Township of SEVERN

COLDWATER WASTEWATER TREATMENT PLANT EXPANSION CLASS ENVIRONMENTAL ASSESSMENT

PUBLIC INFORMATION CENTRE NO. 1

June 1, 2023

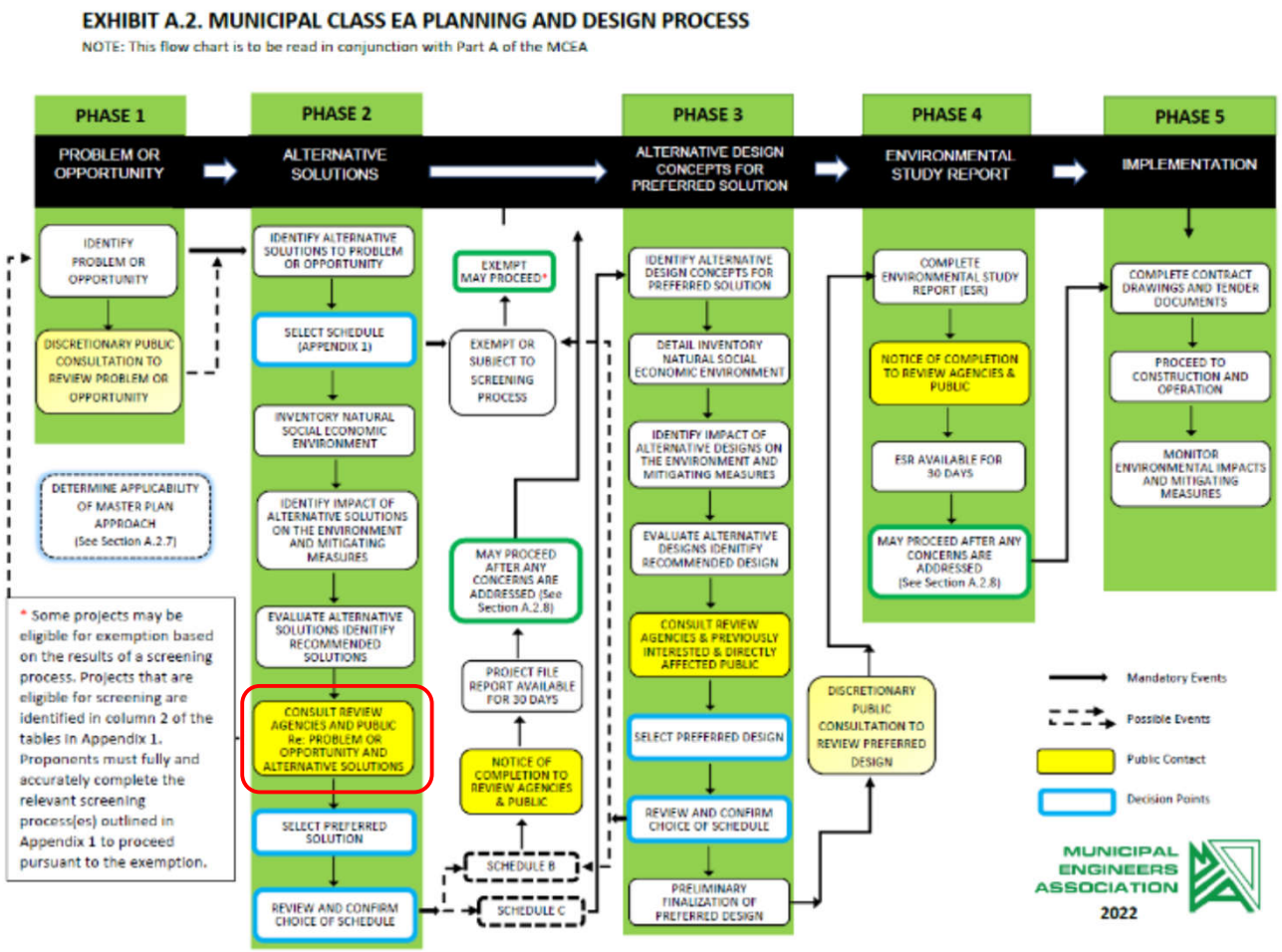
TATHAM ENGINEERING

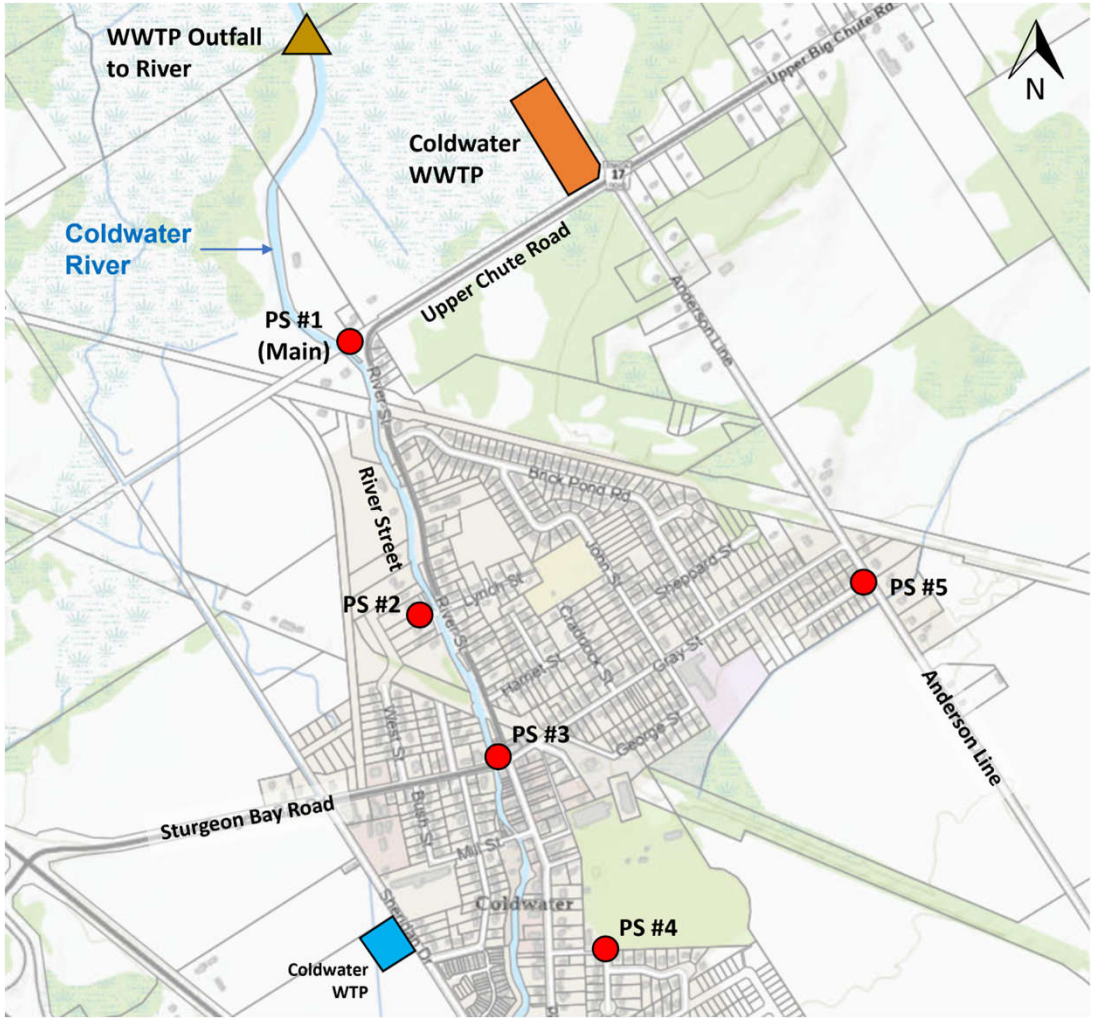
PROBLEM STATEMENT

The community of Coldwater is expected to grow significantly over the next 20 years. The Coldwater wastewater treatment plant (WWTP) does not have capacity to treat the wastewater associated with the anticipated population growth in Coldwater, nor does the Main SPS have capacity to convey the projected wastewater flows to the WWTP.

CLASS EA PROCESS

- We are at Phase 2





EXISTING WASTEWATER INFRASTRUCTURE

- Sanitary sewage collection system
- 5 pumping stations
- Coldwater WWTP
- Treated effluent outfall to Coldwater River

EXISTING MAIN SPS AND COLDWATER WWTP

- The Main SPS (SPS No. 1) is a below-ground station with 3 submersible pumps
- The Coldwater WWTP:
  - receives pumped sewage from the Main SPS
  - has two package treatment plants: an extended aeration (EA) plant and a sequencing batch reactor (SBR) plant
  - treatment includes phosphorus removal and UV disinfection
  - discharges treated effluent to Coldwater River
  - biosolids are digested and stored before disposal by land application

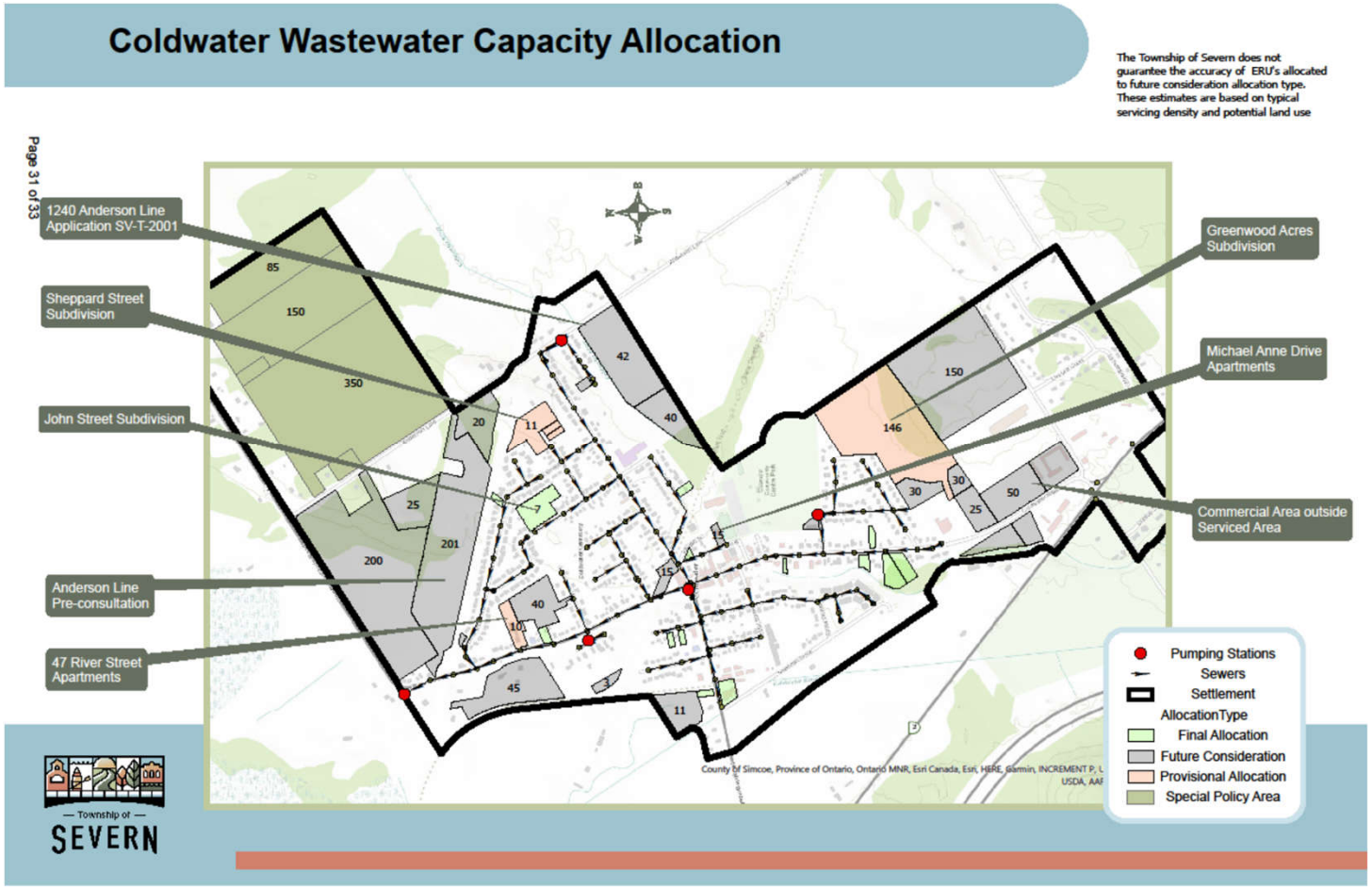
CAPACITIES AND HISTORICAL FLOWS

- The WWTP has an average day capacity of 921 m^3/day and a peak flow capacity of 3,240 m^3/day
- The Main SPS has a rated capacity of 18.8 L/s (1,624 m^3/day)
- Sewage is occasionally hauled from Main SPS to WWTP, because of insufficient capacity of Main SPS

	Influent			Effluent Average Flow	
	Average	Maximum	MDF	SBR	EA
5-year Average (m^3/day)	580		3.4	208	434
5-year Max (m^3/day)		2,392	4.3		
Rated Capacity (m^3/day)	921	3,240	3.5	375	546
Percent Utilization (%)	63	74		55	80

GROWTH AREAS

- Township plan showing the anticipated growth areas in 2022



POPULATION PROJECTIONS

Assumptions

- Commercial/industrial lands wastewater generation rate of 20,000 L/ ha/day
- Projected average occupancy: 2.7 person/unit
- Allowance of 2.5% of new units

	Equivalent Residential Units	Equivalent Population
Existing and Allocated		
Existing	566	1,500
Allocated (Final and Provisional)	187	506
Existing and Allocated	**753**	**2,006**
Future		
0 – 10 Years	661	1,784
10 – 20 Years	629	1,697
20+ Years	971	2,622
Future	**2,261**	**6,103**
Allowance	61	165
Total	**3,075**	**8,274**

GENERATION RATES & DESIGN CRITERIA

- 5-year average wastewater generation rate: 387 L/person/day
- Inflow and Infiltration (I/I) investigation in 2016 found high I/I in the spring due to high groundwater table and snowmelt

	Criteria for Planning
WWTP Design	
Domestic Wastewater Generation Rate, incl. average I/I	400 L/p/day
Maximum Day Factor	4
SPS Design	
Peak I/I	0.23 L/ha/s
Harmon Peaking Factor	As calculated for tributary population

WWTP PROJECTED FLOWS AND DEFICITS

- WWTP will be operating at 88% of its rated capacity when all allocated units are built
- Insufficient capacity to accommodate anticipated growth in next 10 years
- Design of WWTP expansion should be initiated at about 85% of its rated capacity

	Cumulative Equivalent Population	Projected Average Flows (m^3/day)	Residual WWTP Avg. Capacity (m^3/day)
Existing and Allocated	2,018	807	114
10-year Growth	3,847	1,539	(618)
20-year Growth	5,587	2,235	(1,314)
Build-out (20+ Years)	8,274	3,310	(2,389)

DESIGN FLOWS AND CAPACITY EXPANSIONS

- Based on projections, a 2-phase WWTP expansion would be needed, to be confirmed in Class EA Phase 3
- For build-out condition, SPS would need to be expanded from 18.8 L/s to 108 L/s.

WWTP Phased Expansions	Average Capacity (m^3/day)	Peak Capacity (m^3/day)
Existing WWTP	921	3,240
Phase 1 Expansion (20-year growth)	2,400	9,600
Phase 2 Expansion (Build-out)	3,300	13,200

WWTP PERFORMANCE

- WWTP consistently meets its effluent objectives and compliance criteria
- In the past 5 years, there was only one exceedance of a compliance limit

Parameter	Influent Quality (Avg.)	Effluent Quality		Effluent Objective	Effluent Limit
		Average	No. of Exceedances		
Total Suspended Solids (mg/L)	125	7	1	10	15
CBOD (mg/L)	119	3	0	10	15
Total Phosphorus (mg/L)	3.4	0.1	0	0.3	0.5
Ammonia (mg/L)		1.5		1 – 3	
E. Coli (cfu)		13		200	

COLDWATER RIVER WATER QUALITY

Parameter	Upstream Sampling Locations		Downstream Sampling Locations	
	1989-1990	2021-2022	1989-1990	2021-2022
Dissolved Oxygen (mg/L)	11.6	12.4	9.6	10.3
Total Suspended Solids (mg/L)	8.9	14.7	9.1	13.5
Total Phosphorus (mg/L)	0.025	0.019	0.841	0.024
Ammonia (mg/L)	0.07	0.03	0.07	0.06
Unionized Ammonia (mg/L)	0.0003 – 0.0017		0.0003 – 0.0025	

- Water quality in Coldwater River was measured upstream and downstream of WWTP outfall in 1989-1990 and 2021-2022
- WWTP outfall had minimal effects on the water quality in Coldwater River
- Total Phosphorus below PWQO of 0.03 mg/L to prevent algae growth
- Unionized Ammonia well below PWQO of 0.02 mg/L to prevent toxicity to aquatic life

FUTURE WWTP EFFLUENT QUALITY

- Effluent quality of expanded WWTP will need to be improved proportional to the increase in effluent flows to Coldwater Creek to maintain the current approved loading limits
- Required effluent quality will be confirmed in pre-consultation with MECP

Parameter	Effluent Loading Limit / Objective (kg/day)	Expected Effluent Quality Limits (mg/L)		
		Existing 921 m^3/day	Expansion 1 2,400 m^3/day	Expansion 2 3,300 m^3/day
CBOD & Suspended Solids	13.8	15	6	4
Total Phosphorus	0.28	0.3	0.13	0.09
Ammonia – Summer	0.92	1	0.4	0.3
Ammonia – Winter	2.76	3	1.2	0.9

ALTERNATIVE PLANNING SOLUTIONS

1. Do Nothing / Limit Growth
   - Growth limited to available capacity of WWTP
2. Reduce Wastewater Flows
   - Rehabilitate sewers to reduce extraneous flows
3. Expand Coldwater WWTP and Main SPS at Existing Sites
   - Expand existing facilities on current sites
4. Build a new WWTP on the Existing Site and Expand Main SPS
   - Replace existing WWTP with new WWTP on existing site
   - Expand Main SPS on existing site
5. Build a new WWTP on a New Site and Expand Main SPS
   - Replace existing WWTP with new WWTP on a new site
   - Expand Main SPS on existing site

Criteria	Alt 1 Do Nothing/ Limit Growth	Alt 2 Reduce Wastewater Flows	Alt 3 Expand WWTP & Main SPS at Ex. Sites	Alt 4: Build new WWTP & Expand Main SPS	
				4A. Build New WWTP on Ex. Site	4B. Build New WWTP on New Site
Addresses Problem	No	No	Yes	Yes	Yes
Impact to Coldwater River	None	None	Low potential impact	Low potential impact	Low potential impact
Natural, Cultural, and Archaeological Impacts	None	None	Low potential impacts on existing disturbed site	Low potential impacts on existing disturbed site	Higher potential impact on undisturbed land
Impacts on Residents	None	Temporary impacts during sewer construction	Capital costs paid by DCs	Capital costs paid by DCs and ex. residents	Capital costs paid by DCs and ex. residents Land acquisition
Flexibility for Phasing/Future	None	None	Some flexibility	More flexibility	More flexibility
Use of Existing Infrastructure	Yes	Yes	Yes	No	No
Climate Change Resiliency	No	Could reduce impacts of severe wet weather events	Opportunity to build-in climate change resiliency	More opportunity to build in climate change resiliency	More opportunity to build in climate change resiliency

Legend: Very positive | Positive | No impact | Minor negative | Negative

EVALUATION OF ALTERNATIVE SOLUTIONS

- Do Nothing/Limit Growth (Alt. 1) does not address the Problem Statement
- Reduce Wastewater Flows (Alt. 2) is not sufficient on its own to generate the required wastewater capacity, but I/I in sewers should be addressed
- Expanding the Coldwater WWTP and Main SPS on the current sites (Alt. 3) would be feasible, have low potential environmental impacts, and have the lowest costs, paid through DCs from new developments.
- Building a new WWTP on the current site or new site (Alt. 4) would have more potential environmental impacts and higher costs, and would not maximize use of existing infrastructure, but would provide more flexibility/opportunity for energy-efficient and climate change resilient facility

Preliminary Preferred Solution:

- **Expand Coldwater WWTP and Main SPS on existing sites**
- **Implement an I/I control program**

CLASS EA NEXT STEPS

- Obtain and review comments from public, agencies and stakeholders
- Incorporate comments into assessment and select preferred solution
- Proceed to Phase 3 of the Class EA process:
  - Develop and assess alternative design concepts for the preferred planning solution
- Hold PIC 2 to seek input on assessment of design concepts
- Prepare Draft Environmental Study Report
- 30-day public and agency review

Please fill in a comment sheet and submit to us by June 16, 2023

THANK YOU FOR YOUR INPUT

TATHAM ENGINEERING

Township of SEVERN