



Ridgefield Water Pollution Control Authority

# Phase 1 & Phase 2 Wastewater Facilities Plan

## Public Hearing

May 3, 2017

AECOM

# Outline

- **Introduction**
  - WPCA Function and Responsibilities
  - Facilities Plan Drivers & Objective
  - Sewer District Service Areas
  - District 1 South Street WWTF & District 2 Route 7 WWTF
- **Facilities Planning Approach and Recommendations**
- **Project Estimated Cost and Funding**
- **Schedule**
- **Next Steps**
- **Comments**





# WPCA Function and Responsibilities



From the Town Charter:

- “The WPCA shall be responsible for supervision of the Town's sewer plants”.
- “The WPCA shall formulate and approve a fee schedule”.
- “The WPCA shall formulate and periodically update a water pollution control plan for the Town. Such plan shall designate and delineate the boundary of: areas served by municipal sewerage systems; areas where sewerage facilities are planned and the schedule of design and construction anticipated or proposed; areas where sewers are to be avoided; areas served by community sewerage systems not owned by the Town and areas to be served by any proposed community sewerage system not owned by the Town”.

# Facilities Plan Drivers

- **National Pollutant Discharge Elimination System Permit**
  - State (DEEP) issues Town permits for treated effluent discharge under Federal Clean Water Act
  - South Street WWTF
    - 3.5 mg/L Total Nitrogen annual target concentration
    - 0.06 mg/L Total Phosphorus seasonal average (April-October)
  - Route 7 WWTF
    - 1.0 mg/L Total Phosphorus seasonal average (April-October)
- **Aging Systems and Equipment**
  - South Street WWTF
    - Last major upgrade in early 1990
    - Equipment at or approaching end of useful life
  - Route 7 WWTF
    - Majority of equipment original from 1985
    - Equipment at end of useful life



# Wastewater Facilities Plan Objectives

- Assess current conditions and identify upgrade needs
- Develop recommended plan to address wastewater needs through 2035
- Meet more stringent nitrogen and phosphorus limits
- Identify required capital improvements
- Estimate cost and prepare implementation schedule

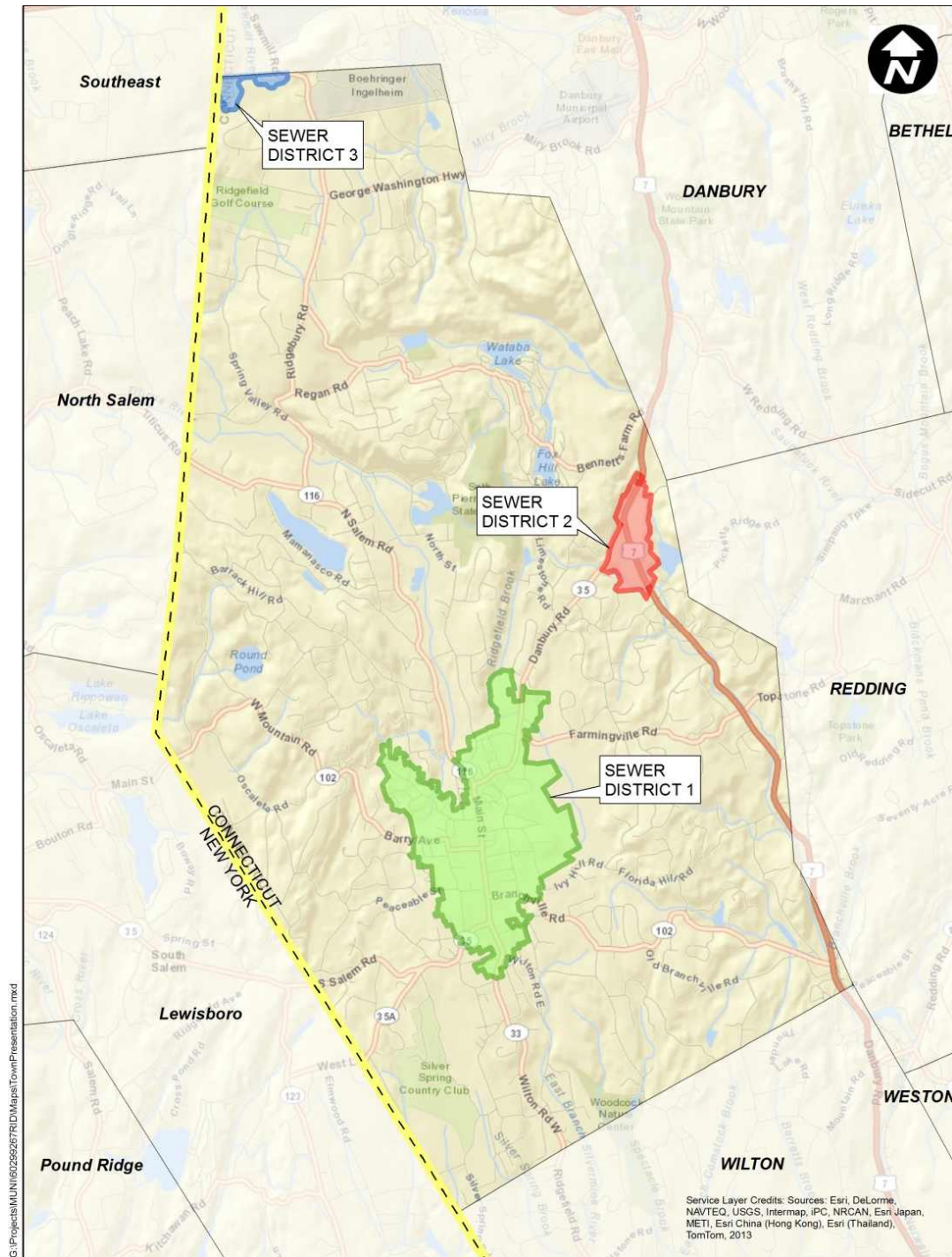


# Why Undertake Project Now (Why Do We Have To Do It)?

- New NPDES permits have compliance schedules
- Aging equipment runs 24/7 in damp, corrosive, and abrasive conditions
- Decreased reliability and increasing operating costs
- Increase energy efficiency
- Improve water quality



# Town Sewer Districts





# District 1 – Collection System

90,000 feet of gravity sewers

Serves the village and downtown

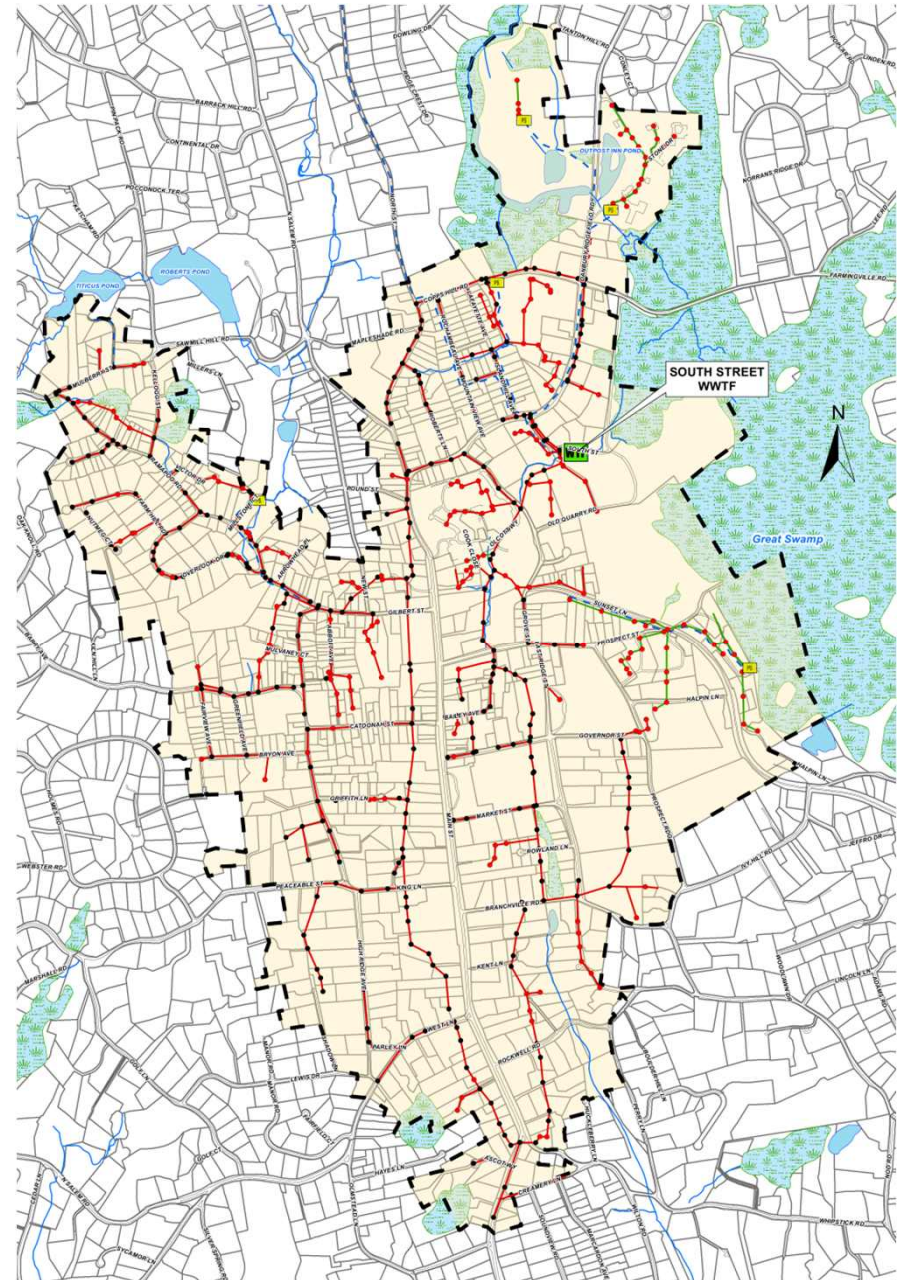
## Six Pump Stations

- South Street WWTF Influent PS
- Copps Hill PS
- Ramapoo Road PS
- Quail Ridge PS
- Fox Hill PS
- High School/SR Middle School PS

Oldest sewers date from early 1900's – various pipe materials

System flows affected by precipitation and groundwater

Conveys wastewater to the South Street Wastewater Treatment Facility (WWTF)





# District 1 – South Street WWTF

Design capacity:

- Average daily flow: 1.0 mgd

Provides secondary treatment and partial nitrogen and phosphorus removal

Discharges treated effluent to the Great Swamp (headwaters of the Norwalk River)

Last major upgrade 1990



## District 2 – Collection System

6,000 feet of gravity sewers

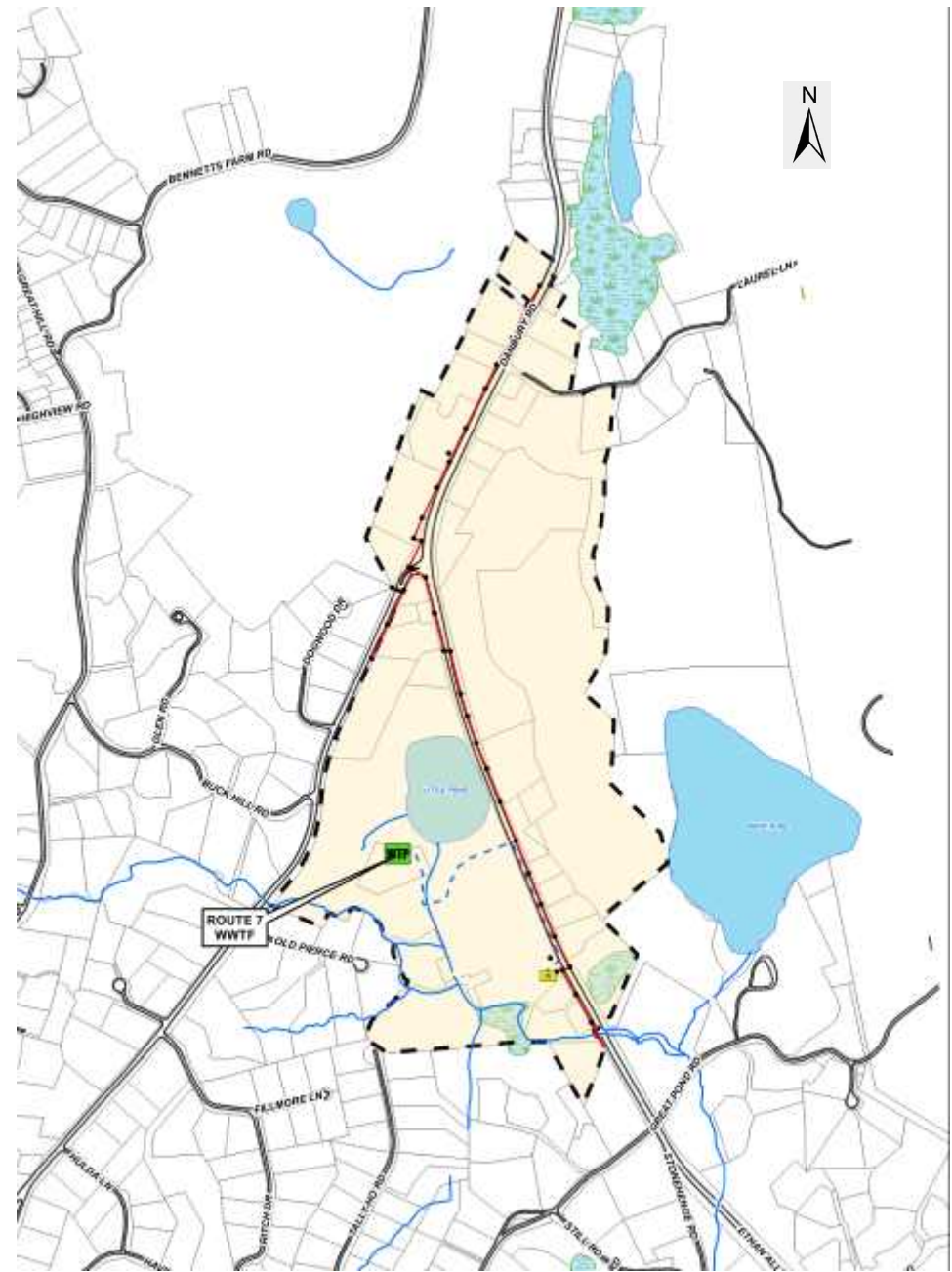
Serves Route 7/35 area

One pump station

Entire sewer system built 1985  
– PVC pipe

System flows not significantly  
affected by precipitation and  
groundwater

Conveys wastewater to the  
Route 7 WWTF





## District 2 - Route 7 WWTF and Influent Pump Station





## District 2 – Route 7 WWTF

Design capacity:

- Average daily flow: 0.12 mgd

Provides secondary treatment

Discharges treated effluent to the Norwalk River

Built in 1985



# Two Phase Facilities Planning Process

## The Facilities Plan was Undertaken in Two Phases

### Phase 1:

- Identified current and projected future flows and loadings for both sewer districts
- Conducted smoke testing to locate inflow sources in District 1
- Evaluated the capacities of the two WWTFs



# Two Phase Facilities Planning Process (continued)

## Phase 2:

- Evaluated the condition and upgrade needs of the two WWTFs
- Developed/evaluated alternatives for the upgrade of both WWTFs, including the potential to eliminate the Route 7 WWTF by pumping to the South Street WWTF
- Conducted further Infiltration/Inflow investigations, such as house to house inspections for sump pumps, to locate inflow sources
- Recommended upgrade program for the two WWTFs





The background is a solid blue color. On the right side, there are several thin white lines that intersect to form a series of triangles and other geometric shapes, creating a modern, abstract design.

# EXISTING AND PROJECTED FUTURE FLOWS

## Existing Wastewater Flows

- Review and Analyze 3 Years (2010-2013) of Flow Data
- Existing Wastewater Flows:
  - South Street WWTF: 850,000 gallons per day out of the 1,000,000 gallons per day design capacity
  - Route 7 WWTF : 54,000 gallons per day out of design capacity of 120,000 gallons per day



# Future Flow Identification – Sewer District 1

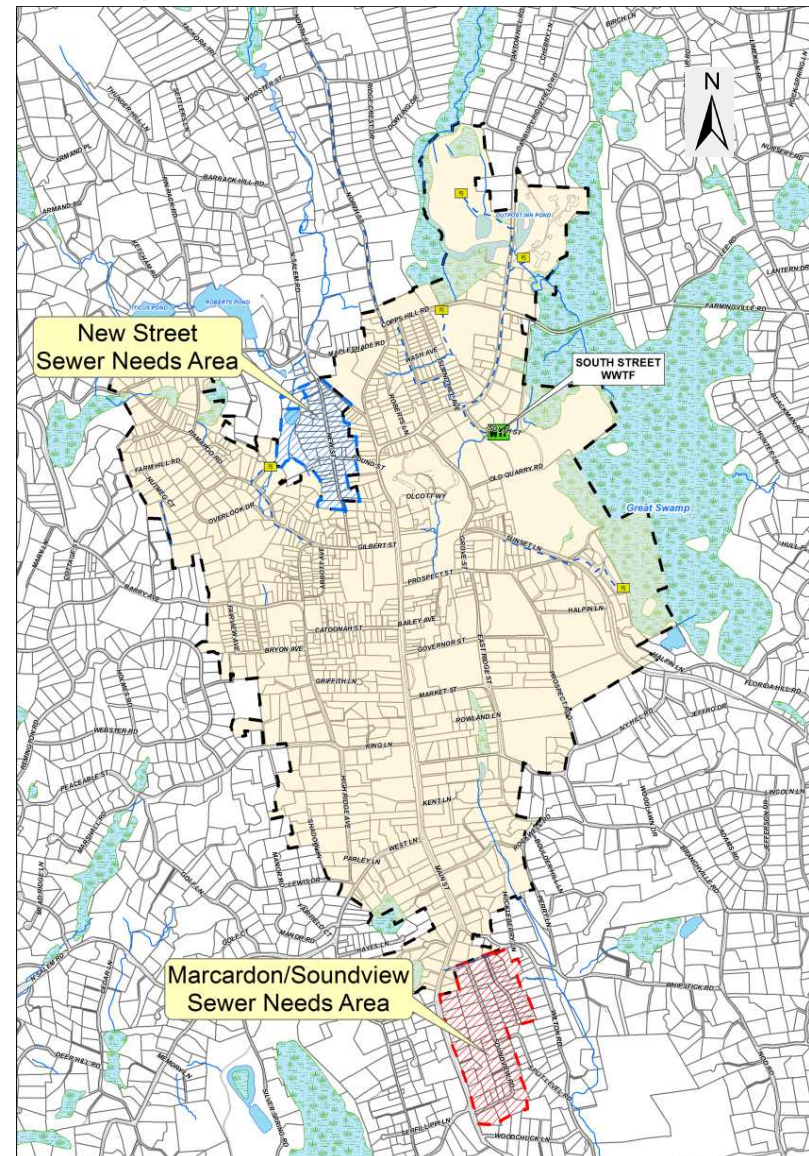
- **Infilling of Properties in District**
  - Approximately 140 parcels out of 1,500 currently unconnected
  - Redevelopment of parcels under current zoning
- **Expansion of District**
  - Address health and septic issues





# Future Flow Identification Summary

- Sewer District 1
  - Some Infilling
    - 70 % of buildout under current zoning
  - Potential District Expansion
    - Marcardon/Soundview Area
    - New Street area

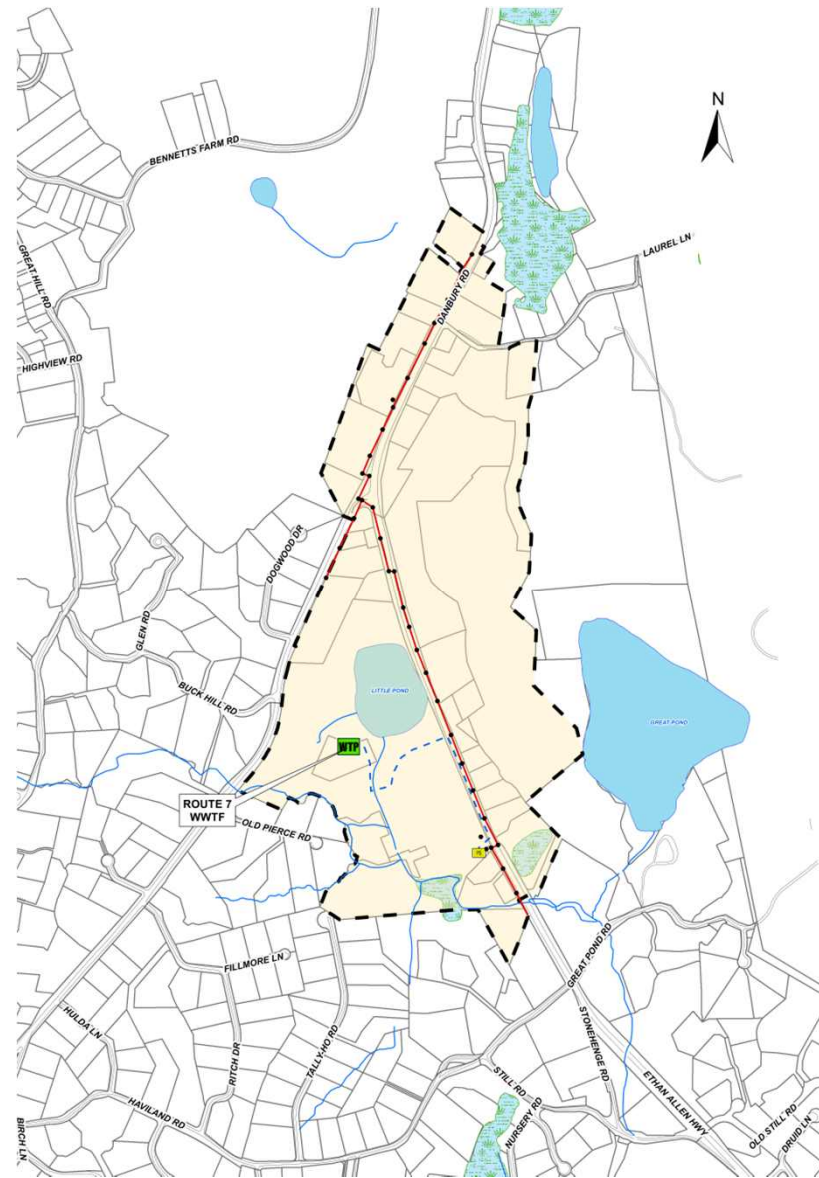


## Future Flow Identification – Sewer District 1

FLOW COMPONENT	ESTIMATED FLOW (GALLONS PER DAY)
Existing Average Daily Flow	850,000
Projected Flow From Infilling	112,000
Projected Flow from Sewer Needs Areas	<u>38,000</u>
Total Projected Future Average Daily Flow	1,000,000
Total Projected Future Peak Flow	5,300,000

## Future Flow Identification Summary

- **Sewer District 2**
  - Current WWTF capacity of 120,000 gallons per day allocated to existing properties in District 2
  - No identified sewer needs areas





## Future Flow Identification – Sewer District 2

FLOW COMPONENT	ESTIMATED FLOW (GALLONS PER DAY)
Existing Average Daily Flow	54,000
Potential Flow Increases Within District	<u>66,000</u>
Total Projected Future Average Daily Flow	120,000
Total Projected Future Peak Flow	720,000

# Sewer District 1 Infiltration and Inflow (I/I) Evaluations

- Wet Weather Flows Have Infrequently Exceeded WWTF Peak Flow Capacity
- Recent activities to locate sources:
  - I/I investigations and rehabilitation efforts
    - Yearly TV inspections of select areas
    - 2010 Sewer Rehabilitation Contract addressed specific pipe defects
  - Phase 1 wastewater facilities planning efforts (2015)
    - Sewer District 1 smoke testing
    - Limited manhole inspections
  - Phase 2 wastewater facilities planning efforts (2017)
    - Dyed water testing
    - Dyed water tracing
    - CCTV of selected mainline and lateral sewers
    - Completion of manhole inspections
    - House to house inspections



# Sewer District 1 Peak Flow Management Recommendations

- **Future Peak Flow Management**
  - **Collection system inflow reduction efforts**
    - Redirect 105 sump pumps connected to the sewer system.
    - Conduct building inspections on Main Street to locate roof drains connected to sewer system within the limits of the DOT Main Street Reconstruction Project and work with DOT on integrating redirecting roof drain connections into the DOT Main Street Reconstruction project
    - Eliminate 44 private and 5 public inflow sources identified through smoke testing



The background is a solid blue color. On the right side, there are several thin, white, intersecting lines that create a geometric pattern, resembling a stylized 'X' or a series of overlapping planes.

# CONDITION ASSESSMENTS- EXISTING TREATMENT SYSTEMS



## District 2 - Route 7 WWTF – Built 1985



GRIT CHAMBER



EQUALIZATION TANK



UV DISINFECTION SYSTEM



ELECTRICAL TRANSFORMER



SLUDGE STORAGE TANKS

This equipment runs 24/7 in damp, corrosive, and abrasive conditions

# District 1 - South Street WWTF – Last Upgrade 1990



1970 AERATION TANKS



INFLUENT BUILDING



1990 AERATION TANKS



FINAL SETTLING TANKS



SLUDGE PUMPS

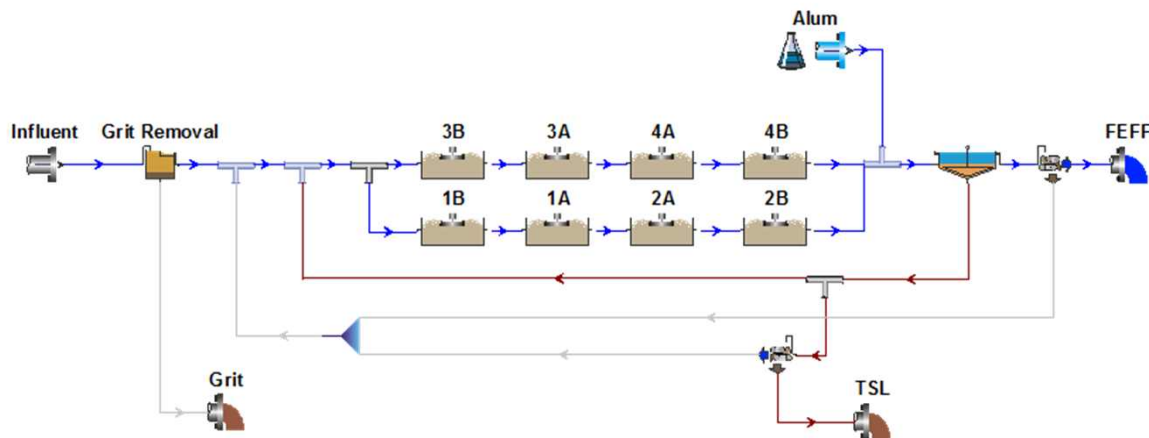


SLUDGE BELT THICKENER/PRESS



# WWTF Capacity Evaluation

- Evaluated hydraulic capacity
- Evaluated pollutant treatment capacity
- Evaluations identified limitations to be addressed in upgrade





The background is a solid blue color. On the right side, there are several thin, white, intersecting lines that create a geometric pattern, resembling a stylized 'X' or a series of overlapping planes.

# **UPGRADE NEEDS, EVALUATION APPROACH, AND RECOMMENDED PLAN**

# Upgrade Needs

- **Phosphorus Limits – Both WWTFs cannot meet limits**
  - Phosphorus – naturally occurring nutrient, controlling nutrient in fresh water
  - Control needed to improve water quality
  - DEEP issued limits
- **Nitrogen Limits – SS WWTF cannot meet limit**
  - Nitrogen – naturally occurring nutrient, aquatic “fertilizer” in salt water
  - Nitrogen impacts to Long Island Sound
  - Control needed to improve water quality
  - DEEP issued limits
- **Aging Equipment**
  - Equipment operates continuously in damp, corrosive, abrasive conditions
  - Service life is 20 years
    - South Street WWTF: 27 years
    - Route 7 WWTF: 32 years
  - Increasing costs for repair and maintenance
  - Decreasing reliability and increasing potential for failure

# Facilities Planning Alternatives

- **Keep Both WWTFs in Operation**
  - Consider treatment process alternatives for each WWTF to meet new NPDES permit limits and improve energy efficiency
- **Decommission Route 7 WWTF and Treat All Wastewater at the South Street WWTF**





# Current and Anticipated WWTF Permit Limits Summary

Effluent Parameter	SOUTH STREET WWTF PERMIT LIMITS Sewer District 1 Flows	ROUTE 7 WWTF PERMIT LIMITS Sewer District 2 Flows	ANTICIPATED SOUTH STREET WWTF PERMIT LIMITS Sewer District 1 and 2 Flows
Average Day 2035 Design Flow	1.0 mgd	0.12 mgd	1.12 mgd
Total Nitrogen Target Annual Average at Design Flow	3.5 mg/l	No Limit	3.4 mg/l
Total Phosphorus Seasonal Average at Design Flow	0.062 mg/l (Apr-Oct)	1.0 mg/l (Apr-Oct)	0.055 mg/l (Apr-Oct)

# Facilities Planning Methodology

- **Identify Alternatives for Evaluation Based on:**
  - Experience with other WWTFs
  - Town/Suez recommendations
- **Narrow Alternatives for Evaluation with Town/Suez**
- **Evaluate Selected Alternatives Based on:**
  - Costs including:
    - Capital
    - Annual O&M costs
    - Life cycle costs, 20 year period
  - Advantages / disadvantages



# Route 7 WWTF Decommissioning Alternative

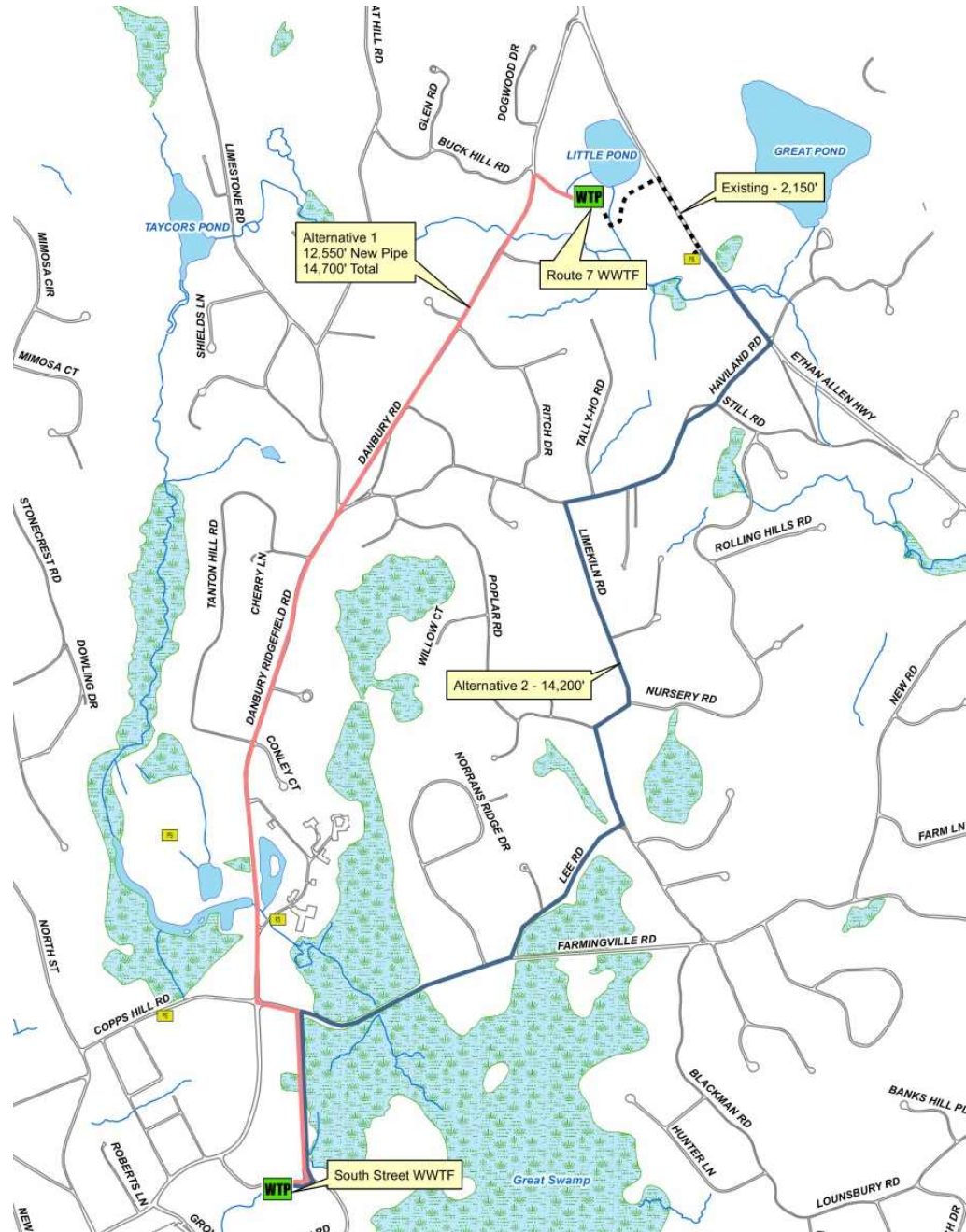
- **Treat All Wastewater at the South Street WWTF and Decommission Route 7 WWTF**
  - Convey Sewer District 2 to South Street WWTF
    - New Route 7 Pump Station
    - New Force Main
  - Upgrade South Street WWTF for:
    - Additional flows and loads
    - More restrictive permit requirements
  - Demolish Route 7 WWTF and Reclaim Site





# Route 7 Force Main Alternatives to South Street WWTF

- Route 35  
Alternative (Red)
- Local Road  
Alternative (Blue)
- Preferred Route To  
Be Determined

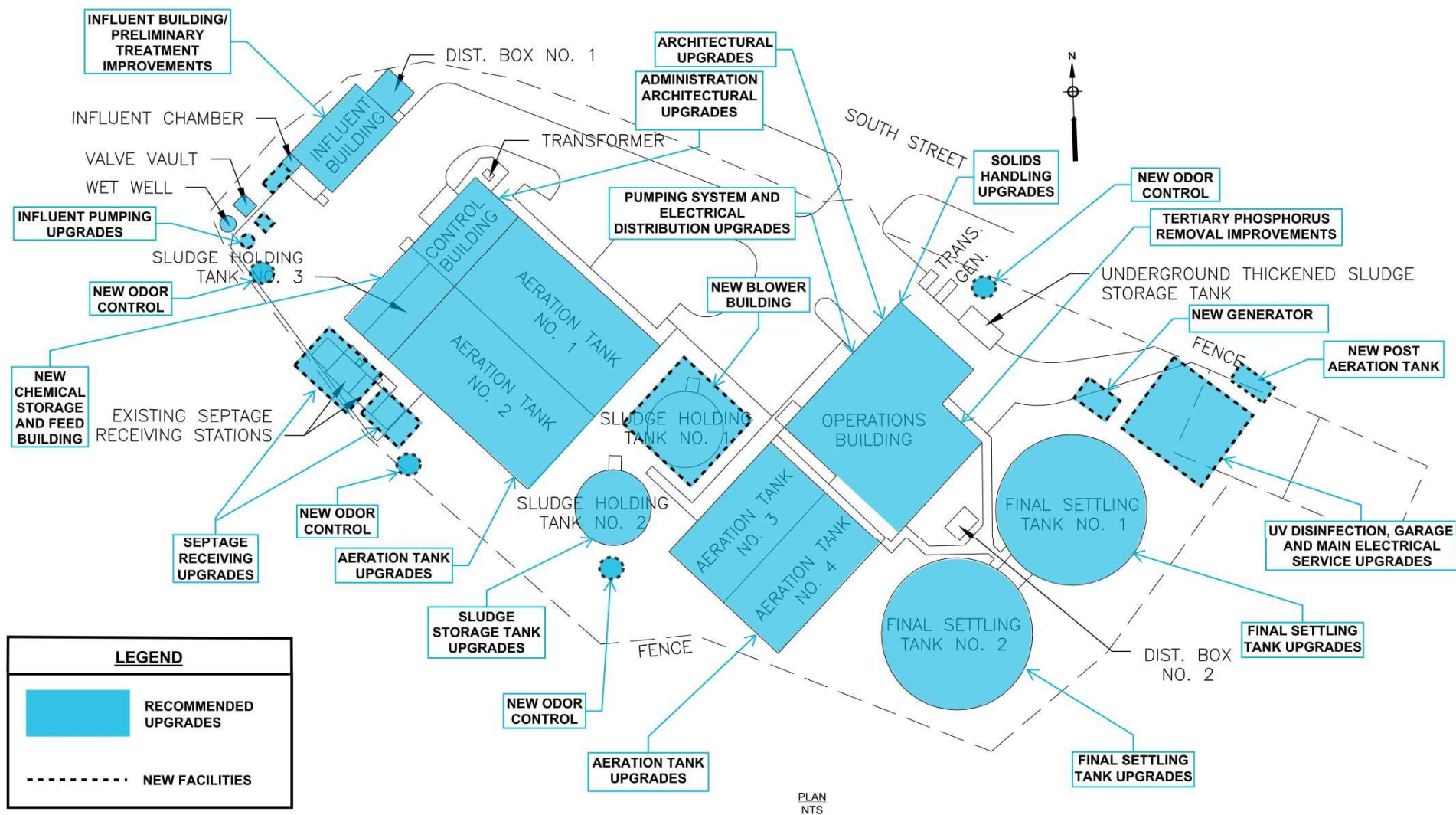


## Benefits of Combining both WWTFs at South Street

- Lower Capital Cost
- Lower Operating Cost
- Lower Life-Cycle Cost
- Consolidates all WWTF Operations to One Facility
- Improved Water Quality
- Allows for Sale or Repurposing of Route 7 WWTF Property



# South Street WWTF Recommended Upgrades



The background is a solid blue color. On the right side, there are several thin white lines that intersect to form a series of triangles and other geometric shapes, creating a modern, abstract design.

# PROJECT ESTIMATED COST AND FUNDING



## Estimated Conceptual Project Cost and Grant Funding Cost Summary

FACILITIES	DEEP CLEAN WATER FUND ELIGIBLE GRANT (%)
Phosphorus Treatment	50
Nitrogen Treatment	30
All Other Work	20

TOTAL ESTIMATED CAPITAL COST	ESTIMATED GRANT AMOUNT	ESTIMATED LOAN AMOUNT
\$41,900,000	\$9,800,000	\$32,100,000

# SCHEDULE

The image features a solid blue background. On the right side, there are several thin, white, intersecting lines that create a geometric pattern. These lines are not perfectly horizontal or vertical, but rather diagonal and intersecting at various angles, forming a series of triangles and quadrilaterals. The word "SCHEDULE" is written in a bold, white, sans-serif font on the left side of the image.

## Schedule Drivers

- NPDES Permits require new facilities to be operational and permit compliance by September 2020
- Eligibility for 50% DEEP phosphorus removal grant requires construction contract award by **July 1, 2019**



# Proposed Project Schedule

Wastewater Facilities Upgrade Project Milestone	Milestone Date
Start Design	Spring 2017
WWTFs Upgrade Design Complete	Summer 2018
WWTFs Upgrade Town Funding Referendum	Fall 2018
Advertise Upgrade Project for Bid	Winter 2018/2019
Award Project and Begin Construction	Spring 2019
Complete Construction	Fall 2021



# NEXT STEPS

The background is a solid blue color. On the right side, there are several thin, white, straight lines that intersect to form a series of triangles and other geometric shapes, creating a modern, abstract design.

## Next Steps

- Comments received tonight are being documented and will be submitted to DEEP
- There is a 7 day public comment period following the hearing. Comments will be accepted until May 10, 2017
- Submit public comments to the WPCA:
  - » Via mail to: WPCA, 66 Prospect Street, Ridgefield CT 06877
  - » Via email: [dvanness@ridgefieldct.org](mailto:dvanness@ridgefieldct.org)
- DEEP completes the Facilities Plan review process
- Design of Upgrades Initiated

The background is a solid blue color. On the right side, there are several thin, white, intersecting lines that create a geometric pattern. These lines are not perfectly horizontal or vertical, but rather diagonal and intersecting at various angles.

# COMMENTS