November 4, 2024

Municipality of Strathroy - Caradoc

Water, Wastewater and Stormwater Master Plan and Pollution Prevention Control Plan

Council Presentation

Master Plan/PPCP Project Schedule

Presentation Purpose

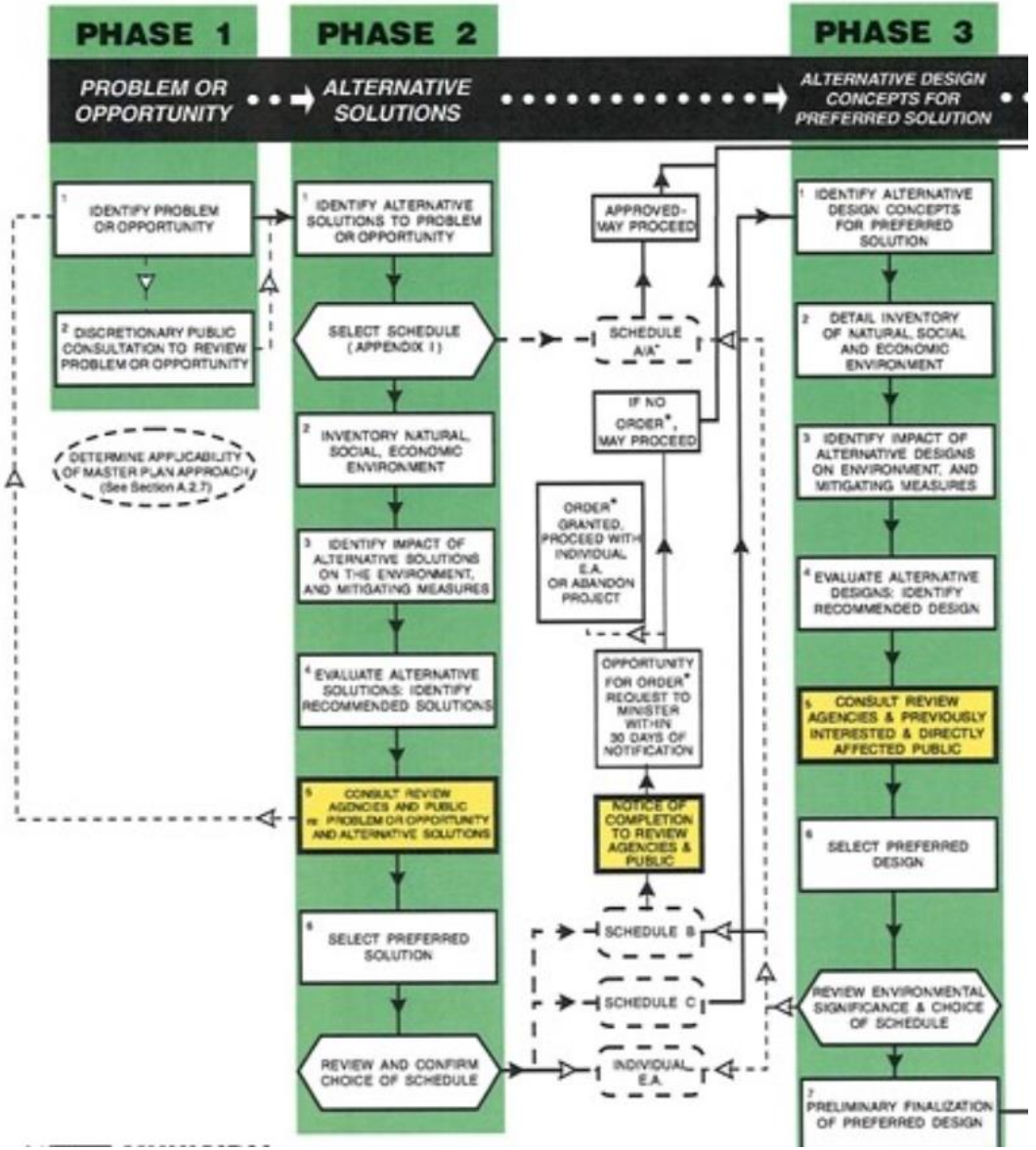
- Provide details on findings of the Water, Wastewater and Stormwater Management (SWM) Master Plan
- Provide details on findings of the Pollution Prevention Plan (PPCP) Identify the issues and reason for this study
- Summarize the recommendations and costs associated with the Master Plan and PPCP

Schedule

- Assigned to RVA April 2023
- Undertook background review, site visits, flow monitoring, hydraulic modeling
- PIC #1 held on January 10, 2024
- PIC #2 held on September 11, 2024
- Following Council Approval Municipality Issues Notice of Completion – November 2024
- Master Plan and PPCP Completed (following 30-day review period) – December 2024

Master Plan/PPCP Purpose and Objectives

- Master Plans rely on analysis and policies developed in municipal Official Plans such as the expected speed, location and type of growth to determine infrastructure needs
- Addresses Phases 1 and 2 of Municipal Class EA process
- Follows Approach #1 of the MCEA process



Master Plan/PPCP Purpose and Objectives

The Municipality has chosen the following as its statement of the Problem and Opportunity Statement to be addressed by the Master Plan/PPCP:

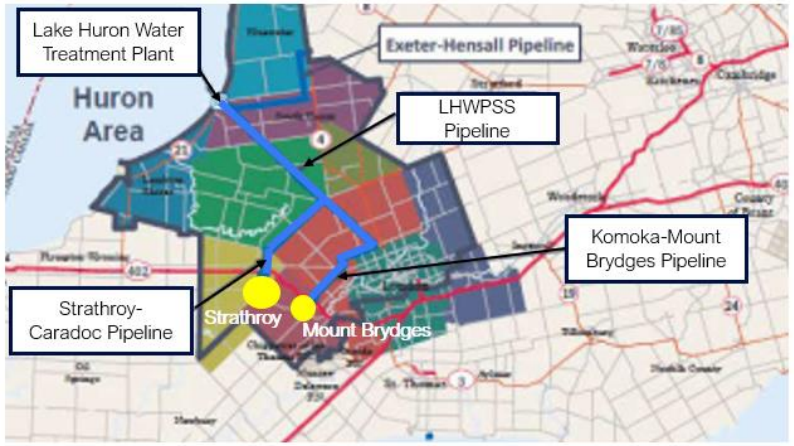
> *To identify preferred water and wastewater serving strategies to meet the Municipality of Strathroy-Caradoc's growth needs to 2046 as well as provide effective on-going continuity to existing serviced community areas across the Municipality of Strathroy-Caradoc as appropriate.*

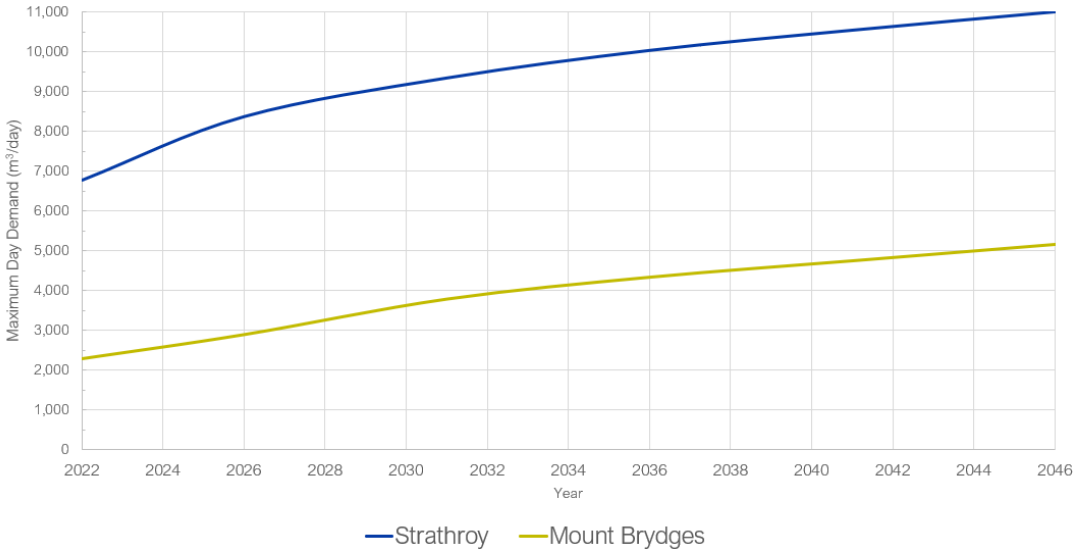
A Pollution Prevention Control Plan (PPCP) is Intended to be a part of the Municipality's ongoing efforts to improve the performance of sanitary and storm sewer infrastructure

The Master Plan and PPCP focus on the two urban settlement areas (Strathroy and Mount Brydges)

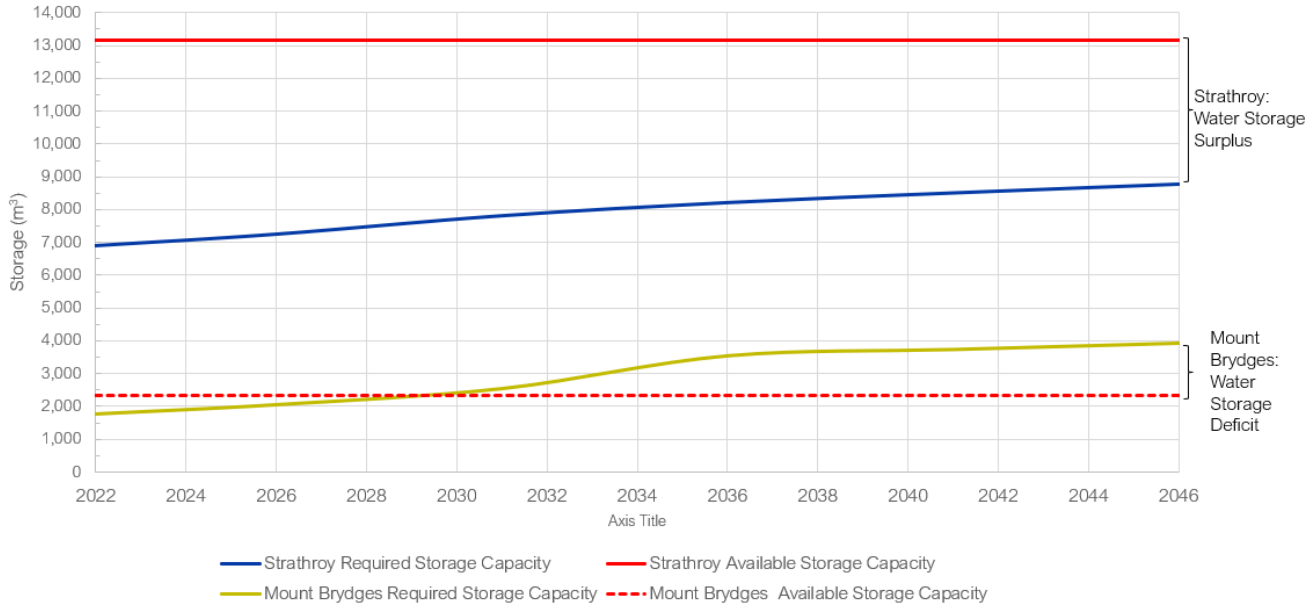
Drinking Water Distribution

- **Strathroy WDS** and **Mount Brydges WDS** are both supplied from the Lake Huron Primary Water Supply System (LHPWSS) through separate connections
- LHPWSS current capacity is 340 mega-litres per day (ML/d) and the 2023 maximum day flow was 198.5 ML/d – water supply is not an issue





Water Demand

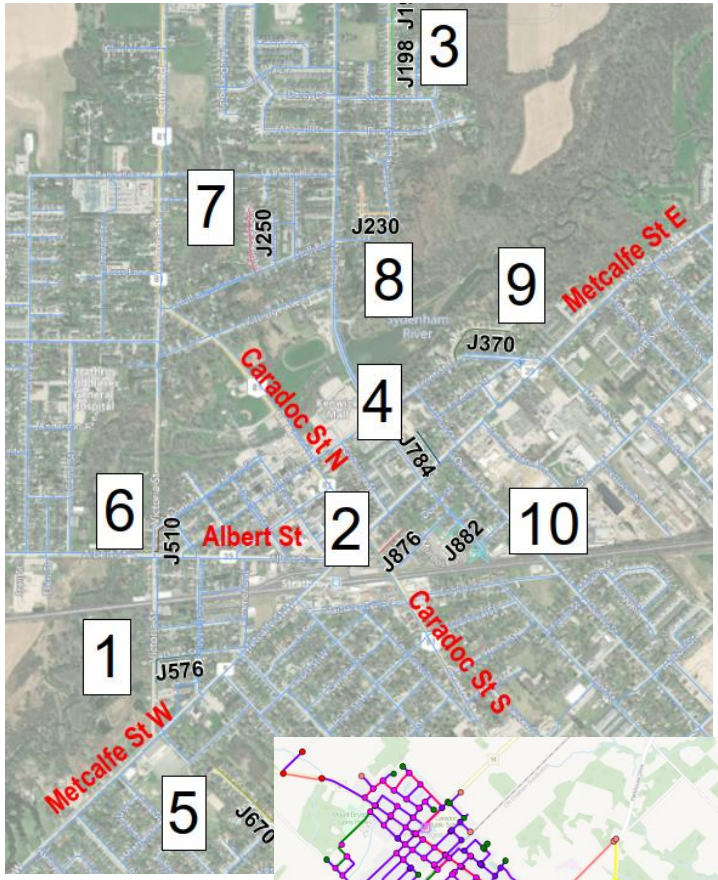


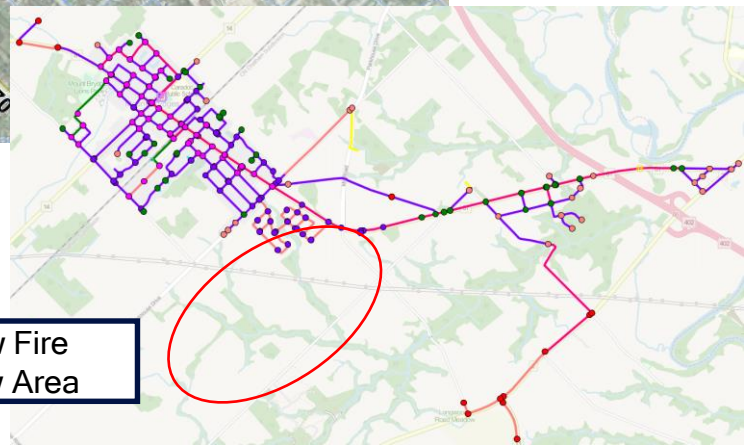
Water Storage

Drinking Water Storage & Hydraulic Modelling

- **Strathroy Drinking Water System**
  - No issues noted related to growth
  - 10 sections of undersized watermains in the distribution system that need to be upsized to meet fire flow targets

- **Mount Brydges Drinking Water System**
  - Currently have 2,350 m^3 of storage
  - Additional storage capacity required by 2031 for total capacity of 3,913 m^3
  - Some isolated rural areas east of Adelaide Rd. and Gibson Rd. have lower than required fire flows





Low Fire Flow Area

Recommended Water Strategy

Strathroy Drinking Water System

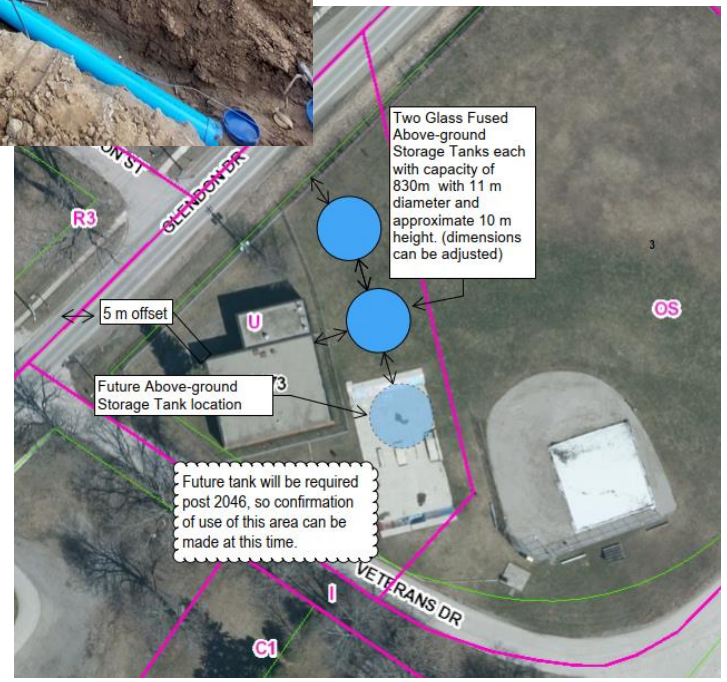
- Upsize 10 sections of undersized watermains in Strathroy (2025 to 2035)

Mt. Brydges Drinking Water System

- Increase Mount Brydges storage with two above ground storage tanks at current Glendon Rd Storage Facility (2025-2026)

Area east of Adelaide Rd. and Gibson Rd.

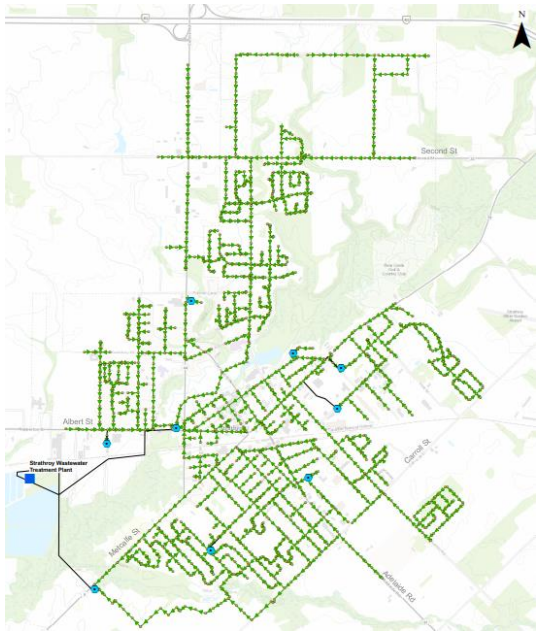
- Increasing watermain size would affect water quality and operations
- Treat areas as rural for fire protection and monitor water modelling in future



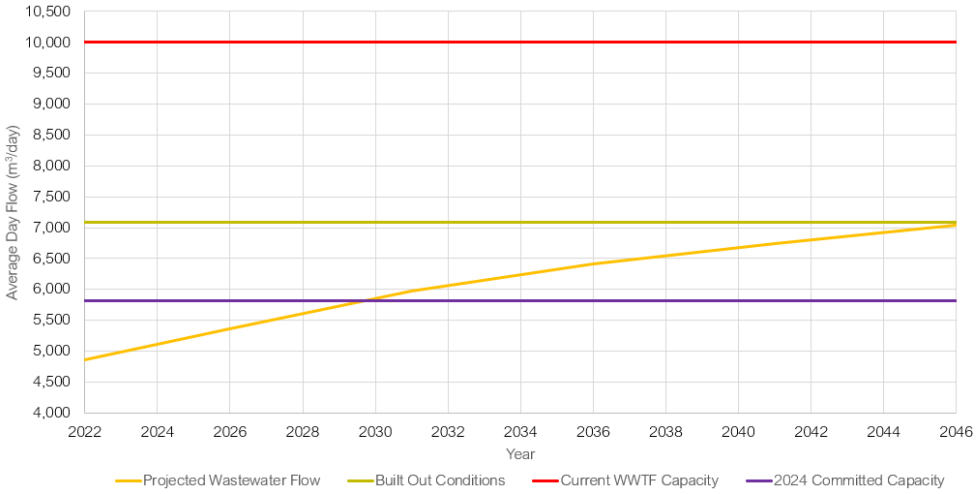
Strathroy – WW Collection and Treatment

- Wastewater flow projections to 2046 were undertaken and are shown in the table below

Parameter	2026	2031	2036	2041	2046
Population	18,200	20,300	21,800	22,900	23,900
Average Day Flow (ADF)	5,357	5,975	6,416	6,740	7,034



- The Strathroy wastewater collection system was modelled (PS, forcemains and sewers)
- Existing collection system adequate for flows to 2046
- The Strathroy WWTF has a ADF capacity of 10,000 m^3/day and does not need to be expanded for capacity in the period to 2046



Mount Brydges WW Collection

- Wastewater flow projections to 2046 were undertaken and are shown in the table below

	Years				
Parameter	2026	2031	2036	2041	2046
Total Population	4,200	5,500	6,300	6,900	7,500
Connected Population Growth	2,295	4,111	5,440	6,593	7,500
WWTF Capacity Requirement (m^3/day)	718	1,287	1,703	2,064	2,348

- Existing collection system adequate for flows from currently connected areas
- Collection system to be upgraded to connect existing, non-serviced residents by 2046
- 11.6 km of new sanitary sewers will be required
- Cost will depend on extent of road and storm sewer upgrades if included as part of sanitary sewer construction

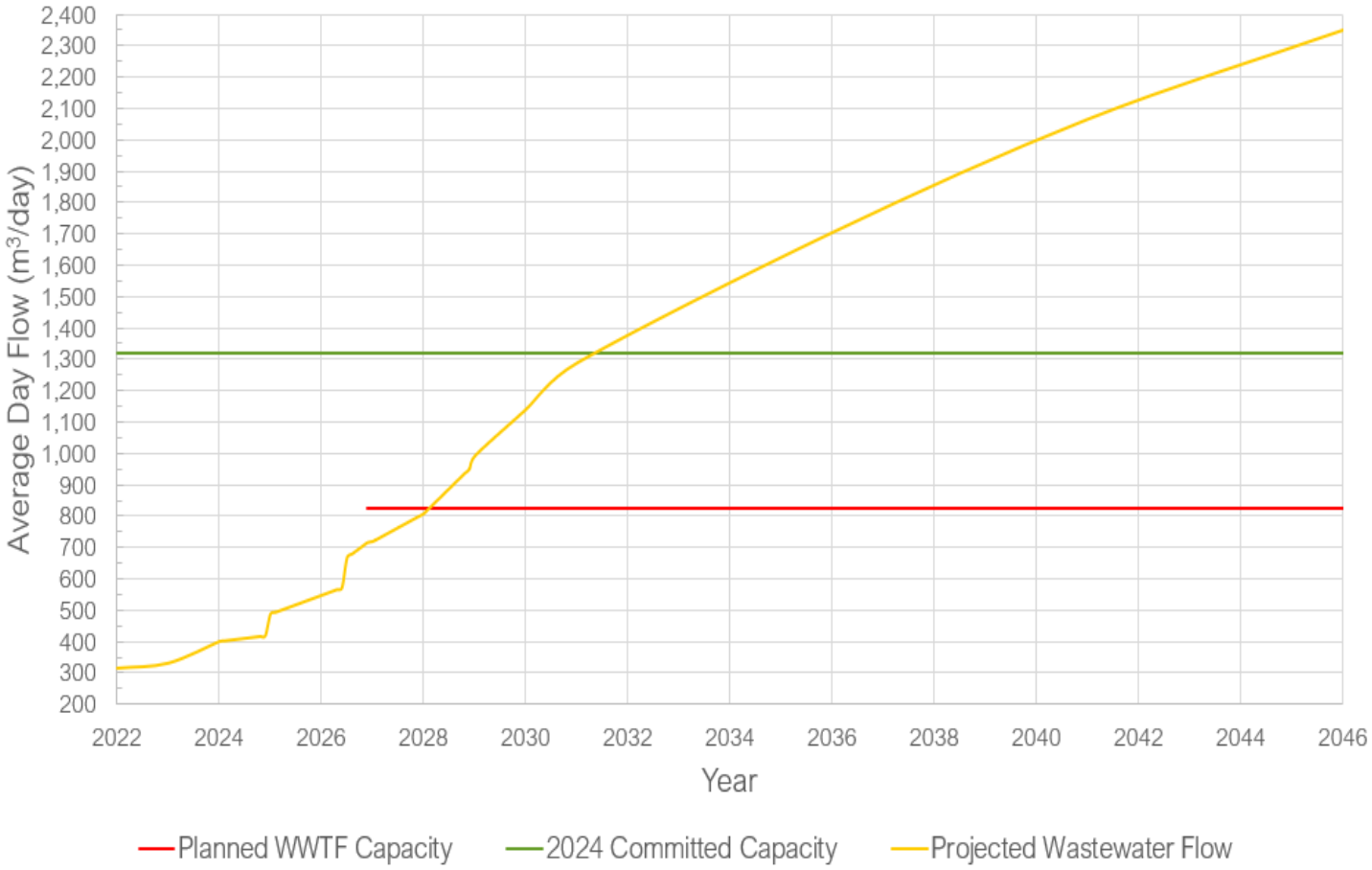
Mount Brydges WW Treatment

Mount Brydges Wastewater Treatment

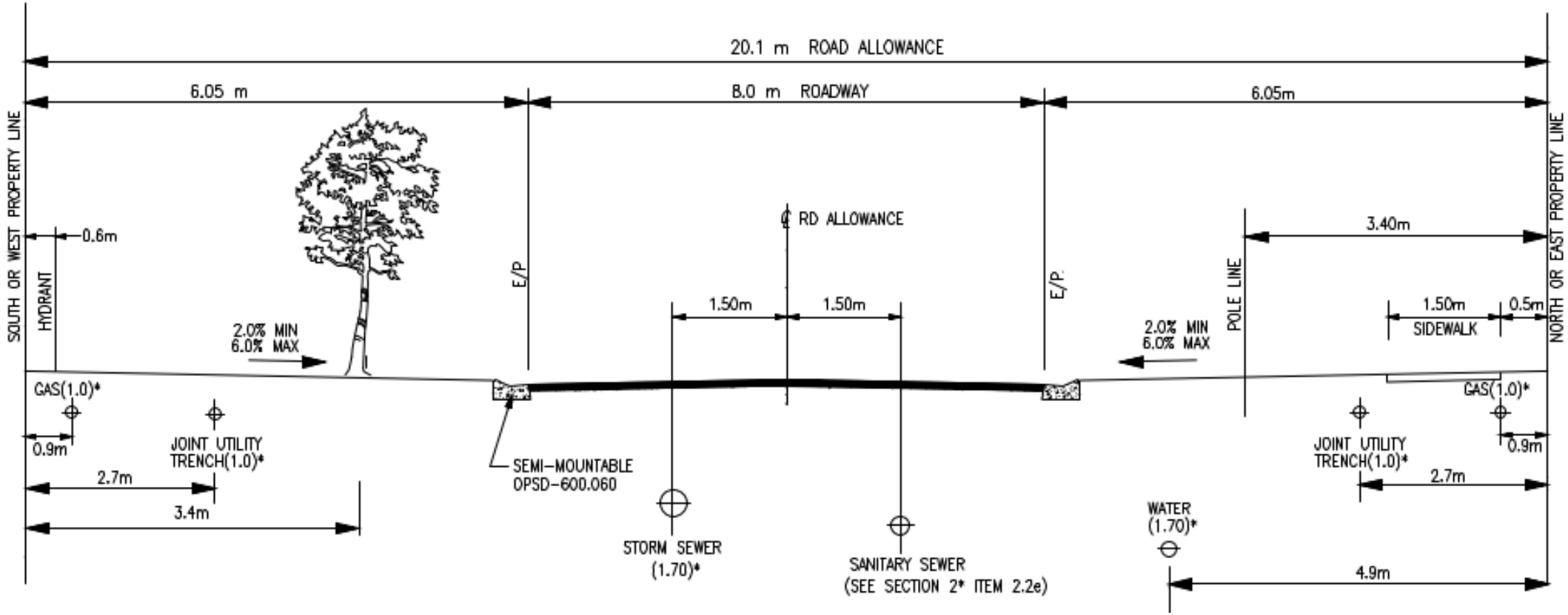
- Mount Brydges WWTF currently struggling to meet effluent limits
- Treatment capacity of 825 m^3/day expected to be restored by 2026

Wastewater Treatment Expansion

- Total wastewater loading in Mt. Brydges expected to be 2,348 m^3/day by 2046
- Schedule C Class EA required to confirm wastewater servicing strategy



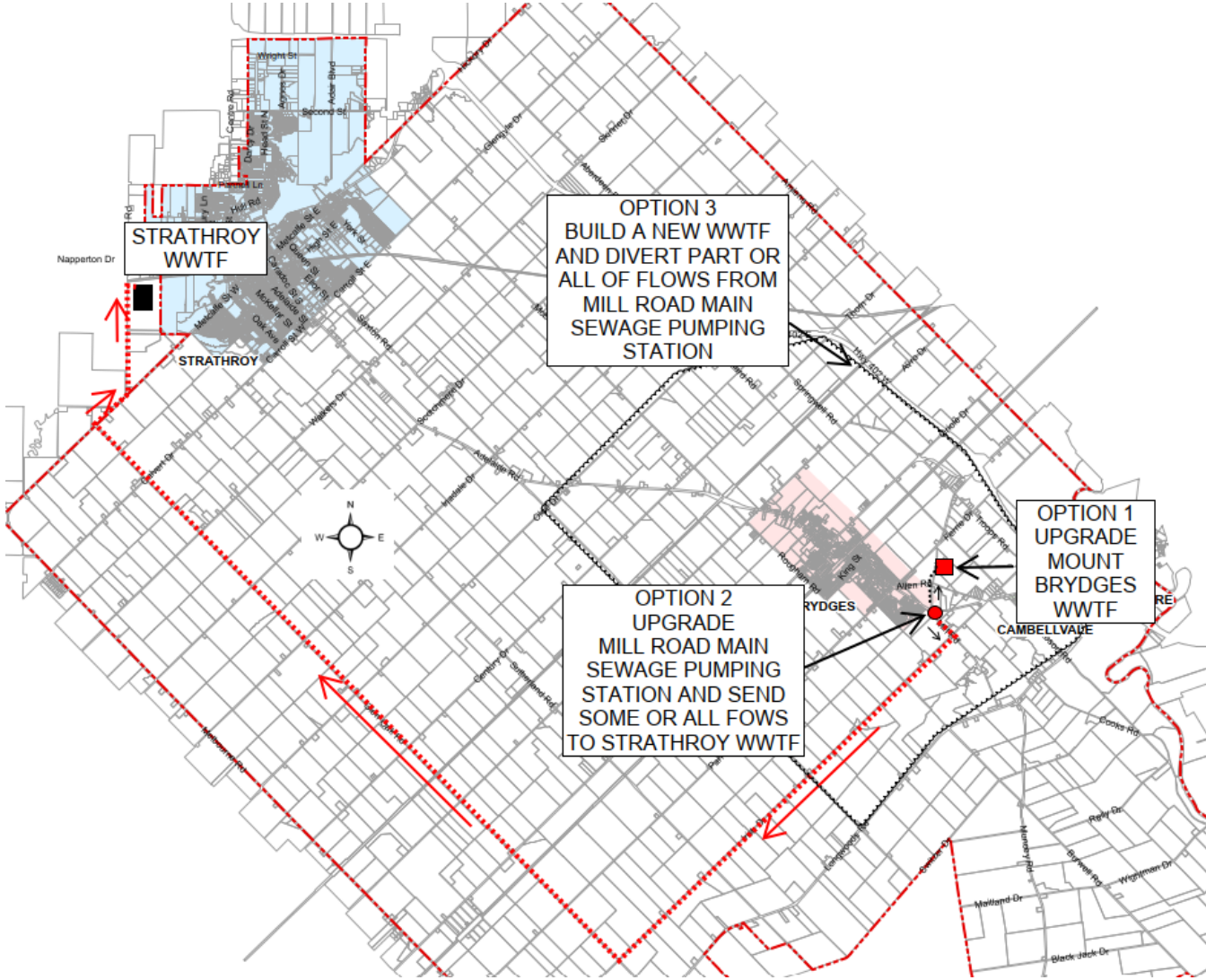
Mount Brydges WW Treatment Capacity



Typical Road Allowance

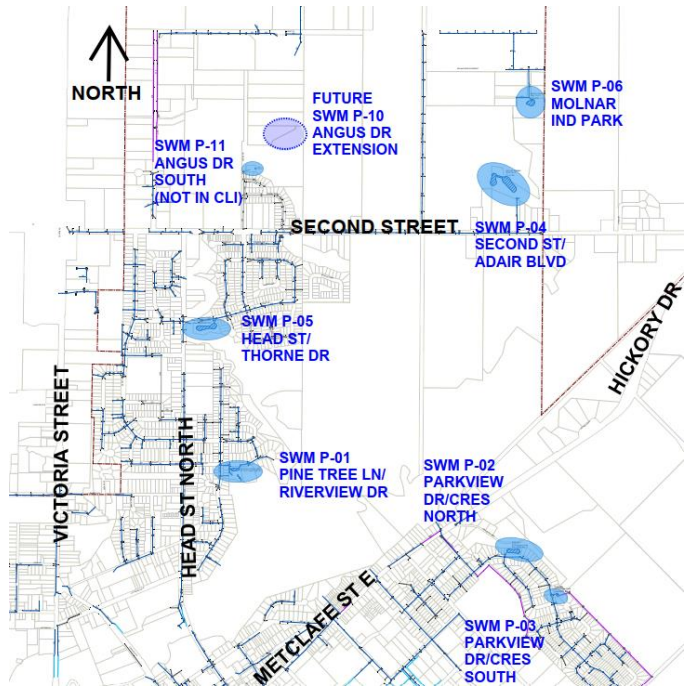
Mount Brydges WW Treatment Expansion

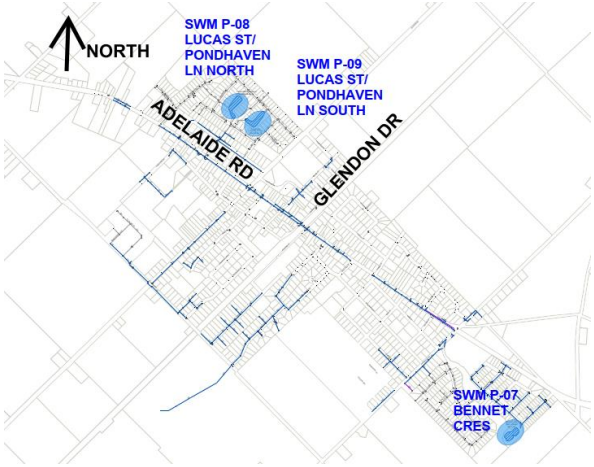
- Options :
  1. Upgrade Existing Mount Brydges WWTF
  2. Upgrade Mill Road Main Sewage Pumping Station and construct new forcemain to pump flows to Strathroy WWTF
  3. Build New WWTF, upgrade Mill Road Main Sewage Pumping Station and construct new forcemain to pump flows to New WWTF



Stormwater Management (SWM)

- Municipality has 11 SWM facilities 10 of which are included in the MECP Environmental Compliance Approval for a Municipal Stormwater Management System ECA Number: 058-S701
- Municipality's policies, standards, development agreements, capital budget and asset management plan was reviewed
- Gaps were noted in aspects of the Current Subdivision Agreement, Site Plan Agreement and the current SCSS
- The current 10-year capital plan appears to underfund the required management and maintenance of SWM Facilities that is needed over their lifecycle to maintain function and reduce risks and impacts to Municipality
- Recommended program for SWM Facility management includes
  - Stage 1: Develop Overall SWM Policy for Council Endorsement
  - Stage 2: Update Procedures Facility Assessment and Assumption
  - Stage 3: Implement SWM Lifecycle Management Program to prioritize the rehabilitation of SWM Facilities





Pollution Prevention Control Plan (PPCP)

- Findings of PPCP were as follows:
  - Modeling completed corroborated that the existing conveyance system will have sufficient capacity as flows increase to 2046
  - The Municipality had no recorded sewage overflows in the period reviewed and is therefore in compliance with MECP Procedure F-5-1 and F-5-5
  - A review of historical data from 2019 through 2023 found minor by-passes at the WWTFs in both Strathroy and Mount Brydges however none of these occurrences were caused by wet weather flows
  - By-passes at the Mount Brydges WWTF were the result of equipment failures and will be addressed through the on-going upgrades
- Recommendations :
  - Any cross connections found should be addressed through separation and storm sewer installation
  - To improve the accuracy of the sanitary hydraulic model, combined sewer and pumping station surveys should be undertaken to gather any missing, incomplete or inaccurate data
  - Modeling completed corroborated that the existing conveyance system will have sufficient capacity as flows increase to 2046

Master Plan Cost Opinion

- Opinions are Class 5 based on a design definition of 0-2% complete and are considered to have a range of accuracy of -30% to +50%
- Linear construction costing is based on data from 2023 linear urban infrastructure renewal projects in Strathroy-Caradoc
- Water and wastewater facility and study costing is based on recent projects in Ontario
- SWM restoration costs are based on recent public tenders for the rehabilitation of SWM Facilities
- Hydraulic model costs include field work to confirm systems, upgrades to model from additional data and new infrastructure, and upgrades to modelling software over the time of the Master Plan
- It is recommended that the Municipality review the proposed projects identified and consider them within the context of:
  - The 10-year Capital Plan
  - The Asset Management Plan
  - Other Municipal policies, studies and initiatives
  - The Municipality's financial capacity
- NOTE: Cost estimates to not include current work being undertaken at Strathroy WWTF and Mount Brydges WWTF

Master Plan Cost Opinion

Project	Area	Cost Opinion	Project Complete Year
Water System			
Centre Street Watermain Upgrades	S	$840,000	2032
Concord Drive Watermain Upgrades	S	$760,000	2032
Riverview Drive Watermain Upgrades	S	$760,000	2032
Oak Avenue Watermain Upgrades	S	$1,830,000	2032
North Street Watermain Upgrades	S	$1,770,000	2033
Locke Heights Watermain Upgrades	S	$1,430,000	2033
Lamore Crescent Watermain Upgrades	S	$1,210,000	2034
Mill Pond Crescent Watermain Upgrades	S	$1,430,000	2034
Head Street Watermain Upgrades	S	$2,030,000	2035
Storage Upgrades	MB	$2,575,000	2032
Updating of Water Hydraulic Model	SC	$400,000	2032
Water Total		$15,035,000	
Wastewater System			
WWTF Schedule C Class EA	MB	$350,000	2026
WWTF Cost	MB	$25,768,000	2030
Existing Servicing Phase 1-10	MB	$54,000,000	2028-2046
Annual Updating of Wastewater Hydraulic Model	SC	$600,000	2029, 2039
Wastewater Total		$80,718,000	
Stormwater Management			
Stage 1 SWM Policy Initial Policy & 1 Update	SC	$200,000	2026
Stage 2 SWM	SC	$315,000	2029
Stage 3 SWM	SC	$5,640,000	2027-2044
Stormwater Total		$6,155,000	
Pollution Prevention Control Plan			
PPCP Data Collection to update WW Hydraulic Model	SC	$300,000	2029, 2039
PPCP Total		$300,000	
TOTAL		$102,208,000	