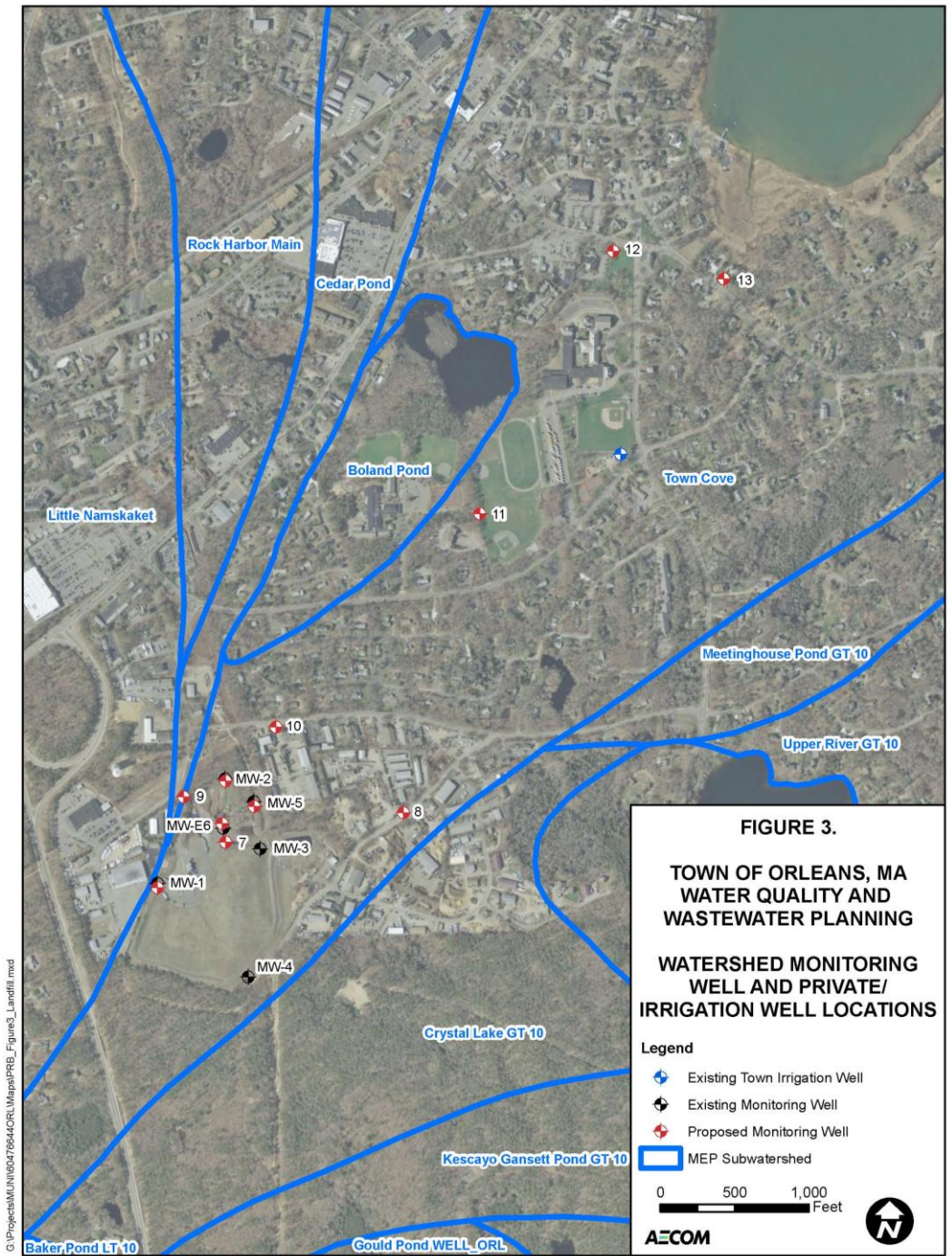


FIGURE 2.
TOWN OF ORLEANS, MA
WATER QUALITY AND
WASTEWATER PLANNING
PROPOSED SAMPLING
PLAN AT TOWN LANDFILL

- Legend**
-  Existing Monitoring Well
 -  Proposed Monitoring Well
 -  MEP Subwatershed

0 100 200
 Feet





NT Technology Demonstration Projects

Nitrogen Reducing Barriers (NRB)

❖ Identification of Sites with Bob Canning

- Initial Meeting Identified Approximately 48 sites
- Evaluation Identified 20 Sites
- Evaluation and 2nd Meeting Identified About 10 Sites

❖ Conducting Detailed Evaluation on Remaining Sites

❖ Meeting to be Scheduled with County Department of Health:

- Review Identified Sites
- Obtain Other System Details: Contract Documents and Monitoring Requirements

❖ Prepare Letter of Interest to Property Owners

❖ Prepare Design and Plan for Implementation



Downtown Area Preliminary Design Report - 25% Design

❖ Progress to Date

- Conducted two workshops: December 20, 2016 and January 5, 2017
- Completing topography, subsurface investigation and cultural resource evaluation

❖ Next Steps

- Evaluate lots using information on existing system, elevation data
- Update collection technology evaluation and refine system configuration
- Update preliminary WWTF process design
- Prepare 25% design data & updated program cost estimates

❖ Anticipate Deliverables

- Recommend system configuration, technologies and costs
- Preliminary phasing plan



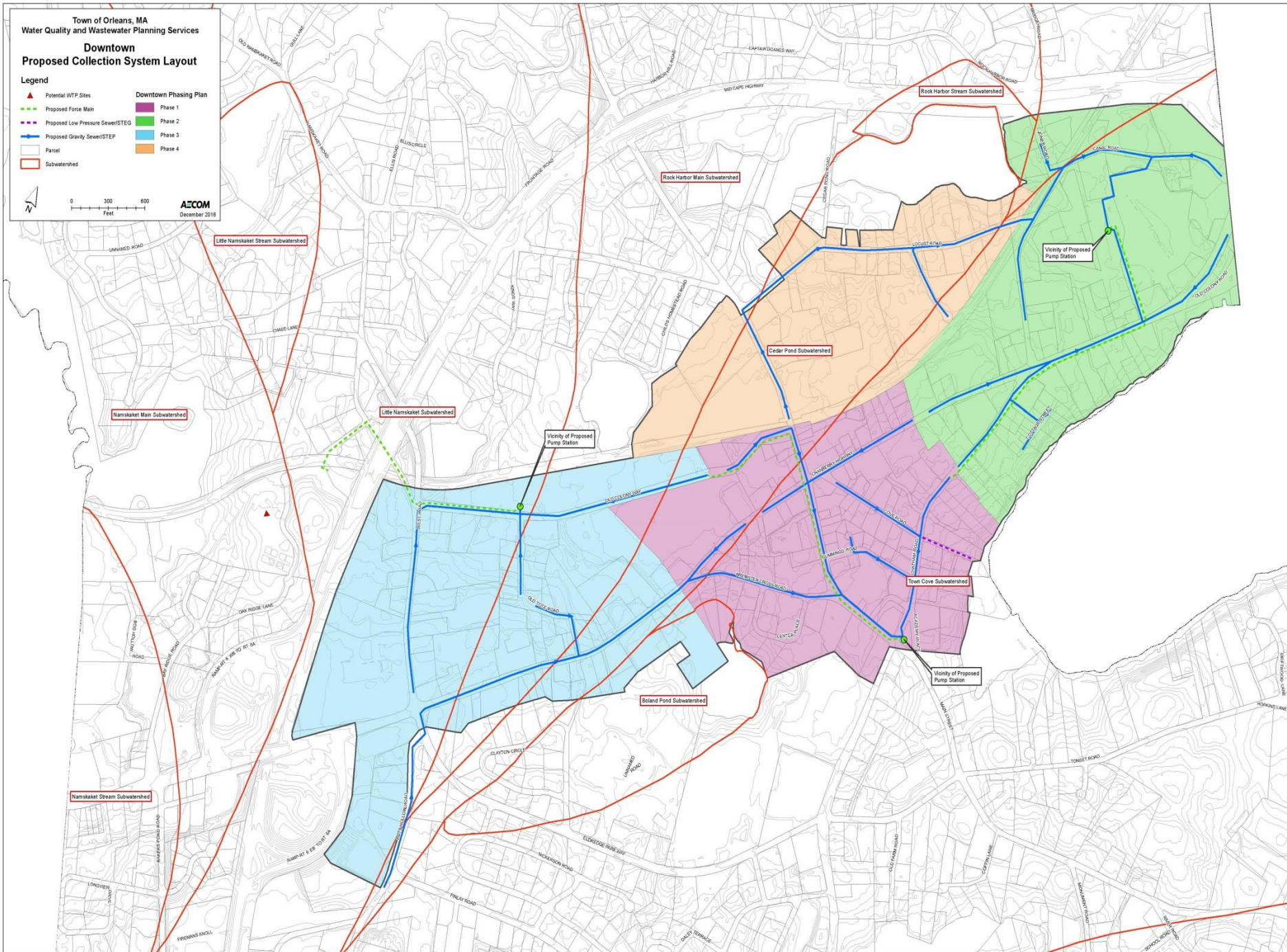
Town of Orleans, MA
Water Quality and Wastewater Planning Services

**Downtown
Proposed Collection System Layout**

Legend

- | | |
|----------------------------------|-------------------------------|
| Potential WTP Sites | Downtown Phasing Plan Phase 1 |
| Proposed Force Main | Phase 2 |
| Proposed Low Pressure Sewer/STEG | Phase 3 |
| Proposed Gravity Sewer/STEP | Phase 4 |
| Parcel | |
| Subwatershed | |

0 300 600 Feet
AECOM
December 2018



Downtown Area Preliminary Design Report - 25% (cont.)

❖ Wastewater Treatment Facility

- 2 vs 1 Facility
- Septage Receiving

❖ Effluent Disposal

- Site 1/1A – Awaiting Response from MHC
- Downtown Area – Meeting with Nauset Regional School District
- Route 6 Exit 12



Monitoring and Modeling Plan (AMP) Update

SMAST Technical Assistance: FY17/18 Scope

❖ **Water Quality Project Baselines**

- Marine and fresh waters
- Organize WQ data base, QA/QC, gap analyses
- Baselines for demonstration projects

❖ **Shellfish Demonstration Project Implementation**

- Lonnies Pond continuation
- Town Cove quahog inventory
- Kent's Point demonstration plan
- Expansion of existing grants

❖ **MEP Model Updates**

- Pleasant Bay MEP prep in cooperation with PBA Towns
- Nauset: Remodel/confirm N thresholds with new boundary condition and nitrogen flux estimates



Monitoring and Modeling Plan (AMP) Update (cont.)

SMAST Technical Assistance: FY17/18 Scope

❖ Cedar Pond – Rock Harbor Creek Planning

- Monitoring and technical assistance
- Preliminary alternatives review for plan update...or
- Rerun MEP for saline Cedar Pond and evaluate

❖ Namskaket Watershed Plan (with Brewster)

- Consolidate and review data bases
- Define stresses, threats
- Scope additional studies and watershed plan scope





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Break

Fresh Water Ponds Planning Update

- ❖ **Convened Work Group: First Meeting on November 29**
- ❖ **Meeting: Tuesday, December 13, 1:00 PM Nauset Room**
 - Presentation on DPW Stormwater Program (Delayed to Jan. 17 Mtg.)
 - Discussion of need for freshwater ponds QAPP
 - Discussion of need for updating data bases
 - Plan for updating of ponds prioritization (from 2007 CWMP work)
 - Refine SMAST scope to fit Ponds Work Group needs
- ❖ **Update pond impairment screening**
- ❖ **Shortlist and recommend initial pond project**
- ❖ **Develop implementation scope and budget for Spring TM**



Amended CWMP Document: Next Steps

- ❖ **BOS provided “agreement” to distribute the Preliminary Amended CWMP to CCC and MassDEP for their review and comment on compliance with regulatory processes**
- ❖ **Continue to update the Preliminary Amended CWMP throughout Spring 2017**
- ❖ **Final Amended CWMP to be completed and submitted by June 30, 2017**



Update on Financial Analyses

❖ Progress to Date

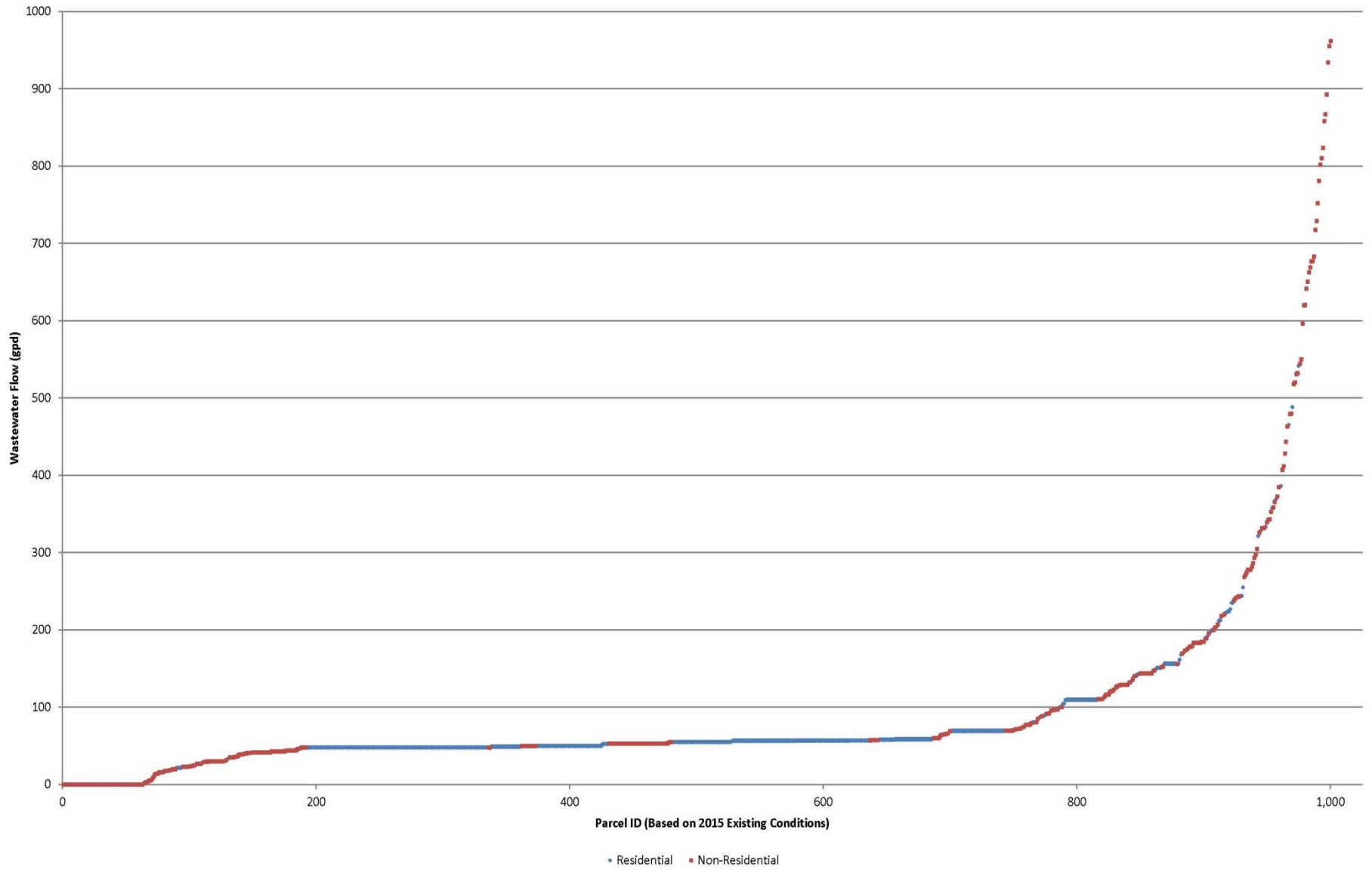
- Incorporated implementation phasing plan for program, including Downtown, into model
- Incorporated water use and property assessment data
- Reviewed and adjusted O&M and R&R costs

❖ Next Steps

- Continue to evaluate feasibility of other procurement methods
- Continue to investigate other state funding sources to further reduce costs to Town
- Provide update to Downtown Owners User Group



2015 Existing Conditions - By Owner (excluding outliers)



Update on Financial Analyses (cont.)

Example Cases (Finance Committee Request: All Capital Costs on Taxes)

- **Case A, Baseline:** 100% capital cost on tax rate; 100% O/M/R/R on user charge; 4% conventional financing; 20 years
- **Case B, Historic EPA Grant Funding:** Same as Case A but with 90% Grant/Loan forgiveness with balance of capital cost using conventional financing
- **Case C, Introduce SRF at 2% Financing:** Same as Case A but 2% SRF financing instead of 4% conventional financing
- **Case D, Introduce 0% SRF Financing:** Same as Case C but 0% instead of 2% SRF financing
- **Case E, Introduce the 25% Grant/Loan Forgiveness:** Same as Case D but with 25% Grant/Loan forgiveness with balance of capital cost at 0% financing
- **Case F, Extend Borrowing:** Same as Case E but extend borrowing to 30 years
- **Case G, Multiple Discounts:** Same as Case F but also include D/B/O with 21% savings on capital and additional 7% savings on O&M; 5% local options tax savings; septage revenue; and reduce contingency on capital from 25% to 15%



Design-Build and Design-Build-Operate Delivery Option Evaluation Process

- ❖ Determined that special legislation will be required; Plan to include authorization to file in Spring Warrant Article
- ❖ Evaluation of D/B and D/B/O options to include:
 - Phasing implementation of downtown system components
 - Options for addition of Meetinghouse Pond facilities at later date
 - Evaluation of prospective bidder pool
 - Eligibility for SRF financing
 - Contract change order conditions
 - Contractor incentivization options
 - Inflation and cost escalation protections
 - Administrative services to be contracted (e.g. billing)
 - Asset management provisions and protections
 - Contract default provisions
 - Delivery (design and construction) schedules
- ❖ Planning BOS Workshop in Mid-February



Other Items and Public Comment

❖ **OWQAP Meeting**

- February 8, 2017, 9:00 am to Noon

❖ **Public Information Activities**

- P3 – February 1, 2017 at 9:00 am at Cape Cod Commission
- BOS – Design-Build Operate Workshop – February 8, 2017 at 6:30 pm
- NT Technologies Working Groups
 - Shellfish Working Group - TBD
 - PRB / NRB Working Group - TBD
 - Downtown Collection System Working Group – TBD
 - Freshwater Ponds Working Group – TBD
- Status Reports and FAQ on Various Projects



Other Items and Public Comment (cont.)

- ❖ **Effluent Disposal - Downtown Area - 01/18/17**
- ❖ **Financial Analysis - 01/18/17**
- ❖ **Nitrogen Removing Barriers (NRB) - 02/08/17**
- ❖ **Town Landfill 1,4-Dioxane and Nitrogen - 02/08/17 and 03/08/17**
- ❖ **Town Cove Lease Sites - 03/01/17**
- ❖ **Update Collection System Type Evaluation and Preliminary System Configuration - 03/01/17**
- ❖ **DBO and Financial Analysis – March 2017**





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Thank You