Board of Selectman

Water Quality and Wastewater Planning

Program Status Update

January 11, 2017

Agenda

- **NT Technology Demonstration Projects**
  - Aquaculture
  - Permeable Reactive Barriers
  - Nitrogen Removing Barriers
- **Downtown Area PDR (25% Design)**
- **Miscellaneous**
  - Wastewater Treatment Facility
  - Effluent Disposal
  - DBO
- **Upcoming Key BOS Discussions**

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.)

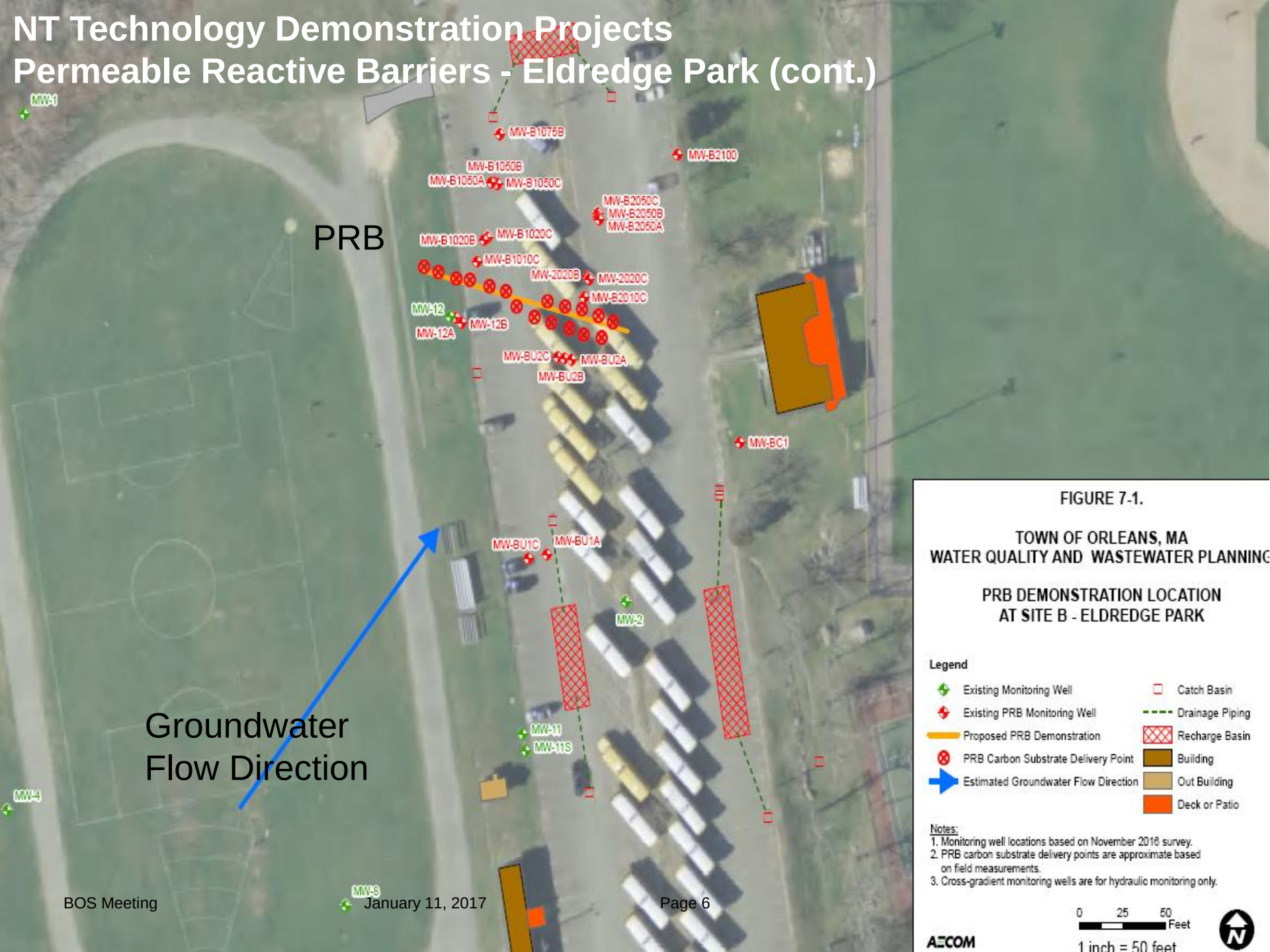


FIGURE 7-1.

TOWN OF ORLEANS, MA
WATER QUALITY AND WASTEWATER PLANNING

PRB DEMONSTRATION LOCATION
AT SITE B - ELDREDGE PARK

Legend

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

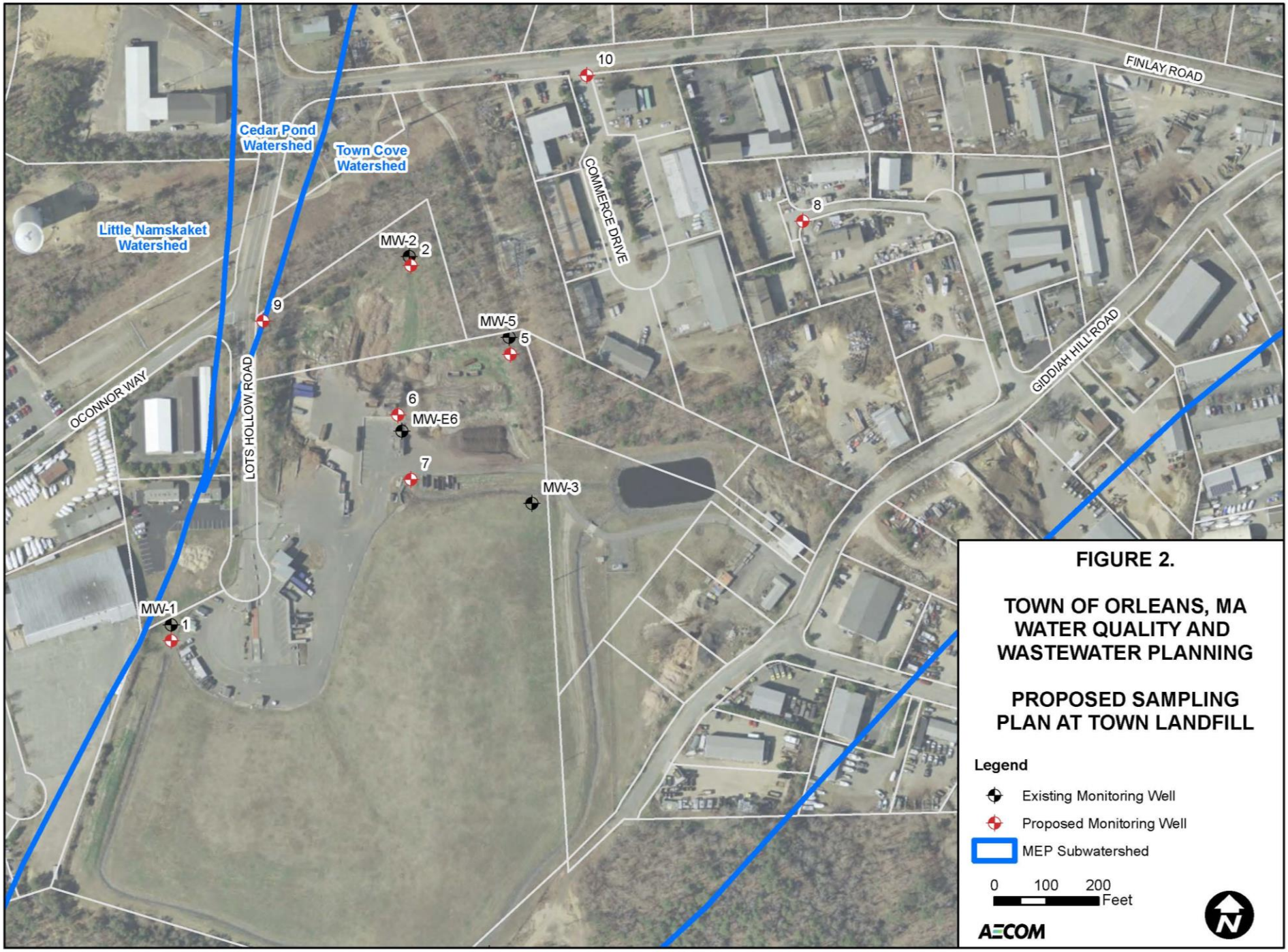
Notes:
1. Monitoring well locations based on November 2016 survey.
2. PRB carbon substrate delivery points are approximate based on field measurements.
3. Cross-gradient monitoring wells are for hydraulic monitoring only.

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 to assess groundwater hydrogeology
  - 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
- **Develop a comprehensive project base map**
- **Analyze water samples - downgradient private wells**
- **Analyze soil samples - former septage lagoon area**
- **Evaluate data and develop recommended plan for FY18 Warrant**
- **Working with DPW to connect remaining potable wells**


Cedar Pond Watershed
Town Cove Watershed
Little Namskaket Watershed
FINLAY ROAD
COMMERCE DRIVE
GIDDIAH HILL ROAD
OCONNOR WAY
LOTS HOLLOW ROAD
10
8
MW-2
2
9
MW-5
5
6
MW-E6
7
MW-3
MW-1
1
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
AECOM
N

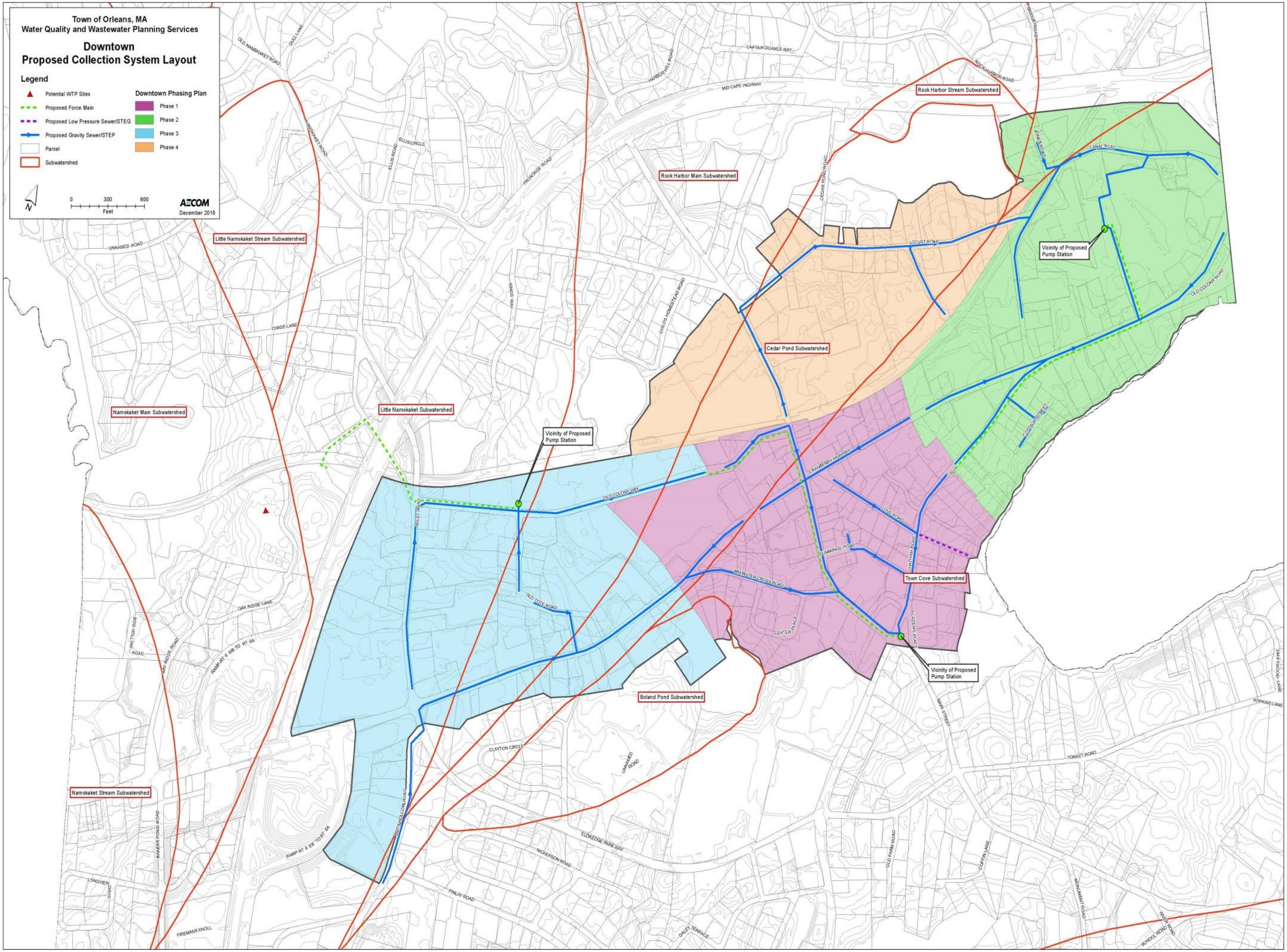
NT Technology Demonstration Projects
Nitrogen Reducing Barriers (NRB)

- **Identified approximately 20 sites with Bob Canning. Meeting with Bob Canning to identify 10 sites for detailed evaluation.**

- **Meeting to be Scheduled with County Department of Health:**
  - Review Identified Sites
  - Obtain Other System Details: Contract Documents and Monitoring Requirements

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
Proposed Force Main
Proposed Low Pressure Sewer/STEG
Proposed Gravity Sewer/STEP
Parcel
Subwatershed
Downtown Phasing Plan
Phase 1
Phase 2
Phase 3
Phase 4
0
300
600
Feet
AECOM
December 2016
Rock Harbor Stream Subwatershed
Rock Harbor Main Subwatershed
Little Namskaket Stream Subwatershed
Cedar Pond Subwatershed
Namskaket Main Subwatershed
Little Namskaket Subwatershed
Town Cove Subwatershed
Boland Pond Subwatershed
Namskaket Stream Subwatershed
Vicinity of Proposed Pump Station
Vicinity of Proposed Pump Station
Vicinity of Proposed Pump Station
MID CAPE HIGHWAY
CAPTAIN DOANES WAY
ROCK HARBOR ROAD
CANAL ROAD
LOCUST ROAD
OLD COLONY ROAD
OLD COLONY WAY
CRANBERRY HIGHWAY
COVE ROAD
CUMMINGS ROAD
BREWSTER CROSS ROAD
CHATHAM ROAD
ACADEMY PLACE
CENTER PLACE
OLD TOTE ROAD
WEST ROAD
COTTAGE STREET
MAIN STREET
TONSET ROAD
ELDRIDGE PARK WAY
NICKERSON ROAD
FINLAY ROAD
OLD FARM ROAD
COFFIN LANE
CLAYTON CIRCLE
OAK RIDGE LANE
CHASE LANE
UNNAMED ROAD
FRONTAGE ROAD
ELLIS ROAD
ELLIS CIRCLE
NAMSKAKET ROAD
OLD NAMSKAKET ROAD
HARBOR HILL ROAD
CEDAR POND ROAD
CHILDS HOMESTEAD ROAD
JONES ROAD
HOPKINS LANE
DALEY TERRACE
FIREMANS KNOLL
LONGVIEW DRIVE
BAKERS POND ROAD
RAMP-RT 6 EB TO RT 6A
RAMP-RT 6 WB TO RT 6A
BAY RIDGE ROAD
BOG HOLLOW ROAD
MONUMENT ROAD
SCHOOL ROAD

Miscellaneous Items

- **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
- **DBO**
  - Evaluate of D/B and D/B/O options and recommend procurement plan
  - Conduct BOS Workshop – Mid to End of February

Upcoming Key BOS Discussions

- 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
- Septage Receiving at New WWTF
- DBO and Financial Analysis – March 2017

Town of Orleans Massachusetts

Thank You