

Route 28 West Sewer Expansion Project

Project Design Informational Session

February 5, 2025

Barnstable Adult Community Center



Town of Barnstable
Department of Public Works



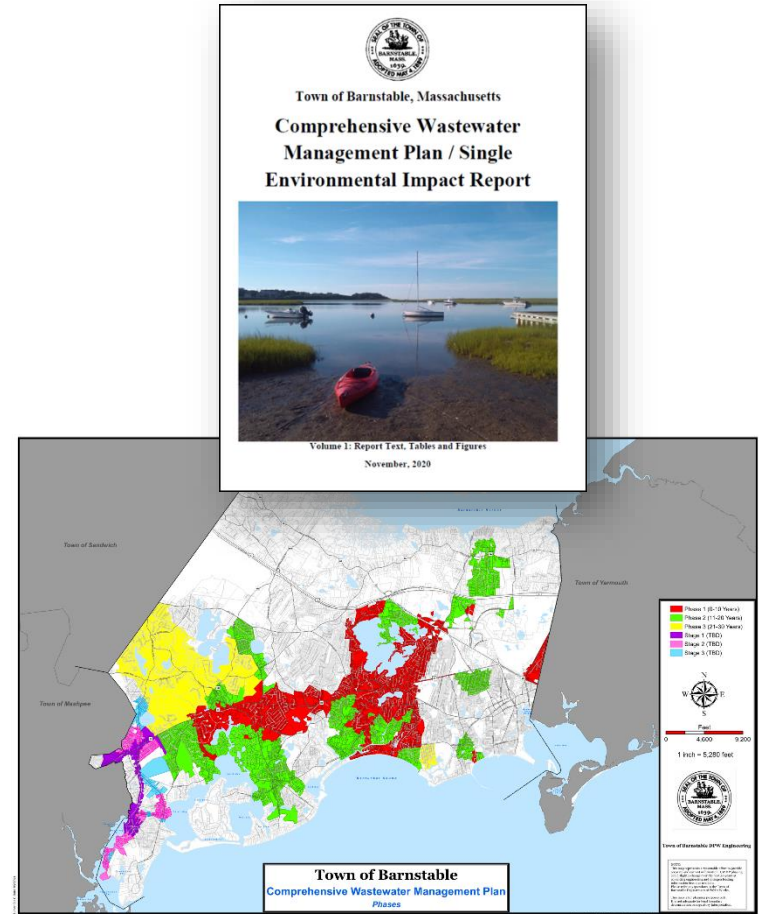


Meeting Agenda

- **Comprehensive Wastewater Management Plan (CWMP) Overview**
- **Route 28 West Sewer Expansion Project**
 - **Project Objectives**
 - **Project Route**
 - **Sewer Construction Impacts**
 - **Pump Station Locations**
 - **Decommissioning of the Marstons Mills Wastewater Treatment Plant**
 - **Project Funding**
 - **Connection Process**
 - **Anticipated Schedule & Next Steps**
- **Project Contacts**
- **Questions**

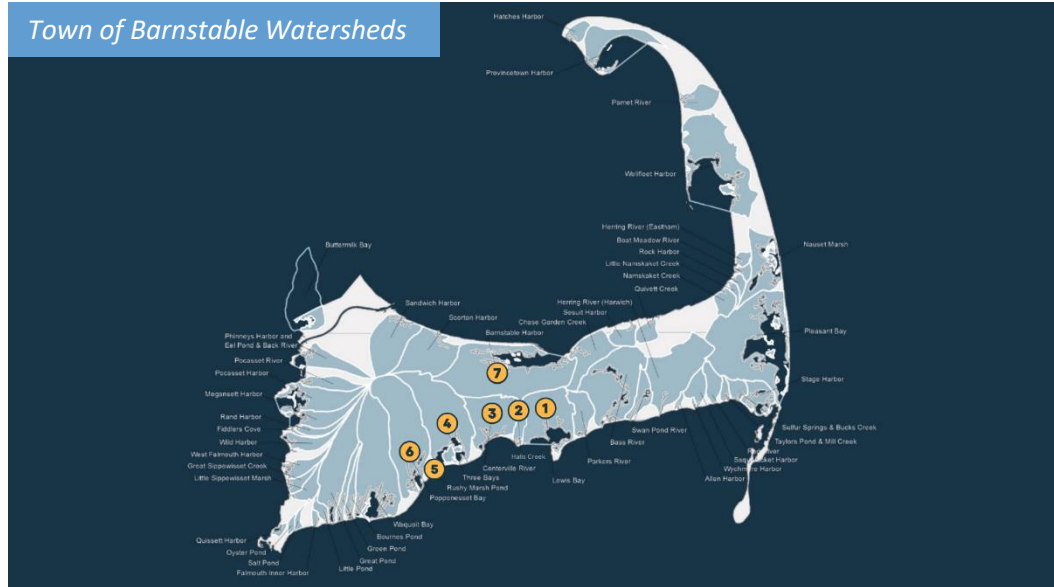
What is the CWMP?

- **C**omprehensive **W**astewater **M**anagement **P**lan
- A planning document, required by regulatory agencies, which identifies the Town's wastewater needs and establishes a recommended plan for resolving them
- Barnstable's CWMP was approved in April of 2021
 - We are currently in Year 4 of 30



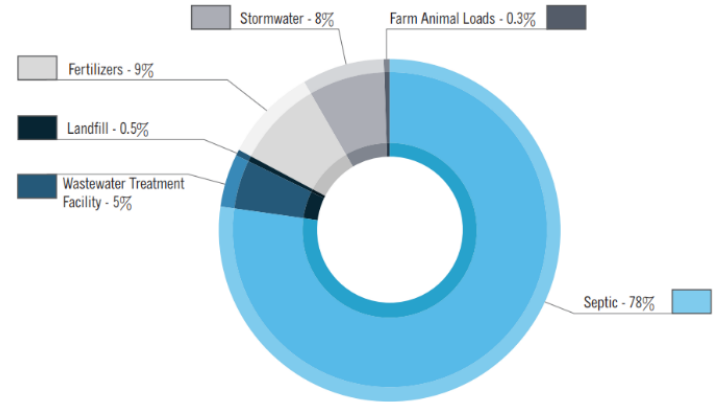
The General Problem

- Impaired coastal waters (**nitrogen**)
- Groundwater quality concerns
- Pond water quality concerns
- Flood zone and climate change
- Promote targeted economic development
- Regulatory requirements



Nitrogen Pollution in Barnstable

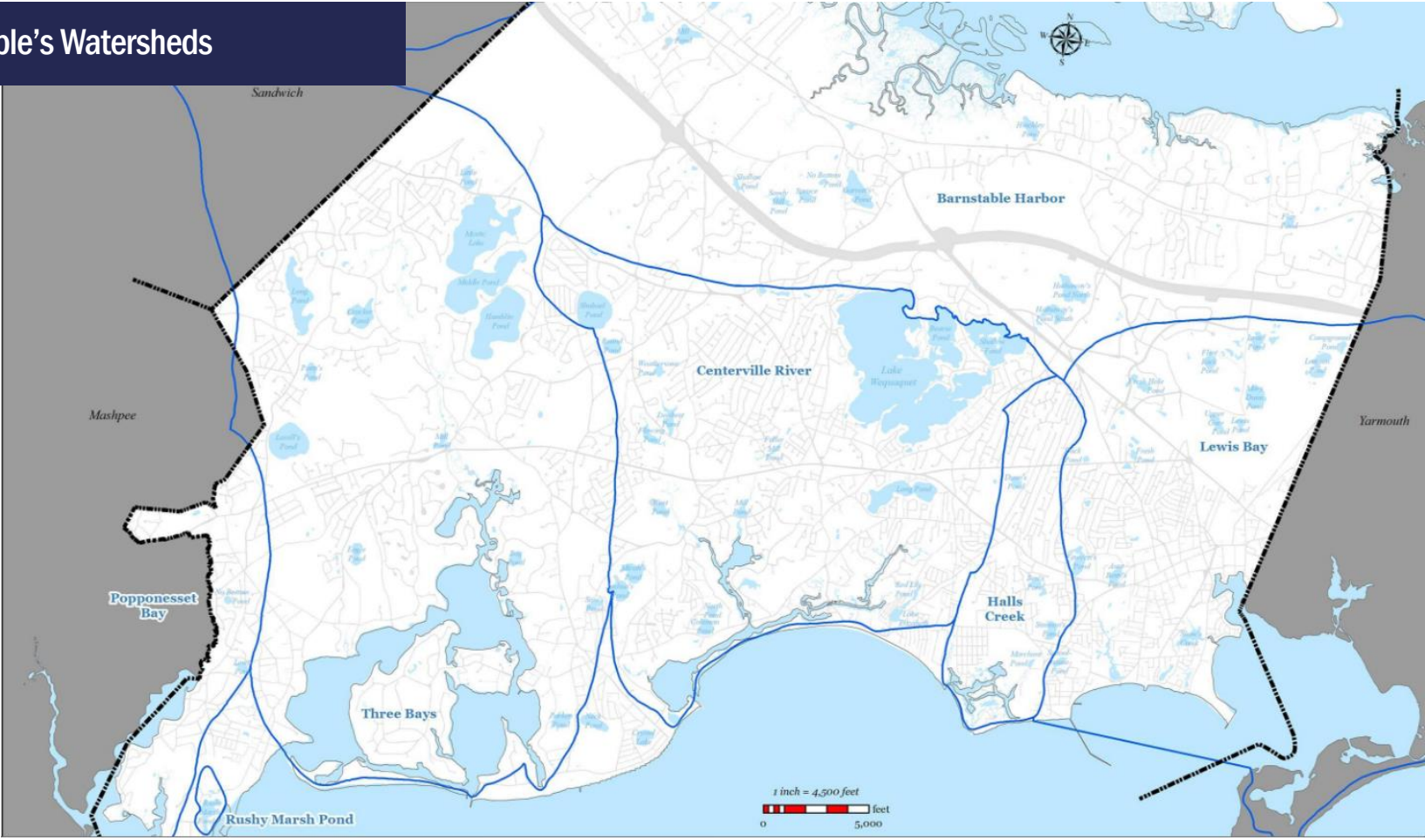
- Nitrogen pollution in Barnstable has been documented by the Massachusetts Estuary Project (MEP)
- Barnstable's coastal waters are impaired due to nitrogen
- Town must meet Total Maximum Daily Loads (TMDL's)
- ±78% of controllable nitrogen comes from **septic systems**
 - Title 5 systems are not designed to remove significant nitrogen
 - Currently approved Innovative/Alternative (I/A) septic systems do not remove enough nitrogen to achieve TMDL's in Barnstable
- Impairment and removal requirements to achieve TMDL's varies by watershed
- **Sewers necessary to achieve TMDL's**



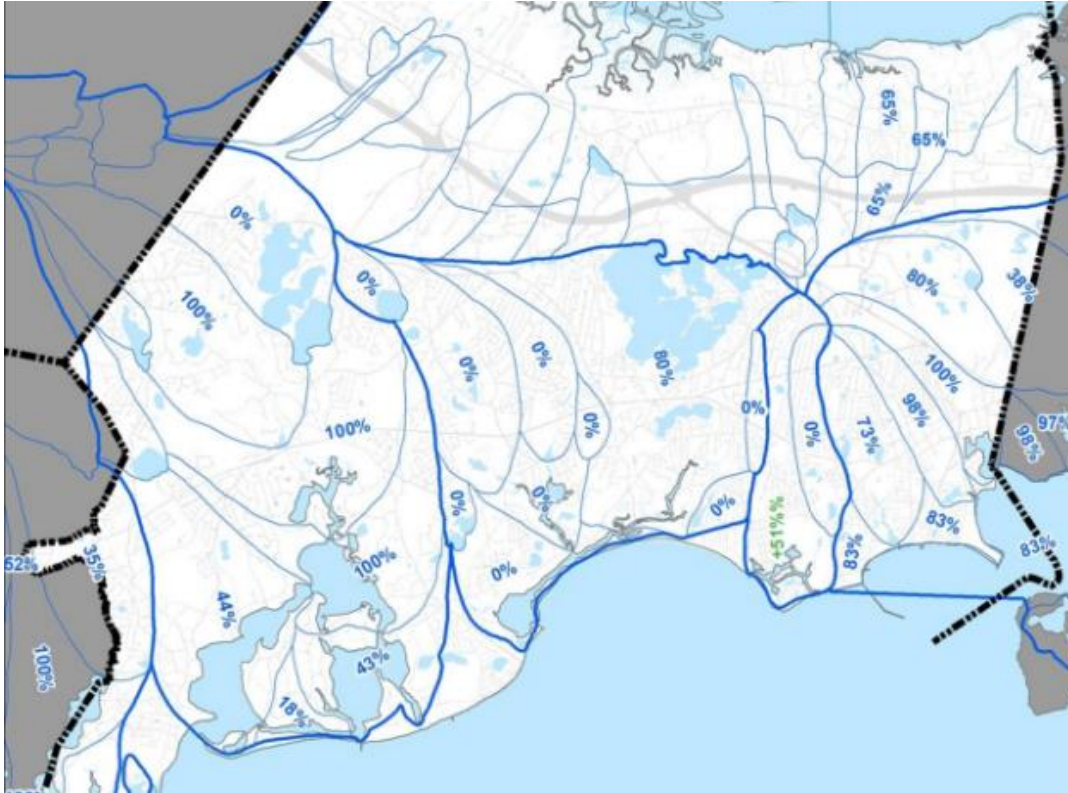
Controllable Nitrogen Sources on Cape Cod

Source: Cape Cod Area Wide Water Quality Management Plan Update, 208 Plan; Cape Cod Commission; June 2015

Barnstable's Watersheds



MEP Modeled Septic Load Removal Targets



- MEP identifies target septic load removals necessary within each subwatershed to achieve TMDLs
- Many subwatersheds within the Three Bays Watershed require 100% septic load removal to achieve TMDLs
- CWMP used this as the foundation of the program and then builds on this to also address other wastewater needs (ponds protection, water supply protection, etc.)

Cost of Inaction

- Federal Clean Water Act requires communities to meet TMDL's
- Failure to implement:
 - Further damage to water quality and water resources
 - Negative impacts to local economy and property values
 - Town at risk of court order, lawsuits and/or regulatory enforcement
- Newly proposed Title 5 regulations
 - Town must implement watershed management plan, or all properties will be required to install I/A systems
 - On September 1, 2023, the Town submitted its application for a Watershed Permit to MassDEP
 - Anticipate MassDEP issuing permit in coming months

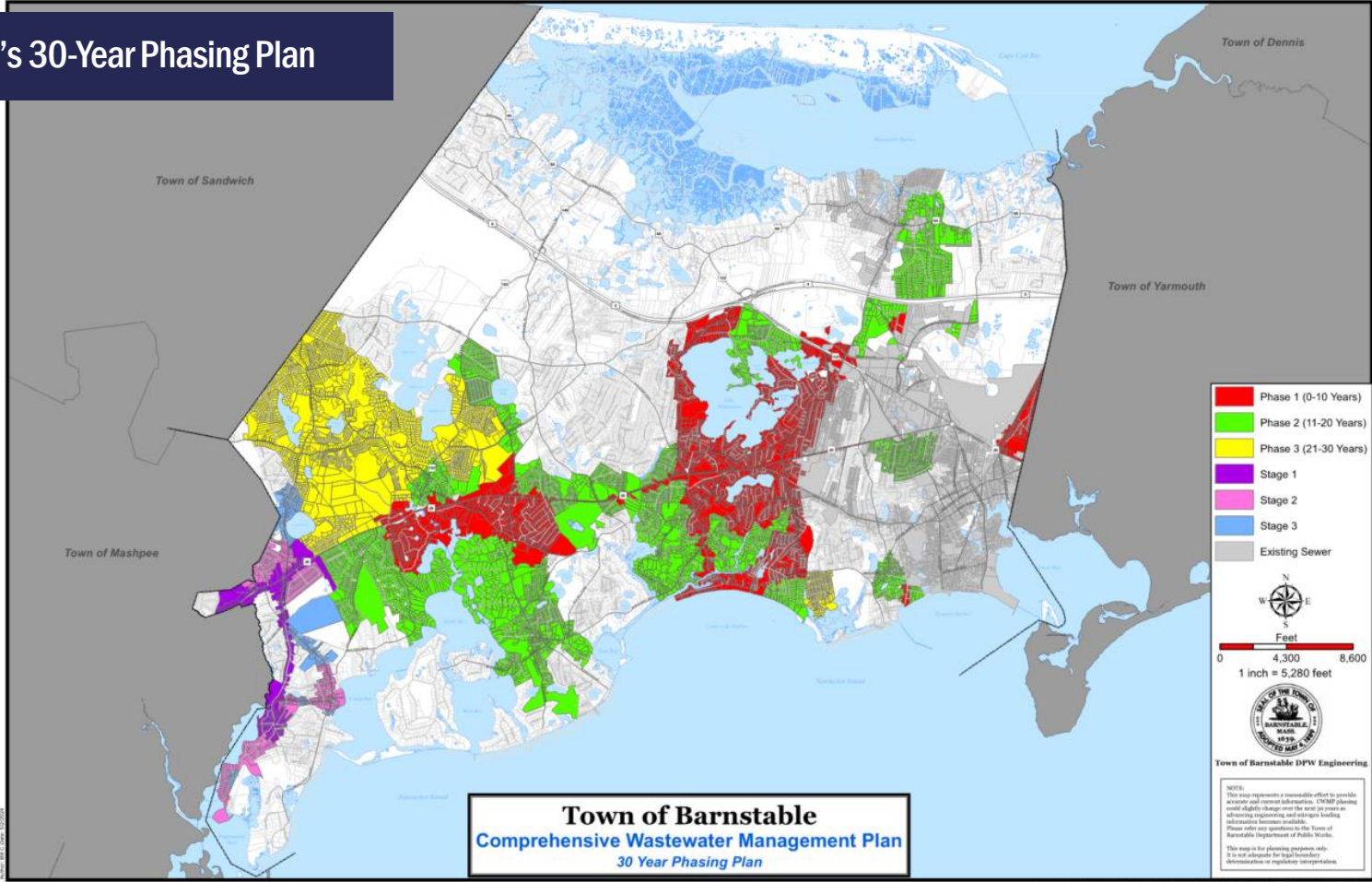


Barnstable's Plan

- Watershed by watershed approach
- (3) 10-Year Phases of Sewer Expansion
 - ±190 miles of new sewers
 - ±11,800 properties to be connected to sewer
 - Phases executed as multiple smaller projects
- Leverages existing infrastructure (WPCF, sewers, etc.)
- Incorporates “non-traditional projects” (dredging, stormwater, etc.), but doesn't rely on them
- Adaptive Management
 - Plan is flexible and adaptive
 - 5-Year updates required
 - Annual updates to Cape Cod Commission
- Achieves TMDLs



Barnstable's 30-Year Phasing Plan



Town of Barnstable
Comprehensive Wastewater Management Plan
30 Year Phasing Plan

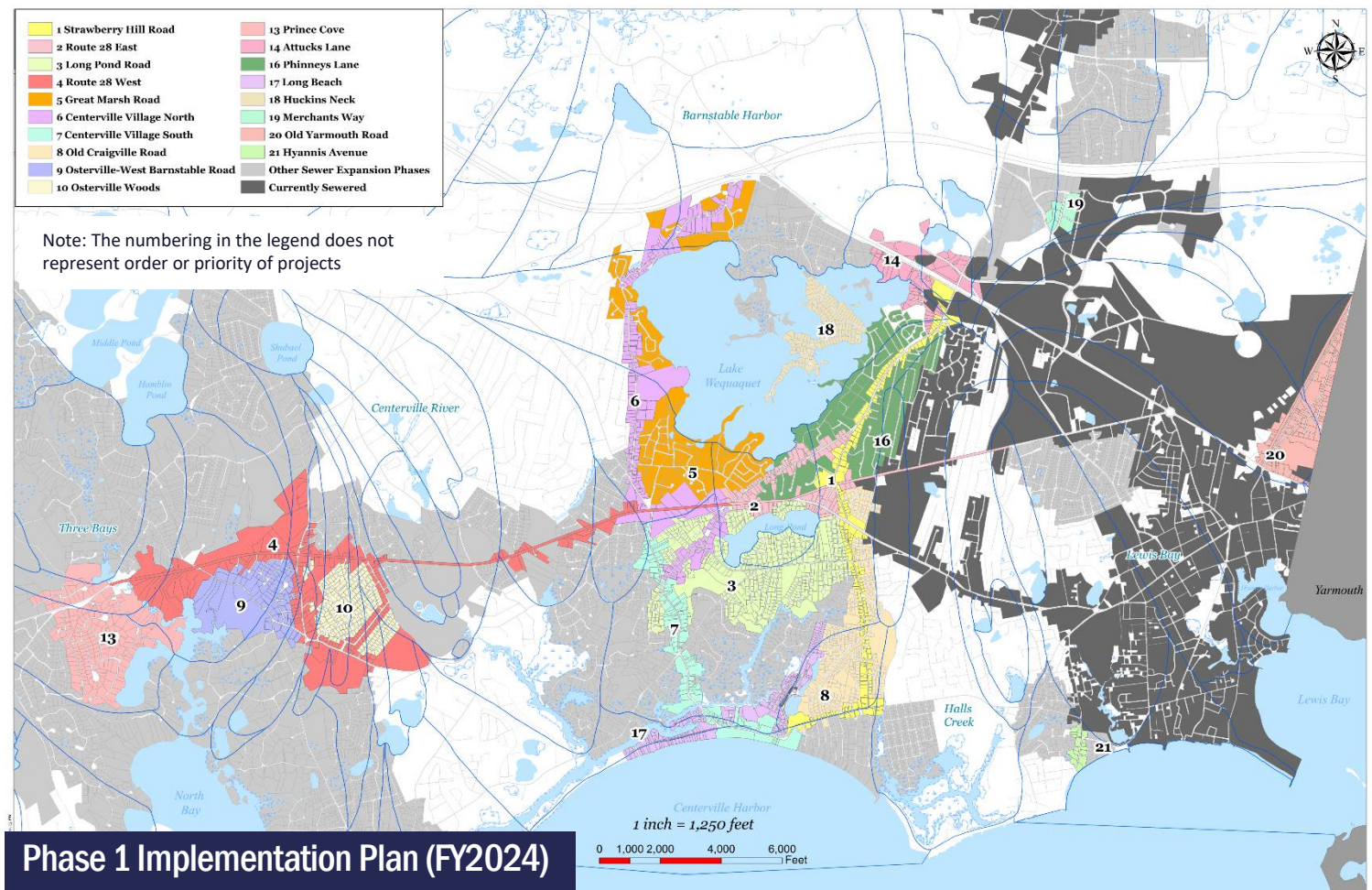


NOTE:
This map represents a reasonable effort to provide accurate and current information. CDDP planning could slightly change over the next 30 years as additional engineering and design findings are incorporated into the plan.
Please refer any questions to the Town of Barnstable Department of Public Works.
This map is for planning purposes only. It is not adequate for legal boundary determination or regulatory interpretation.

Document Path: E:\Sewer Expansion Project\2014\1 Master Sewer Phasing\Phasing\2014-CDDP_Phasing_20140202.mxd

- | | |
|-----------------------------------|------------------------------|
| 1 Strawberry Hill Road | 13 Prince Cove |
| 2 Route 28 East | 14 Attucks Lane |
| 3 Long Pond Road | 16 Phinneys Lane |
| 4 Route 28 West | 17 Long Beach |
| 5 Great Marsh Road | 18 Huckins Neck |
| 6 Centerville Village North | 19 Merchants Way |
| 7 Centerville Village South | 20 Old Yarmouth Road |
| 8 Old Craigville Road | 21 Hyannis Avenue |
| 9 Osterville-West Barnstable Road | Other Sewer Expansion Phases |
| 10 Osterville Woods | Currently Sewered |

Note: The numbering in the legend does not represent order or priority of projects



Phase 1 Implementation Plan (FY2024)

Phase 1 Goals

Sewers



- **Construction of sewers on Route 28**
 - Backbone of westerly sewer expansion
- **Sewer expansion adjacent to impaired ponds in Centerville**
 - Lake Wequaquet, Bearses Pond, Shallow Pond, Long Pond, Red Lily Pond, Lake Elizabeth
- **Sewer expansion in identified economic develop areas**
 - Route 28, Route 132, Old Yarmouth Road “triangle”
- **Sewer expansion in flood zones**
 - Craigville Beach / Long Beach region
- **Sewer expansion adjacent to Prince Cove and Warren’s Cove**
 - Most impaired water bodies in Three Bays



Treatment

- **Upgrades at BWPCF identified in CWMP**
 - Nitrogen, Headworks and Solids Processing Upgrades
- **Effluent disposal solution**
 - Increase permitted discharge capacity

Non-Traditional

- **Implementation of non-traditional projects in Three Bays Watershed**
 - Mill Pond Dredging
 - Warren’s Cove Aquaculture
 - Cotuit Cut Dredging
 - Green Stormwater Projects

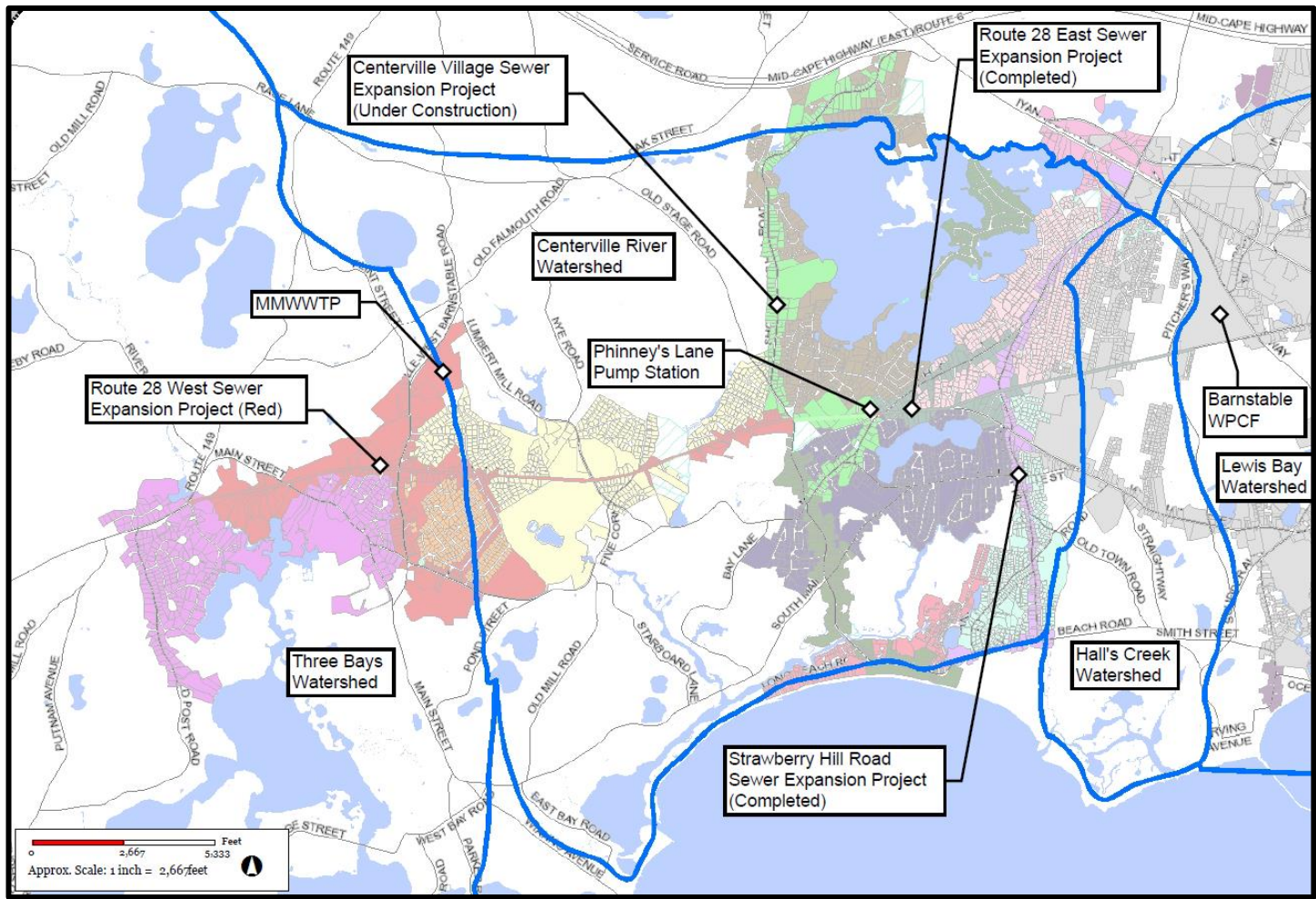
Other Goals

- **Continued pursuit of potential regional solutions**
- **Continue monitoring program**

Route 28 West Sewer Expansion Project

Project Objectives

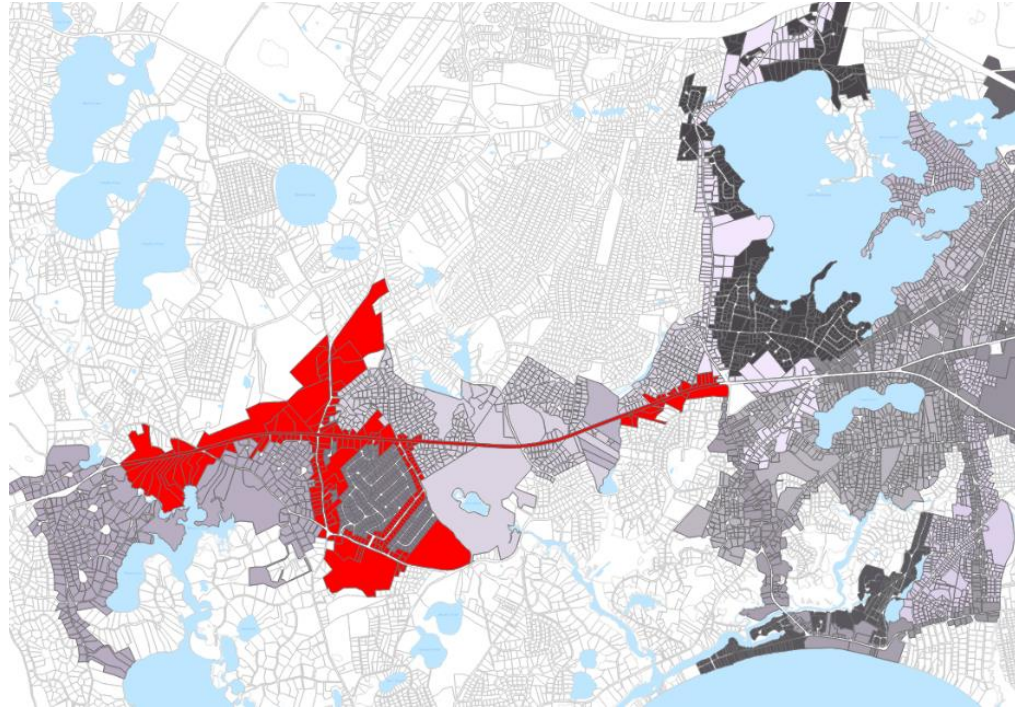
- Expand municipal sewer westerly down Route 28 from Old Stage Road to Route 149
 - Infrastructure will be the “spine” of the westerly sewer expansion, as required by the CWMP
 - Project will result in sewers reaching the heavily impaired Three Bays Watershed
 - Provides a pathway for eventual sewer expansion in Marstons Mills, Osterville and Cotuit
- Decommission the existing Marstons Mills Wastewater Treatment Plant (MMWWTP) and connect to the newly expanded municipal collection system
- **Without the infrastructure to be installed as part of this project, the westerly expansion of the municipal sewer system as required in the CWMP cannot be achieved, the TMDLs in the Three Bays Watershed cannot be met, and the MMWWTP would need to be independently upgraded**



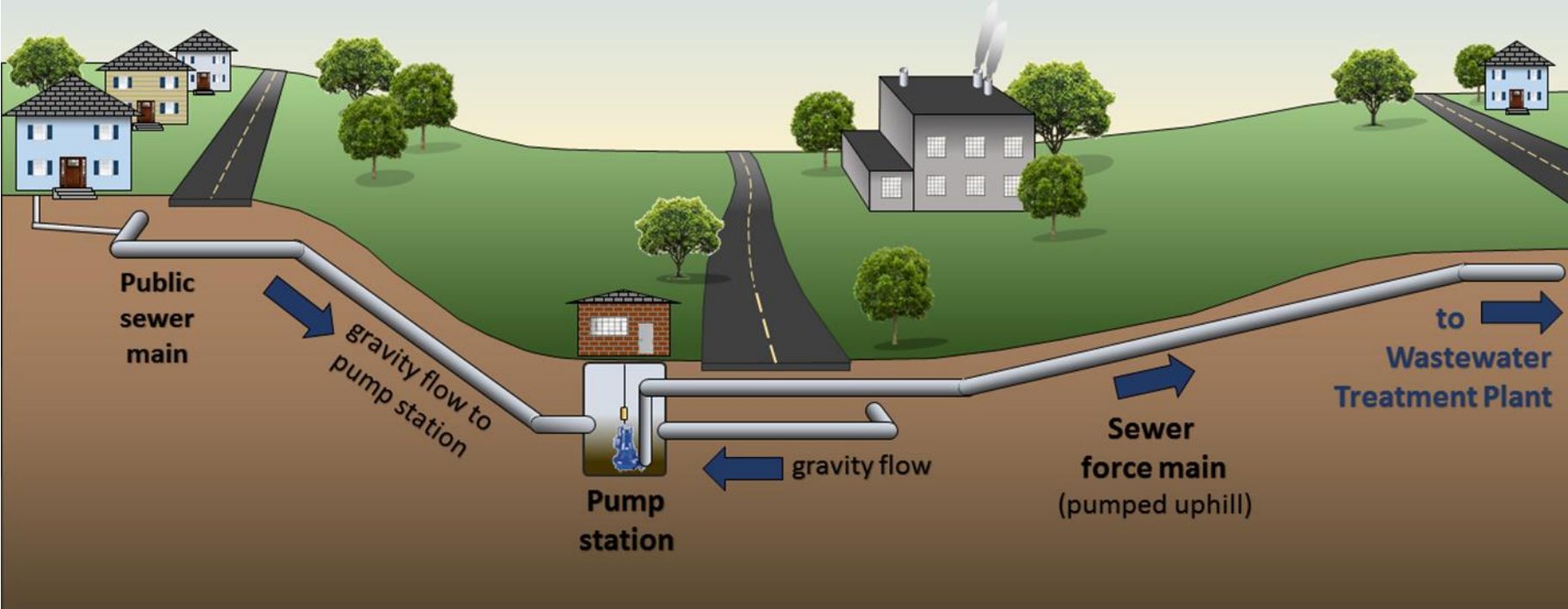
Project Route

This project will install new sewers in the following roadways:

- Route 28 from Old Stage Road to Route 149
- Osterville-West Barnstable Road from Flint Street to Bumps River Road
- Bumps River Road from Osterville-West Barnstable Road to the Cape Cod Collaborative School
- Old East Osterville Road
- Oldham Road
- Marion Way
- Marquand Drive



How the Sewer Works



Schematic Design of Sewers

13 Miles of sewer pipe to be installed

Route 28

- 8" to 30" gravity sewers at varying depth (8' to 22')
- Two sewer force mains (8" and 14")
- **Night work anticipated**

Osterville-West Barnstable Road and Bumps River Road

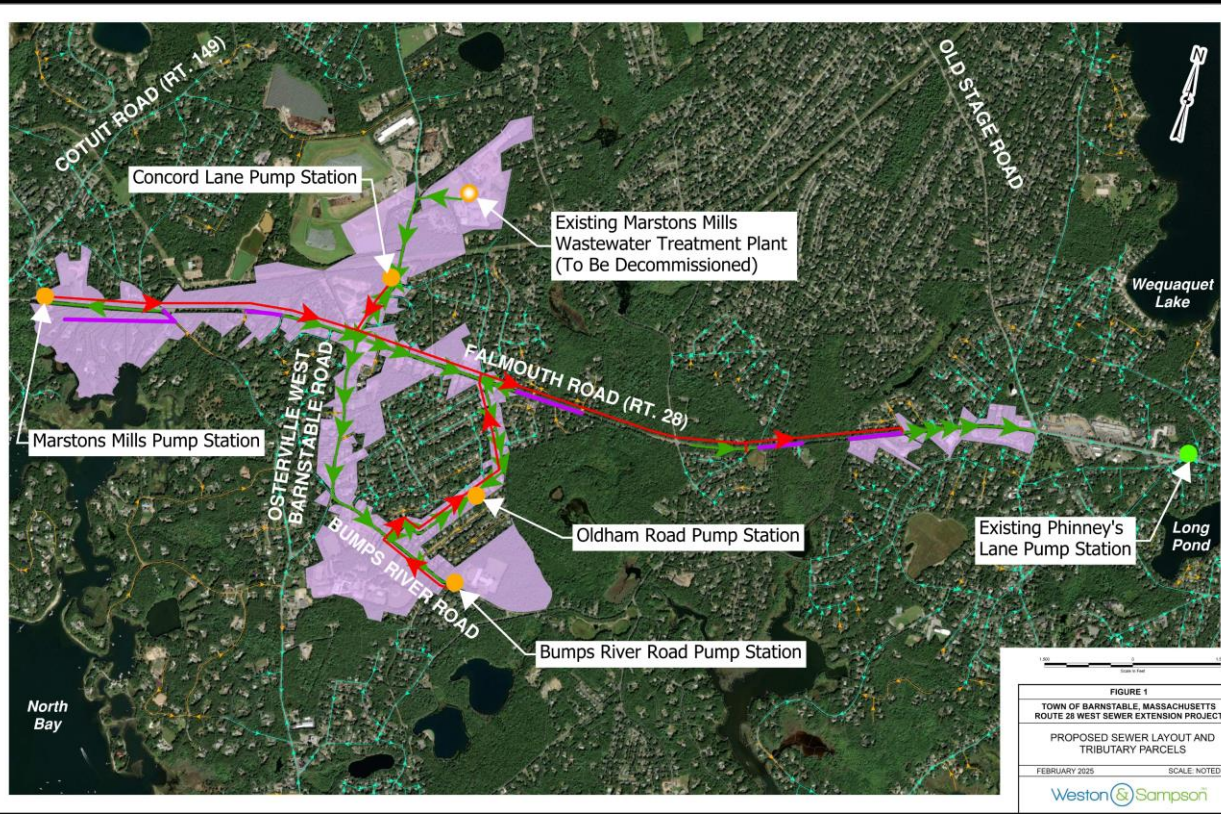
- 8" to 15" gravity sewers at varying depth (7' to 21')
- Two sewer force mains (variable sizes 6", 8" & 10")

Marian Way, Oldham Road and Old East Osterville Road

- 8" gravity sewers at varying depths (5' to 20')
- Two sewer force mains (6" and 10")

Marquand Drive

- Low pressure sewers w/ grinder pumps (due to topography)



Sewer Construction Impacts

- Sewer construction is a major infrastructure project
 - Sewer = deep excavations (Typically 8-15' deep, up to 25' deep)
- Coordinated road closures and detours necessary for public safety
 - Police details, flaggers, signage, etc.
- Trimming of trees above roadway necessary; selective removal of trees may be necessary (extent TBD as design advances)
- Noise and vibrations from construction activities
- Fences, landscaping, etc. located in the public right of way may need to be relocated
- Uneven road surfaces
- Potential temporary utility disruptions



Examples of Sewer Construction Activities



Preparation: Tree Trimming



Construction: Road Closures / Detours



Construction: Excavation & Sewer Installation



Construction: Temporary Paving



Restoration: Tree Trimming

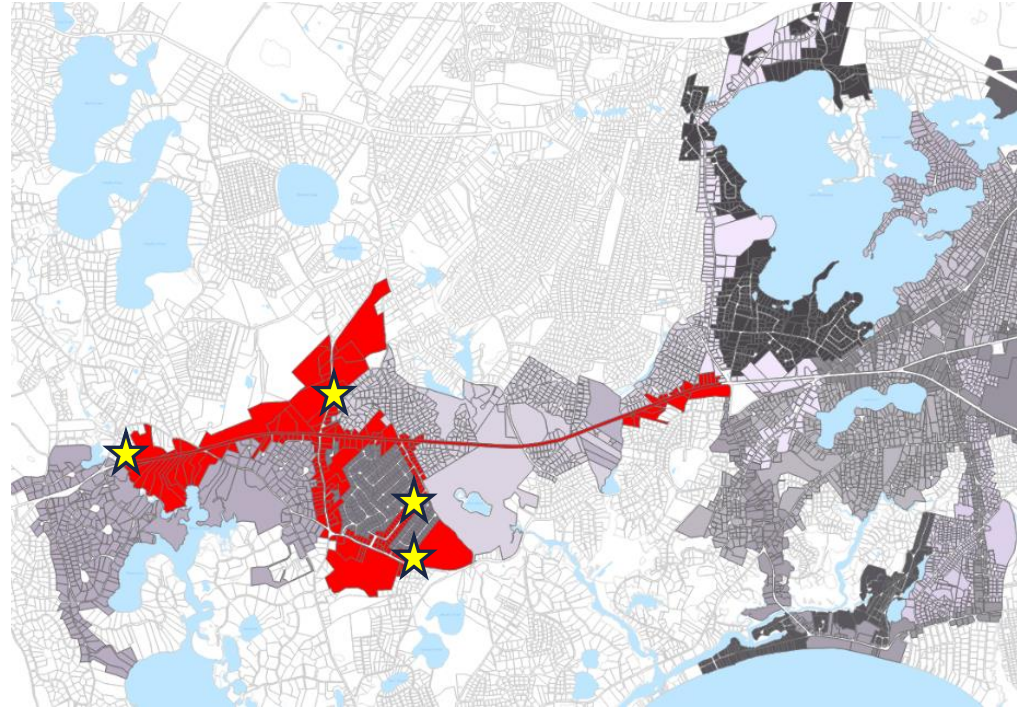
Mitigating Sewer Construction Impacts

- Work Hours:
 - Overnight construction on Route 28 expected
 - Normal working hours expected elsewhere (Typically 7:00 AM to 4:00 PM)
- No work between Memorial Day and Labor Day, unless rationale for extension
- Road closures and detours closely coordinated by DPW, BPD, Fire, and Schools
- Roadways remain accessible to local traffic and businesses
- Multiple communication platforms for traffic impacts:
 - BarnstableWaterResources.com and associated email newsletter
 - Town of Barnstable eNews
 - MyBarnstable Mobile App
 - Town of Barnstable Social Media: Facebook, Twitter, Instagram
 - Waze/Google Live Closure Map
- Construction inspectors on-site full-time during sewer construction
- Communication and coordination with impacted residents and businesses
- Restoration of public right of way (repaving, loam and seed, etc.)

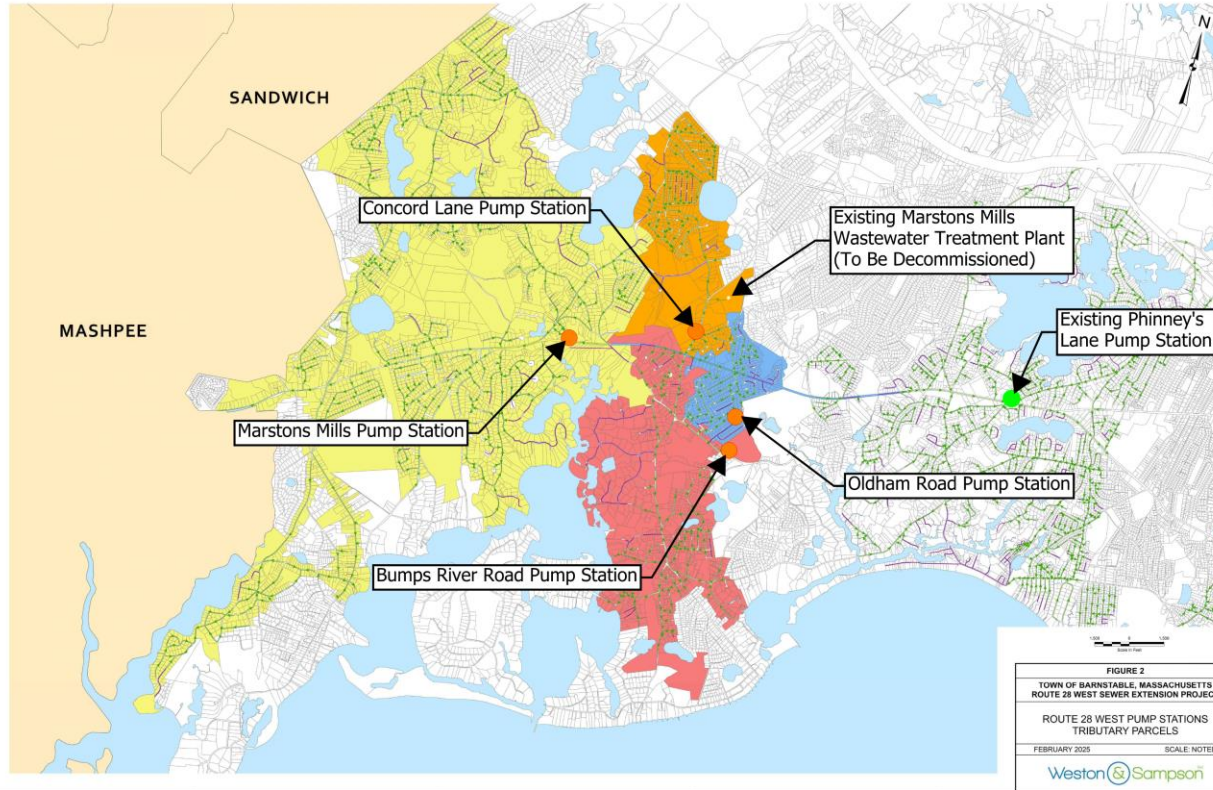
Pump Station Locations

Four sewer pump stations are necessary along this project route and are proposed at the following locations:

- Southwestern corner of the former Marstons Mills School Property
- Southwesterly corner of the Cape Cod Collaborative School Property
- A town-owned parcel located on Oldham Road (181 Oldham Road)
- Within the public right-of-way of Osterville-West Barnstable Road, across from the intersection with Concord Lane



Pump Stations - Future Service Areas



Marstons Mills Pump Station

- Suction-Lift Pump Station
- Designed to serve 3,400 parcels and 725,000 gallons per day (GPD) average daily flow (ADF) at completion of CWMP

Bumps River Road Pump Station

- Suction-Lift Pump Station
- Designed to serve 1,000 parcels and 330,000 GPD ADF at completion of CWMP

Oldham Road Pump Station

- Suction-Lift Pump Station
- Designed to serve 500 parcels and 93,000 GPD ADF at completion of CWMP

Concord Lane Pump Station

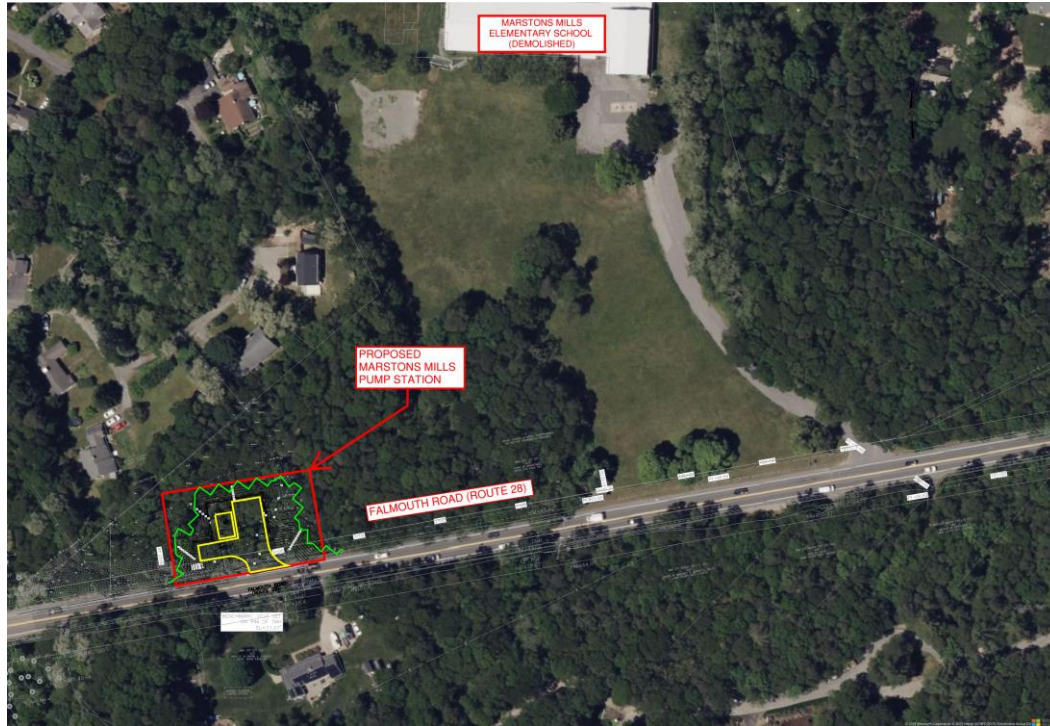
- Submersible Pump Station
- Designed to serve 620 parcels and 160,000 GPD ADF at completion of CWMP
- Will serve the flow from the to be decommissioned MMWWTP

Pump Station Operations

- Crews required to visit the pump station once a day
 - Identifiable in Town pickup truck, will consist of visual inspection
 - Pump station monitored remotely
- Periodic maintenance to service old/failing components
- Generators automatically exercised weekly for 15 minutes
- Odors and noise are generally not an issue for pump stations when properly functioning
- Landscaping is maintained by Town crews

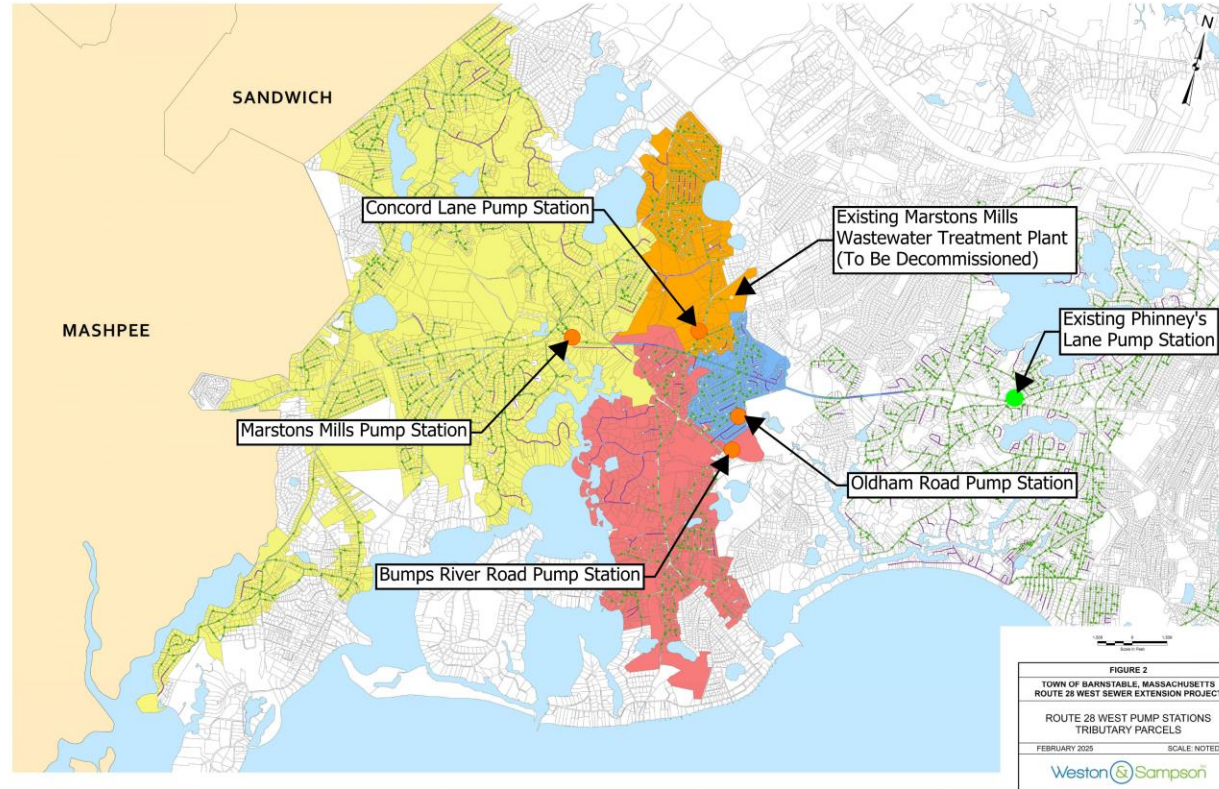


Marstons Mills Pump Station



- Second largest pump station necessary for the westerly sewer expansion
 - Recently constructed Phinney's Lane Pump Station is largest
 - Without this facility, the western sewer expansion in the Three Bays Watershed cannot occur
- Proposed on the southwestern, triangular corner of the former Marstons Mills School property
- Suction Lift Pump Station
- Includes a building similar to the Phinney's Lane Pump Station, though slightly smaller
- Driveway access off of Route 28
- Due to topography of the site, a retaining wall up to ten feet high, will be necessary
- Facility will include a backup generator, below grade utilities and landscaping.

Marstons Mills Pump Station – Future Service Area

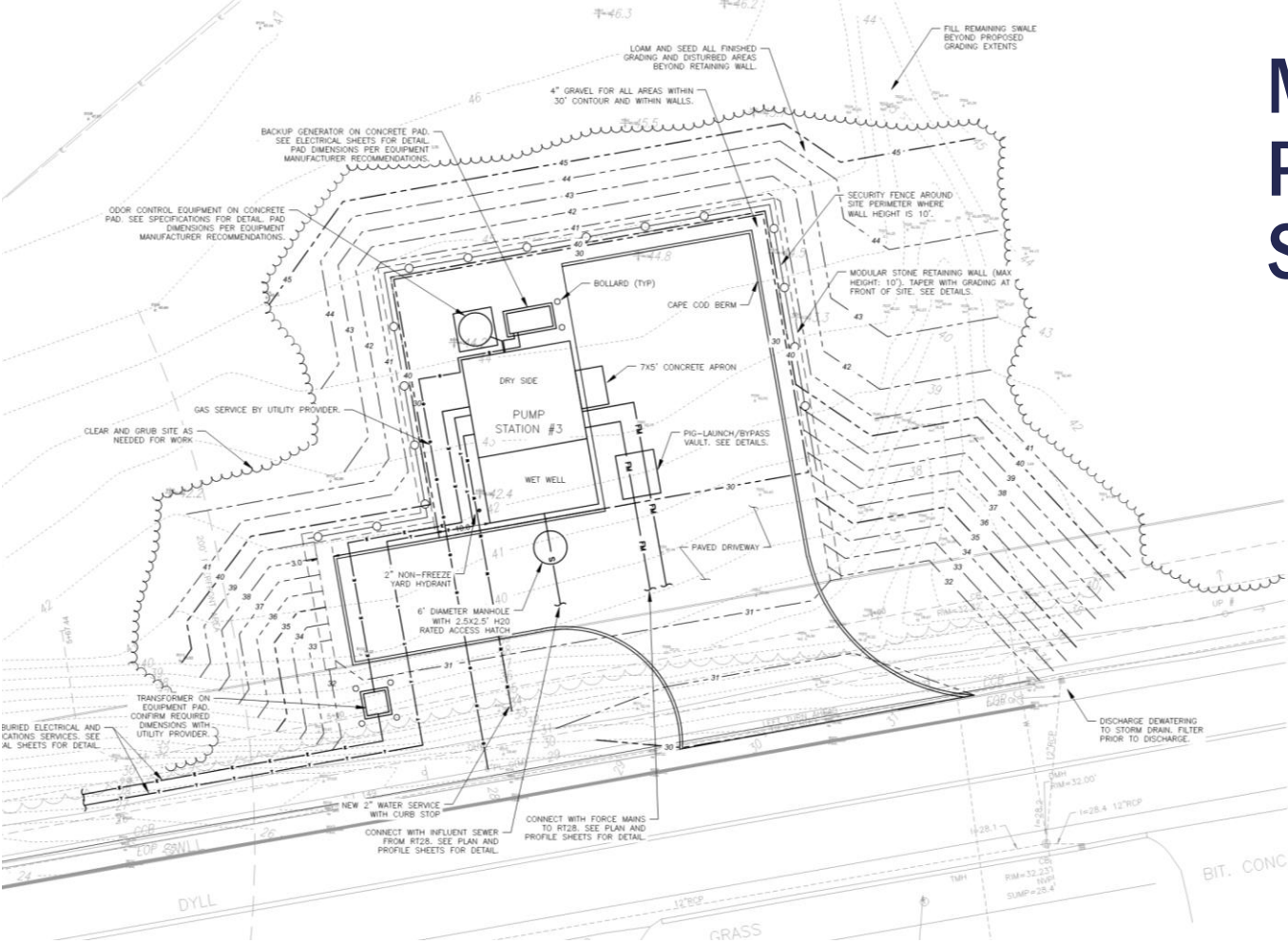


- Station service area will ultimately include all areas west, north and south of the facility, including Cotuit and the majority of Marstons Mills (Yellow area)
 - Pump station will ultimately serve approximately 3,400 parcels and 725,000 GPD ADF

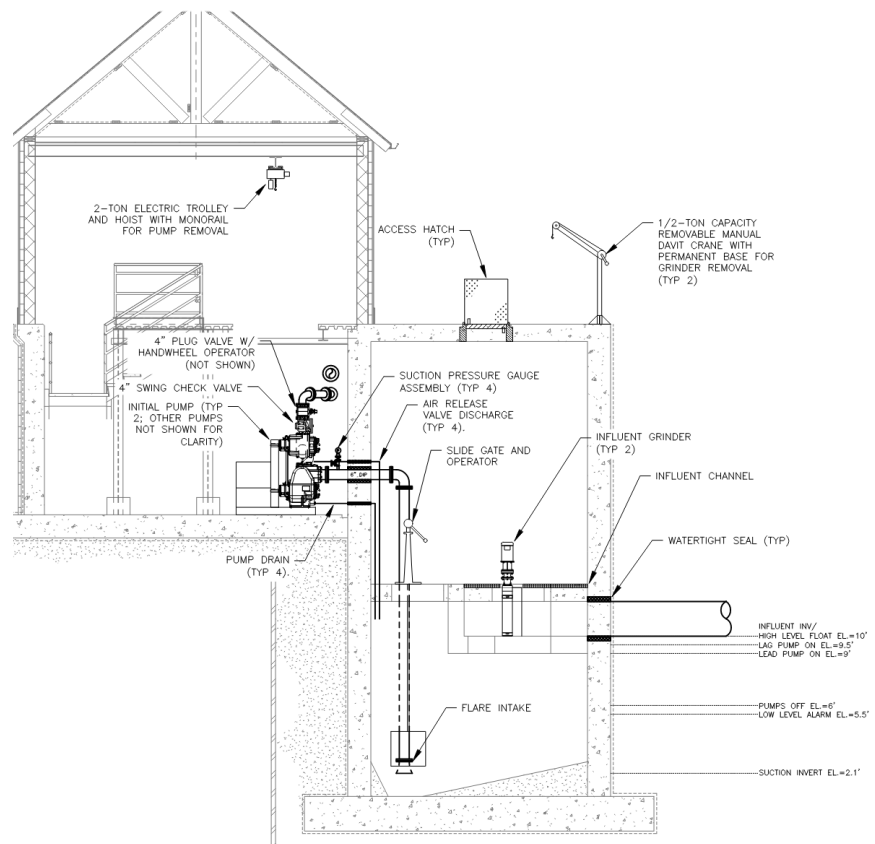
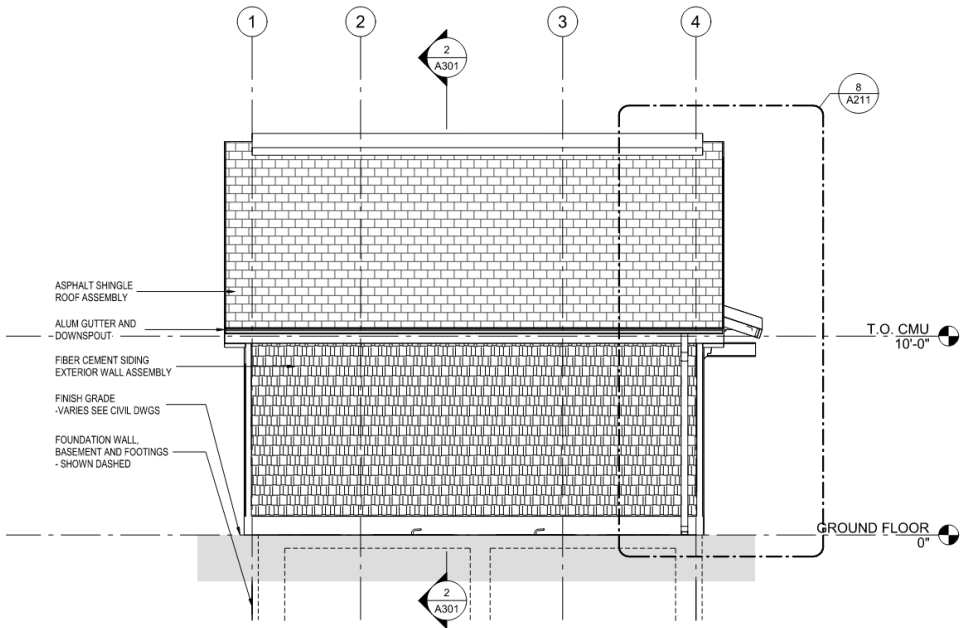
Marstons Mills Pump Station – Street View



Marstons Mills Pump Station Site Plan



Marstons Mills Pump Station Elevation and Section Views



Marstons Mills Pump Station - Rendering

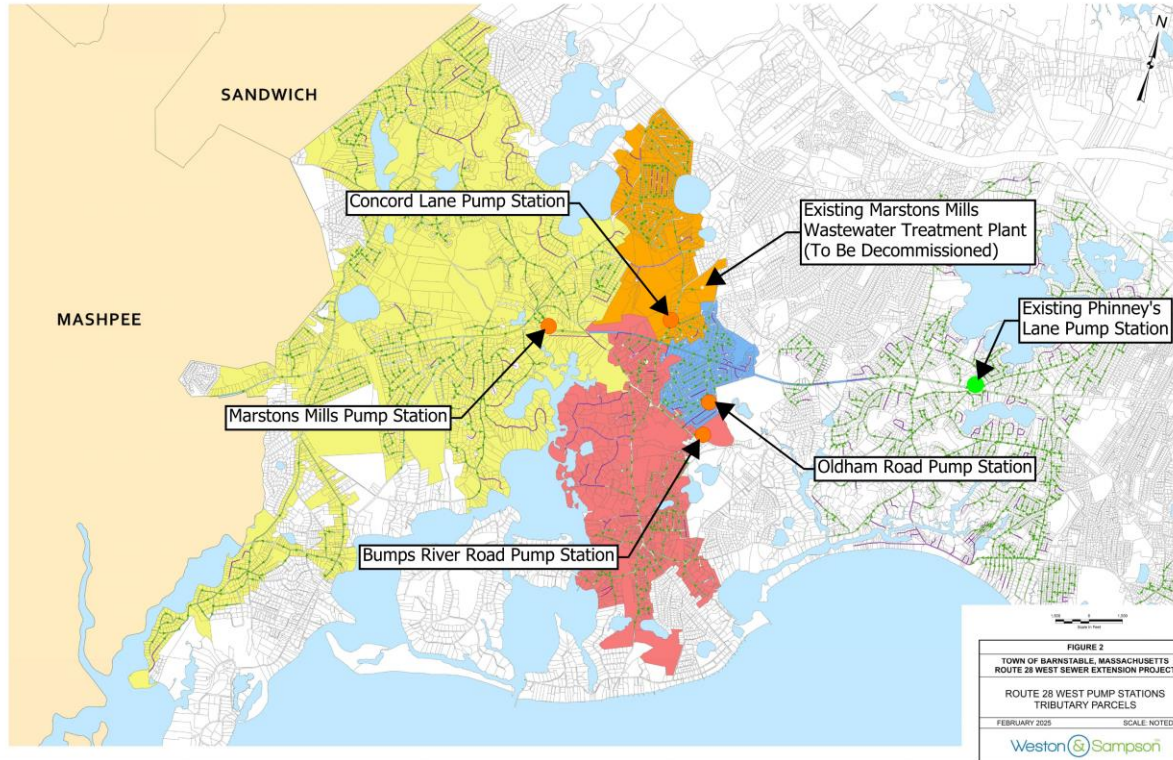


Bumps River Road Pump Station



- Southwestern corner of Cape Cod Collaborative School property (Town owned parcel)
- Suction Lift Pump Station
- Proposed sewer pump station site is approximately 4,000 SF
- Shed size building to house equipment (pumps, electrical, instrumentation)
- Building footprint approximately 13' x 16'
- Site will include driveway, backup generator, below grade utilities, and screening

Bumps River Road Pump Station – Future Service Area

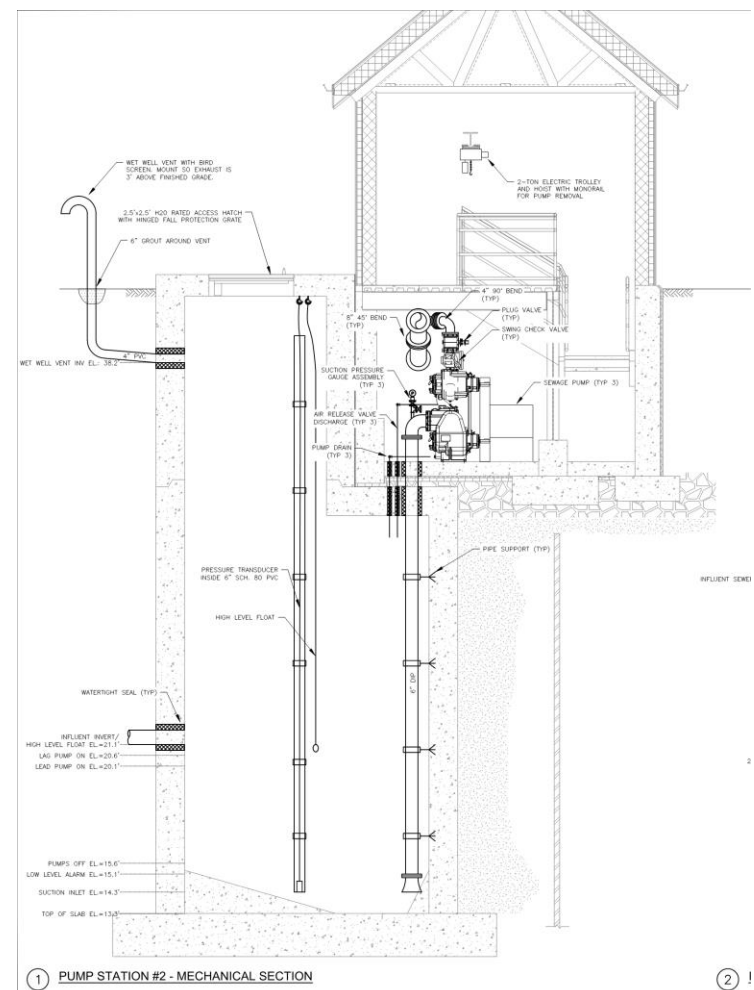
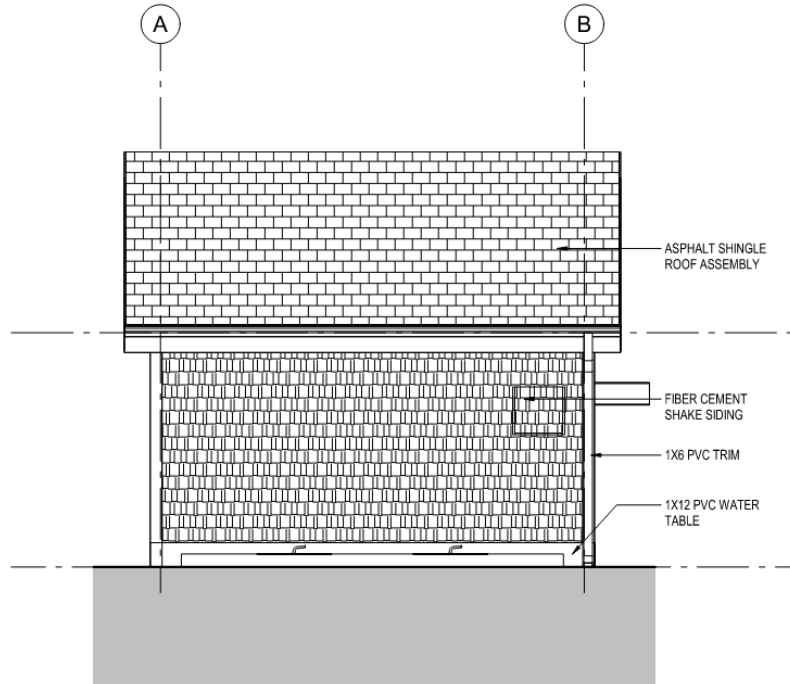


- Station service area will ultimately include Route 28 from South County Road to Osterville-West Barnstable Road and southerly into Osterville Village center (Red area)
- Pump station will ultimately serve approximately 1,000 parcels and 330,000 GPD ADF

Bumps River Road Pump Station – Street View



Bumps River Road Pump Station Elevation and Section View



Bumps River Road Pump Station - Rendering

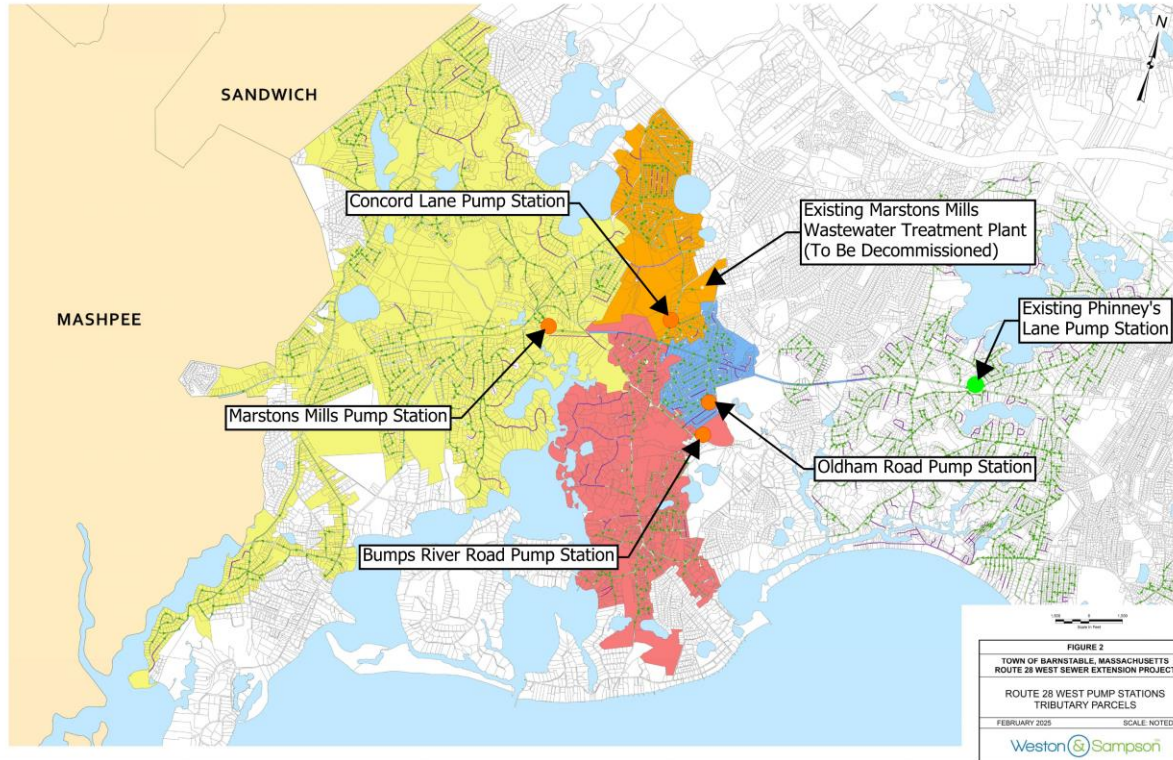


Oldham Road Pump Station



- Proposed on a Town owned parcel located at 181 Oldham Road
- Suction-lift Pump Station
- Shed size building to house equipment
- Building footprint approximately 13' x 16'
- Building approximately 23' from roadway
- Site will include driveway, backup generator, below grade utilities, and screening
- Site is designed to maximize distance from wetland resource area located on the property and abutters, to the maximum extent possible

Oldham Road Pump Station – Future Service Area

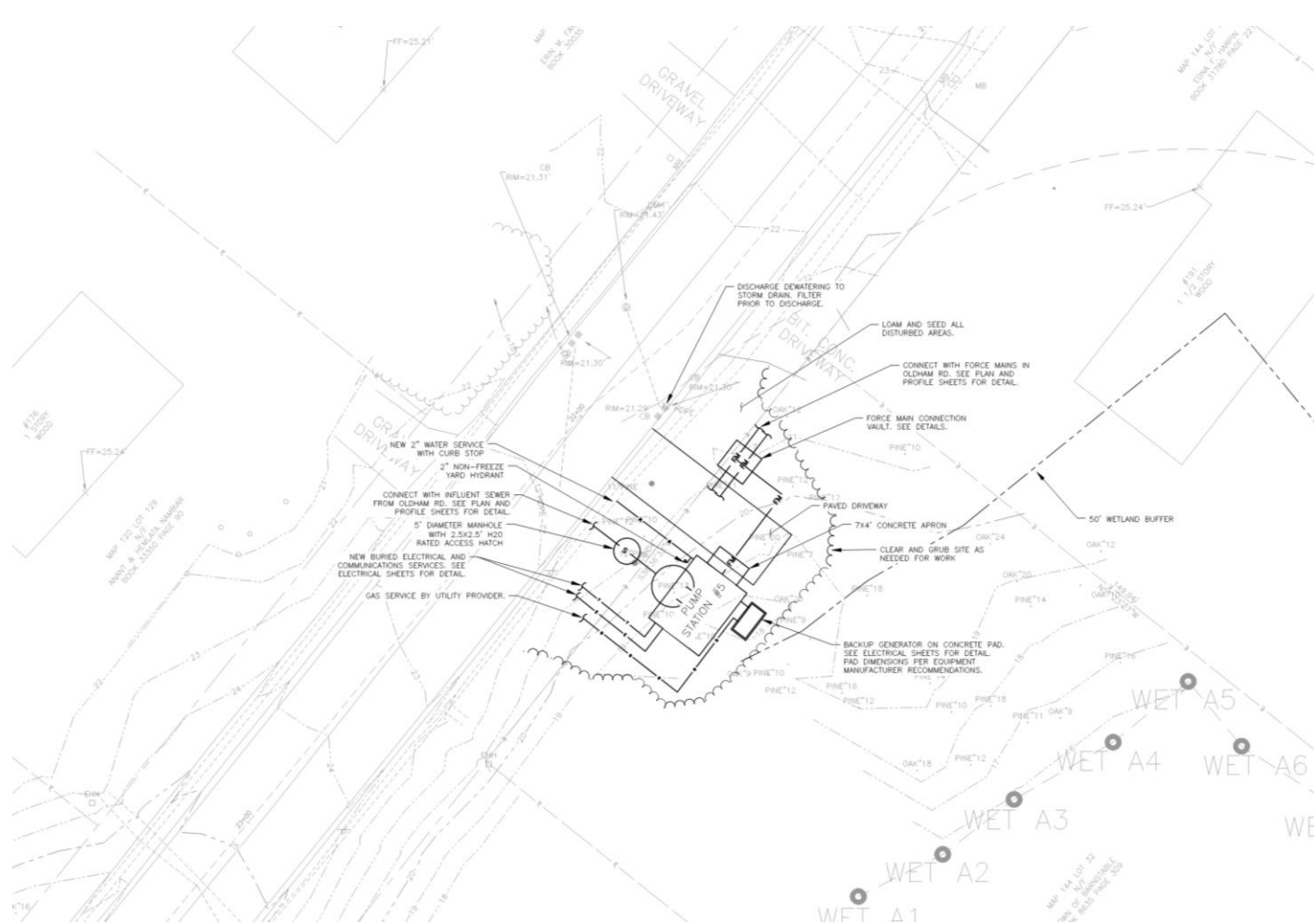


- Station service area will ultimately include Route 28 from Osterville-West Barnstable Road to Renoir Drive and the entirety of the adjacent residential areas (Blue area)
 - Pump station will ultimately serve approximately 500 parcels and 93,000 GPD ADF

Oldham Road Pump Station – Street View



Oldham Road Pump Station Site Plan



Oldham Road Pump Station - Rendering

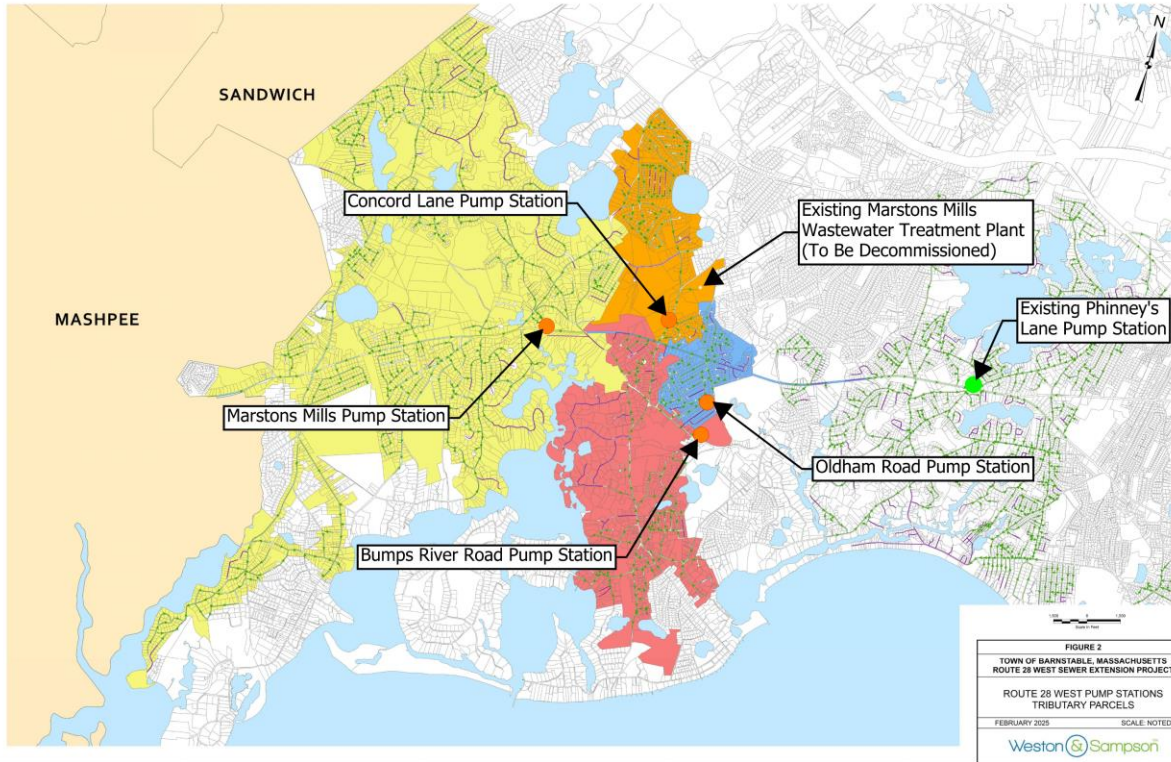


Concord Lane Pump Station



- Proposed within the public right-of-way of Osterville-West Barnstable Road, across from Concord Lane
- Submersible Pump Station
- Site will include gravel parking area, backup generator and below grade utilities
- Will serve the flow from the to be decommissioned MMWWTP

Concord Lane Pump Station – Future Service Area

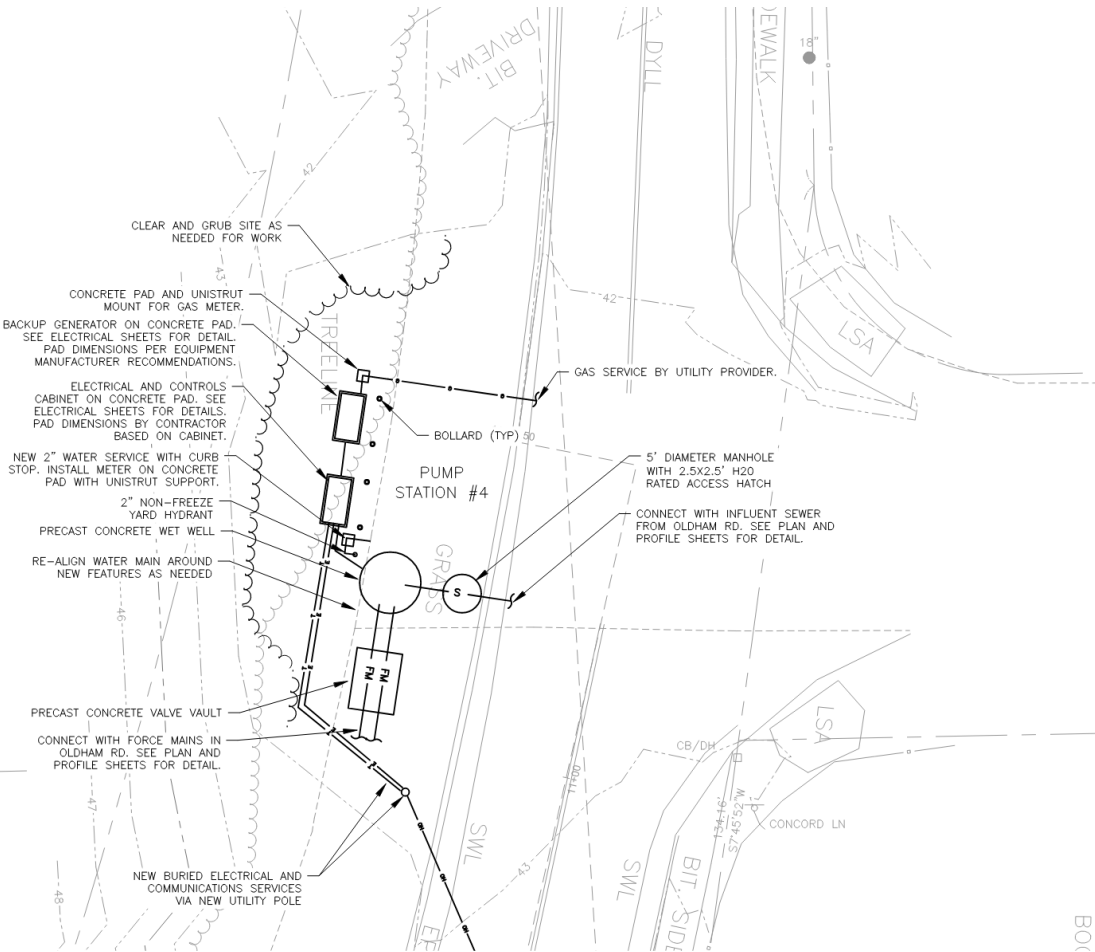


- Station service area will ultimately include Osterville-West Barnstable Road, Flint Street, portions of Route 149, and residential areas adjacent to Shubael Pond (Orange area)
 - Will serve the flow currently handled by the to be decommissioned MMWWTP
 - Pump station will ultimately serve approximately 620 parcels and 160,000 GPD ADF

Concord Lane Pump Station – Street View



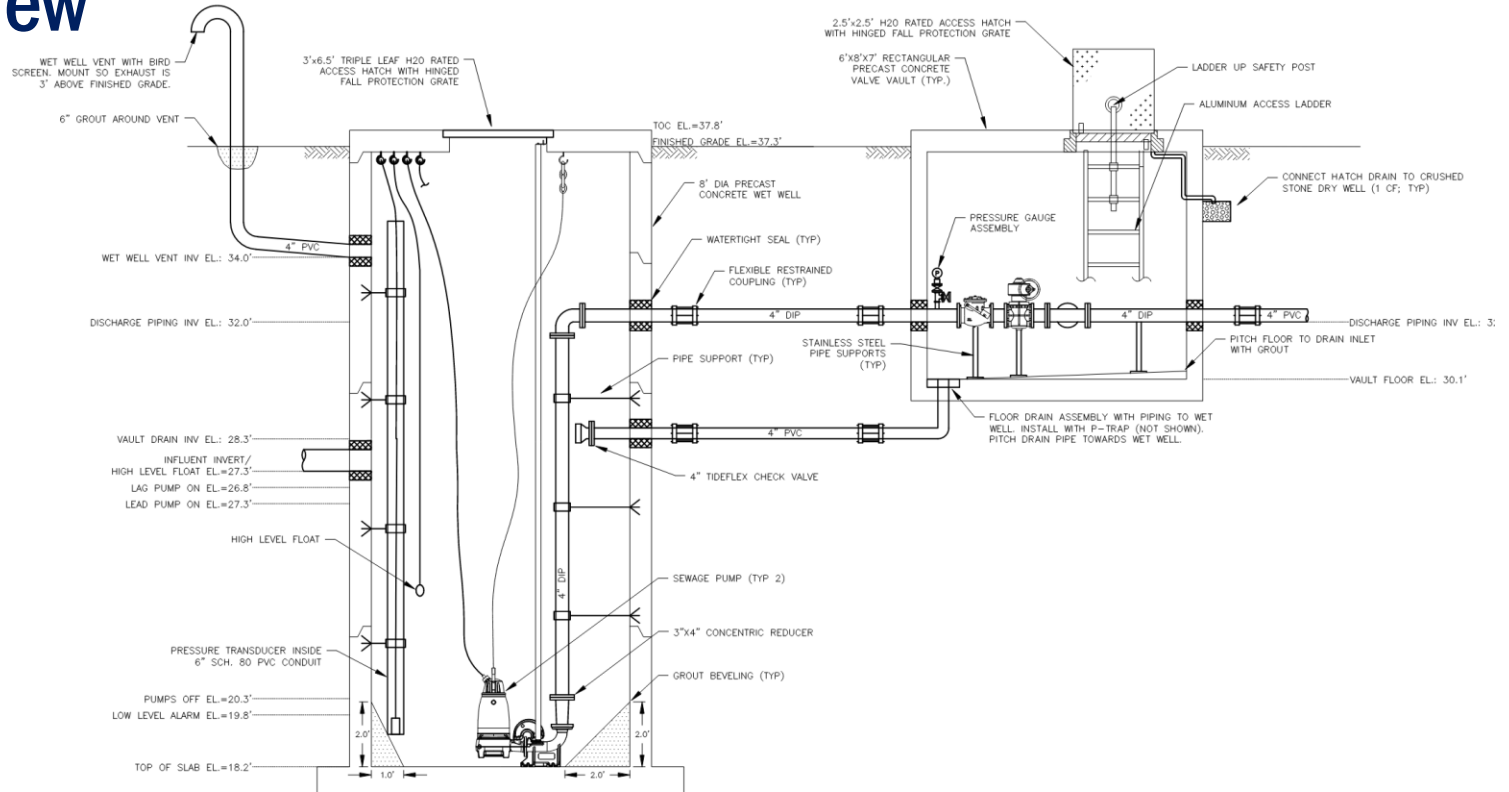
Concord Lane Pump Station Site Plan



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BOX

Concord Lane Pump Station Section View



Concord Lane Pump Station

Examples of Submersible Pump Stations in Barnstable



Strawberry Hill Road Pump Station



Rendezvous Lane Pump Station

Decommissioning of the Marstons Mills Wastewater Treatment Plant (MMWWTP)



- MMWWTP was constructed in 1993
- Currently serves Barnstable United Elementary School, West Villages Elementary School, and adjacent residential development
- Operated and maintained by the DPW Water Pollution Control Division
- Approaching the end of its design life and would require significant investment in rehabilitation to continue operations
- Permitted to treat and discharge up to 42,900 GPD
- Treated effluent discharges into nitrogen sensitive Centerville River Watershed
- Treatment at this facility is more expensive than at Barnstable WPCF
- Recommended to be decommissioned, connected to the new sewer system, and treated at Barnstable WPCF

Decommissioning of the Marstons Mills Wastewater Treatment Plant (MMWWTP)



- Install a new sewer to intercept existing flow into the MMWWTP and divert it to the new sewers in Osterville-West Barnstable Road
- Once new sewers are completed, MMWWTP would be decommissioned
- Work on school property to be restricted to summer months and be coordinated with School Dept
- MMWWTP building anticipated to be repurposed for school use (likely storage)

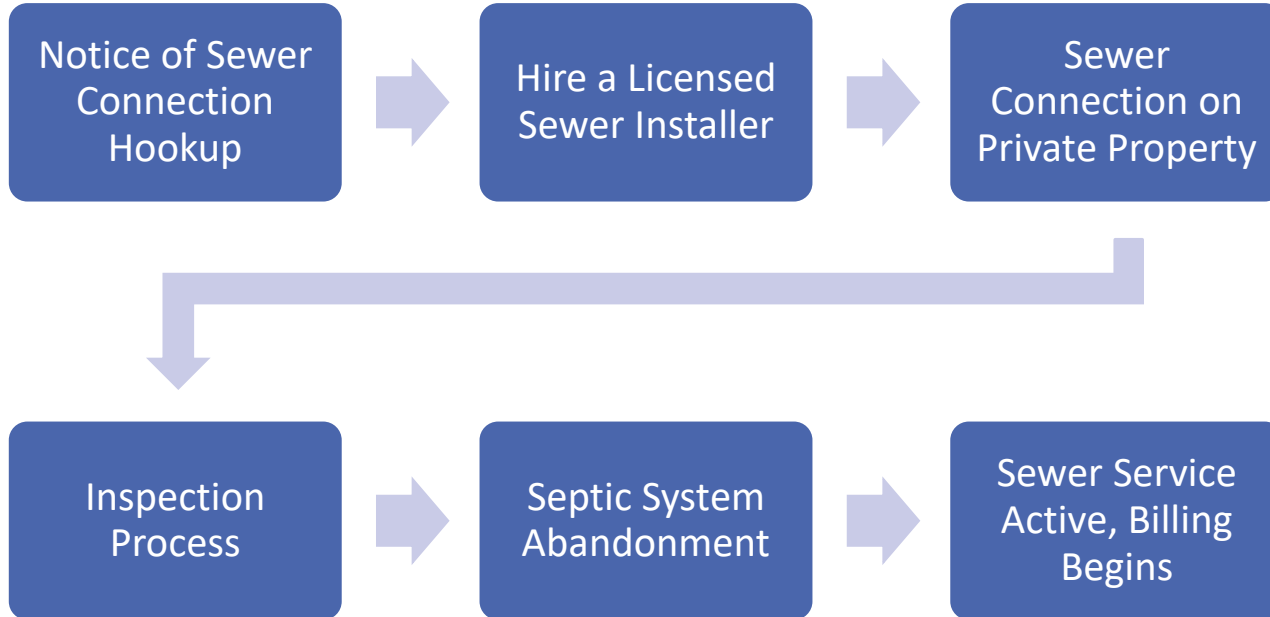
Route 28 West Sewer Expansion Project Funding

- Anticipated construction cost = \$59,650,000
 - Appropriated in FY25 Capital Budget
- Project ranked #3 on the 2024 Clean Water State Revolving Fund (CWSRF) Intended Use Plan
 - Low interest loan (1.5% for Barnstable as a Housing Choice community)
 - Loan forgiveness subsidy (% TBD)
 - Anticipate additional subsidy from Cape Cod and Islands Water Protection Fund (25% in previous years)
- Financial updates provided to Town Council by Finance Director Mark Milne include:
 - 2023 CWMP Program Financial Update - <https://www.youtube.com/watch?v=h9i-vV1onx4&t=7589s>
 - 2024 Town Financial Update - <https://www.youtube.com/watch?v=0krYFHuC9E0>

Anticipated Schedule & Next Steps

- Finalize Project Design: Winter/Spring 2025
- Bidding for Construction: Spring 2025
- Award Construction Contract: Summer 2025
- Pre-Construction Outreach: Summer 2025
 - Includes Project Notification Letter and Sewer Connection Form sent to all property owners identified within Project Route, sent via USPS Certified Mail
 - Additional in-person outreach conducted as needed
 - Pre-Construction Public Informational Meeting
- Commence Construction: Fall 2025
- Target for Construction Completion and Sewer Connection Availability: 2028

Sewer Connection Process



Anticipated Sewer Connection Costs

Each property owner receiving sewer service will be responsible for (3) three costs:

1. Sewer Assessment

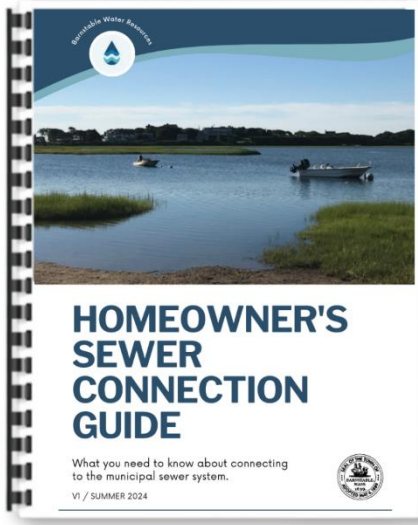
- Voted on by Town Council in July 2021 to be capped at \$10,000 per Sewer Unit
- A **Residential Sewer Unit** is defined as the number of dwelling units on a residential lot
- A **Commercial Sewer Unit** is defined by the amount of sewer flow on the property based on Title 5 of the State Environmental Code, 310 CMR 15.203, system sewage flow design criteria; whereby every 330 gallons per day of flow equals one (1) sewer unit
- Can be financed as part of your Quarterly Tax Bill via the Treasurer/Tax Collector's Office with a +2% interest rate above Town's current borrow rate

2. Sewer Connection on Private Property

- Mandated by Barnstable Board of Health
- Property owner to hire a licensed sewer installer to complete connection on private property
- Costs will vary on a property-by-property basis
- Residential connection costs can be financed through the Barnstable County Cape Cod Aquifund
 - 0% and 2% interest rate loans available for qualifying NEW sewer connections
 - 4% interest rate loans available for qualifying condominium and apartment communities

3. Utility Billing

- Based upon water usage
- Billed at same frequency as you receive your water bill



Available for download at
BarnstableWaterResources.com

Project Contacts

- **Project Contacts**

Griffin Beaudoin, P.E. at Griffin.Beaudoin@town.barnstable.ma.us

Town Engineer, Barnstable Department of Public Works

Tyler Gilman, P.E. at Tyler.Gilman@town.barnstable.ma.us

Project Manager, Barnstable Department of Public Works

Ansley deMerlier at Ansley.deMerlier@town.barnstable.ma.us

Sewer Connection Program Manager, Barnstable Department of Public Works

Kelly Collopy at Kelly.Collopy@town.barnstable.ma.us

Communications Manager, Barnstable Department of Public Works

Christopher Gadd at Christopher.Gadd@town.barnstable.ma.us

Communications Assistant, Barnstable Department of Public Works

- **Inquiries or Public Comment**

Email: WaterResources@town.barnstable.ma.us

Phone, DPW Administration: 508-790-6400

**Financial Questions:
Please contact the
Treasurer's Office at 508-862-4054**

**Septic System Questions:
Please contact the
Health Division at 508-862-4644**

**Review Project Materials and
CWMP Information at:
www.barnstablewaterresources.com**



Questions?