Topsham Development, Inc.

Sewer & Water Study to Evaluate Service Options

February 2025

Chris Dwinal, PE
Jackie Cobb, PE
Brody Campbell, PE
Kristopher Dow, EI

WRIGHT-PIERCE
Engineering a Better Environment

Presentation Overview – Scope of Study

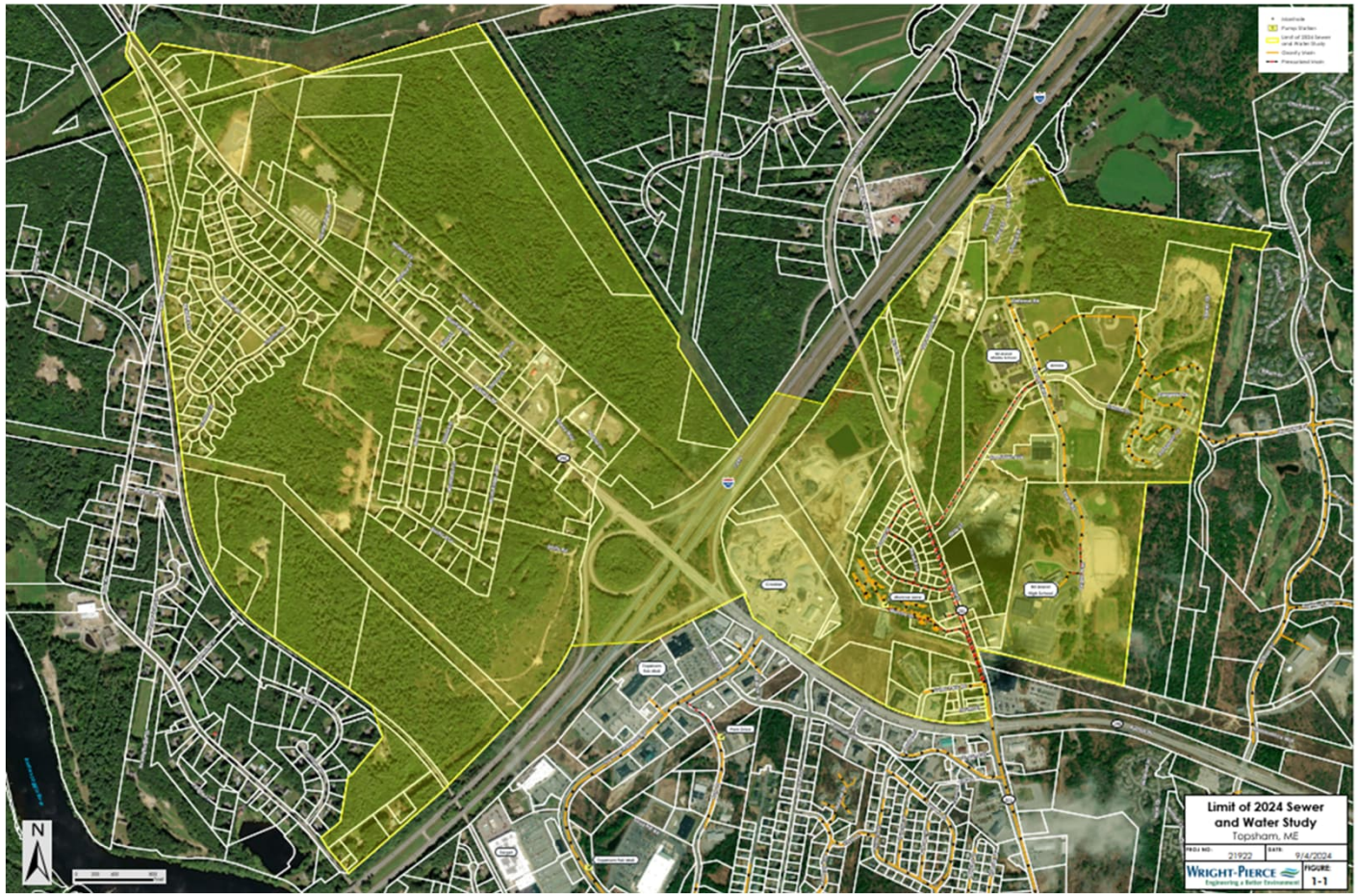
Wastewater

- Flow Projections
- Infrastructure Requirements
- Proposed Wastewater Projects & Costs
- East & West Side Needs

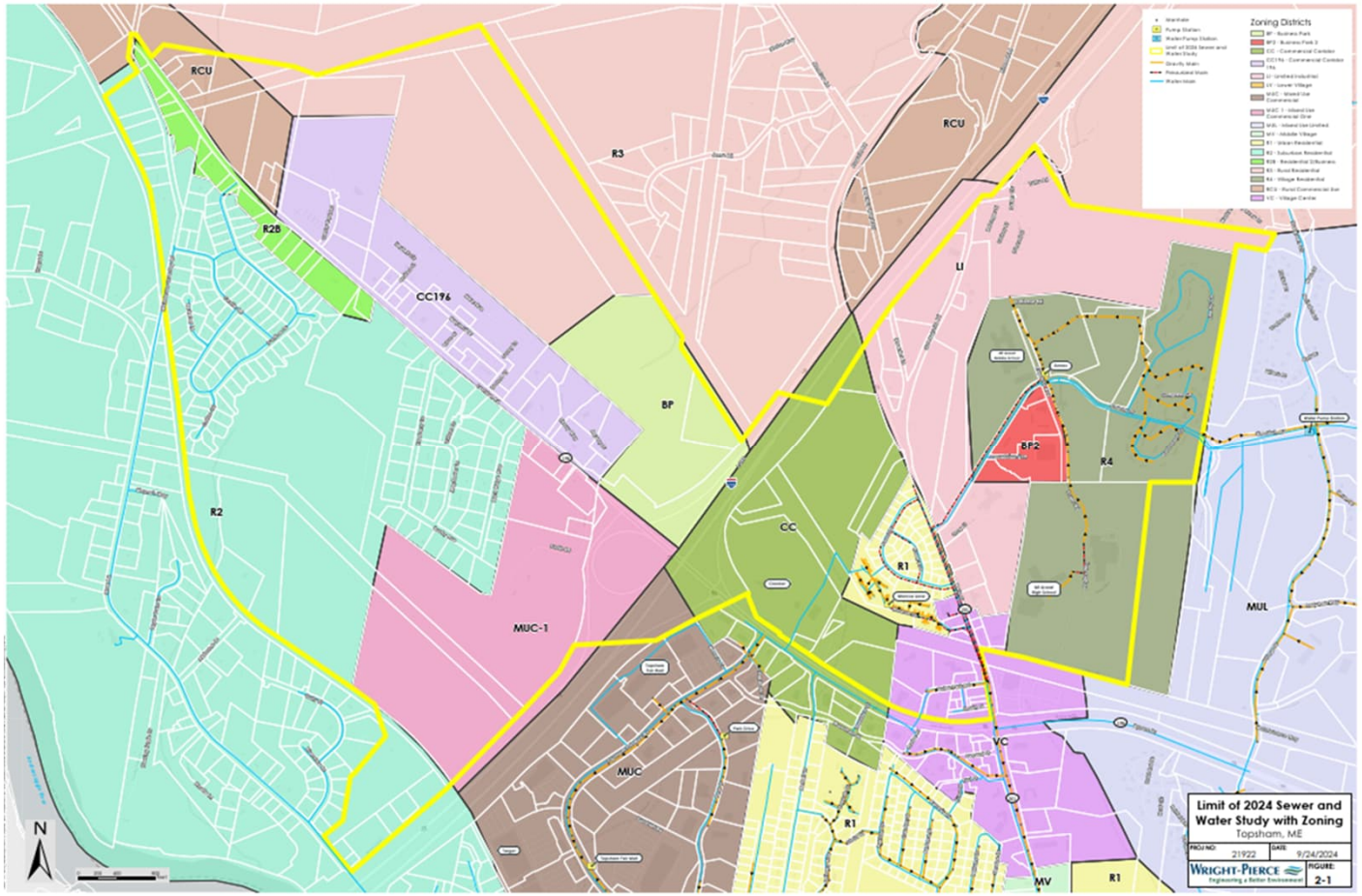
Water

- Prior Studies
- Design Criteria
- Hydraulic Analysis
- Alternatives Evaluated
- Proposed Water Projects & Costs – East & West Side

Study Area

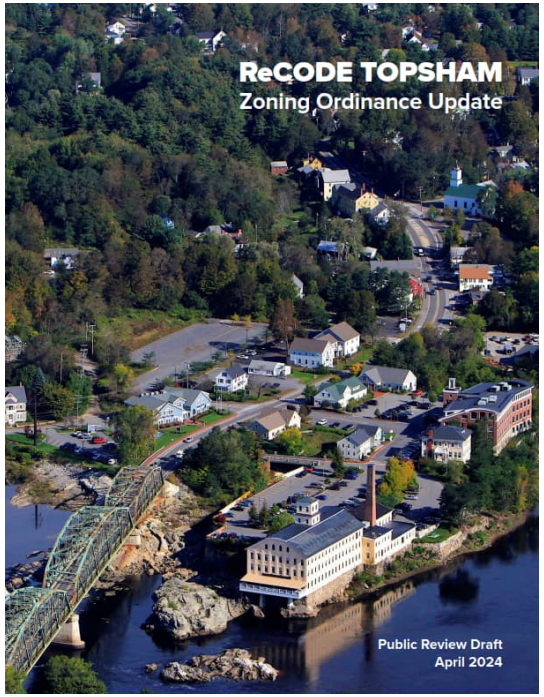

Limit of 2024 Sewer and Water Study
Topsham, ME
21922
9/4/2024
WRIGHT-PIERCE
1-1

Study Area (Zoning)



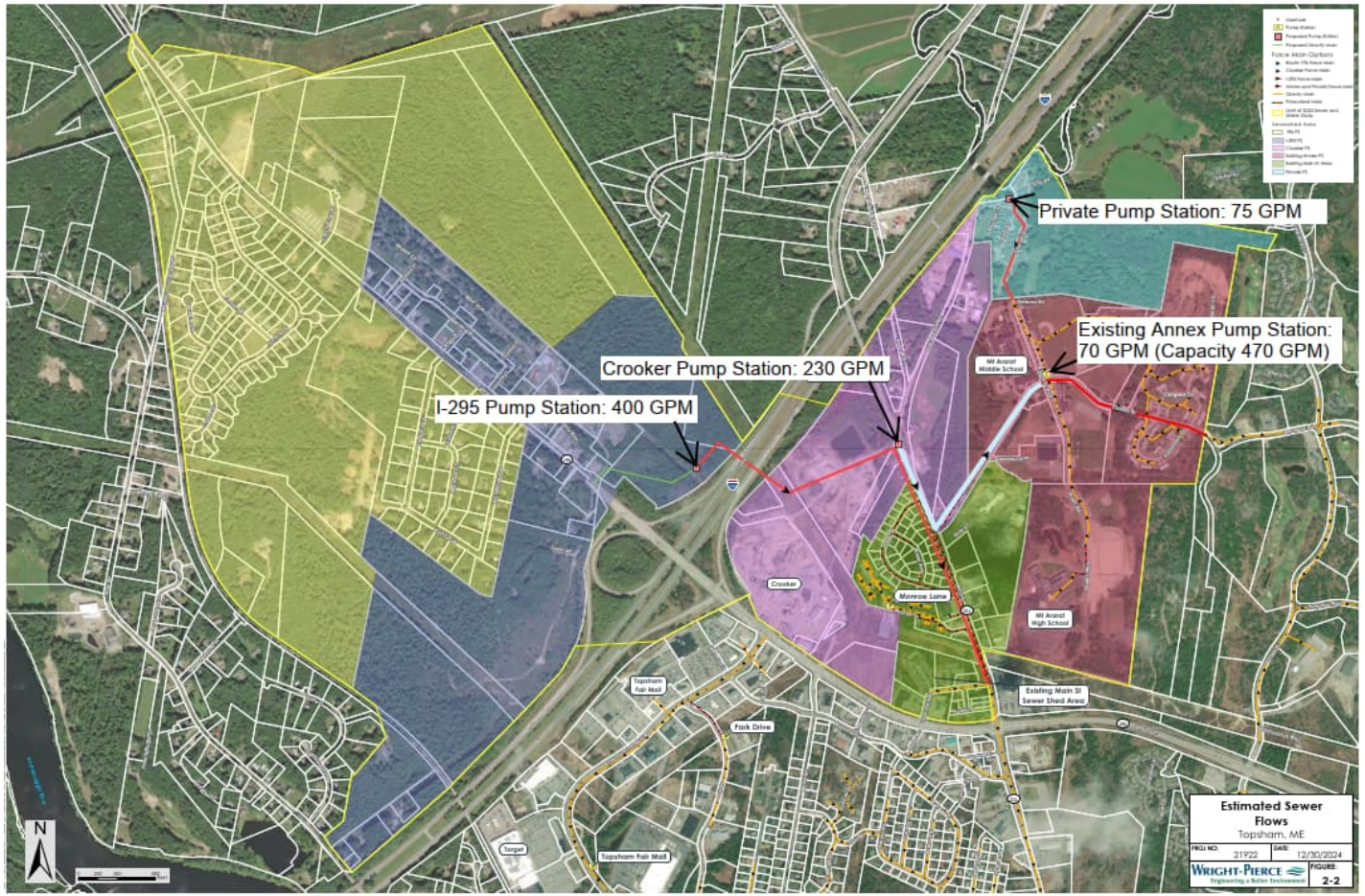
Wastewater Flow Projections

- Current Topsham Fair Mall Road water usage ~ 500 gpd/acre
- Commercial
  - Use 500 gpd/acre for smaller lots
  - Use 1,000 gpd/acre for larger parcels i.e., Crooker and MUC
- Residential - Use 175 gpd/lot consistent with past studies
- Approved/proposed developments

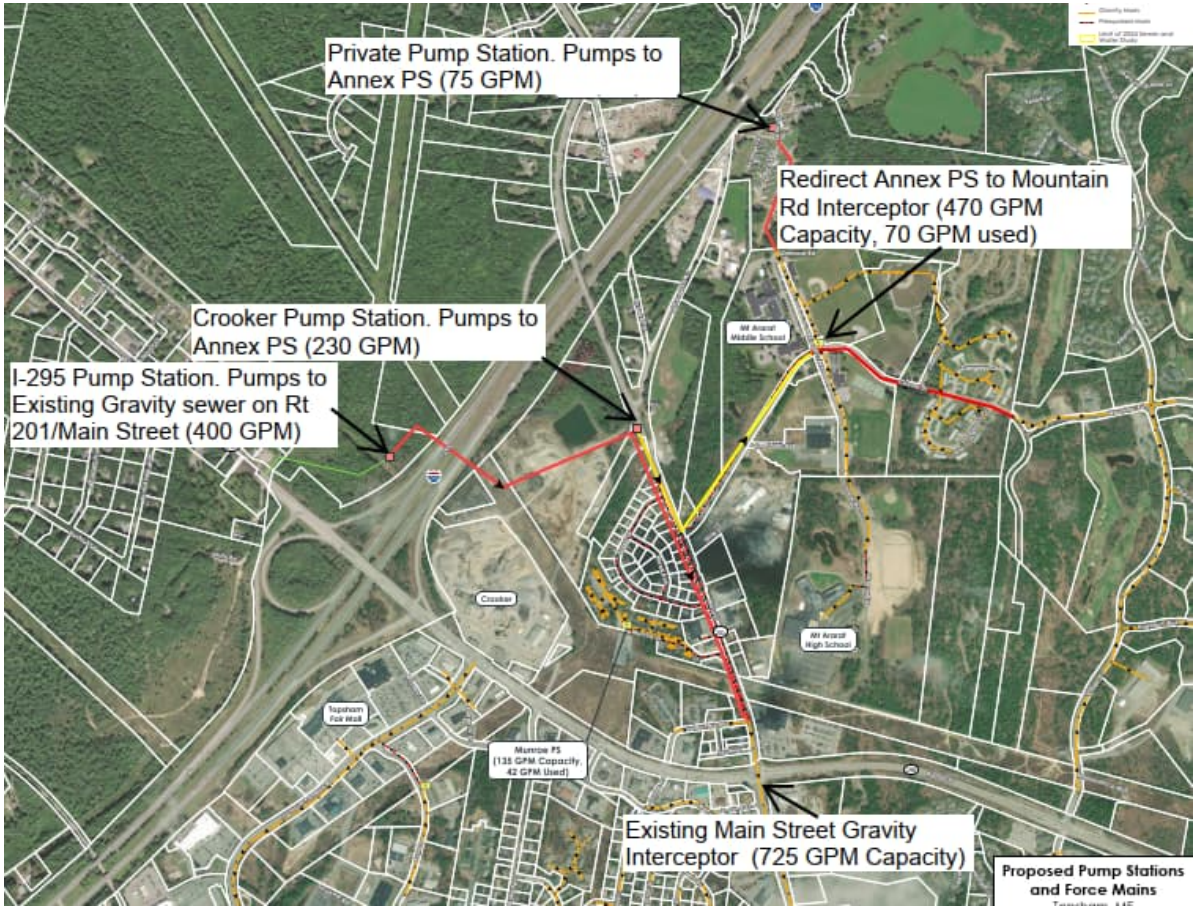


WRIGHT-PIERCE
Engineering a Better Environment

Wastewater Estimated Flow Areas



Wastewater Infrastructure Requirements



- Redirect Annex Pump Station Force Main to Mountain Road
  - Provide capacity in Main Street sewer for west of 1-295
- Crooker Parcel and LI Zone
  - New Pump Station and Force Main to Annex
- West of I-295
  - I-295 Pump Station and Force Main to Main Street
  - Reduced study area west of I-295

WRIGHT-PIERCE
Engineering a Better Environment

Wastewater Proposed Projects & Costs

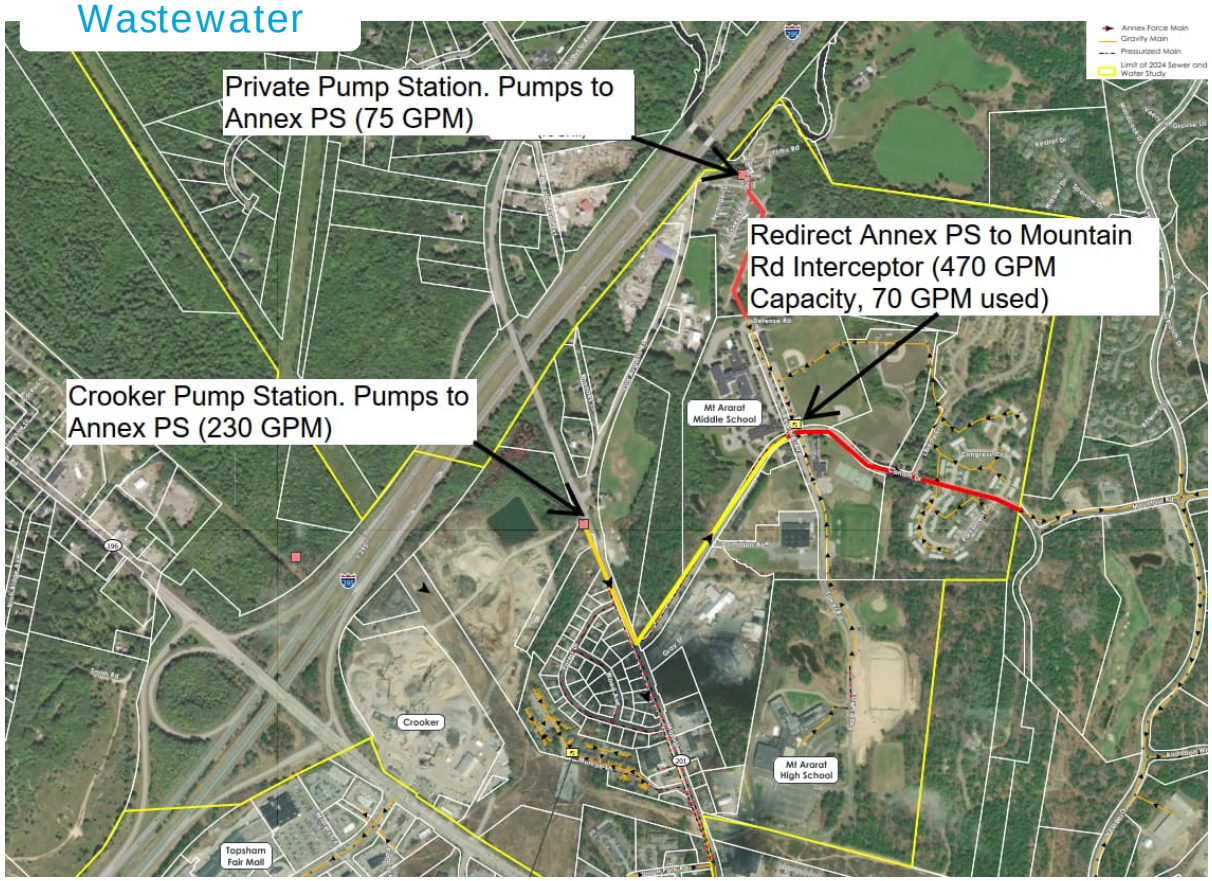
Estimated Total Project Costs

- Annex Pump Station and Force Main $1,350,000
- Crooker Pump Station and Force Main $3,340,000
- I-295 Pump Station and Force Main $6,350,000

** requires directional drill under I-295

WRIGHT-PIERCE
Engineering a Better Environment

Needs – East of I-295 (Wastewater)



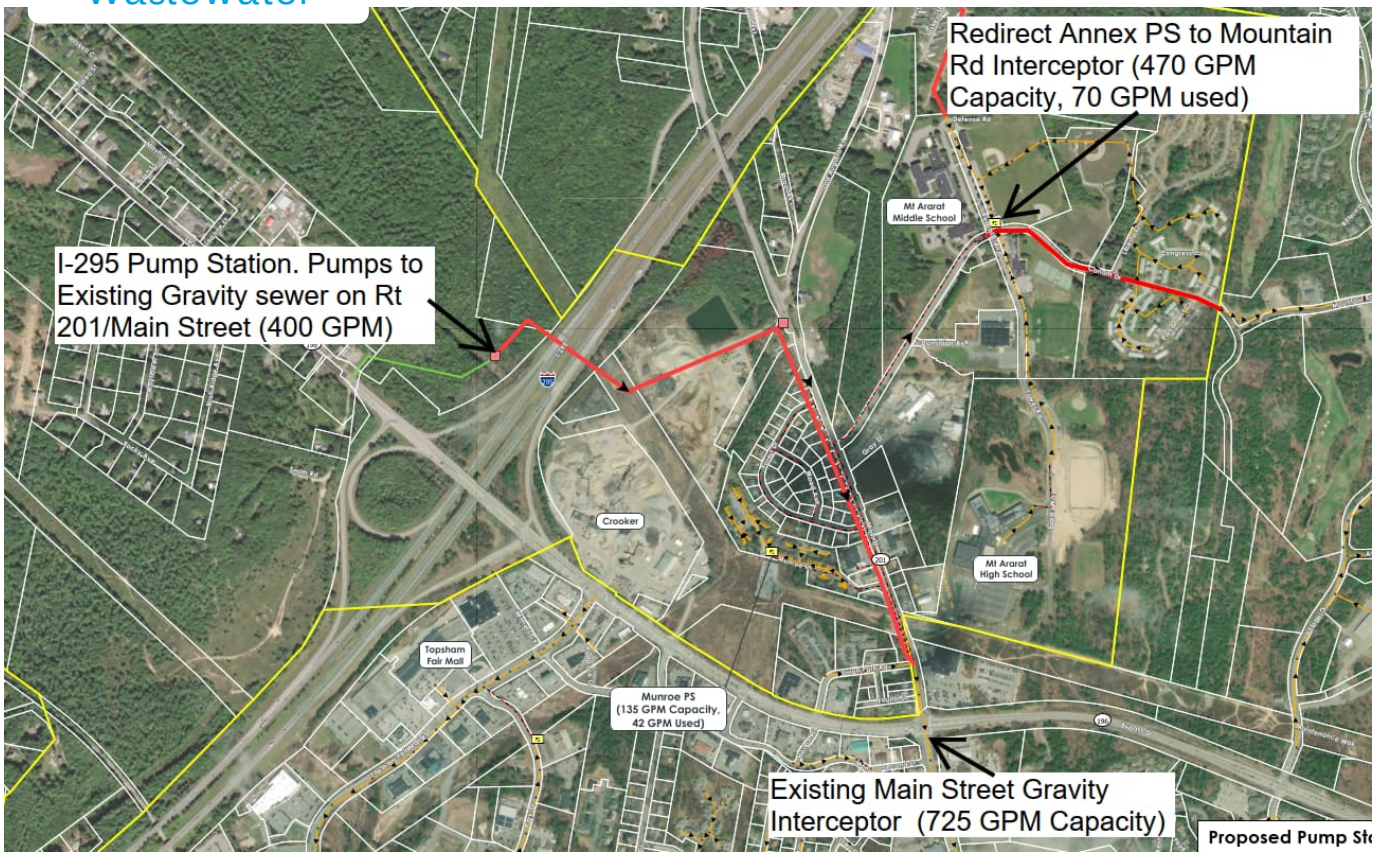
Wastewater

- Install Crooker Pump Station, Force Main, and Gravity Sewer to Serve Crooker Parcel and some LI area
- Redirection of Annex PS force main optional but advised (if only east side development)
- Developer/Owner to install Private Pump Station to serve some LI area

WRIGHT-PIERCE
Engineering a Better Environment

Needs – West of I-295 (Wastewater)

Wastewater



Wastewater

- Redirect Annex Pump Station Force Main
- Install I-295 Pump Station, Force Main, and Gravity Sewer

WRIGHT-PIERCE
Engineering a Better Environment

Prior Studies (Water)

2005 – Expanded High Pressure Area

- Scenario 1 – Annex, HG, MUC-1
- Scenario 2 – Annex, HG
- Findings
  - Tank at MUC-1 could serve scenario 1 and 2
  - Tank at HG property could serve Scenario 2 only
  - Planning level cost estimates

2019 – Annex and Highland Green

- Memo Report by BTWD
- Based on 2005 Study Scenario 2
- Findings
  - Tank recommendation
  - Highland Green booster station
  - Water mains for Mountain Road and Annex area
  - Planning level cost estimate

Water Design Criteria

Service Pressure

- Minimum pressure of 35 psi
- Pressures exceeding 80 psi require PRV

Fire Flow Requirements*

- Annex / Highland Green – 1,000 gpm
- Crooker – 3,500 gpm
- Mixed-Use Property – 3,500 gpm

Brunswick-Topsham Water District

- No privately owned infrastructure
- Requires water utilities to be in public right-of-way (no cross-country mains)

Land-Use or Building Type	Range of Required Fire Flows
Single- and Two-Family Dwellings	500 to 1,500 gpm
Over 100 feet Building Separation	500 gpm
31 to 100 feet Building Separation	750 gpm
11 to 30 feet Building Separation	1,000 gpm
10 feet or less Building Separation	1,500 gpm
Multiple Family Residential Complexes	2,000 to 3,000 gpm
Average Density Commercial	1,500 to 2,500 gpm
High Value Commercial	2,500 to 3,500 gpm
Light Industrial	2,000 to 3,500 gpm
Heavy Industrial	2,500 to 3,500 gpm

Water Hydraulic Analysis – Existing Conditions

Crooker Parcel

- Fire flows >3,500 gpm
- Static Pressure ~50 psi

Annex

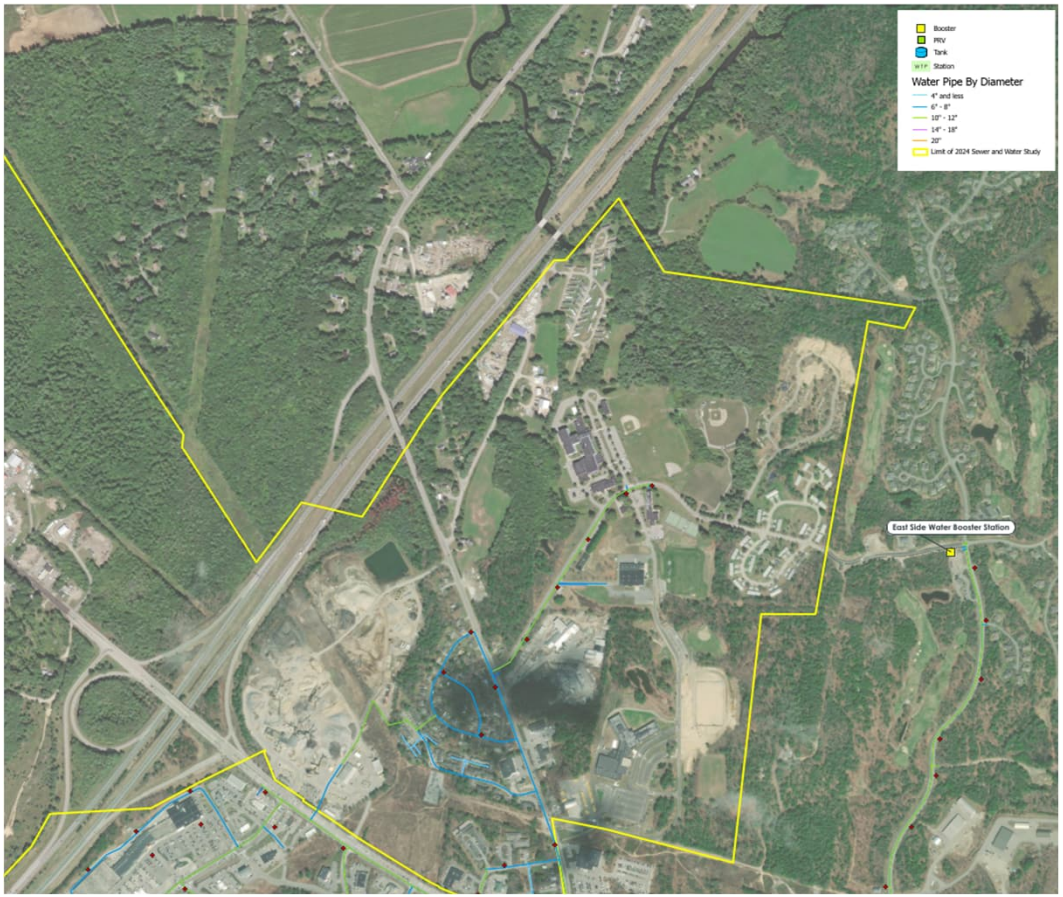
- Fire Flows >1,000 gpm
- Static Pressure ~35-55 psi

Highland Green

- Service Pressure ~65-70 psi
- Privately owned booster pump station

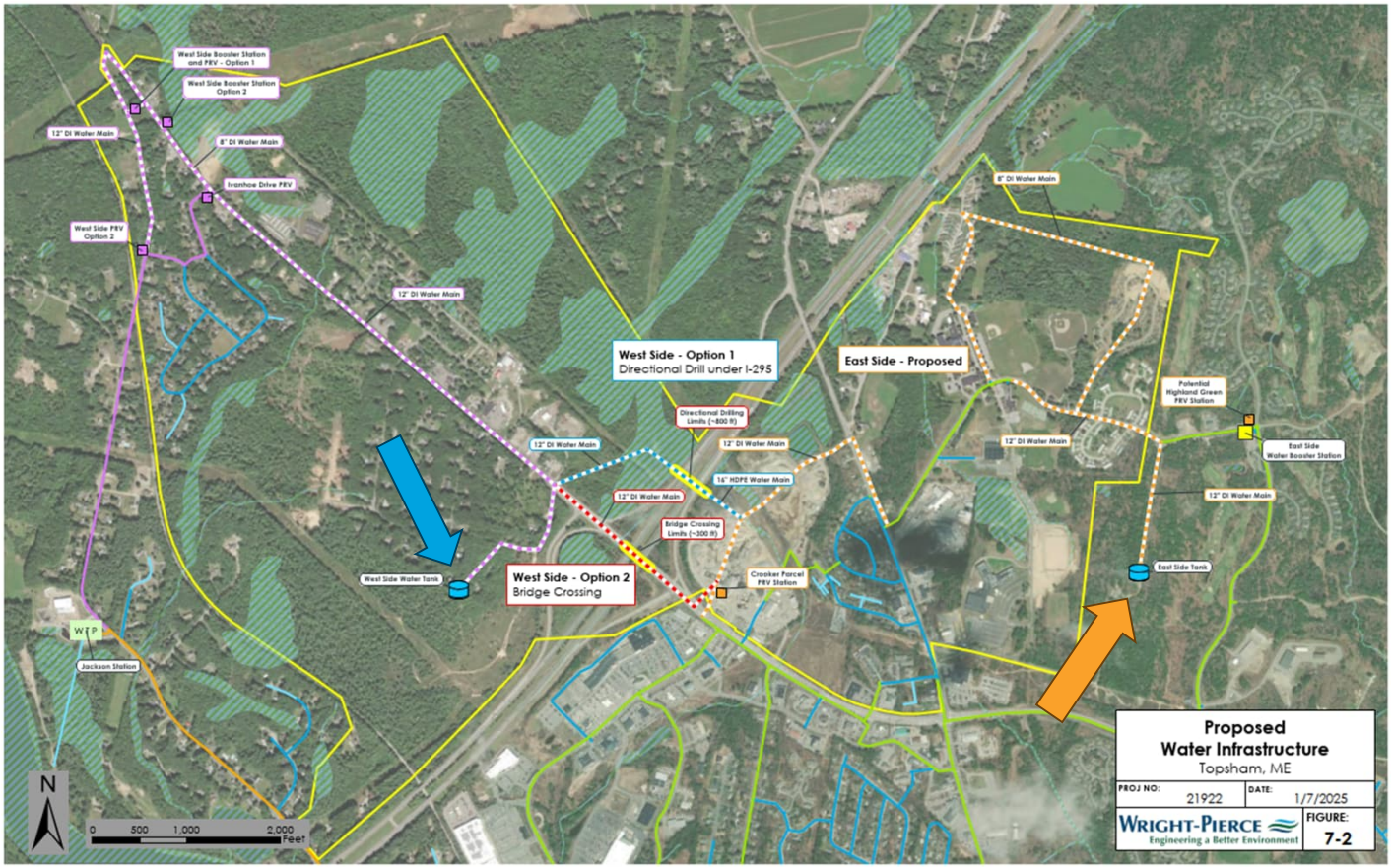
Mixed-Use Property

- No water services currently
- Requires interconnection across I-295



WRIGHT-PIERCE
Engineering a Better Environment

Water Alternatives Evaluated



1. Single East Side Tank
   - Only serving East side (Crooker/Annex)
2. Single West Side Tank
   - Serving East/West sides (Crooker/Annex/MUC-1)
   - I-295 Directional-Drill required
3. Multi-Phase Expansion
   - Phase 1 – East
   - Phase 2 – West
   - Both phases require tank & water main extensions

Water Hydraulic Analysis – Limitations (Pressure & Fire Flow)

Existing Tanks/Zones

- Limited fire protection for Annex and Highland Green
- 2-story development at Crooker (would require looped water main)
- 1-3 story single family dwellings at Annex (location dependent)

Single East Side Tank (0.5 MG)

- Allows for replacement of existing private infrastructure (MRRA)
- Improved fire protection for Highland Green & Annex
- Multi-story development of Crooker & Annex (4-story limit)
- No development of mixed-use property (MUC-1)

Single West Side Tank (1 MG)

- All design criteria met
- Immediate development of East / West

Multi-Phase Expansion (Dual 0.5 MG Tanks)

- All design criteria met
- Limited to development of East side first

Village Drive Booster Pump Station

WRIGHT-PIERCE
Engineering a Better Environment

Water Proposed Projects and Costs

Development Approach	Planning Cost Estimate
Existing Tanks/Zone (Serving East only)	$700,000
Water Main Extensions (2,100-ft)	
Single Tank Approach (Serving East only)	$12,600,000
0.5 MG Water Storage Tank	$4,500,000
Water Main Extensions (12,100-ft)	
Pump Station Upgrades / PRVs	
Single West Tank (Serving East/West)	$18,400,000
1 MG Water Storage Tank	$5,800,000
Water Main Extensions (24,000-ft)**	
Pump Station / PRVs	
Dual Tank Phased Approach (Serving East/West)	$25,500,000
0.5 MG Water Storage Tank (x2)	$8,000,000
Water Main Extensions (25,400-ft)**	
Pump Station / PRVs	

** requires directional drill under I-295

Elevated Water Tank Examples

Pedosphere – Welded Steel

Composite – Concrete Base/Steel Tank

THANK YOU

WRIGHT-PIERCE
Engineering a Better Environment

Contact Information

CHRISTOPHER DWINAL

chris.dwinal@wright-pierce.com
207.798.3725

JACQUELINE COBB

jacqueline.cobb@wright-pierce.com
207.798.3703

Contact Information

BRODY CAMPBELL

brody.campbell@wright-pierce.com
207.798.3752

KRISTOPHER DOW

kristopher.dow@wright-pierce.com
207.319.1526