



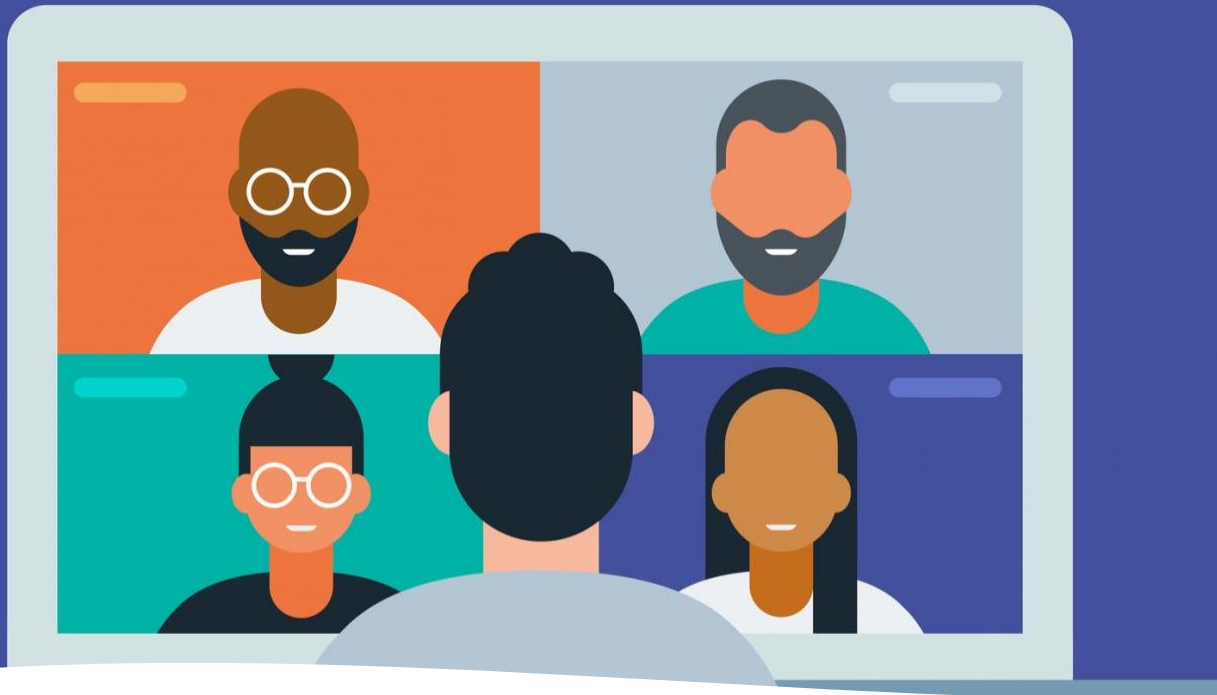
Pollution Prevention Control Plan

Virtual Public Consultation Meeting
December 1, 2021



R.V. Anderson Associates Limited
engineering • environment • infrastructure





Virtual Meeting Format

- Presentation by Project Team.
- Question and Answer Period “Raise Your Hand” or Dial “9”.
- Presentation, Transcript and Question and Answer Summary will be available at www.stthomas.ca/P_P_C_P after the meeting.
- Please provide your comments by December 10, 2021.

Purpose of Meeting

- Update you on the study.
- Provide an overview of the study process.
- Highlight key findings.
- Report on key recommendations for future studies and projects to address noted issues.

We want to hear from you!

- Do you have any observations that you would like to share?
- Do you have any questions regarding the study?
- Do you have any questions regarding the Master Plan process?

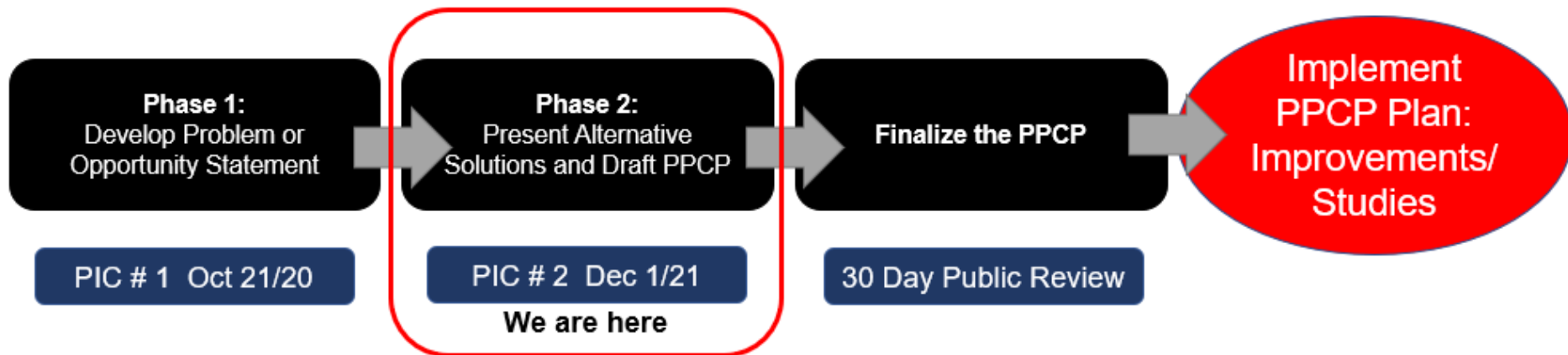


Municipal Class Environmental Assessment

This study is being undertaken in accordance with the Municipal Class Environmental Assessment process for Master Plans.

Master Plans are long range plans, which integrate infrastructure requirements for existing and future land use with environmental assessment principles.

This Master Plan, the Pollution Prevention Control Plan, will address Phases 1 and 2 of the Municipal Class EA process.



Problem or Opportunity Statement

The PPCP will be a part of the City's ongoing efforts to improve the performance of our sanitary and storm sewer infrastructure.

The PPCP is aimed at reducing sewer system overflows (SSO's) and bypasses of pumping stations and the pollution control plant during extreme weather events.

The PPCP will act as a master planning level tool that provides St. Thomas with guidance for capital planning and project implementation for the next 20 years and beyond.

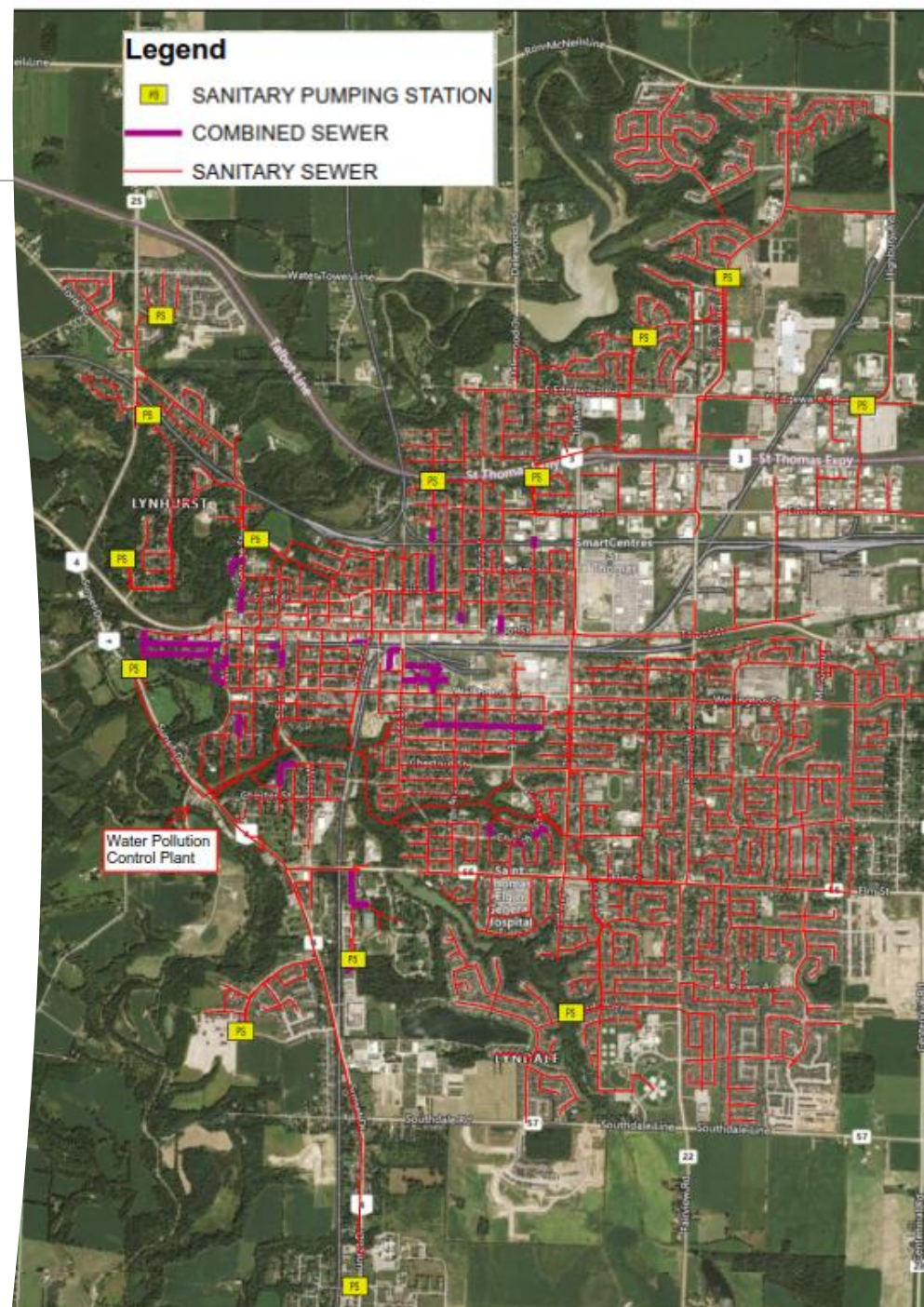


Existing Sewer Infrastructure

City of St. Thomas, covers a land area of approximately 35.5 km² and has a population of 43,276.

Sanitary Collection and Treatment System consists of:

- 220 km of sanitary sewers.
- 2.5 km of combined sewers (combining storm and sanitary sewage in older areas of the City).
- 16 Sanitary Pumping Stations.
- 4000 m³ Combined Sewer Overflow Facility (upstream of plant).
- Water Pollution Control Plant (at Sunset and Bush Line) with a rated treatment capacity of 316 litres per second and a peak flow capacity of 632 litres per second.

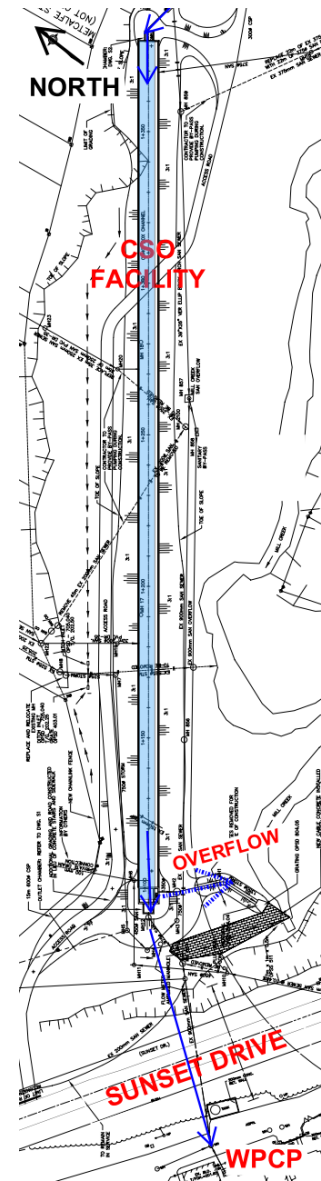
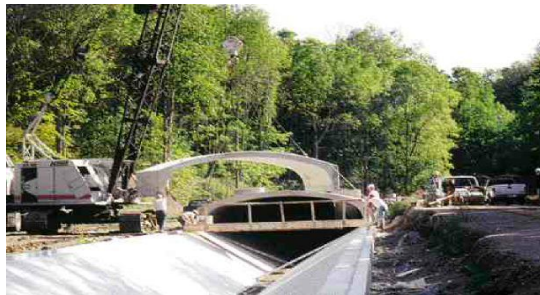


Combined Sewer Overflow (CSO) Facility

A CSO facility was built in 2002 to store high sanitary sewer flows to minimize overflows at the WPCP.

Located on the north side of Sunset Dr.

Flows in excess of the WPCP capacity overflow to drain, which is connected to Kettle Creek.

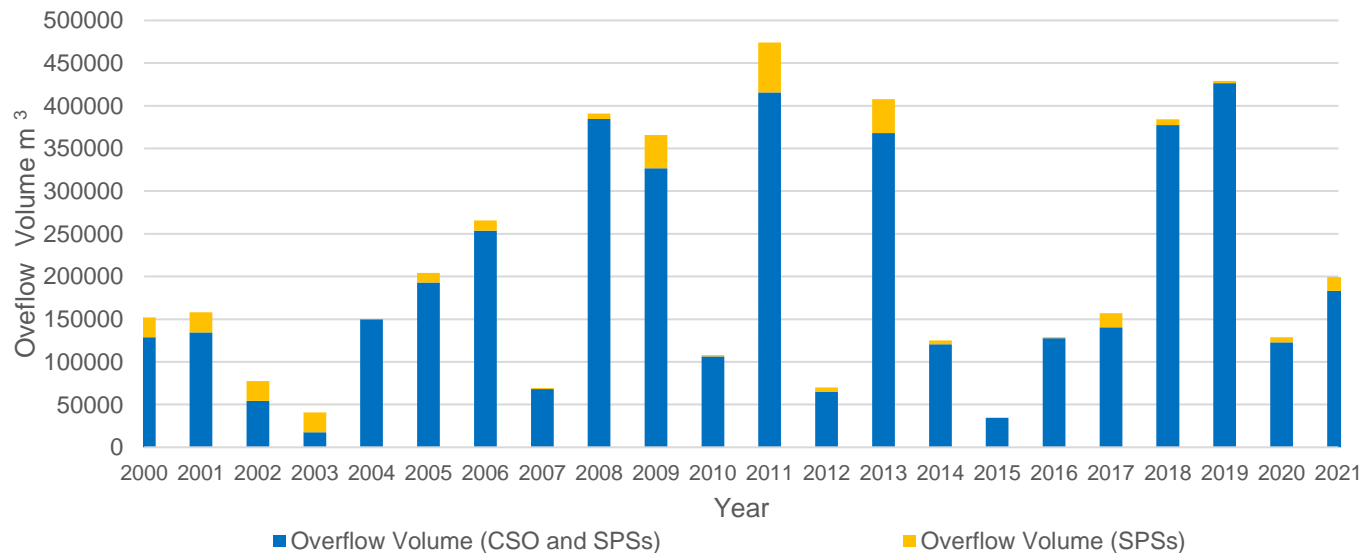


SPS, CSO, & WPCP Overflows

A Sanitary pumping station (SPS) pumps collected sanitary flows to the WPCP or to other sewers which flow to the WPCP. On occasion they experience flows in excess of their capacity which are directed to a local water course.

On occasion, the WPCP cannot treat all the flows that are directed to it and some of these are directed to overflow sewers to Kettle Creek prior to full treatment.

Volume of Overflows



Key Components to Prepare the PPCP

#	Component	Activity
1	Review of natural water features within the City of St. Thomas and the impact on these features as a result of the existing infrastructure deficiencies.	<ul style="list-style-type: none"> • Background Review – Reported in PIC 1
2	Inventory and review of the current state of the collection system.	<ul style="list-style-type: none"> • Background Review – Reported in PIC 1
3	Assess the ability of the collection system to convey normal and wet weather flows.	<ul style="list-style-type: none"> • Review of Previous Studies • Additional Flow Monitoring (October 2020 to February 2021) • Review of CSO Operation • Develop Hydraulic Model of the Collection System
4	Assess the quantity and quality of system overflows and by-passes.	<ul style="list-style-type: none"> • Use model to review and confirm impacts on the collection system and CSO facility • Use model to review potential solutions
5	Provide recommendations for short-term remedial measures and further investigations for a long-term PPCP.	<ul style="list-style-type: none"> • Develop recommended list of solutions including infrastructure improvements, operational changes and ongoing study

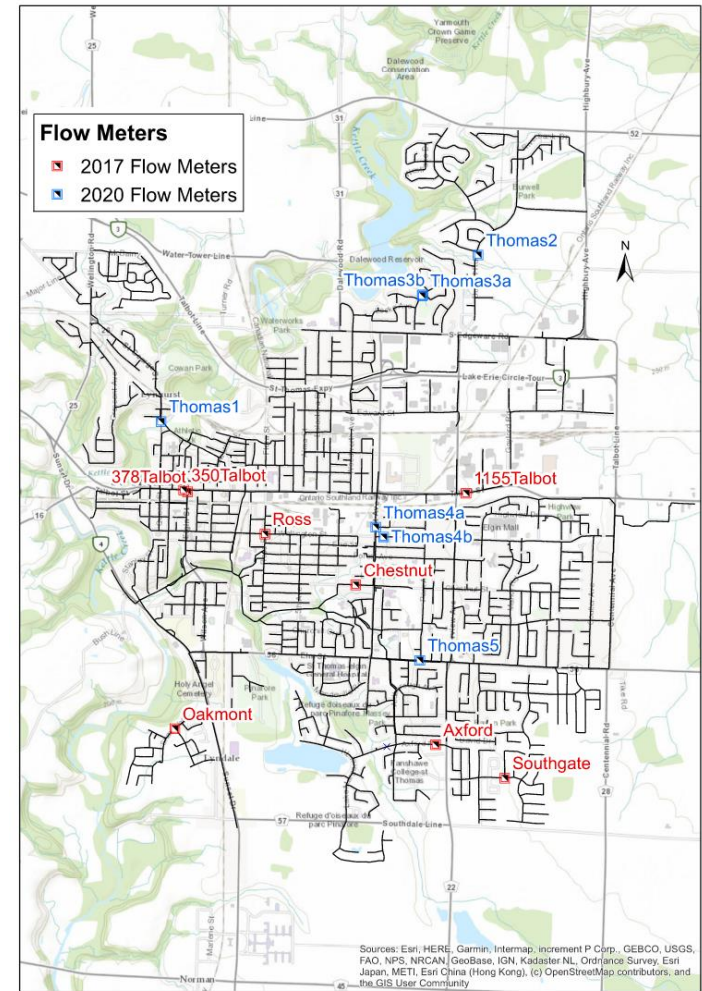
Flow Modeling

The following information was collected to build the hydraulic model of the City's collection system:

- GIS infrastructure data;
- Population and parcel data;
- Rainfall data; and
- Flow monitoring data.

The model reviewed both dry weather and wet weather conditions to determine the impact of groundwater and rainfall induced groundwater flow.

Wet weather analysis consisted of looking at more extreme weather events 1:2 year to 1:100 year.



Analysis

Wet weather analysis consisted of running rainfall events from 1:2-year to 1:100-year.

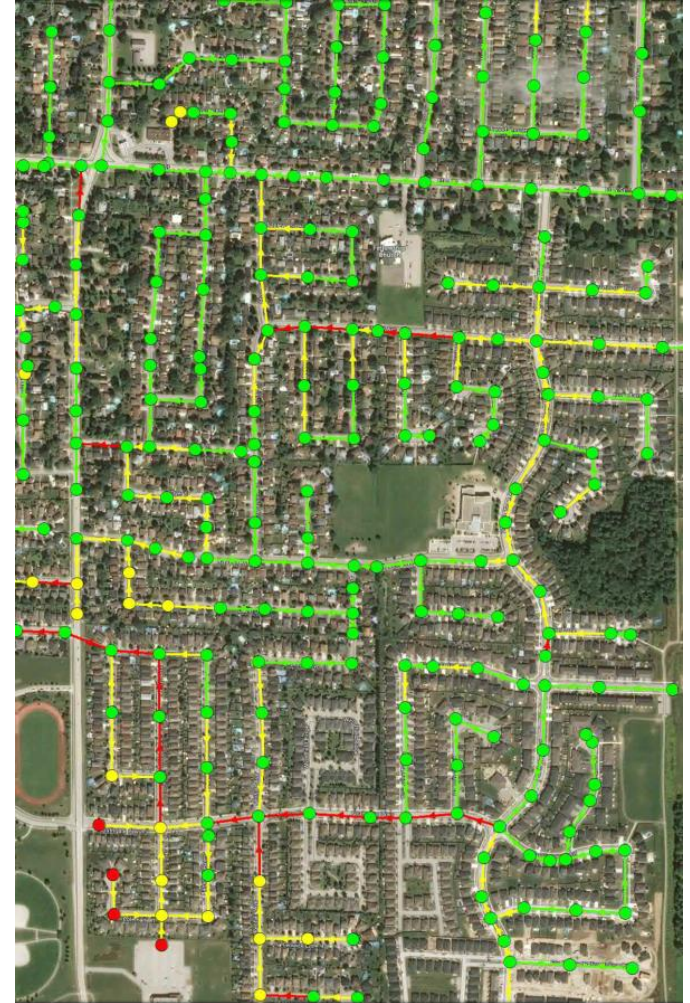
The impact on the sewage pumping stations and the CSO Facility were reviewed as well as the flows directed to the WPCP.

The level of water in the system was reviewed to confirm the potential for basement flooding.

Potential overflow volumes were reviewed based on the existing system.

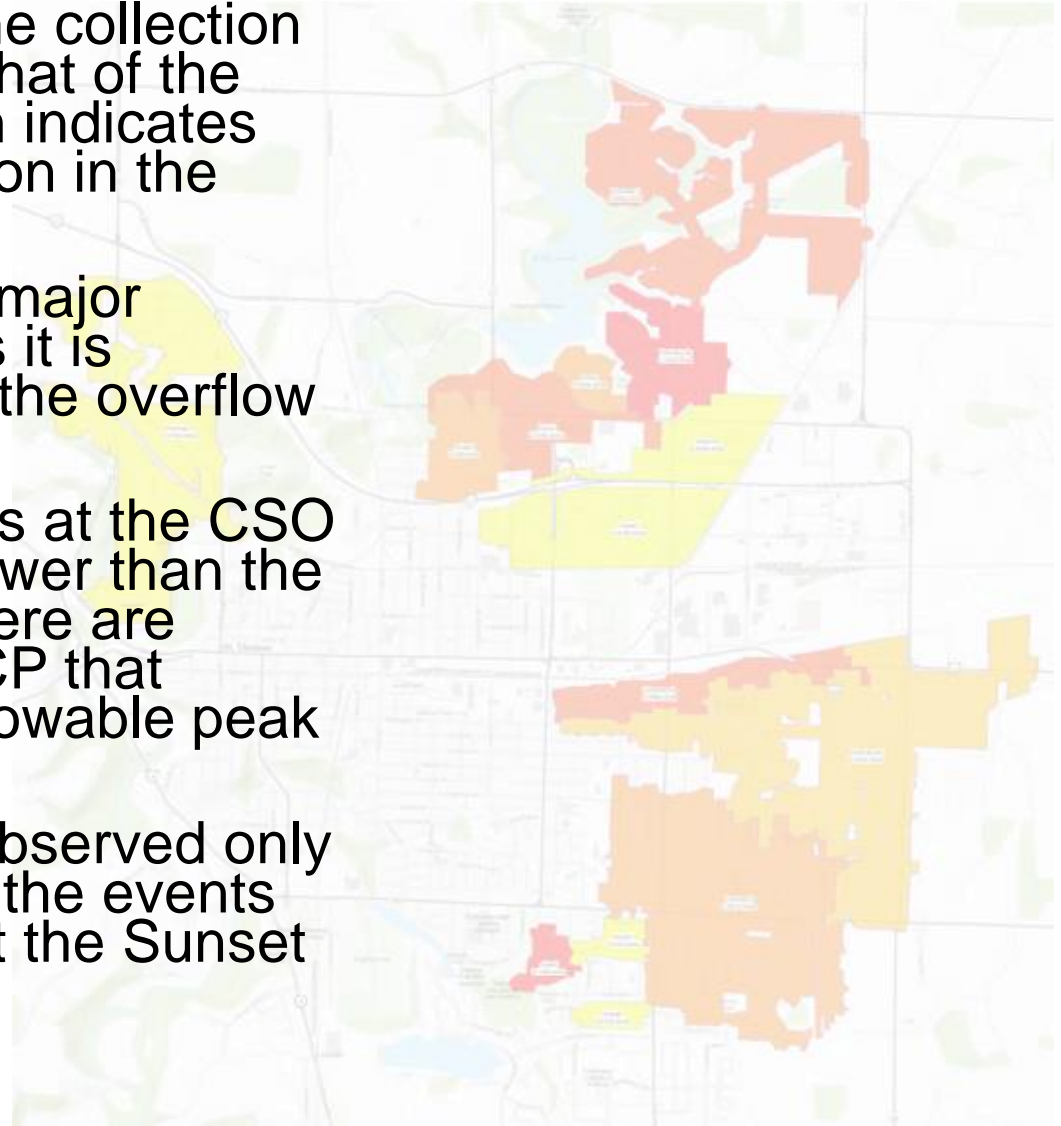
Overflow volumes were reviewed based on potential system improvements.

Reviewed existing data to validate required improvements.



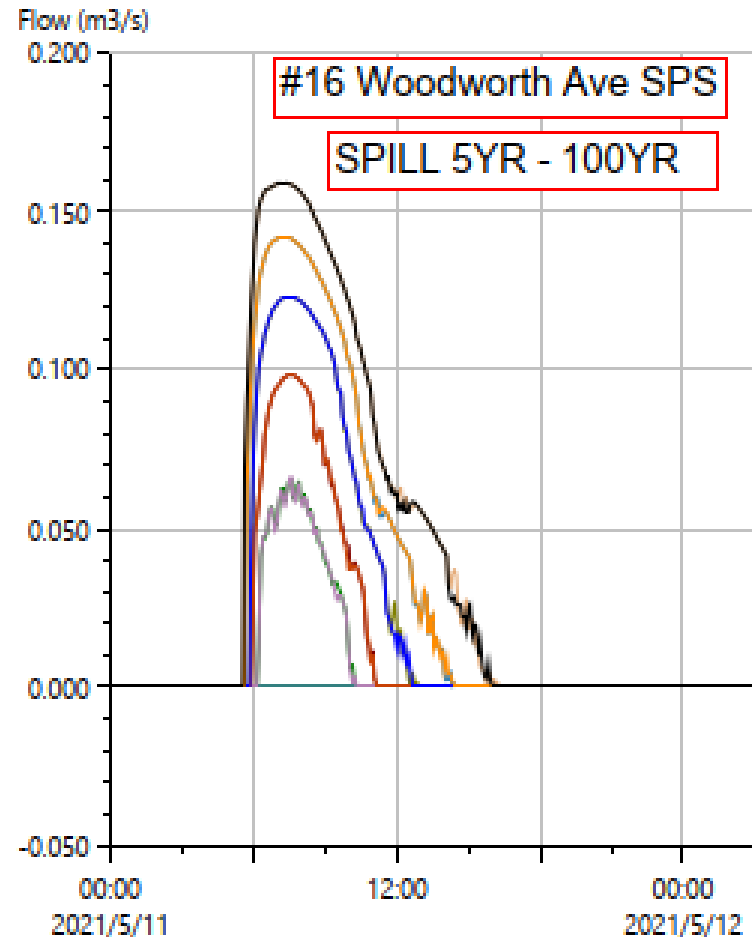
Major Conclusions

1. The peak day flow of the collection system is 4 to 5 times that of the average day flow which indicates high inflow and infiltration in the collection system.
2. The CSO facility is the major location of overflows as it is responsible for 97% of the overflow volumes.
3. 50-70% of the overflows at the CSO facility occur at flows lower than the WPCP's capacity as there are bottlenecks at the WPCP that restrict it passing its allowable peak flow.
4. Overflows have been observed only at 5 SPSs with most of the events (over 80%) occurring at the Sunset and Woodworth SPSs.



Major Conclusions

5. Sunset SPS is being reconstructed to allow for growth and this will address overflows at this station.
6. Overflows at the Woodworth Ave SPS are potentially caused by high inflow and infiltration in its sewershed and/or inadequate pumping capacity.
7. Demand growth may require the capacity expansion of the Burwell Road SPS.
8. More study may help to better characterize the inflow and infiltration issues in the collection system to confirm the long-term overflow reduction strategy.



PPCP Recommendations

1. Upgrade capacity of Sunset SPS and Collection System as part of current expansion project.
2. Undertake Improvements to the Woodworth Ave SPS and/or Collection System to address overflow issues.
3. Undertake Improvements to the Burwell Ave SPS and Collection System to address potential overflow issues.
4. Undertake an Annual Sanitary Sewer Lining Program to reduce inflow.
5. Removal of Capacity Constraints at the WPCP to allow it to pass permitted wet weather flows.
6. Optimize the CSO to control flows to the allowable limit of the WPCP.
7. Long Term I&I Mitigation Measures
 1. Installation of a Permanent Rain Gauge at the WPCP to better understand local conditions;
 2. Undertake annual flow monitoring program; and
 3. Annual Updating of the Hydraulic Model prepared for the PPCP.

PPCP Costs

The estimated costs for this proposed program are:

Recommended Projects	Planning Level Cost
Sunset SPS in addition to current expansion costs	\$145,000
Woodworth Ave SPS and Collection System Upgrades	\$7,427,000
Burwell Rd SPS Upgrades and Collection System Upgrade	\$4,125,000
Remove Bottlenecks at the WPCP	\$3,000,000
Permanent Rain Gauge Installation at WPCP	\$19,000
Sewer Lining (500 m/year)	\$715,000 per year
Camera Inspection of Collection System	\$50,000 per year
Placement of Additional Flow Monitors	\$35,200 per year
Annual Update of Collection System Model	\$15,800 per year

The 10-year cost of this program is \$22,876,000 (+50%/-30%).

Next Steps

- Review and consider feedback and data received from the public and agencies.
- Finalize PPCP Report.
- Present findings of PPCP to City Council.
- File PPCP with MECP.
- City to implement recommendations at their discretion.



Questions?

- Please feel free to “raise your hand” to ask a question or submit your comments via email or phone to a member of the study team.
- This presentation, transcript and question and answer summary will be posted on www.stthomas.ca/P_P_C_P

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