

May 10  
2022



**PRESENTED BY**  
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Jack Troidl

# CONGAMOND LAKES SEWER FEASIBILITY STUDY

PRESENTATION TO WATER POLLUTION CONTROL AUTHORITY  
SUFFIELD, CT

# AGENDA

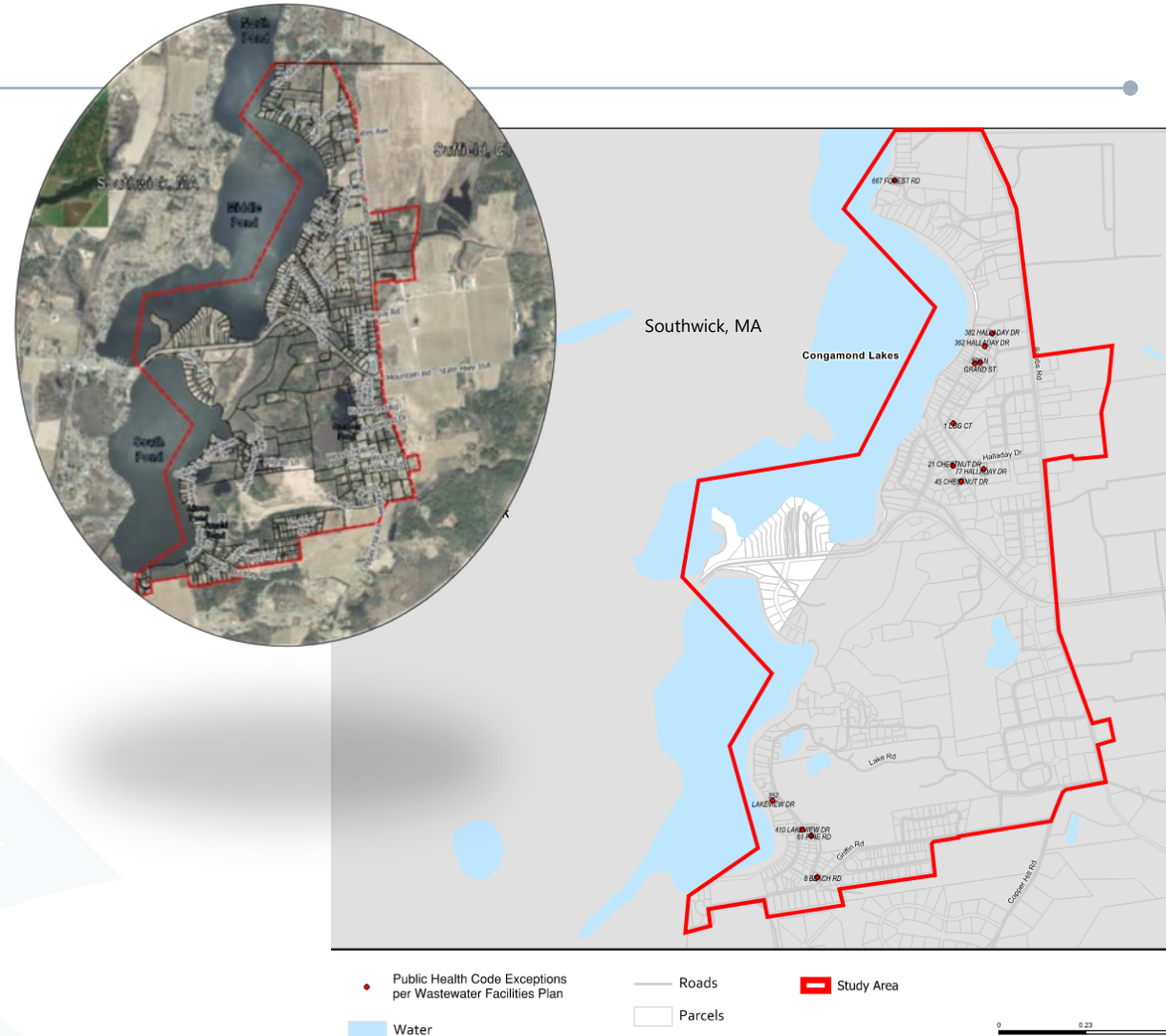
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- Study Area, Purpose, & Scope of Work
- Capacity Need (Flows)
- Alternatives
  - Southwick/Westfield
  - Suffield WPCA
  - Community WWTF
- Alternatives Analysis & Summary of Alternatives
- Conclusions & Next Steps



# Congamond Lakes – Study Area & Purpose

- Study Area:
  - Primarily Residential ~ 500 homes; limited commercial area
  - Remote from WPCA's sewer system
  - 644 acres (26% < 0.5 acres)
  - 604 parcels
- Purpose:
  - Improve water quality in the Lakes - Eastern Shore of Congamond Lakes
  - Within Southwick's Drinking Water Supply Protection Area
  - Wastewater Solution for small parcels adjacent to Lakes
  - Advance efforts from April 2013 Wastewater Management Study to actionable recommendations



# Scope of Work

- **Existing Conditions Assessment:** Reviewing previous efforts from the 2013 report and analyzing zoning, land use, and environmental conditions.
- **Design Flows:** Estimating current and future wastewater flows based upon zoning and land use data along with Connecticut Department of Public Health (CT DPH) requirements and the New England Interstate Water Pollution Control Commission “TR-16 Guides for the Design of Wastewater Treatment Works” (TR-16) design guidelines.
- **Alternative Analysis:** Evaluating alternatives including a community system, a sewer system connected to Southwick and Westfield, MA, combinations of the two, and a force main to the Suffield WPCA collection system.
- **Proposed Alternative and Preliminary Design:** Developing a preliminary sewer layout based upon the study area topography, design flows, and current buildout. An engineer’s opinion of probable cost was included in the sewer development for several feasible alternatives.
- **Project Cost and Funding:** Reviewing funding and financing opportunities with various cost recovery options, including public funding, betterments, and a sewer rate charge analysis.
- **Regulatory Requirements and Environmental Permitting:** Discussions with regulatory authorities on permitting requirements and other considerations for future design.

# Capacity Needs | Flow Calculations

## → Flow Calculations:

- ▶ 182 GPD per household; (Consistent with Facility Plan – 70 gpd/capita x 2.8)
- ▶ Non-Residential – Converted to average flow
- ▶ Calculated for entire project area

## → Current/Existing Wastewater Flow Needs:

- ▶ Include I/I for sewers (@ 250 gpd/IDM)

## → Future Wastewater Flow Needs:

- ▶ Includes I/I for sewers and 4,000 gpd Contingency
- ▶ Sand Pit Property (75 acres – 12,000 GPD +2,000 gpd for I/I)
- ▶ Babb's Beach (7,000 gpd)

**Table 3-1: Estimated Current Wastewater Flows**

Land Use	Average Daily Flow (ADF)		Peaking Factor <sup>1</sup>	Peak Hourly Flow (PHF)	
Residential	94,000	GPD	5	326	GPM
Commercial / Industrial	2,000	GPD	5	7	GPM
I/I	12,000	GPD	-	8	GPM
Total	<b>108,000</b>	GPD	-	<b>342</b>	<b>GPM</b>
Equivalent Dwelling Units <sup>2</sup>	633	EDUs			

<sup>1</sup> Based on peaking Factor of 5 per TR-16

<sup>2</sup> EDU value was developed by dividing the total flow by the flow per EDU as developed in Section 3.1.1

**Table 3-3: Future Wastewater Flows**

Land Use	Average Daily Flow (ADF)		Peaking Factor <sup>1</sup>	Peak Hourly Flow (PHF)	
Residential	127,000	GPD	5	427	GPM
Commercial / Industrial	9,000	GPD	5	31	GPM
I/I	14,000	GPD	-	10	GPM
Contingency	4,000	GPD	5	14	GPM
Total	<b>150,000</b>	GPD	-	<b>482</b>	<b>GPM</b>
Equivalent Dwelling Units <sup>2</sup>	748	EDUs			

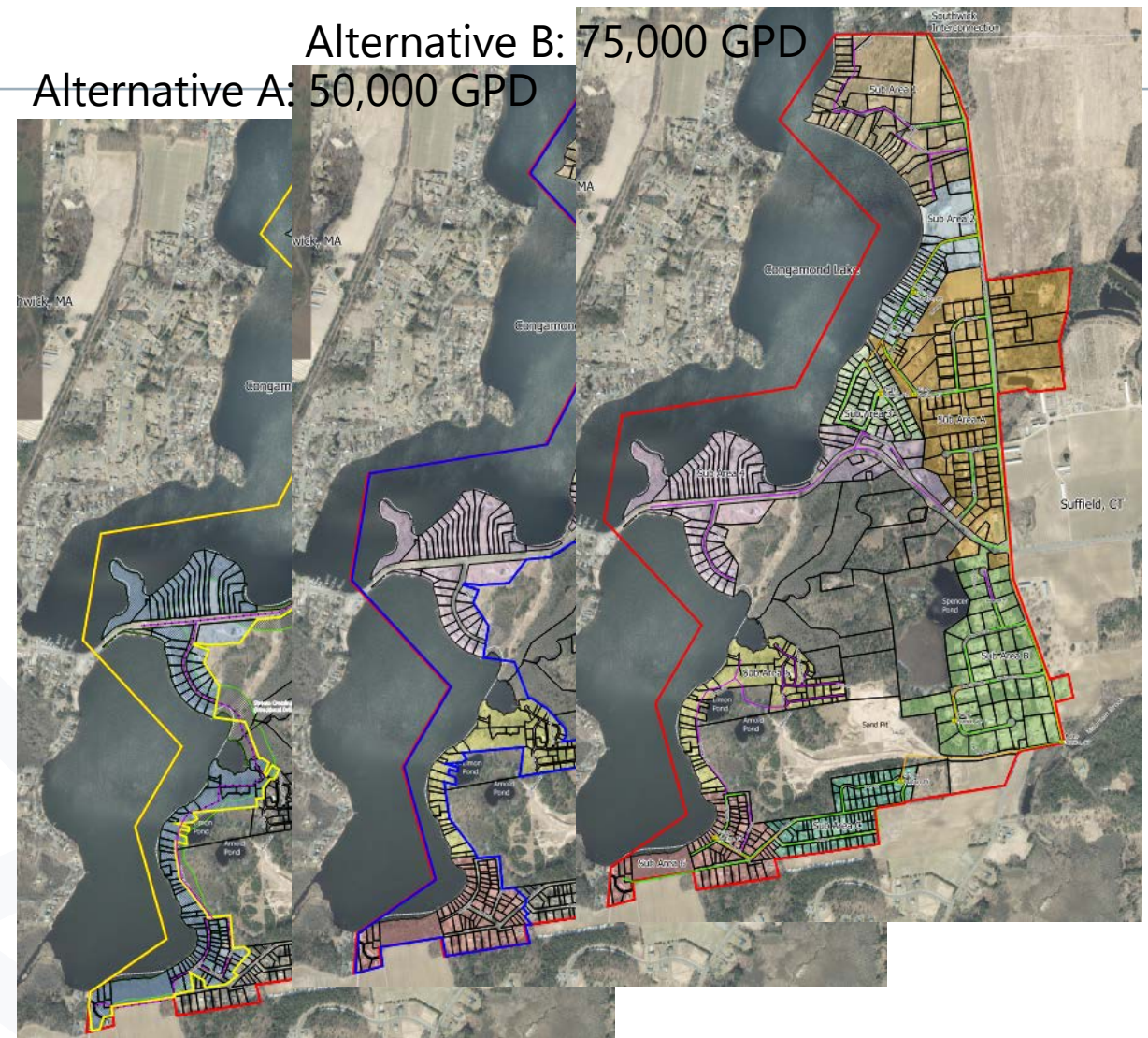
<sup>1</sup> Based on peaking Factor of 5 per TR-16

<sup>2</sup> EDU value was developed by dividing the total flow by the flow per EDU as developed in Section 3.1.1



# Alternatives Analysis | 3 Service Area Alternatives

- Alternative A: Maximum 50,000 GPD (Based on a 300-foot buffer from the lakefront)
- Alternative B: Maximum 75,000 GPD (Serves only the subareas abutting the lake)
- Alternative C: 150,000 GPD (Serves the entire study area)



# Alternatives Analysis | Collection System Costs

## → Assumptions:

- Low Pressure Sewer for A, B and part of C
  - » Due to topography/spread out nature of area (initially looked at many pump station)
- Providing Grinder Pumps - \$5k
  - » A: ~\$2.15M (10% of total project cost)

Table 4-4: Opinion of Probable Costs – Sewer Collection System

			Alternative A – 50,000 gallons		Alternative B – 75,000 gallons		Alternative C – 150,000 gallons	
Item	Unit Cost	Units	Quantity	Cost	Quantity	Cost	Quantity	Cost
Gravity Sewer	\$500	LF	0	\$0	0	\$0	30,500	\$15,250,000
Low Pressure Sewers	\$300	LF	23,000	\$6,900,000	27,050	\$8,116,000	16,500	\$4,950,000
Force Main	\$250	LF	0	\$0	0	\$0	9,600	\$2,400,000
Pump Station	\$400,000	EA	0	\$0	0	\$0	7	\$2,800,000
Grinder Pumps	\$5,000	EA	296	\$1,480,000	396	\$1,980,000	177	\$885,000
Water Crossing	\$100,000	EA	2	\$200,000	2	\$200,000	1	\$100,000
<b>Construction Subtotal</b>				<b>\$8,580,000</b>		<b>\$10,296,000</b>		<b>\$26,400,000</b>
Contingency	20%			\$1,716,000		\$2,059,000		\$5,280,000
Engineering – Design	10%			\$858,000		\$1,030,000		\$2,640,000
Engineering – Construction	15%			\$1,287,000		\$1,544,000		\$3,960,000
<b>Total Collection System Construction Cost<sup>1</sup></b>				<b>\$12,441,000</b>		<b>\$14,929,000</b>		<b>\$38,280,000</b>

All costs are listed in 2022 dollars.

# Alternatives Analysis | Wastewater Solutions

→ Three conveyance, treatment and disposal options:

- ▶ 1: Connection to Southwick & Westfield WRF
  - » Limited to 50,000 GPD (requires further negotiation to go above 50,000 gpd)
- ▶ 2: FM to Suffield System
- ▶ 3: Community WWTF & Groundwater Discharge

Alt.	Service Area Alt.	Flow
1 – Connection to Southwick & Westfield WRF	A: 300' Buffer	50,000 GPD
	B: Lake Abutting Area	75,000 GPD
	C: Entire Study Area	150,000 GPD
2 – FM to Suffield System	Entire Study Area	150,000 GPD
3 – Community WWTF & Groundwater Discharge	Entire Study Area	150,000 GPD

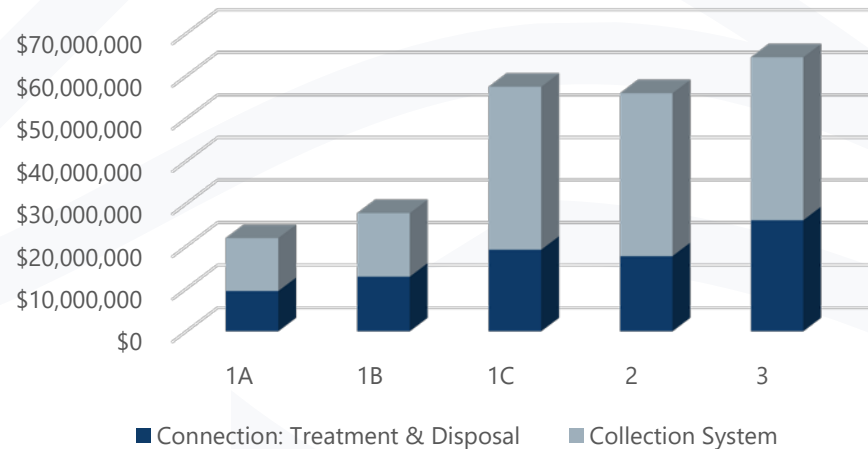


# Alternatives Analysis | Project Costs

## → Key Assumptions:

- Downstream Upgrade
- Capacity Acquisition

Cost Breakdown



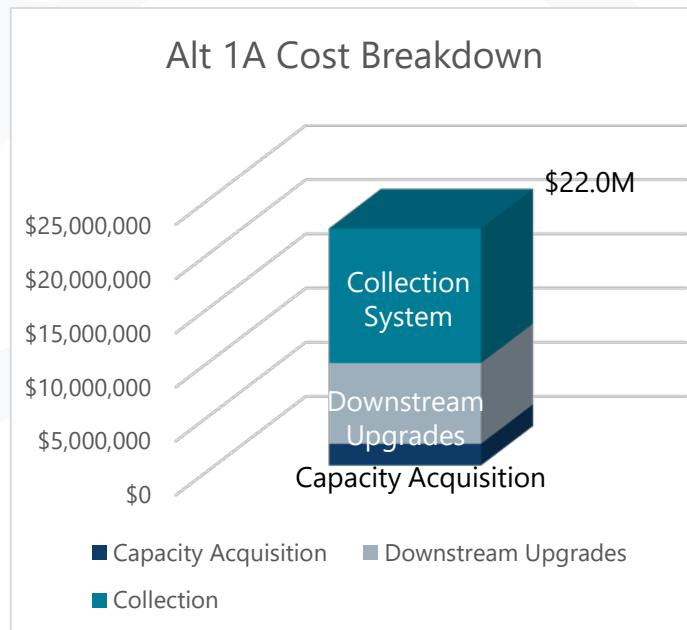
Alt	Description	Flow (gpd)	EDUs	Connection (Treatment & Disposal) Cost	Collection System Construction Cost (Section 4)	Total Project Cost	Supports Existing Use or Buildout of Area
1A	Southwick Connection	50,000	264	\$9,480,000	\$12,441,000	\$21,921,000	Existing Use Only
1B		75,000	319	\$12,860,000	\$14,929,000	\$27,789,000	Existing Use Only
1C		150,000	528	\$19,190,000	\$38,280,000	\$57,470,000	Buildout
2	FM to Suffield	150,000	528	\$17,690,000	\$38,280,000	\$55,970,000	Buildout
3	Community WWTF	150,000	528	\$26,125,000	\$38,280,000	\$64,405,000	Buildout

All costs are listed in 2022 dollars.

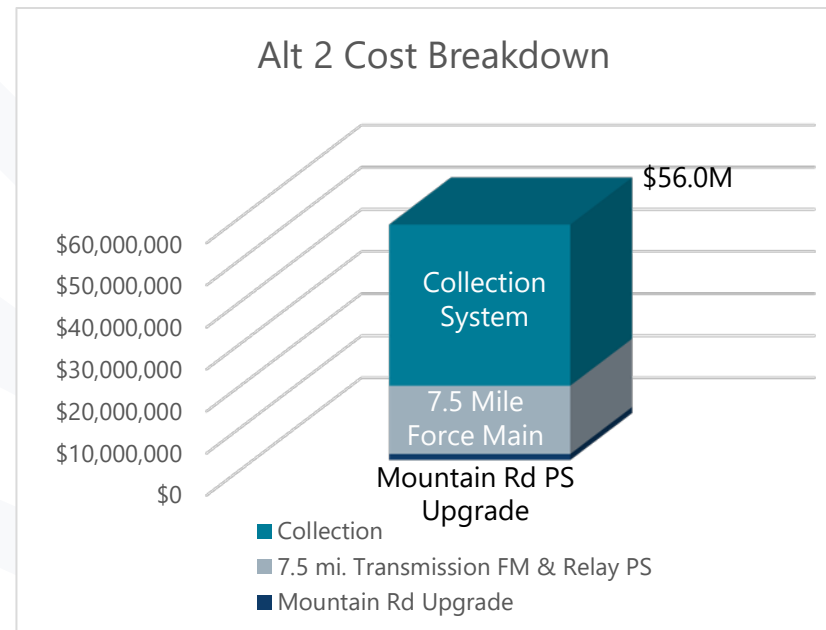
# Summary of Alternatives | Cost Breakdown

All costs are listed in 2022 dollars.

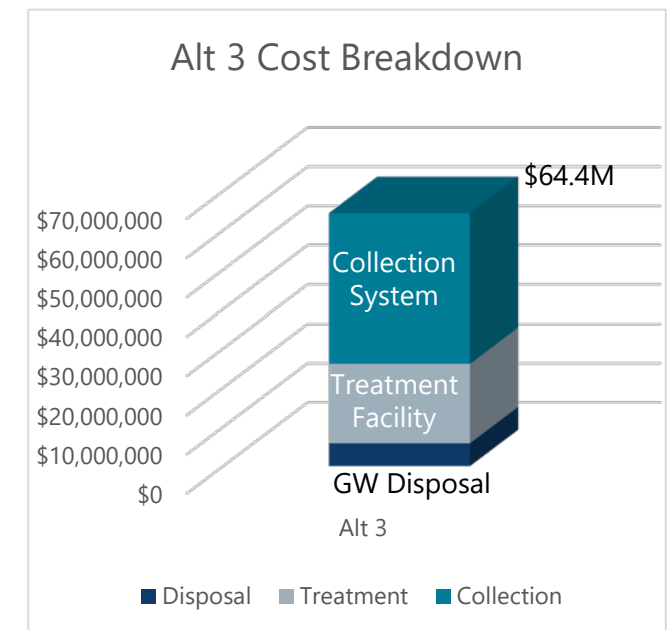
- Relative Cost Components
  - Driven by collection system



Southwick Connection  
50,000 GPD



FM to Suffield  
150,000 GPD



Community WWTF  
150,000 GPD

# Summary of Alternatives |

Alt	Description	GPD	Estimated Total Project Cost	Reduces Pollutants in Lake?	Addresses all Public Health Code Exceptions? <sup>1</sup>	Additional Considerations	Notes
1A	Southwick Connection	50,000	\$22.0M	Yes	Most	Southwick and Westfield seem amenable	\$ Least Total Cos and Least per EDU Cost
1B		75,000	\$27.8M	Yes	Yes	Southwick has indicated this will require additional negotiation	\$\$
1C		150,000	\$57.4M	Yes	Yes	Southwick has indicated this will require additional negotiation	\$\$\$ Highest Total Costs and Highest Cost pe EDU
2	FM Suffield	150,000	\$56.0M	Yes	Yes	Potential maintenance and odor issues with a long force main	
3	Community WWTF	150,000	\$64.4M	Yes	Yes	Will require significant additional permitting requirements	
<sup>1</sup> This assessment is for the study area only. There are additional public health exceptions in the Town of Suffield that are not in the Congamond Lakes study area.							

All costs are listed in 2022 dollars.



# Summary of Alternatives | Capital/Operations Costs

## → Capital Costs:

- Assessments ~\$75k to \$100k per home
  - » Look to alternative funding to lower assessments

## → Operations Costs

- Early connections are key to sustainable costs
- O&M costs are typical at buildout.

Table 6-2: Summary of Feasible Alternatives per Assessable EDU

	Alternative 1A	Alternative 1B	Alternative 1C	Alternative 2	Alternative 3
Description	50,000 GPD to Southwick	75,000 GPD to Southwick	150,000 GPD to Southwick	FM to Suffield	Community WWTF
<b>CAPITAL COSTS</b>					
Capital Outlay	\$22,921,000	\$28,789,000	\$58,470,000	\$56,970,000	\$65,405,000
Grant % of Capital	0%	0%	0%	0%	0%
Assessable EDU Count	295	358	633	633	633
Betterment/Assessable EDU	\$77,698	\$80,416	\$92,370	\$90,000	\$103,325
Repayment Period	30	30	30	30	30
Finance Rate (APR)	3%	3%	3%	3%	3%
Annual Repayment	\$3,964	\$4,103	\$4,713	\$4,592	\$5,272
<b>OPERATIONS COSTS</b>					
Collections Costs	\$49,505	\$74,257	\$148,515	\$148,515	\$148,515
Treatment Costs	\$85,775	\$128,663	\$257,325	\$148,515	\$193,069
Wheeling Costs	\$8,578	\$12,866	\$25,733	\$0	\$0-
Annual Cost/Assessable EDU	\$524	\$524	\$524	\$360	\$414

Notes:

- 1 These scenarios finance the debt associated with each scenario with a 30-year loan, a 3% financing rate, and no grant percentage from the ARPA;
  - a. The per EDU costs shown for capital also include the assumption that the properties in the service areas will be developed by 50% of the remaining expansion capacity through the term of the financing.
- 2 These differences provide significantly different outcomes for the capital spending but the outcomes for the annual operational costs, being based upon existing budgets and IMA agreements, are accurate given the existing WPCA budgets and inter-municipal T&D contract between Southwick and Westfield.
- 3 Attached to this report is a file which will allow the WPCA to assess changes in financing outcomes as more information on ARPA rollout becomes available.

All costs are listed in 2022 dollars.

# Conclusion & Next Steps | Next Steps & Funding

## → Path Forward for most advantageous alternative:

- Alt. 1A: Southwick Connection; \$21.9M; ~264 EDUs;
  - » ~\$333 per month (\$4,000 per year or \$78,000/EDU)
  - » Best opportunity to defray costs (lowest capital cost)
  - » Project Cost Factors (need several):
    - > Inflation / Construction Climate / Availability (X)
    - > Eliminate purchasing grinder pumps (\$2.15M) (✓)
    - > Catalyst (mutually beneficial project) (✓)
    - > Town Contribution (✓)
    - > Refined downstream capacity upgrades costs (✓)
    - > Negotiated Capacity Acquisition with Southwick (✓)
    - > Benefit to Southwick (Lake improvement & water supply protection) (✓)
    - > Stimulus/Grant Funding (✓)

## Funding Options to Explore:

- ❖ Tax Increment Financing TIF (Capital Recovery)
- ❖ Sewer Assessments (Capital Recovery)
- ❖ Clean Water Fund (Financing)
- ❖ Federal Funding (Infrastructure Bill and Earmarks)

