

# Oronoco Regional Wastewater System and Water Distribution Facility Plan

## Public Hearing

December 11, 2018  
City of Oronoco

Presentation: Joe Palen and Ron LaFond



Note: Hold questions until the end of the presentation.

## Introduction / Background

June 2017	State \$500K grant for Regional Wastewater Study
September 2017	MN PFA Authorizes Regional Wastewater Study
December 20, 2017	Presentation Draft Regional Wastewater Study: - City of Pine Island
January 8, 2018	Presentation Draft Regional Wastewater Study: - City of Rochester
Jan./Feb. 2018	Rochester/Pine Island Review and Response
Feb./March 2018	Oronoco Reviews Options
April 10, 2018	Public Info. Meeting (Regional Wastewater Study)
May/June 2018	Oronoco Selects Preferred Options: - Rochester Connection - Oronoco WWTF (Local & Regional Options)



Highlights of the development of the wastewater project and evaluation of numerous regional wastewater collection and treatment options.

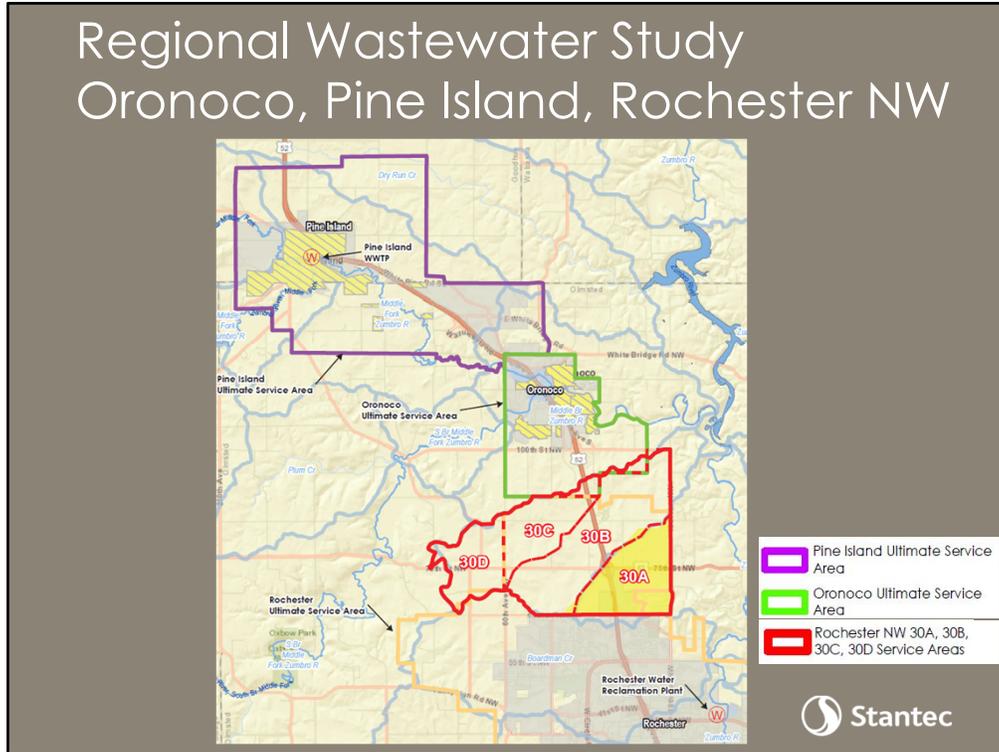
## Introduction / Background

May 2018	State approves \$2.5M grant for Regional Wastewater System Design
June 28, 2018	Public Info Meeting (Alternatives Discussion)
July 17, 2018	Oronoco Council Selects: Regional WWTF Option
Aug. – Oct. 2018	Complete: Regional Wastewater Study & Water / Wastewater Facility Plan
Nov. 13, 2018	Present Facility Plan to Sewer & Water Comm.
Dec. 11, 2018	Facility Plan Public Hearing



Tonight's Public Hearing for Facility Plan provides another opportunity to update regarding the status of the project and address questions that the public and impacted agencies might have.

# Regional Wastewater Study Oronoco, Pine Island, Rochester NW



Review map and legend that illustrates Regional Wastewater Study Area and municipal boundaries.

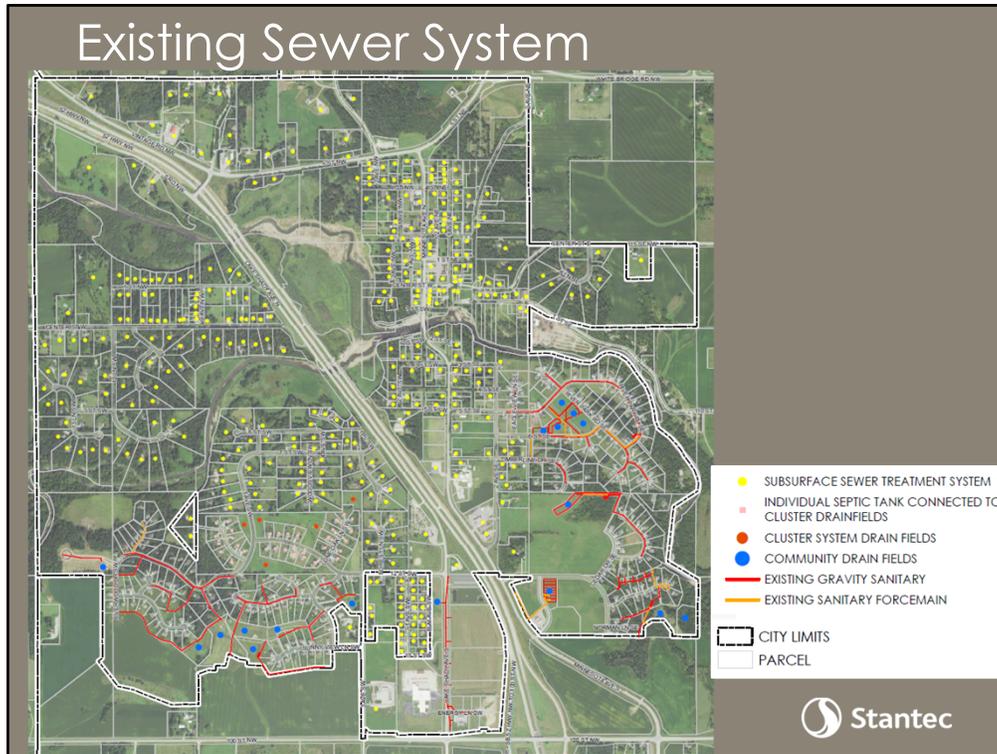
Discuss options evaluated in Regional Wastewater Study

- Oronoco, Rochester & Pine Island (PI) to Regional WWTF
- Oronoco, Rochester & PI to Rochester

Options of Lesser Regional Significance evaluated as part of the Regional Wastewater Study:

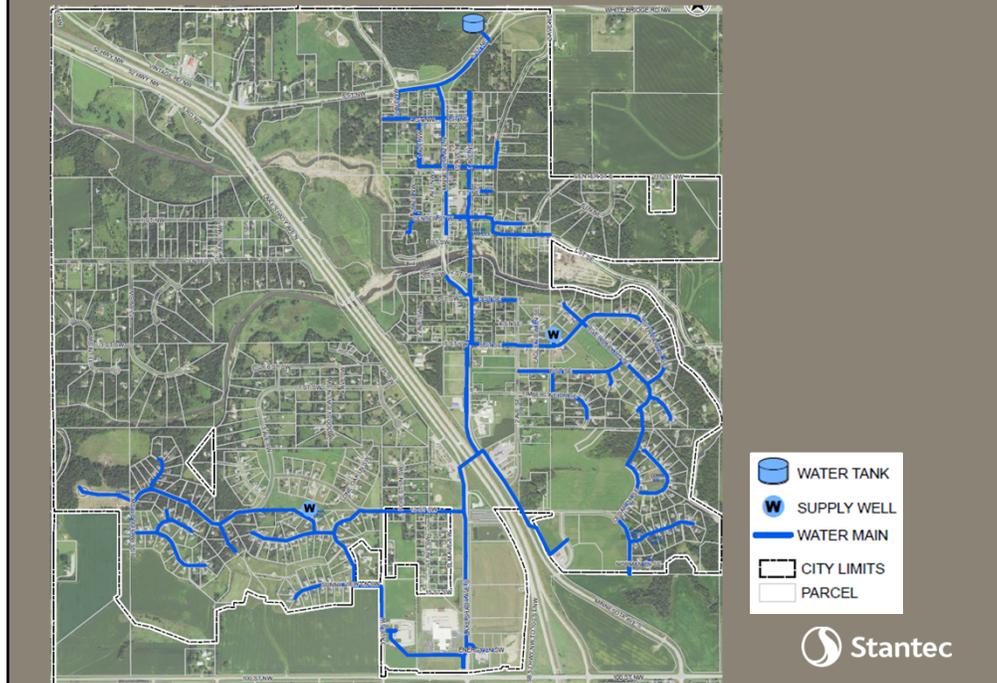
- Oronoco to Rochester
- Oronoco to PI
- Oronoco & Oronoco Estates (OE) to Reginal Facility, PI maintains their own WWTF
- Oronoco & Southern portion of PI to Oronoco WWTF

Oronoco ultimately chose to pursue the construction of a WWTF to serve Oronoco and OE.



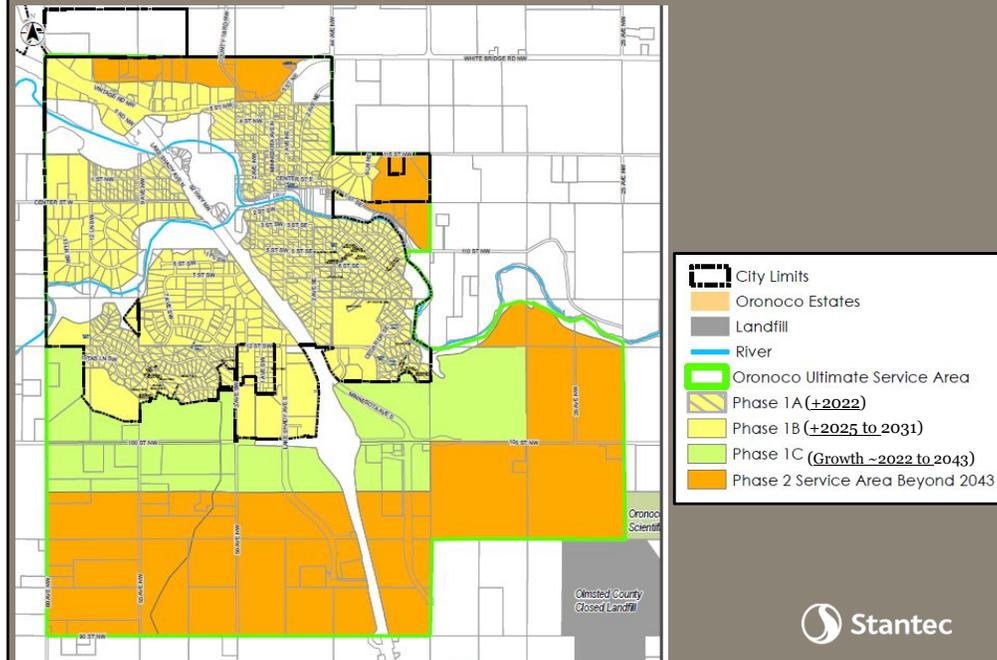
1. Discuss different types of systems (Review Legend)
2. Oronoco is the largest Unsewered City in Minnesota
3. Approximately 75% of systems in Downtown Oronoco fail to meet current SSTS standards or exceeded their useful life.
4. Oronoco is located in a Karst geologic area that makes protecting ground and surface area a challenge and priority.
5. Rolling topography, shallow bedrock, TH 52 and the Middle Fork and South Branch of the Zumbro River provide additional challenges.
6. Lack of municipal sewer makes it difficult to support (commercial development and services that many in Oronoco will like to have within the community)

# Existing Water System



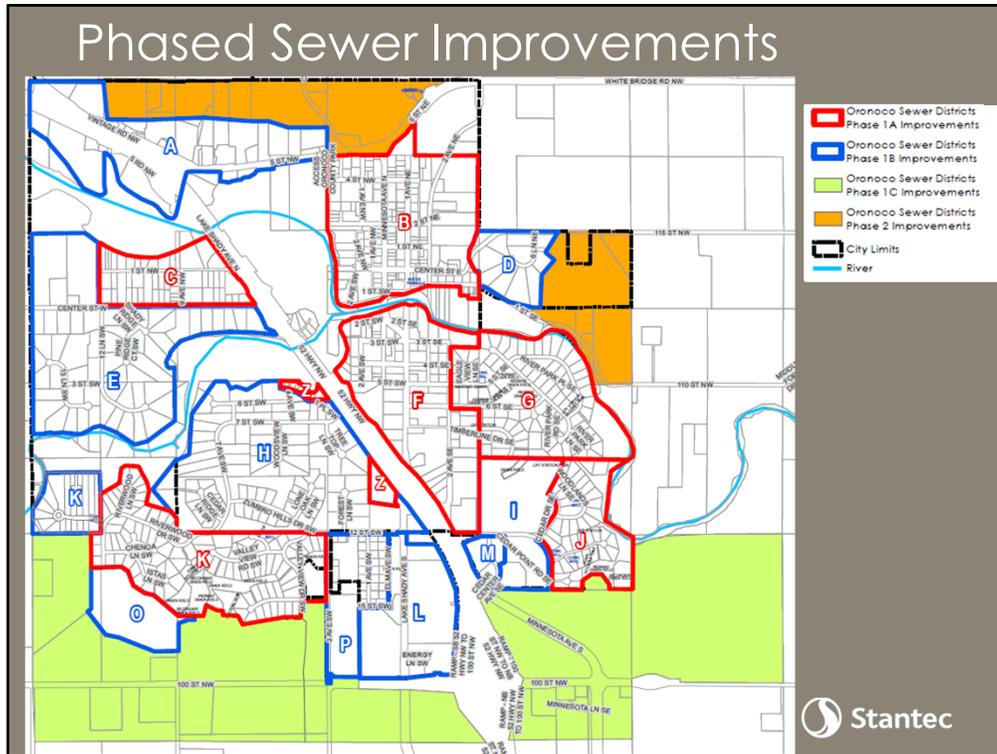
Review well and water reservoir locations constructed in 2009.  
Note City's goal to loop trunk watermain to enhance system reliability and fire protection.

# Ultimate Service Area Sewer Phasing



Discuss project general sewer phasing:

- Yellow with grey hatch = Phase 1A – Operational by 2022
- Yellow with no hatch = Phase 1B – Construction within ~10 Years
- Green = Growth 2022 to 2043
- Orange = Growth beyond 2043



Review Phased approach to serving Oronoco.

- Highest 4 priority areas in (B,C, F and Z) – SSTS Subject to MPCA/Olmsted County MOU – Action by March 2020.
- 3 other areas with existing community waste treatment systems (Areas G, J, K)
- Phase 1B includes A, D, E, H, L, M, and River Bend.
- Most of the rest of the City planned to be served over the next ten years.

# Estimated Benefitting Units

Phase	Service Area	# Units
Phase 1A	B	119
	C	49
	F	67
	G	85
	J	41
	K	102
	Z	7
	<b>Total</b>	<b>470*</b>

Phase	Service Area	# Units
Phase 1B	A	20
	D	13
	E	56
	H	83
	I	4
	K	27
	L	10
	M	3
	O	1
	P	34
<b>Total</b>	<b>251*</b>	

Phase	Parameter	Total
Phase 1C	Total Area (Acres)	776
	Developed Acres (50% Total)	388
	Density Units/Acre	3.0
	<b># Units</b>	<b>1,164</b>

\* Assumes no future in-fill development in Phase 1A and 1B

Phase	# Units
Phase 1A	470
Phase 1B	251
Phase 1C	1,164
<b>Total</b>	<b>1,885</b>

Total Equivalent Residential Units (ERU)= 1,885



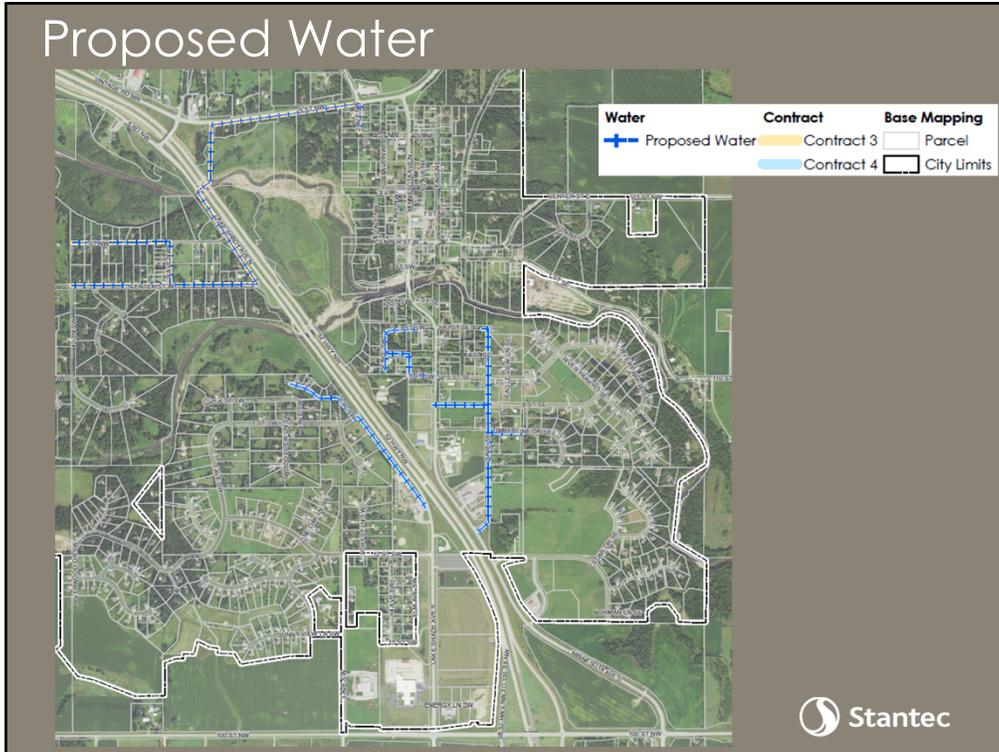
- Growth Projection based on average of 25 Building Permits per year for 20 years + 127 Commercial acre development at 1,360 gpad = 0.436 MGD
- Existing Population is 1,500. Projected population in 2043 = 2,940 (This equates to ~2.8% growth in population per year)



Proposed sanitary sewer collection facilities proposed to serve Phase I A:

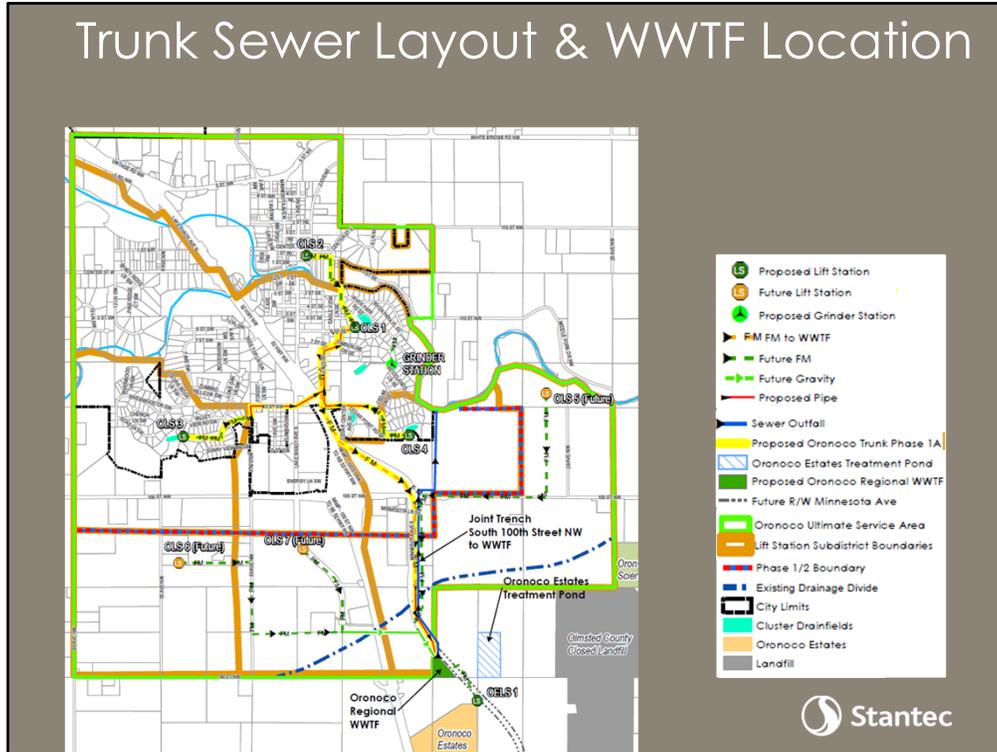
- Laterals sewer consists of 8" gravity pipe in combination with small diameter Force Main (FM) with grinder pumps.
- Trunk sewer include 4 Lift Stations (LS), Trunk gravity and FM sewers conveying flows to the WWTF.
- Project to be separated into 4 contracts for ease of construction (including WWTF).

# Proposed Water



Water Distribution improvements are proposed to serve areas that are not currently served with water and are also being proposed to be served with sewer. The rationale for the proposed service area is that these areas need water service and the disruption from the sewer improvements provides an economical opportunity to complete the watermain installation.

# Trunk Sewer Layout & WWTF Location

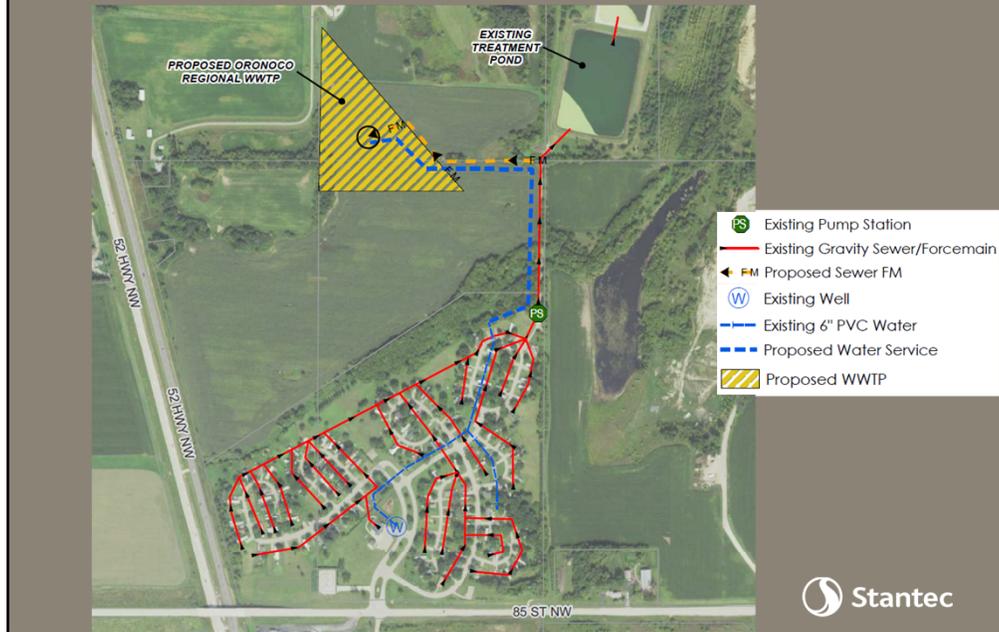


Review Figure Legend: Ultimate service boundary and future growth areas, phase 1 / 2 boundary, LS locations and service boundaries in orange, proposed trunk sewer (sewer / FM) in yellow, Future Sewer / FM in Green, WWTF location and outfall, Oronoco Estates, County Landfill, Mn Avenue CDS

Discuss trunk sewer layout and conveyance to WWTF.

1. Four trunk sewer lift stations in Phase 1 with 6" to 16" diameter FM.
2. Three future trunk lift stations with FM to serve future Phase 2 areas.

# Proposed Sewer/Water Infrastructure Oronoco Estates



- Review figure and legend.
- OE = 216 existing sites + room to add an addition 100 sites.
- Currently have a treatment pond with spray irrigation discharge.
- Strong interest in being served by the project.
- Able to supply water to proposed WWTF.

# Proposed Regional Wastewater Treatment Parameters

Parameter	Projections		
	2022	2031	2043
Sanitary Sewer Service Population	573	2,220	3,723
Average Influent CBOD, lb/d	83	440	787
Average Influent Total Kjeldahl Nitrogen, lb/d	19	103	184
Average Influent Total Phosphorus, lb/d	2	11	20
Average Influent Flow, MGD	0.052	0.274	0.491
Average Dry Weather Flow, MDG	0.044	0.233	0.417
Average Wet Weather Flow, MGD (Maximum Month Influent Flow)	0.067	0.357	0.638
Peak Hour Influent Flow, MGD	0.207	1.015	1.719
Peak Instantaneous Flow, MGD	0.218	1.066	1.804



Projections include Oronoco Estates.

## Proposed Regional Wastewater Treatment Facility Effluent Limits

Parameter	Average Monthly Effluent Limit
cBOD	25 mg/l
TSS	30 mg/l
Total Phosphorus	
Pre-Waste Load Allocation June-Sept	0 kg/d
Estimate Post Load Allocation June-Sept	0.68 kg/d <sup>1</sup> (0.28 mg/l at AWW)
Annual Avg. Concentration	1.0 mg/l
Mercury	6.9 ng/l
Fecal Coliform (Apr-Oct)	200 org/100 ml
Total Residual Chlorine	0.038 mg/l



- Summary of Effluent Limits for proposed WWTF from MPCA.
- Oronoco will need to pursue credits to offset phosphorous discharge until MPCA provides a waste load allocation.

## Wastewater Treatment Options Considered

- On-Site subsurface treatment systems
- Pond Systems (aerated or un-aerated)
- Regionalize wastewater treatment in Rochester or Pine Island
- Mechanical Wastewater Treatment Plants



Mechanical wastewater treatment was determined to be feasible, slightly less costly than regionalization with Rochester and best meets Oronoco's short and long term needs.

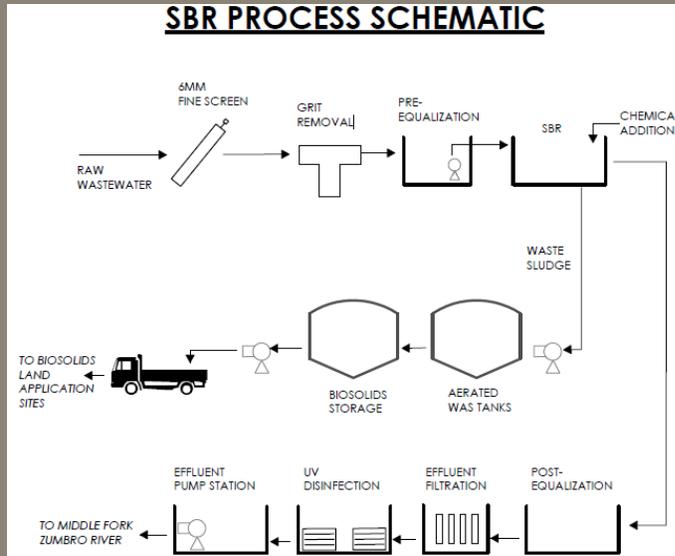
## Mechanical Wastewater Treatment Processes Considered

- Oxidation Ditch
- Sequencing Batch Reactor (SBR)
- Membrane Biological Reactor (MBR)

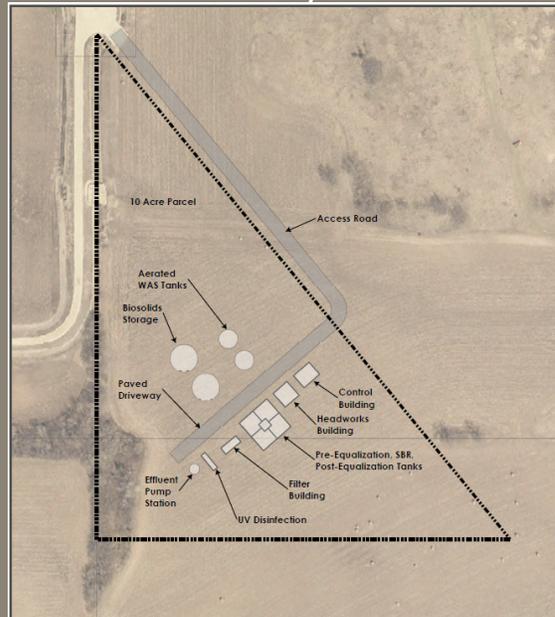


After weighing the advantages and disadvantages of the three activated sludge processes, MBRs and SBRs were retained for further evaluation. Through additional evaluation and correspondence with the City of Oronoco the SBR process was found to be most feasible in terms of cost, operations and maintenance and its ability to meet current and future effluent limit requirements.

# Proposed Regional Wastewater Treatment Facility



# Proposed Regional Wastewater Treatment Facility



- SBR site Layout.
- Proposed WWTF is located just south of the Minnesota Avenue cul-de-sac and is generally located 0.3 miles east of TH 52 and 0.5 miles north of 85<sup>th</sup> Street NW.
- Property owner is Mathy Construction

## Preliminary Cost Estimate WWTF & Collection

Improvement Element	Oronoco Sewer	Oronoco Water	Oronoco Estates	Total
WWTF (SBR process)	\$ 17,510,000	-	\$ 2,210,000	\$ 19,720,000
Trunk Sewer	\$ 7,530,000	-	\$ 50,000	\$ 7,580,000
Lateral Sewer	\$ 7,000,000	-	-	\$ 7,000,000
Lateral Watermain (Area C, F, Z)	-	\$ 2,760,000	-	\$ 2,760,000
<b>Total Cost</b>	<b>\$ 32,040,000</b>	<b>\$ 2,760,000</b>	<b>\$ 2,260,000</b>	<b>\$ 37,060,000</b>

- Project costs include estimated Legal, Engineering Services + 15% contingency factor.
- Note: \$2.5 M has been appropriated by State (2018 Bonding)



Without Watermain: SBR Total is \$ 34,570,000

OE is 11.2% of WWTF cost based upon Flow and is 6.1% of total collection and treatment cost.

# Revenue Source

Item	Revenue Source
WWTF	Plant Investment Fee (PIF) Connection Charge/Assessment
Trunk Sewer	Service Availability Charge (SAC) Connection Charge/Assessment
Lateral Sewer	Lateral Assessments



Revenue Sources to Pay Oronoco Local Share – proposed to be funded through CWRP low interest loan (20 to 30 year term)

## Cost Impact per ERU for Phase 1A 0%, 50%, 80%, 90% Funding

<b>Oronoco</b>	<b>Estimated Capital Cost</b>	<b>Est. ERU</b>	<b>0% Funding Cost/ERU</b>	<b>50% Funding Cost /ERU</b>	<b>80% Funding Cost /ERU</b>	<b>90% Funding Cost/ERU</b>
PIF - Phase 1 (WWTF)	\$ 17,510,000	1,885	\$ 9,300	\$ 4,650	\$ 1,860	\$ 930
SAC - Phase 1 (Trunk Sewer)	\$ 7,530,000	1,885	\$ 4,000	\$ 2,000	\$ 800	\$ 400
Lateral Sewer - Phase 1A	\$ 7,000,000	470	\$ 14,900	\$ 7,450	\$ 2,980	\$ 1,490
Total wastewater collection & treatment cost	\$ 32,040,000	-	\$ 28,200	\$ 14,100	\$ 5,640	\$ 2,820
Total Estimated Funding	-	-	0	\$ 16,020,000	\$ 25,632,000	\$ 28,836,000

<b>Oronoco Estates</b>	<b>Estimated Capital Cost</b>	<b>Est. ERU</b>	<b>0% Funding Cost/ERU</b>	<b>50% Funding Cost /ERU</b>	<b>80% Funding Cost /ERU</b>	<b>90% Funding Cost/ERU</b>
PIF – (WWTF)	\$ 2,210,000	300	\$ 7,400	\$ 3,700	\$ 1,480	\$ 740
SAC (Lift Station and FM)	\$ 50,000	300	\$ 200	\$ 100	\$ 40	\$ 20
Total wastewater collection & treatment cost	\$ 2,260,000	-	\$ 7,600	\$ 3,800	\$ 1,520	\$ 760
Total Estimated Funding	-	-	0	\$ 1,130,000	\$ 1,808,000	\$ 2,034,000



- Oronoco is lobbying for 80% or higher cost share (grant funding) from the State of Minnesota through available funding programs (PSIG, WIF) and the 2020 bonding bill. The final funding amounts provided by the State of Mn will not be determined until ~2020.
- The cost per ERU assumes the addition of 1,415 ERU's consisting of existing and future development to 2043.
- Costs exclude interest on any loan repayments.

# Estimated Monthly User Rates

- Basis for Rate
  1. Number of Connections
  2. Wastewater Flow
  3. Operation & Maintenance Cost (Treatment/Collection)

2022 Estimated Monthly User Rate	
Fixed Charge	\$ 20.00 / month
Cost/1,000 Gallons	\$ 5.00 / 1,000 gallons

Typical Home	
2 People @ 3,000 gallons/month	\$ 35.00 / month
4 People @ 5,000 gallon/month	\$ 45.00 / month



The Rates shown in the table are equivalent to Rochester's rate in 2022.

# Estimated Annual O & M

## Estimated Annual O&M Items

1. Billable Wastewater Flow, GPD	5. WWTF Equipment O&M	9. WWTF Biosolids Disposal
2. WWTF Electricity	6. WWTF Equipment Replacement	10. WWTF Lab, Supplies, Testing, Misc.
3. WWTF Other Utilities	7. WWTF Labor	11. Collection System O&M
4. WWTF Chemical	8. WWTF Odor Control	12. Collection System Annualized Equipment Replacement

## Estimated Cumulative Revenue 5-Year Increment

	2022	2025	2030	2035	2040	2043
Estimated O&M Cost (Per Year)	\$201,233	\$352,824	\$478,552	\$597,070	\$737,013	\$779,546
Total Annual Revenue <sup>(1)</sup>	\$286,330	\$428,628	\$594,040	\$832,868	\$1,030,930	\$1,153,398

(1) User Rate Estimate for 2022 include: Fixed Charge \$20/Month/ERU; Plus \$5/1,000 Gallons



The total estimated annual revenue comfortably exceeds estimated O & M Costs.

# Project Schedule

December 11, 2018	Facility Plan Public Hearing
December 18, 2018	City Council Adopt Facility Plan / Submit to MPCA
Winter 2019	MPCA Facility Plan Approval Public Hearing (Water Improvements)
Spring – Fall 2019	Design
Spring 2019	Feasibility Report Public Hearing (Watermain)
Fall 2019	Feasibility Report Public Hearing (Sewer)
Fall 2019 – Winter 2020	Apply / Secure Funding
Spring 2020	Finalize Design
Summer 2020	Advertise for Bids / Award Contract
Fall 2020	Start Construction
Fall 2021	Substantial Completion of Collection System
Spring 2022	Final Completion (WWTF Operational)



## Next Steps

- Oronoco City Council adopt Facility Plan at its December 18, 2018 Council Meeting; Submit to MPCA
- Submit Antidegradation Alternatives Analysis and seek MPCA / EPA Approval
- Pursue phosphorous trading agreement with area municipality
- Finalize treatment plant site location/acquisition with Mathy Construction
- Finalize Sewer Agreement and develop Memorandum of Understanding (MOU) with Oronoco Estates
- Complete Environmental Document (MPCA)



## Next Steps (Cont.)

- Review with MPCA consideration for Closed Land Fill leachate to be included in WWTF design
- Update Future Land Use Plan and amend Ultimate Service Boundary
- Review & Update Sanitary Sewer Ordinance
- Complete Feasibility Report on Water Distribution Improvements and conduct a Public Hearing
- Coordinate relevant activities with MPFA/MPCA and Oronoco Water/Sewer Committee
- Identify and pursue all funding opportunities



Questions?

