



Brookfield, CT Sanitary Sewer Extension Project

Dean Road and Pocono Road Area

November 21, 2024 Public Information Meeting



Presentation and Report Outline

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2. Septic System Concerns
3. Wastewater Management Alternatives
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5. Design Activities
6. Cost Analysis
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Project Background and Study Area



Project Background and Study Area

- Current Brookfield Sewer Collection System:
 - 17 miles gravity sewers; 14 pump stations, 7 miles force main – Approximately 2,300 connected customers
 - Treatment at Danbury Water Pollution Control Facility (WPCF)
- Dean & Pocono Roads area includes approximately 91 residential properties and the Municipal Center
- 2020 Dean & Pocono Roads *Wastewater Management Plan* study recommended sanitary sewer extension





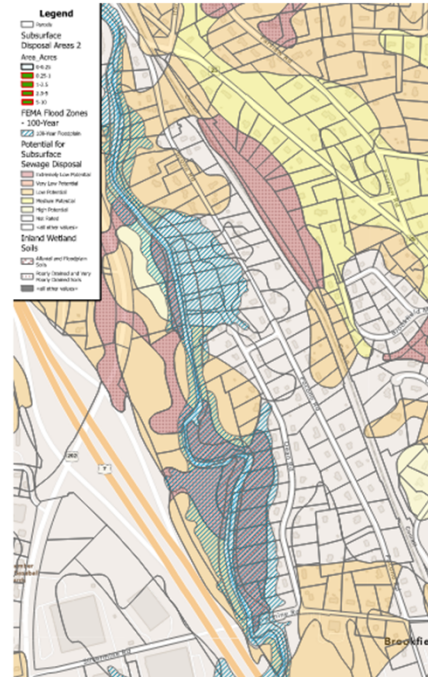
Septic System Concerns



Septic System Concerns

■ Soil and Groundwater Conditions

- Approximately 50% of parcels are in the floodplain; numerous parcels with wetlands present
- National Resources Conservation Service (NRCS) classification of soils in the area are “low, very low, or extremely low” regarding potential for subsurface sewer disposal
 - Low percolation rate, seasonal high groundwater table, flooding concerns
 - Soil and ground conditions not conducive to nutrient removal from septic systems
- Portions of Still River considered Impaired as Habitat for Fish, Aquatic Life, Wildlife (2022 EPA List of Impaired Waters for Connecticut)



Septic System Concerns

- Septic System Records and Age
 - Brookfield Board of Health Data on approximately 57% of properties in the Dean and Pocono Roads Area (43% no information)
 - Age information on approximately 34% of properties
 - Of those: 65% greater than 20 years old, 35% greater than 30 years old, and 16% greater than 40 years old
 - Many properties constructed in the 1960s – some may still have original systems
 - Typical septic system life 30 to 40 years when constructed in good conditions
- Area reliant on drinking water wells - separation distance constraints



Wastewater Management Alternatives



Wastewater Management Alternatives

- Sanitary Sewer System Extension
 - Traditional gravity sewer system
 - All gravity connections or limited number of private grinder pumps
 - Brookfield owned/maintained community pump station where topography requires
 - Low-pressure sewer system where every property is served by a grinder pump
- Septic System Maintenance
 - Maintain Septic Systems with Program of Inspections and Improvements as Needed

Traditional Gravity Sewer with All Gravity Connections or Limited Number of Private Grinder Pumps

- All septic tanks would be replaced with a connection to a gravity sewer
 - Majority gravity connections; some private grinder pumps depending on elevation of lowest properties
 - Requires one Brookfield owned/maintained community pump station to serve area
- Pros
 - Low energy requirement; gravity conveys flow during power outages
 - Least amount of long-term system maintenance
 - Can handle seasonal flow fluctuations
 - Simple to expand to adjacent areas
 - Brookfield operations staff familiar with infrastructure
- Cons
 - Topography may result in deep sewers
 - Potentially high construction costs associated with dewatering and bedrock removal
 - Preliminary geotechnical explorations indicate shallow groundwater
 - Need to site pump station
 - Potential for infiltration into gravity pipes as system ages

Low-Pressure Sewer System

- All septic tanks would be replaced with a grinder pump; system is pressurized
 - One grinder pump per residential property; commercial properties may need multiple pumps
 - Project area is pumped to an existing gravity sanitary sewer
- Pros
 - Typically less expensive construction than gravity - smaller diameter pipes at shallower depth
 - Piping has fused joints; more watertight than gravity sewer, limiting future concerns about infiltration
 - Easily service areas with very flat or undulating topography
 - Shorter construction duration and less disruption
 - No need to site Brookfield owned/maintained pump station
- Cons
 - Requires a mechanical component (pump) at every property
 - Higher energy use compared to gravity system
 - Requires specialized operator training for system and regular maintenance of grinder pump units (whether by homeowner or Brookfield WPCA)
 - More sensitive to wastewater flow fluctuations
 - Prolonged power outages can lead to backups where standby power is not provided

Septic System Maintenance/ Upgrades/ Replacement

- Continued use of septic systems throughout study area
- Systematic program of inspection and improvements (possibly by Brookfield Health Department, not Brookfield WPCA)
- Pros
 - No capital construction project for the Brookfield WPCA
 - No/low disruption to roads and low construction traffic
 - Some systems compliant, would not need short-term improvements
 - No annual sewer user fees (though there is a cost for pumping and inspection program)
 - No change in practice for homeowners (other than systematic inspection program)
- Cons
 - Similar potential for failure as current systems based on existing ground conditions and system age
 - Engineered and elevated/mounded septic solutions raise the system replacement cost
 - Areas with poor soils, presence of wetlands, flood hazards, shallow groundwater, and those reliant on wells for water supply would remain areas of environmental concern
 - Life cycle costs will remain the responsibility of property owners

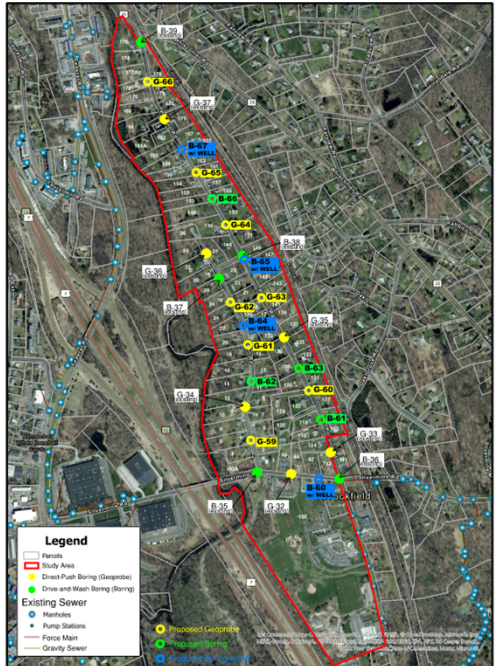


Recent Activities and Funding



Survey and Geotechnical Explorations

- Survey and Wetlands Delineation
- Geotechnical Investigations
 - 13 borings including 4 groundwater monitoring wells
 - 14 geoprobes with environmental sampling
 - Confirmed shallow groundwater through much of the study area (4' to 5' deep typical)
 - Laboratory analysis for soil handling and excavation support requirements



Funding to Date

- Study Phase including recent survey and geotechnical work funded with 55% Planning Grant from CT DEEP Clean Water Fund
- Design Phase being funded with \$300K Long Island Sound Futures Fund (LISFF) grant from the National Fish and Wildlife Foundation (with \$75K match by BWPCA)
 - "Project will produce a pathway to improve water quality by reducing bacteria, nitrogen and phosphorus into the Still River and Long Island Sound"

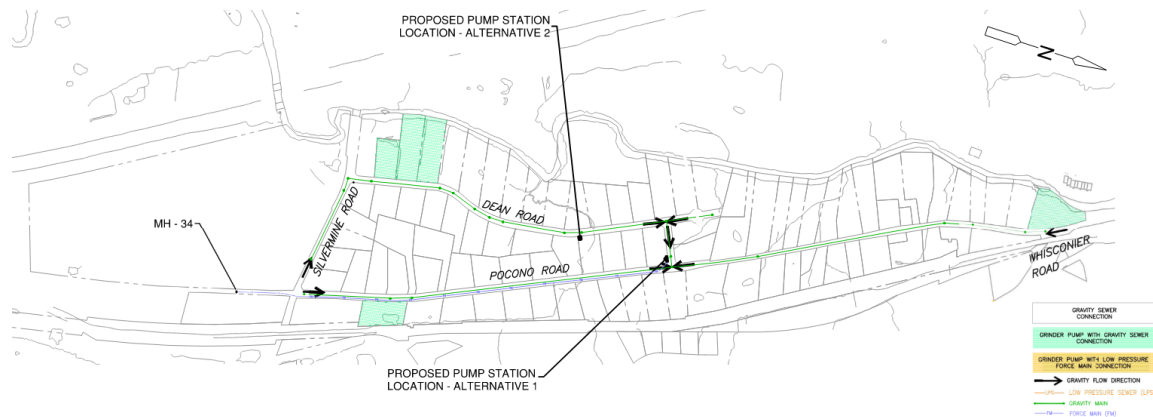


Design Activities



Gravity Sewer with One Pump Station

- Majority of homes would connect by gravity; few low-lying parcels likely to need grinder pump
- Two possible locations for Brookfield WPCA Pump Station (outside of flood plain)
- Connect to existing gravity sewer on Pocono Road



Low-Pressure Sewer System

- All properties will receive their own grinder pump
- Small-diameter low-pressure sewers will be installed approximately 5 feet below ground surface
- Connect to existing gravity sewer on Pocono Road



Overall Design Activities

- Design underway for both the gravity sewer and low-pressure sewer options
- Preparation of design drawings including finalizing alignment, slope, depths, utility crossings, connections to each property
- Evaluation of constructability requirements including excavation support, soil handling and dewatering
- Design of pump station including site layout and screening, mechanical, electrical, control equipment
- Local permitting
- Updating Opinions of Probable Construction Cost (OPCCs)
- Contract and bidding documents including multiple alternatives



Cost Analysis



Dean and Pocono Roads Area – Life Cycle Cost Summary

- 50-year Life Cycle costs include both Brookfield WPCA and residents' costs
 - Initial Project “Capital” Costs include:
 - Engineer’s OPCC: sewer infrastructure construction (pipes/MHs in road; stubs to property line; purchase of grinder pumps) including labor, equipment, materials, contractor general conditions, overhead and profit, construction estimating contingency
 - Escalation to end of 2025, engineering and implementation costs, and project contingency
 - Life Cycle (50-year) Costs include:
 - Capital project costs outlined above (20% CWF grant assumed for sewer projects)
 - Gravity sewer system expected life >50 years (salvage value not credited); pump station equipment replacement every 20 years; grinder pump replacement every 15 years
 - Approximate septic life 30 to 40 years (3% replaced per year) at \$35,000 each replacement
 - For septic option, \$400 every 3 years for tank pumping and \$600 every 5 years for inspection program
 - For sewer options, user bill of \$520 per year and average of \$10,000 per property to connect to the system
 - Utility power costs for Brookfield WPCA pump stations and grinder pump electricity at \$0.25/kWh
 - 4% annual escalation; 2023 EPA discount rate of 2.5% for present value calculation

Dean and Pocono Roads Area– Life Cycle Cost Summary

Alternative	Initial Project Capital Cost (\$)	Initial Project Capital Cost (\$) (after 20% CWF Grant)	50 Year Estimated Life Cycle Cost	Approximate Annual Cost, \$/year per property
Dean and Pocono Alternative 1 Gravity Sewer with One BWPCA Pump station	\$6,700,000	\$ 5,400,000	\$ 9,700,000	\$ 2,100
Dean and Pocono Alternative 2 Low-Pressure Sewer System	\$3,400,000	\$ 2,700,000	\$ 9,200,000	\$ 2,000
Dean and Pocono Alternative 3 Septic System Maintenance/ Upgrades/ Replacement	n/a	n/a	\$ 9,300,000	\$ 2,000

- Overall life cycle costs +/- 10 % for all options
 - Septic System Maintenance not recommended due to poor soils, shallow groundwater, and reliance on drinking water wells
- Capital costs being refined as part of sewer extension design process
- **Additional grants would lower capital costs**
 - Design currently being funded with Long Island Sound Futures Fund (LISFF) Grant
 - BWPCA applied for LISFF Grant towards construction
- BWPCA evaluating cost and financing options



Schedule and Next Steps



Schedule and Next Steps

- Submitted application for LISFF grant for construction phase (up to \$1.5M)
- Complete planning phase (survey, geotechnical and environmental evaluations) anticipated before end of 2024
- Complete design- anticipated by July 2025
- Future public meeting in spring 2025: updated costs, grant status, and public input





Public Comments and Discussion

