

London Pollution Prevention Control Plan (PPCP) Update Study

City of London, Ontario

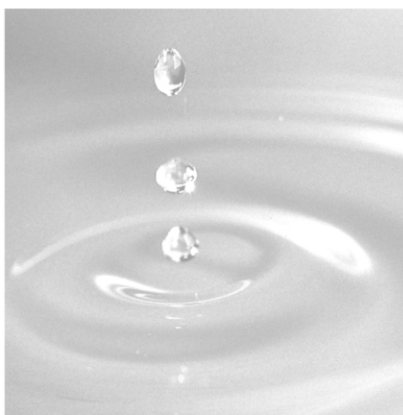
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List of Abbreviations

Acronym or Abbreviation	Meaning
BSDI	Building Sewer & Drain Inspections
City	City of London
CSO	Combined Sewer Overflow
EA	Environmental Assessment
EAA	Environmental Assessment Act
FNWWAP	First Nations Water and Wastewater Action Plan
FPIC	Free, Prior, and Informed Consent
FTE	Full time equivalent
I&I	Inflow and Infiltration
MEA	Municipal Engineers Association
MECP	Ministry of Environment, Conservation, and Parks
MLD	Million Liters per Day
MPAC	Municipal Property Assessment Corporation
NASSCO	National Association of Sewer Service Companies
OBC	Ontario Building Code
PACP	Pipeline Assessment Certification Program
PDC	Private Drain Connection
PIC	Public Information Centre
PPCP	Pollution Prevention Control Plan
PS	Pumping Station
PPS	Provincial Policy Statement
SCADA	Supervisory Control and Data Acquisition
SSO	Sanitary Sewer Overflows
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UTRCA	Upper Thames River Conservation Authority
WiiFAT	Wastewater Inflow & Infiltration Flow Analysis Tool
WWTP	Wastewater Treatment Plant

Land and Treaty Acknowledgement

The Project Team acknowledges that the Pollution Prevention Control Plan (PPCP) Update Study occurred on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron. The City of London (City) aims to build and strengthen its relationships with First Nations communities to further the Calls to Action outlined within the Truth and Reconciliation Commission's final report.

Through the Land Acknowledgement below, the City is committed to honouring the following treaties:

- Two Row Wampum Belt Treaty of the Haudenosaunee Confederacy/Silver Covenant Chain
- Beaver Hunting Grounds of the Haudenosaunee NANFAN Treaty of 1701
- McKee Treaty of 1790
- London Township Treaty of 1796
- Huron Tract Treaty of 1827, with the Anishinaabeg
- Dish with One Spoon Covenant Wampum of the Anishinaabek and Haudenosaunee

“This land continues to be home to diverse Indigenous people (First Nations, Métis and Inuit) whom we recognize as contemporary stewards of the land and vital contributors to society. We hold all that is in the natural world in our highest esteem and give honour to the wonderment of all things within Creation. We bring our minds together as one to share good words, thoughts, feelings and sincerely send them out to each other and to all parts of creation. We are grateful for the natural gifts in our world, and we encourage everyone to be faithful to the natural laws of Creation.”

Executive Summary

E.S.1. Introduction

The City of London is one of Ontario's fastest growing municipalities and is the largest urban centre within the Middlesex County area. It is located at the forks of the Thames River in central Western Ontario on the southwestern peninsula and within the Treaty territories of the Anishinaabeg and Haudenosaunee Confederacy. The Oneida Nation of the Thames, Chippewas of the Thames First Nation, and Munsee Delaware Nation are located south-west of the City.

The City is a single-tier municipality that owns and operates all its sewer system infrastructure. The existing sewer infrastructure includes approximately 1,450 km of sanitary sewers, 11.5 km of which are still combined. The PPCP update study was initiated by the City in 2023 to build upon their ongoing efforts to improve the performance and resiliency of the City's sanitary and combined sewer infrastructure.

The "unwanted" water that contributes to possible increased overflows and bypasses comes from the inflow of stormwater via direct inflow connections, such as downspouts and weeping tiles, or the infiltration of groundwater into sewer pipes through joints and cracks. Overflow structures that exist in the system were originally built to protect homes from basement flooding caused by an excess of this unwanted water. The overflows and bypasses are a mixture of stormwater and untreated sewage that is then released to the receiving streams, including the Thames River and other tributaries.

E.S.2. Study Framework

The City initiated a PPCP Update Study in 2023 to review and update the Phase 3 Implementation Plan as recommended by the 2018 PPCP study. This study was aligned with the Municipal Engineers Association (MEA) Class Environmental Assessment (EA) process (satisfying Phases 1 and 2) and adhered to the Ministry of Environment, Conservation, and Parks (MECP) F-5-5 Procedure. The F-5-5 Procedure mandates municipalities with combined sewer systems to capture and treat all dry weather flows and 90% of wet weather flows during a seven-month period from April to November for an average year. The study's overarching goal was to update the long-term strategy for managing the wastewater system to proactively address untreated and partially treated sewage discharges and reduce the risk of basement flooding.

The City of London is located on traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron. We acknowledge all the treaties that are specific to this area: the Two Row Wampum Belt Treaty of the Haudenosaunee Confederacy/Silver Covenant Chain; the Beaver Hunting Grounds of the Haudenosaunee NANFAN Treaty of 1701; the McKee Treaty of 1790, the London Township Treaty of 1796, the Huron Tract Treaty of 1827, with the Anishinaabeg, and the Dish with One Spoon Covenant Wampum of the Anishinaabek and Haudenosaunee. This fundamental recognition highlights Indigenous peoples as integral stewards of the land and contributors to society.

The City, as proponent to this PPCP Update Study, has a duty to consult with First Nations communities and played an active and lead role in consultation and engagement with the support of GEI Consultants Canada. The potentially affected First Nations communities, identified by both the MECP and the Project Team, include Aamjiwnaang First Nation, Bkejwanong First Nation (Walpole Island), Caldwell First Nation, Chippewas of the Kettle and Stony Point First Nation, Chippewas of the Thames First Nation, Oneida Nation of the Thames, Munsee-Delaware Nation, and Delaware Nation at Moraviantown. Appropriate communications with these Rights-Holders were maintained throughout the study.

E.S.3. Existing Conditions

Historically, building codes prior to 1985 allowed weeping tiles to be connected directly to sanitary sewers. This practice, however, leads to stormwater overloading the sanitary system during extreme rainfall events, causing untreated discharges from overflow outlets and pumping station bypasses. Approximately 50,000 properties in the City are estimated to still have weeping tiles connected to the sanitary system, contributing significantly to inflow and infiltration (I&I).

The City has implemented various initiatives, including public education campaigns, a *Basement Flooding Grant Program* (offering up to 90% subsidy for disconnections and related works), and pilot weeping tile disconnection projects (e.g., Blanchard Crescent, Remy Crescent, Augusta Crescent). While these voluntary programs have demonstrated that source control through weeping tile disconnection is effective in reducing I&I and can be less expensive than large-scale infrastructure upgrades, they face significant challenges due to low homeowner participation rates.

The primary objective of the PPCP Update Study was to develop an implementation plan for a long-term solution that will limit the volume and frequency of untreated sewage discharges to the receiving streams from various sanitary sewer overflows (SSOs), combined sewer overflows (CSOs), and pumping station bypasses throughout the City, while still maintaining an acceptable level of service and protection against basement flooding.

E.S.4. Study Approach, Methodologies and Results

A typical year rainfall analysis was conducted and based on a comprehensive assessment, 2018 was recommended as the new average year of rainfall. It most closely matched the average number of rainfall events, the average total annual rainfall depth, and the average peak rainfall intensities over the 22-year study period and showed the most typical distribution of rainfall events by intensity ranges.

The adoption of 2018 as the new typical year resulted in changes to the modelled overflow statistics compared to the previous PPCP, which used 2010. The updated hydraulic model was used to assess the City's wastewater system performance against F-5-5 criteria at all overflow locations. This step provided a current and accurate baseline for the PPCP Update Study.

The F-5-5 analysis identified overflow sites that showed overflow discharges for the 2018 typical year of rainfall in the hydraulic model. In addition, high-priority overflow sites were identified using a combination of criteria including the F-5-5 90% volumetric capture target, receiving water quality BioMAP status, and total annual overflow volume. The identified high-priority overflow locations were then used as the focus for developing and evaluating alternative mitigation strategies, with the ultimate

goal of achieving F-5-5 compliance and reducing the volume and frequency of untreated wastewater discharges.

A total of 5 Wastewater Treatment Plant (WWTP) bypasses, 35 pumping station bypasses, and 128 CSOs and SSOs were identified across the City's sanitary system. The F-5-5 percent capture rate of wet weather flows (using raw and secondary bypass for the WWTPs) was estimated. Only sanitary sewer overflows which showed overflow discharges for the 2018 typical year of rainfall in the hydraulic model were included for further analysis to determine high priority. This represents a total of 34 sanitary sewer overflows, of which 12 are grouped together under the Pall Mall System.

E.S.5. Evaluation of Mitigation Strategies

From the F-5-5 analysis, a list of high priority system overflow locations within the City were identified. An evaluation of the following alternatives was conducted to determine most suitable long-term strategy to implement for the City:

- Provision of storage
- Reconfiguration of overflow weirs
- Linear conveyance upsizing
- Pumping station capacity upgrades
- Weeping tile disconnection

Weeping tile disconnection, as a form of source control, will aim to reduce the City's frequency and volume of CSO and SSO discharges beyond the F-5-5 90% compliance: eventually achieving 100% capture rate at most, if not all, high priority overflow sites. In comparison, hard infrastructure measures, including upsizing sewers and constructing storage tanks, will only aim to achieve the minimum compliance target.

E.S.6. Evaluation of Weeping Tile Disconnection Program Approaches

Building upon the preferred mitigation strategy, four main approaches for weeping tile disconnection were reviewed:

1. **Voluntary:** Relies on homeowner initiative, often supported by financial incentives for those eligible. While offering flexibility, it suffers from low participation rates.
2. **Mandatory – City-Wide ("Point-of-Purchase"):** A "soft mandatory" approach where disconnection is required upon property purchase.
3. **Incentivized:** Uses additional incentives shown as a credit benefit on the homeowner's recurring wastewater bills to encourage disconnections. However, these are not enforced for compliance.
4. **Disincentivized:** Uses enforcement shown as a punitive charge on the homeowner's recurring wastewater bills to encourage disconnections.

Based on the results of the evaluation, the preferred disconnection approach was evaluated to be mandatory followed by disincentivized and incentivized, with the existing voluntary being the least preferred. Overall, implementing a city-wide Point-of-Purchase mandatory weeping tile disconnection program is preferred for the long term, allowing for enhanced enforcement and higher homeowner

participation rates. Source control action at the homeowner level will ultimately play a significant role in the reduction of CSOs and SSOs to the Thames River and other receiving streams, as well as improve overall system resiliency.

E.S.7. Public Information Centre

A crucial component of this PPCP Update Study is public consultation, which aims to facilitate information exchange and gather feedback from the public and stakeholders. The first and only Public Information Centre (PIC) was held in-person on May 7, 2025. Only two members of the public, outside of the Project Team, attended the in-person event. Attendees were encouraged to provide comments and questions during the event or through an online feedback form available for a three-week public comment period. Crucially, no comments related to the PIC materials were received by the Project Team, either through the feedback form or by email.

The core long-term strategy proposed at the PIC was the development of a mandatory Point-of-Sale weeping tile disconnection program, which aims to significantly reduce wet weather flow volumes at overflow locations. This approach was seen as the preferred disconnection strategy for its potential for enhanced enforcement and higher homeowner participation rates, ultimately improving system resiliency and reducing untreated discharges to the Thames River and other receiving streams.

E.S.8. Recommendations and Implementation Plan

After additional feasibility analysis and discussions with the City, the strategy shifted to be a mandatory Point-of-Purchase program, with a focus on the buyer instead of the seller. This would involve a new by-law or amendment to the existing by-law, requiring buyers of qualifying properties to disconnect their existing weeping tiles if connected to the municipal sanitary sewer system. An inspection would be triggered at the Point-of-Purchase (i.e., when the title transfer is flagged to the City), and a Certificate of Compliance would need to be obtained, requiring successful disconnection if applicable.

The overview schematic shown in **Figure E-0-1** outlines the process for obtaining a Certificate of Compliance under the proposed Point-of-Purchase Disconnection By-Law, once implemented. It details the transfer of ownership trigger, the necessary weeping tile inspection conducted by City staff, the actions required if weeping tiles are connected to the sanitary system, and the Certificate of Compliance validation period. The timeline for inspection and compliance will be assessed and determined. To implement the disconnection program, the City would need to hire additional Full Time Equivalent (FTE) with a broad range of skill sets.

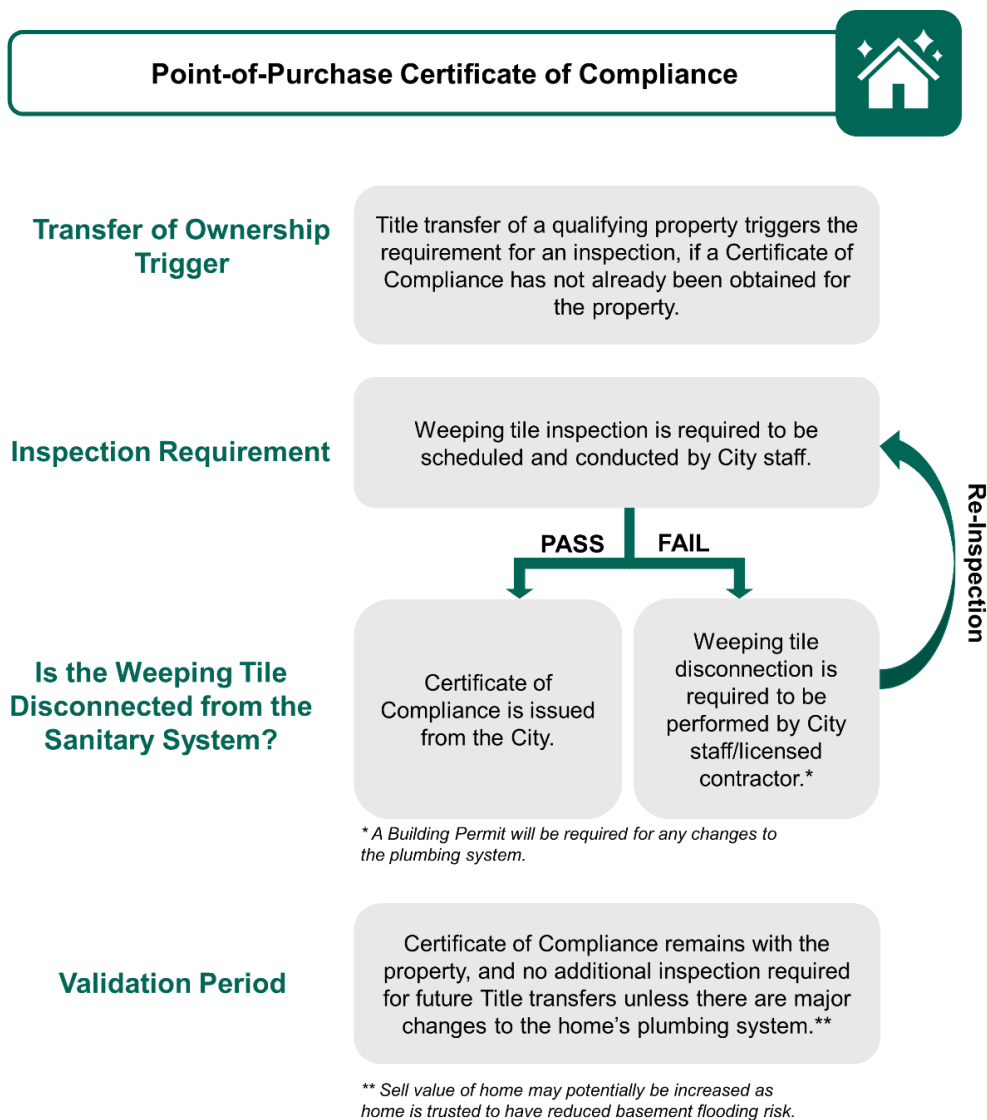


Figure E-0-1 Overview Schematic of the Point-of-Purchase Certificate of Compliance

An inspection is required for all single-family detached housing types to verify that no weeping tiles are connected to the municipal sanitary sewer system, if a Certificate of Compliance has not already been obtained for the property. Each inspection will require one Inspection and Compliance Officer. There are three potential scenarios encountered during the visual inspection, to determine whether there is an existing sump pump and pit and to confirm that the weeping tile is connected to it. Scenario 1 is the ideal system and results in a *pass* with no further inspections required. Scenarios 2 and 3 result in a *fail* and require a further assessment and report generation using secondary Building Sewer & Drain Inspections (BSDI).

An implementation schedule was developed to ensure that the Point-of-Purchase Disconnection By-law is executed in a structured and efficient manner, minimizing disruption to homeowners and optimizing resource allocation. In addition, it will be used to track the program's progress over time and allow opportunities for feedback from key parties to improve future iterations.

1. Introduction

1.1. Study Background

The PPCP Update Study was initiated by the City in 2023 as part of its ongoing efforts to improve the performance and resiliency of the City’s sanitary and combined sewer infrastructure. The “unwanted” water that contributes to possible increased overflows and bypasses comes from the inflow of stormwater via direct connections, such as downspouts and weeping tiles, or the infiltration of groundwater into sewer pipes through joints and cracks. Overflow structures that exist in the system were originally built to protect homes from flooding caused by an excess of extraneous water. The overflows and bypasses are a mixture of stormwater and untreated sewage that is then released to the receiving streams, including the Thames River and other tributaries.

1.2. Study Objectives

The primary objective of the PPCP Update Study was to review and improve the Phase 3 Implementation Plan as recommended by the 2018 PPCP study. The recommended long-term solution will limit the volume and frequency of untreated wastewater discharges to the Thames River and receiving streams from various CSOs, SSOs and bypasses throughout the City, while maintaining an acceptable level of service and protection against basement flooding. The implementation plan adheres to the requirements outlined in the MECP’s Procedure F-5-5. Procedure F-5-5 outlines the minimum overflow controls for municipal and private combined and partially separated sewer systems to ultimately minimize the potential for impacts on human health and aquatic life.

The PPCP Update Study reviewed all related background information from the previous reports and studies since Phase 3 of the 2018 PPCP, including any capital projects that have been completed from the Recommended Implementation Plan. The development of an updated implementation plan over the next 5 years includes short-, medium- and long-term goals, as well as an estimate of costs with consideration for Council funding potential.

2. Study Framework

2.1. Problem Statement

The F-5-5 Procedure mandates municipalities to capture and treat all dry weather flows and 90% of wet weather flows during a seven-month period from April to November for an average year. The study's overarching goal was to update the long-term strategy for managing the wastewater system to proactively address untreated sewage discharges and reduce the risk of basement flooding.

2.2. Public Consultation

Ontario's Environmental Assessment Act (EAA) defines a planning and design process that proponents must follow to examine and document the environmental effects that could result from major projects or activities. The purpose of the EAA is to achieve the betterment of the people of the whole or any part of Ontario by providing for the protection, conservation, and wise management of the environment in Ontario (RSO1990, c.18, s.2). It must also ensure that decisions result from a rational, objective, transparent, replicable, and impartial planning process.

The EAA sets a framework for a rational, objective, transparent, replicable and impartial planning process based on the following five key principles:

1. **Consultation with affected parties.** Consultation with the public and government review agencies is an integral part of the planning process. Consultation allows the proponent to identify and address concerns cooperatively before final decisions are made. Consultation should begin as early as possible in the planning process.
2. **Consideration of a reasonable range of alternatives.** Alternatives include functionally different solutions, "alternatives to" the proposed undertaking and "alternative methods" of implementing the preferred solution. The "Do Nothing" alternative must also be considered.
3. **Identification and consideration of the effects of each alternative** on all aspects of the environment. This includes the natural, social, cultural, technical, and economic environments.
4. **Systematic evaluation of alternatives in terms of their advantages and disadvantages,** to determine their net environmental effects. The evaluation shall increase in the level of detail as the study moves from the evaluation of "alternatives to" to the evaluation of "alternative methods".
5. **Provision of clean and complete documentation of the planning process followed,** to allow "traceability" of decision-making with respect to the project. The planning process must be documented in such a way that it may be repeated with similar results.

This study was completed in alignment with MEA's Municipal Class EA (October 2000, amended 2007, 2011, 2015, 2023, and 2024), which is an approved process under the EAA. The PPCP Update Study followed Phases 1 and 2 of the Municipal Class EA, illustrated in **Figure 2-1**.

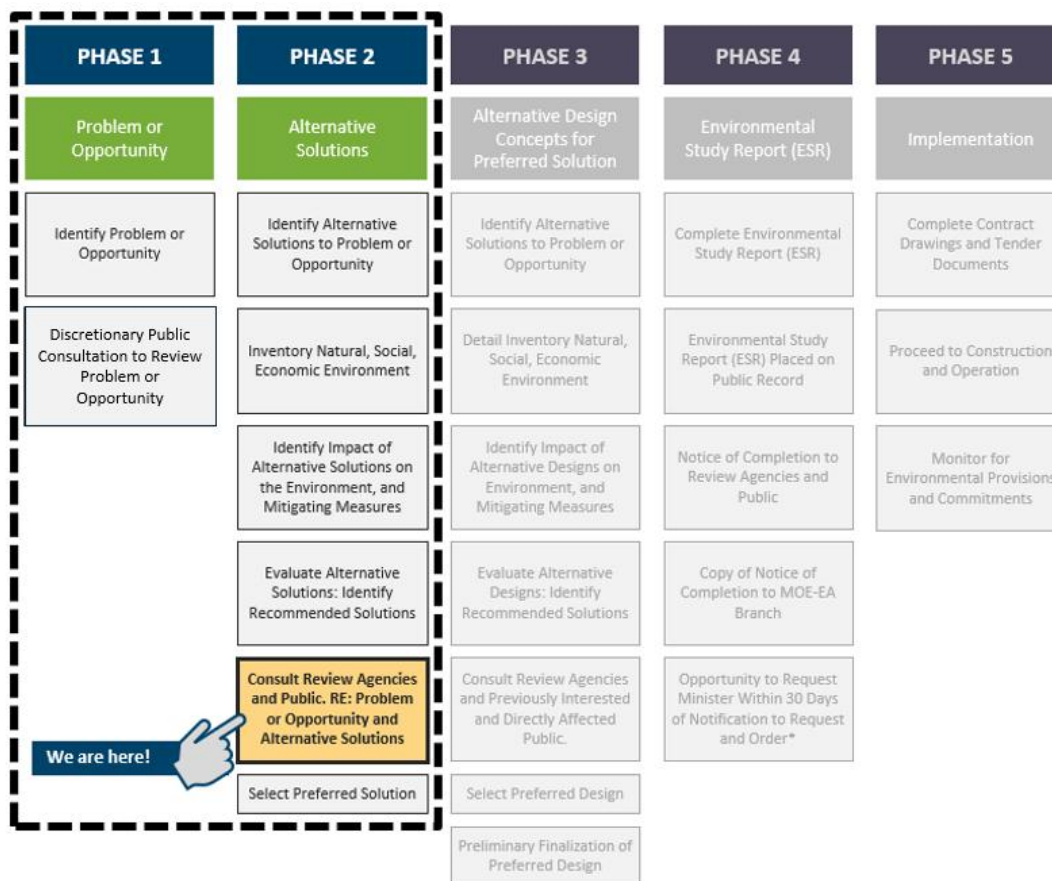


Figure 2-1 MCEA Planning and Design Process

Consultation with the public and stakeholders was an essential part of the PPCP Update Study, which ensured transparency by encouraging external involvement and feedback. One in-person PIC event was held, and a consultation tracking table is provided in **Appendix H**.

2.3. First Nations Consultation

The City of London is located on traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak and Attawandaron. We acknowledge all the treaties that are specific to this area: the Two Row Wampum Belt Treaty of the Haudenosaunee Confederacy/Silver Covenant Chain; the Beaver Hunting Grounds of the Haudenosaunee NANFAN Treaty of 1701; the McKee Treaty of 1790, the London Township Treaty of 1796, the Huron Tract Treaty of 1827, with the Anishinaabeg, and the Dish with One Spoon Covenant Wampum of the Anishinaabek and Haudenosaunee. This fundamental recognition highlights Indigenous peoples as integral stewards of the land and contributors to society.

The City, as proponent to this PPCP Update Study, has a duty to consult with First Nations communities and played an active and lead role in consultation and engagement with the support of GEI Consultants. The potentially affected First Nations communities, identified by both the MECP and the Project Team, include Aamjiwnaang First Nation, Bkejwanong First Nation (Walpole Island), Caldwell First Nation, Chippewas of the Kettle and Stony Point First Nation, Chippewas of the Thames First Nation, Oneida Nation of the Thames, Munsee-Delaware Nation, and Delaware Nation at Moraviantown. These are

considered Rights-Holders, while the Oneida Nation Council of Chiefs was also identified as an Interest-Holder. The contact list, confirmed through government resources and community websites, was updated throughout the study.

The three First Nations that are neighbours to London are the Chippewas of the Thames First Nation; Oneida Nation of the Thames; and the Munsee-Delaware Nation who all continue to live as sovereign Nations with individual and unique languages, cultures and customs. Both the Chippewas of the Thames First Nation and Oneida Nation of the Thames expressed a direct interest in keeping up to date in the PPCP Update Study. In person meetings were held with representatives of both communities.

2.3.1. Legislative and Policy Context

First Nations communities have a unique understanding of the natural environment given their relationship with traditional lands, practices, and way of life. As such, they provide valuable traditional knowledge to help identify solutions and measures to mitigate impacts on natural and cultural resources. First Nations have a deep connection to the Thames River. Water is considered a life source, is alive, has spirit and is home to physical and spiritual beings. First Nations also hold the belief that the Thames River is important to the health and wellbeing of all residents that live in and surround the City of London.

The PPCP Update Study is in alignment with the following water quality and safety frameworks:

- First Nations Water Declaration: An Indigenous law and policy asserting inherent rights and governance over water resources, emphasizing water as a sacred, life-giving force, opposing commercial exploitation, advocating for safe drinking water, and seeking collaborative stewardship. This stands in contrast to the Canada Water Act (1970), which does not explicitly recognize Indigenous water rights, though federal initiatives like the First Nations Water and Wastewater Action Plan (FNWWAP) and the Safe Drinking Water for First Nations Class Action Settlement (2021) aim to address these disparities.
- United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP): This declaration mandates Free, Prior, and Informed Consent (FPIC) for decisions affecting Indigenous peoples. It requires proponents, such as the City, to engage in respectful, ongoing, and culturally appropriate consultations to build partnerships and seek agreement before proceeding with projects that could impact Indigenous rights, lands, cultures, or resources.

2.3.2. First Nations Relationships and Engagement

To foster collaborative relationships, the Project Team adopted several steps: respecting each First Nation's preferred method of involvement, aligning engagement with their specific consultation protocols, incorporating feedback, providing regular updates, and offering review opportunities for the draft PPCP Update Study report. To facilitate a collaborative working relationship, the Project Team engaged a First Nations consultation advisor from KJI Consulting Collective to ensure open and culturally appropriate communication.

The Municipal Class EA process includes specific requirements for consulting with Indigenous communities. The study followed the engagement and consultation process outlined below:

- **Early Engagement:** Notices of Study Commencement were sent to all identified First Nations, introducing the study and inviting feedback and participation. The Chippewas of the Thames First Nation requested and held an in-person meeting to discuss their involvement, expressing a priority for preserving the safety and quality of Deshkan Ziibi (Thames River) for drinking, hygiene, and ceremonial purposes, noting surface water intakes near the river. A Technical Review Agreement was established with Caldwell First Nation to provide monetary resources for their participation.
- **Ongoing Consultation:** Relevant study background information was shared via a Project Information Sheet included in all project status updates. Two Project Status Updates were provided in March 2024 and March 2025, informing communities about background reviews, hydraulic model finalization, and the evaluation and selection of alternative strategies. Notifications for the PIC were also distributed in April 2025, with PIC materials made available online.
- **Meetings:** Additional in-person meetings were held with the Chippewas of the Thames First Nation and the Oneida Nation of the Thames to update them on alternative strategies and the preliminary preferred strategy as the Point-of-Purchase weeping tile disconnection program.

2.3.3. Key Feedback and Outcomes

The City of London was committed to meaningful engagement with Indigenous communities during the PPCP Update Study. Crucially, no concerns related to the preliminary preferred strategy (the Point-of-Sale weeping tile disconnection program) were raised during the meetings with Chippewas of the Thames First Nation and Oneida Nation of the Thames. Representatives from both communities generally expressed support for the initiative. This initiative is anticipated to improve public health and environmental protection, aligning with both Indigenous values and regulatory compliance. Other comments from First Nations typically concerned administrative processes, such as preferred communication methods and capacity funding agreements.

A comprehensive summary of all engagements, including comments received and actions taken, was documented. A Request for Review Letter for the draft study report was sent out.

See **Appendix E** for the complete Technical Memorandum outlining the engagement points and consultation activities with First Nation communities throughout the study.

3. Existing Conditions

3.1. Study Area

The City of London is one of Ontario's fastest growing municipalities and is the largest urban centre within the Middlesex County area. It is located at the forks of the Thames River in central Western Ontario on the southwestern peninsula and within the Treaty territories of the Anishinaabeg and Haudenosaunee Confederacy. The Oneida Nation of the Thames, Chippewas of the Thames First Nation, and Munsee Delaware Nation are located south-west of the City. The Study Area for the PPCP Update Study includes the entire municipal jurisdiction of the City of London.

3.2. System Inventory

The City is a single-tier municipality that owns and operates all of its sewer system infrastructure. The current sewer infrastructure includes approximately 1,450 km of sanitary sewers, 11.5 km of which are still combined. There are also 35 active Pumping Stations (PS) that help to store and lift sewage to higher elevations, 29 of which have bypasses that discharge directly into receiving streams or indirectly by way of storm sewers during extreme wet weather events. There is a total of five WWTPs that are in commission: four conventional activated sludge secondary treatment plants with seasonal ultraviolet disinfection (Greenway WWTP, Adelaide WWTP, Pottersburg WWTP, and Vauxhall WWTP) and one conventional activated sludge with membrane filtration (Oxford WWTP). The City's 2020 total average sewage flow directed to the WWTPs was 194 Million Liters per Day (MLD).

The Study Area is shown in **Figure 3-1** and indicates the location of all active PSs, WWTPs, sewer outfalls and sanitary sewers within each of the five sewersheds.

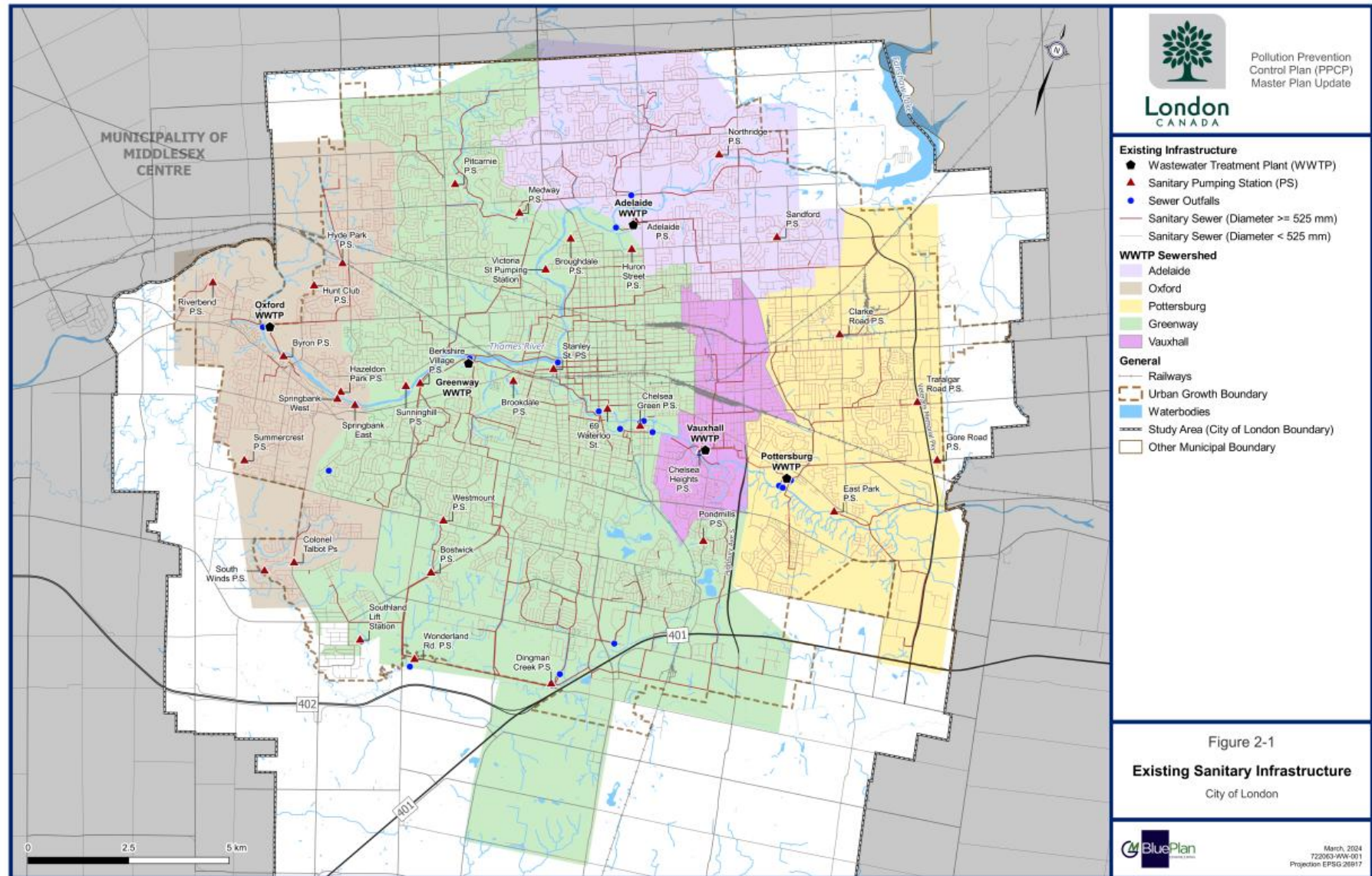


Figure 3-1 Study Area and Existing Sanitary Infrastructure Map

3.3. Natural Environment

There are two main watersheds located within the study area: the Thames River watershed and the Kettle Creek watershed. However, the City's urban area is located exclusively within the Thames watershed, which is further subdivided into 17 individual subwatersheds.

The City is the largest urban area on the Thames River and is the primary contributor of phosphorous from stormwater runoff, localized discharges from WWTPs and pumping stations, overflows and bypasses. Other related receiving streams include the Dingman Creek, Medway Creek, Pottersburg Creek, and the Coves. The Thames River watershed is one of the largest watersheds in the Lake Erie basin and contributes 30%¹ of the phosphorus that comes from Ontario. Provincial and federal initiatives have identified the Thames River as a priority watershed, which requires immediate action to reduce phosphorus loads.

Some important environmental policy designations are also noted within the Study Area, including Areas of Natural and Scientific Interest and local and provincially significant features such as wetlands, valleylands and Environmentally Significant Areas. Other natural heritage features shown on **Figure 3-2** are the City's woodlands, and waterbodies and watercourses.

¹ Upper Thames River Conservation Authority Website: [Great Lakes Connections - Upper Thames River Conservation Authority](#). Visited February 2024.

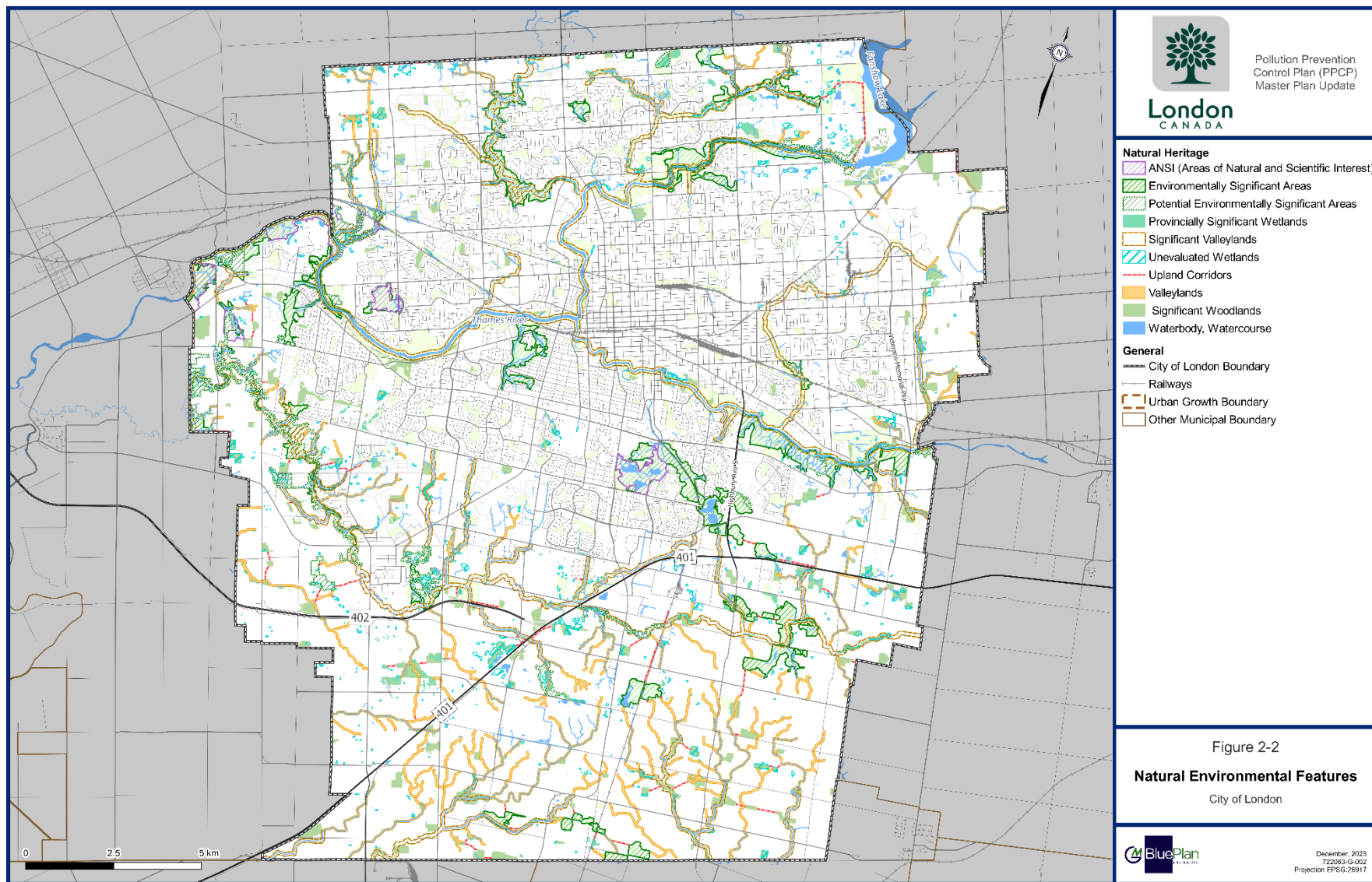


Figure 3-2 Natural Environment Features Map

3.4. Weeping Tile Connections

Prior to 1985, City building codes and local by-laws did not prohibit weeping tile discharge to sanitary sewers. As a result, common practice was to connect weeping tiles - underground perforated pipes around the basement foundation - to the sanitary sewer lateral via a direct (gravity) connection. The aim of the weeping tiles was to capture stormwater and direct it away from the foundation to reduce the risk of basement flooding. However, during heavy rainfall events and/or in areas of high groundwater, stormwater collected from the weeping tiles (in largely connected neighbourhoods) may overload the sanitary sewer capacity and cause a backup of sewage into homes and businesses. Also, this can lead to the release of untreated sewage to the environment at emergency overflow outlets and pumping station bypass locations due to the system's inability to manage the excessive amount of volume.

Approximately 50,000 properties within the City may have existing weeping tiles that are still connected to the sanitary system, and the approximate I&I contributions from these connections is 80% for houses constructed between 1920 to 1985. For most new homes constructed between 1985 and 1995, weeping tiles were required to be connected to a sump pit and pump, designed to discharge to the surface rather than into the storm or sanitary sewer. After 1995, all new homes constructed required their weeping tiles to be connected to a sump pit and pump, designed to discharge to the storm sewer through storm laterals, which includes both the storm building sewer and the private drain connection (PDC).

The City currently maintains a voluntary *Basement Flooding Grant Program* and has completed several incentivized pilot programs to disconnect existing weeping tiles from the sanitary sewer system. Weeping tile disconnection programs can have a significant effect on I&I reduction to control the amount of stormwater entering the sanitary system at the source. Disconnection requires installation of a sump pump pit and pump which discharges water onto the lawn or other permeable surfaces or directly to the storm sewer. A backwater valve may be required if the property has experienced past basement flooding due to sanitary sewer back-ups.

3.4.1. *Basement Flooding Grant Program*

The City operates a voluntary *Basement Flooding Grant Program*, which provides financial assistance to qualifying residential properties that have experienced basement flooding due to City sewer main backup. The program offers a grant of up to 90% of the total cost, to a maximum, for primary items such as disconnecting weeping tiles and redirecting flows to a new sump pit and pump, installing a sump pump battery backup, and installing a backwater valve. Between 2013 and 2023, a total of 499 weeping tiles has been disconnected through this program across the City. This is estimated to have resulted in a peak wet weather flow reduction of approximately 49.9 to 499 L/s for the entire City during a specific storm event.

3.4.2. *Pilot Programs*

The City also initiated several weeping tile disconnection pilot programs to assess the incentivized disconnection program approach. Despite the challenges in achieving high homeowner participation rates even with incentives, weeping tile disconnection was monitored to be an effective strategy for reducing I&I and improving overall system performance.

3.5. Legislation and Regulation

The PPCP Update Study must comply with the provincial and local requirements outlined in **Table 3-1**.

Table 3-1 Provincial and Municipal Legislation and Regulatory Requirements

Regulatory Requirement	Objectives
Provincial Requirements	
Provincial Policy Statement (PPS) 2020	These policies will be considered and incorporated into the evaluation process of the implementation plan where the final recommendations shall be provided in an efficient manner that prepares for the impact of a changing climate.
MECP F-5-5 Procedure	The recommendations from the PPCP Update Study, including the final implementation plan, must satisfy the goals and criteria of the MECP F-5-5 Procedure to mitigate the impacts of CSO, SSO and bypass volumes on the Thames River and its tributaries.
Canada-Ontario Lake Erie Action Plan (2016)	Requires a 40% reduction in phosphorus loads by 2025 (from 2008 levels).
Conservation Authorities Act (1946)	The legislative mandate of the Conservation Authority, as set out in Section 20 of the Conservation Authorities Act, is to establish and undertake programs designed to further the conservation, restoration, development, and management of natural resources.
Local Requirements	
2023-2027 Strategic Plan	Prioritizes Climate Action and Sustainable Growth, ensuring resilient municipal infrastructure.
The London Plan (Official Plan)	Guides land use and development, specifically identifying the need for a PPCP to upgrade and maintain sanitary infrastructure to reduce combined sewers and minimize bypasses, particularly in areas of projected growth.
Domestic Action Plan	The City's Domestic Action Plan includes sewer system overflow reductions to meet these targets.

3.6. Previous PPCP and Related Assessments

The previous PPCP was completed in three phases, as described below.

3.6.1. Phase 1 (2014)

The intent of Phase 1 was to compile and analyze the background information regarding the City sewers and treatment facilities, to develop an understanding of the Thames River water quality, and to create a preliminary ranking of CSO, SSO and bypass locations within each sewershed. A total of 149 CSOs, SSOs and bypasses were confirmed in the City, which corresponded to 45 discharge points.

3.6.2. Phase 2 (2018)

The intent of Phase 2 was to conduct water chemistry studies and benthic macro invertebrate studies to provide a more detailed understanding of the Thames River water quality. As part of Phase 2, 12 modelling assignments were conducted in two rounds between 2015 and 2016 using InfoWorks CS and InfoWorks ICM. A total of 11 CSOs/SSOs and 6 PS bypasses were considered as a high priority and were

further evaluated in Phase 3 to identify the preferred alternatives and develop an Implementation Plan to mitigate and reduce these identified overflow volumes.

3.6.3. Phase 3 (2018)

The short list of priority CSOs, SSOs and bypass locations determined from Phase 2 was further refined as 10 SSOs were since removed, leading to a total of 139 SSOs remaining. The intent of Phase 3 was to evaluate the refined list and to recommend preferred short and medium-term mitigation strategies as part of the implementation plan. The priority CSO and SSO locations were grouped by subcatchment (*"Groups A-F"*), and the priority PS bypasses were considered as standalone (*"Groups G-L"*).

The alternatives for the mitigation and elimination of I&I wet weather flows focused on source and conveyance control methods rather than end-of-pipe controls. Source controls, such as weeping tile disconnection programs, were considered as the best management practice to reduce the volume of I&I that is directed to the combined or sanitary sewers, which increases the overall system performance. Conveyance controls, such as adjusting weir structures, increasing pipe sizes and combined sewer separation, also provide system resiliency potential and additional water quality benefits.

3.6.4. Modelling Report (2022)

The City's hydraulic model covers the five WWTP sewersheds. The 2022 modeling assignment expanded the model to include all serviced areas within these five sewersheds. The hydraulic model was updated to include new pumping stations and additional sanitary servicing to cover the new development areas within the City. The PPCP Update Study used the updated hydraulic model as a baseline to verify the updated SSO inventory and determine the F-5-5 percent capture rate for future capacity assessments.

3.7. 2018 PPCP Recommended Project Status Update

Since the completion of the Phase 3 PPCP Report, several recommended projects have been completed or commenced. Most notably, the combined sewer separation within the City Centre as part of *"Group A"* has been largely completed. Additionally, the installation of a new Cavendish Trunk sewer as part of *"Group D"* has also been completed. **Table 3-2** includes a status update on the specific short-term and medium-term projects that have been completed, are currently underway or have not yet been initiated as part of the 2018 PPCP Implementation Plan:

- Group A: Sewer Separation (In-Progress)
- Group B, H, & I: Weeping Tile Disconnection (In-Progress)
- Group C & E: I&I Reduction Feasibility Studies (In-Progress)
- Group D: Cavendish Trunk Upsizing (Completed)
- Group F: Pipe Realignment (Not yet initiated)

Table 3-2 2018 PPCP Implementation Plan Status Update

Priority Group	Summary of Recommended Projects/Studies from the 2018 PPCP Implementation Plan	Status of Work Completed	Downstream Overflow Locations Impacted	Future Planned Works
Group A	S2: Five phases of sewer separation in the City Centre along York Street, Talbot Street, Richmond Street, King Street, and Clarence Street.	- Phase 1 completed in 2018 – 450 metres separated. - Phase 2 completed in 2019 - 500 metres separated. - Phase 3 completed in 2020 - 255 metres separated. - Phase 4 completed in 2021 - 380 metres separated.	- SW-01 - CW-04	Phase 5 will be completed in 2027- 410 metres to be separated.
	M2: Two phases of sewer separation in the City Centre along Wellington and York Street.	Phase 6 completed 2023 - 410 metres separated.	- SW-01 - CW-04	Phase 7 will be completed in 2024 - 500 metres to be separated.
Group A and Group C	S3: Storm sewer disconnection at MC-02 and DS-01.	Completed in 2022.	- SW-01 - CW-04 - PM-02 - PM-09 - SD-05 - PM-03	
	S4: Determine the feasibility of reducing the I&I by 50% in the PM-02, PM-03 and PM-09 catchment areas (Option 1). S4: Determine the feasibility of removing storm flows from the Pall Mall Storm and Relief sewer to utilize the sewer as in-line storage for the Pall Mall Trunk SSOs (Option 2).	Initiated and on-going.	- SW-01 - CW-04 - PM-02 - PM-09 - SD-05 - PM-03	Option 1 / Option 2.
Group B	S7: Implement a targeted weeping tile disconnection program at a 60 percent participation rate.	Initiated and on-going.	- SP-45 - SW-03	To review how to increase disconnection participation rates.
Group D	S5: Construct the Cavendish Trunk sewer.	Phase 1 completed in 2018 - 220 metres replaced.	SD-01	

Priority Group	Summary of Recommended Projects/Studies from the 2018 PPCP Implementation Plan	Status of Work Completed	Downstream Overflow Locations Impacted	Future Planned Works
		- Phase 2 completed in 2019 - 445 metres replaced. - Phase 3 completed in 2020 - 510 metres replaced.		
Group E	S6: Determine the feasibility of removing I&I from the identified sources.	Initiated and on-going.	CP-09	
Group F	M3: Realignment of the Horton/Wharncliffe Sewer.	Initiated and on-going.	SN-05	Construction to begin in 2025.
Group H	M4: Implement a weeping tile disconnection program.	Initiated and on-going.	Medway PS	To review how to increase disconnection participation rates.
Group I	M5: Implement a weeping tile disconnection program.	Initiated and on-going.	Sunninghill PS	To review how to increase disconnection participation rates.

3.7.1. Sewer Separation Work

The City has invested substantially in combined sewer separation, particularly within the City Centre, as part of projects identified in the 2018 PPCP. Since 2018, approximately \$57 million has been allocated to capital projects related to sewer separation.

This work in the City Centre is still in progress, which aims to prevent stormwater from directly entering the sanitary system. These sewer separation projects targeted various areas, including old sewer sections along York Street, Talbot Street, Richmond Street, King Street, Clarence Street, and Wellington Street. For the area identified within Group A, 2.1km of combined sewers have been removed between 2018-2023, and 0.8km of combined sewer removal is currently underway for 2025.

The combined sewer separation for “*Group A*” is anticipated to have a positive impact in the reduction of stormwater contributions to the downstream overflow locations within the subcatchment area. **Figure 3-3** shows the sewer separation completed to date within the City Centre.

3.7.2. Property Weeping Tile Disconnection Programs

To address I&I at the source, the City implemented and investigated the effectiveness of targeted weeping tile disconnection programs for Groups B, H, and I. These targeted programs aim to reduce the volume of stormwater entering the sanitary sewer system from underground perforated pipes around basement foundations. However, the City faced challenges due to limited participation, where the benefits of disconnection were not conveyed effectively to homeowners and coordination with homeowners to work on their private property and inside homes was difficult. This highlighted the need for further review on how to increase homeowner participation rates and consider other disconnection program approaches.

3.7.3. Other Sewer-Related Work

Beyond sewer separation and property disconnections, the City has completed several other significant sewer infrastructure projects to enhance wet weather flow management:

- New and Replaced Sewers
- Cavendish Trunk Sewer Construction
- Storm Sewer Disconnections
- Overflow Removals and Relocations

The new Cavendish trunk sewer is anticipated to reduce the overflow volume within the “*Group D*” subcatchment area due to the additional capacity provided. **Figure 3-4** shows the location of the upsized Cavendish Trunk sewer.

Overall, these completed works represent a concerted effort by the City of London to enhance its wastewater infrastructure, reduce wet weather flow volumes, and improve compliance with environmental regulations, including the MECP Procedure F-5-5.

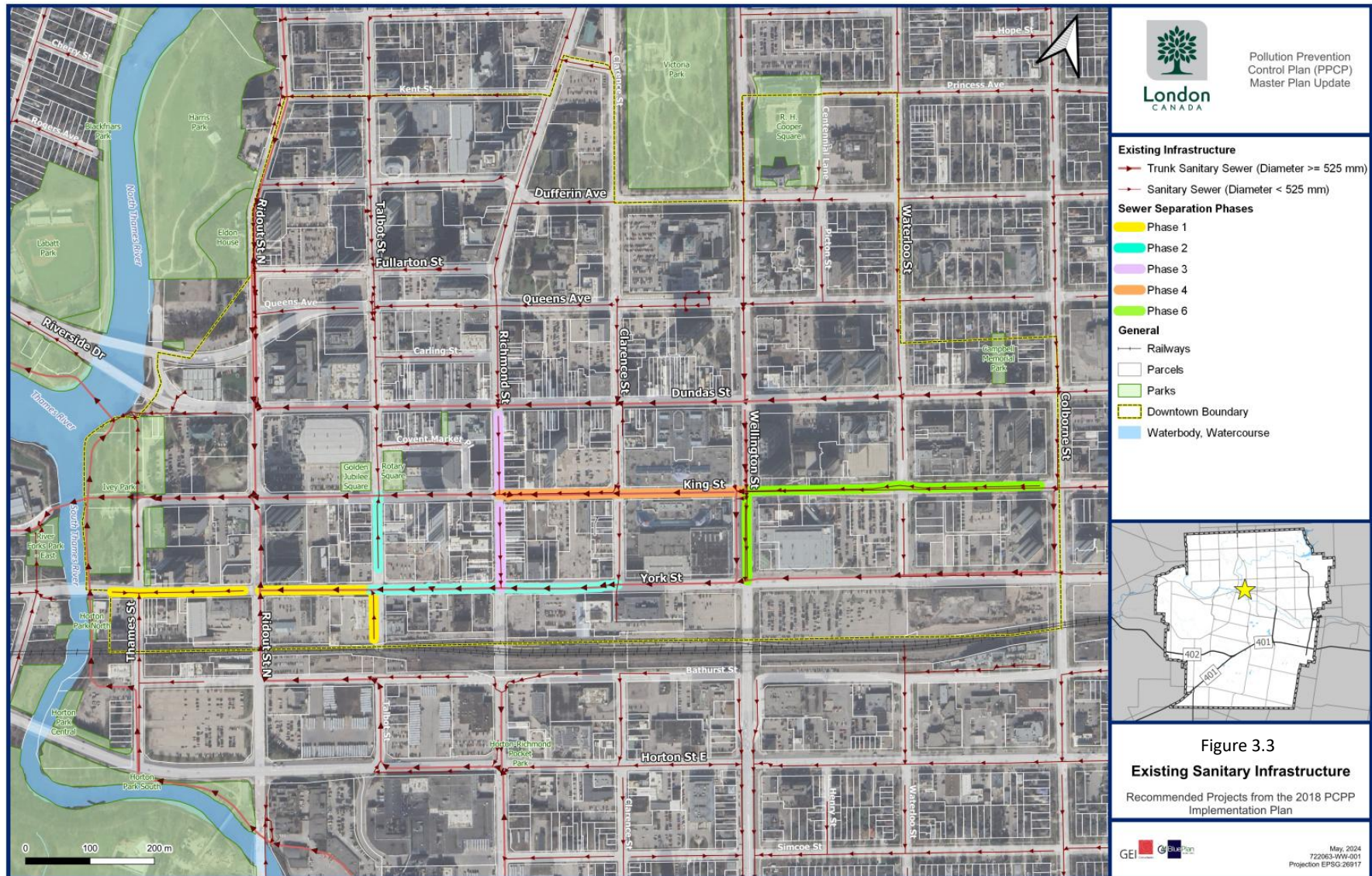


Figure 3-3 “Group A” Sewer Separation Completed

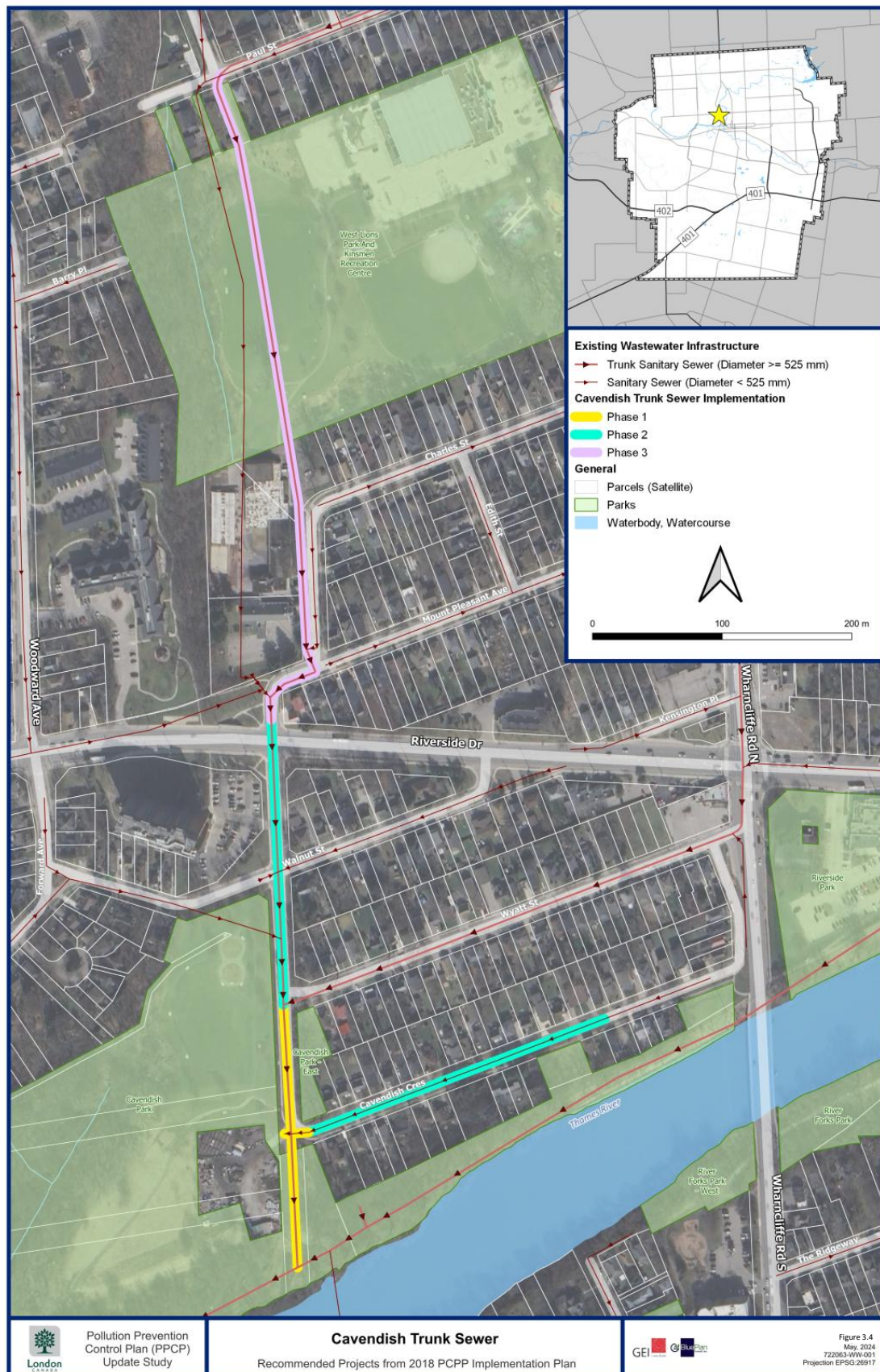


Figure 3-4 "Group D" Cavendish Trunk Sewer Implementation

As a result of the recommended projects, since 2018, 3 SSOs were newly identified and 14 SSOs were entirely removed through sewer system improvements. Many more overflows have been greatly reduced. These newly identified or removed overflow facilities are summarized in **Table 3-3**.

Table 3-3: Newly Identified or Removed SSOs

System Overflow	Year	Newly Identified or Removed	Reason for Identification or Removal
SP-57	-	Identified in 2018 PPCP report	SP-57 has been active since 1987 and was installed to relieve a 1200mm high-level trunk sewer. SP-57 was identified in the previous PPCP commencement and has been assessed in subsequent modelling assignments.
PSO-01	1979	Newly Identified	Newly identified overflow pipe for the Trafalgar pumping station. The facility has been in service since 1980.
MC-03	-	Newly Identified	Newly identified overflow located east of the intersection at Wyatt Street and Cavendish Crescent.
VX-10	2019	Removed	Egerton Sewer system was redesigned; overflows deemed no longer necessary.
VX-11	2019	Removed	
VX-12	2019	Removed	
VX-13	2019	Removed	
VX-14	2019	Removed	
SP-42	2020	Removed	Flow monitor and model analyses showed overflow was inactive; overflow removed in 2020 during reconstruction of Roehampton Avenue.
MC-02	2020	Removed	MC-02 was an overflow from the storm sewer into the sanitary sewer system; removed in 2020 to minimize stormwater entering the sanitary sewer system.
SP-06	2018	Removed	Removed as part of infrastructure renewal project.
SP-50	2018	Removed	Egerton Sewer system was redesigned; overflows deemed no longer necessary.
VX-04	2016	Removed	Sanitary sewers on Ashland Ave were reconfigured in 2017, and overflow VX-04 was removed.
VX-09	2021	Removed	Egerton Sewer system was redesigned; overflows deemed no longer necessary.
PM-26	2023	Removed	Quebec Street was reconstructed in 2023 from Oxford Street East to the CP rail yard. Based on hydraulic analysis during design phase, only PM-25 (which was relocated) and PM-29 (which remained in-place) were recommended to remain active while PM-26, PM-27, and PM-28 were removed during construction.
PM-27	2023	Removed	
PM-28	2023	Removed	

See **Appendix A** for the complete Technical Memorandum outlining all relevant background information available.

4. Study Approach, Methodologies and Results

4.1. Typical Year Rainfall Analysis Review and Update

The primary objective of this analysis was to identify a new, representative "typical" or "average" rainfall year to be used with the City's hydraulic models. This is crucial for estimating overflow discharges and determining compliance with Ontario's MECP Procedure F-5-5.

The City previously used 2010 as its typical year for F-5-5 analysis. However, changing precipitation patterns in terms of rainfall frequency, intensity, and volume necessitated a review to ensure the selected year accurately reflects current annual precipitation conditions.

To achieve this, the PPCP Update Study reviewed long-term rainfall data over a 22-year period (2001-2022). Historical rainfall data from nine rain gauges across the City was processed using GEI's Wastewater Inflow & Infiltration Flow Analysis Tool (WiiFAT) Rainfall Analyzer. The analysis focused on the April to November period, consistent with Procedure F-5-5 guidelines, and identified individual rainfall events with a minimum depth of 5mm. The Oxford WWTP rain gauge was selected for detailed analysis due to its complete data coverage throughout the 22-year period and its representativeness of rainfall metrics. This choice also maintained consistency with the previous 2010 typical year selection.

Based on a comprehensive assessment, 2018 was recommended as the new average year's rainfall. It most closely matched the average number of rainfall events, the average total annual rainfall depth, and the average peak rainfall intensities over the 22-year study period and showed the most typical distribution of rainfall events by intensity ranges. Therefore, 2018 is considered representative of rainfall patterns over the past two decades and served as the basis for evaluating system performance for the PPCP Update Study.

See **Appendix B** for the complete Technical Memorandum outlining the typical year rainfall analysis.

4.2. Hydraulic Model Updates

This component of the project included a review of recently completed sewer related projects and a review of system performance (overflow frequency and total volume). Where indicated by the City, updated sewer infrastructure information was incorporated into the model, specifically in the Greenway sewershed model where important sewer separation and replacement work was recently completed. Updates were also made to the model's subcatchments in select locations upstream of recently completed sewer separation work to better represent post-separation system connectivity and runoff conditions.

4.3. F-5-5 Analysis

The updated hydraulic model, utilizing the newly selected 2018 typical year rainfall series, provided a current and accurate baseline for the F-5-5 analysis. The F-5-5 analysis was completed to assess the

performance of sanitary sewer overflows against the MECP Procedure F-5-5 criteria to determine if the City's existing sanitary system is compliant with Guideline F-5.

4.3.1. Purpose and Regulatory Context:

The MECP Procedure F-5-5 is a key supporting document for Guideline F-5, which sets the "*Levels of Treatment for Municipal and Private Sewage Treatment Works Discharging to Surface Waters*".

Procedure F-5-5 is normally applied to partially separated and combined sewer systems and allows for additional CSO controls where there is a demonstrated impact on human health and aquatic life. It is important to note that the Procedure F-5-5 requires the capture and treatment of all dry weather flows in addition to 90% of the volume resulting from wet weather flows in a 7-month period from April, starting within 15 days of April 1. Additional requirements are depicted in **Figure 4-1**.

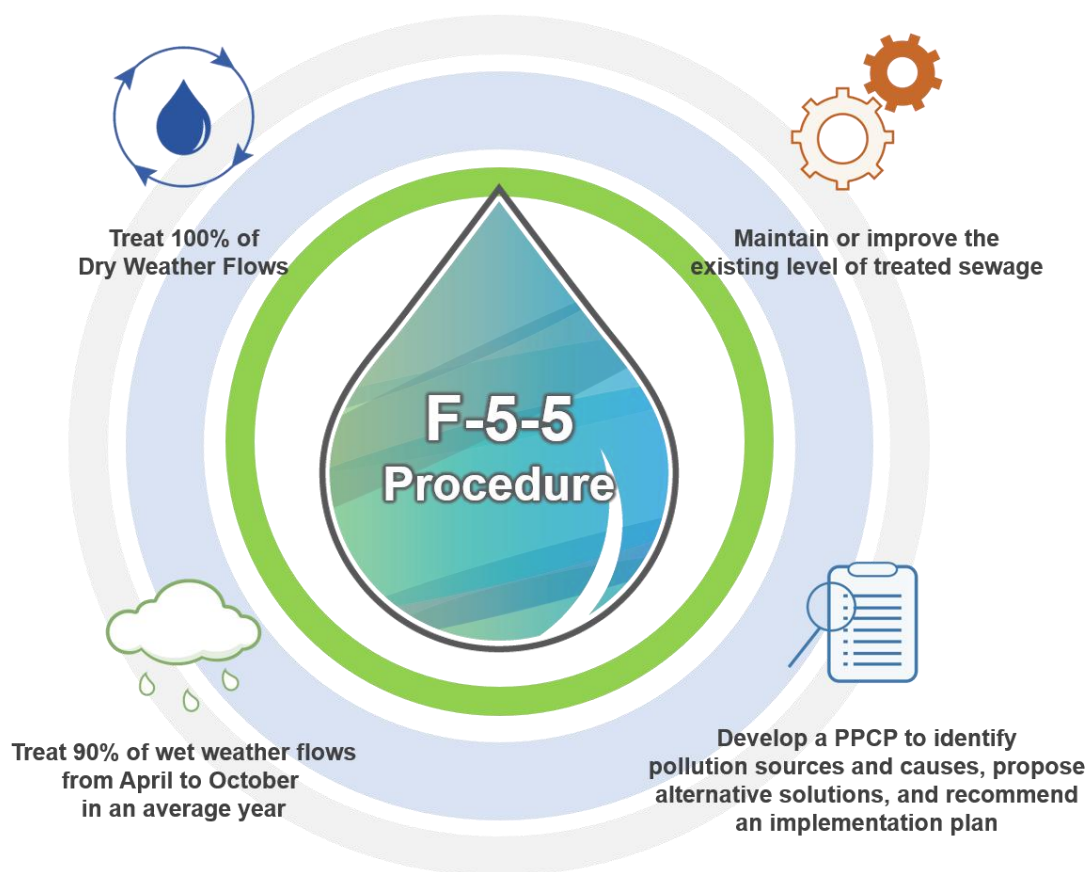


Figure 4-1 MECP F-5-5 Procedure Criteria

4.3.2. Key Inputs

The analysis relied heavily on the City's all-pipe hydraulic model, which characterized the sanitary system response, including local and trunk sewers, to precipitation events. Monitoring the overflow sites in real-time was not included as part of the PPCP Update Study.

- **Rain Gauge Selection:** The Oxford WWTP rain gauge was selected as it had the most complete data coverage and was most representative of rainfall metrics.
- **Typical Year Rainfall:** The analysis used the 2018 as the new "typical" or "average" rainfall year.
- **Data Sources:** A combination of supervisory control and data acquisition (SCADA) data and hydraulic model outputs were assessed to estimate the total number of overflows during the typical year of rainfall and the total annual volume of overflow discharges for each facility.
- **Greenway Sewershed Specifics:** Due to identified discrepancies in the updated hydraulic model for the Greenway sewershed, a modified approach was used. Overflow statistics from the previous 2010 typical year were carried forward and adjusted using calculated percent changes from a 1-in-10-year design storm simulation for areas affected by sewer separation projects. Runoff flow reductions of 50% were assumed in the downtown area for combined sewer separation projects.

4.4. Overflow Results

A total of 5 WWTP bypasses, 35 pumping station bypasses, and 128 CSOs and SSOs were identified across the City's sanitary system. The F-5-5 percent capture rate of wet weather flows (using raw and secondary bypass for the WWTPs) was estimated. Only CSOs and SSOs which showed overflow discharges for the 2018 typical year of rainfall in the hydraulic model were included for further analysis to determine high priority. This represents a total of 34 sanitary sewer overflows, of which 12 are grouped together under the Pall Mall System.

A high priority overflow is an overflow facility that does not satisfy the 90% volume capture criterion, and/or an overflow facility with impaired or transitional receiving water quality, and/or an overflow facility that discharges a significant total overflow volume. This methodology, involving a combination of the following three assessment criteria, is consistent with the previous 2018 PPCP:

1. **MECP F-5-5 Volumetric Capture Criterion:** Discharges for the typical year of rainfall did not meet the MECP F-5-5 volumetric capture criterion of 90%.
2. **Receiving Water BioMAP Quality:** The receiving water is classified as either impaired or transitional. The receiving water quality is determined using the BioMAP protocol, which is based on benthic monitoring studies conducted in 2012 by the Upper Thames River Conservation Authority (UTRCA) for the Thames River, Stoney Creek, and Dingman Creek reaches.
3. **Total Overflow Volume:** The facility discharges a significant total overflow volume (1,000 m³ or greater) for the typical year of rainfall.

If any one of these three criteria is met for a given overflow facility, it is identified as a high-priority site. Additionally, some CSOs and SSOs that did not strictly meet these criteria were still included as high priority due to recent or ongoing changes to the collection system.

A total of 12 high-priority CSOs and SSOs were determined, including 3 high-priority PS bypasses, and 5 WWTF bypasses, which are presented in **Table 4-1** and are shown in **Figure 4-2**. These were used as the focus for developing and evaluating alternative mitigation strategies, with the goal of achieving F-5-5 compliance and reducing the volume and frequency of untreated wastewater discharges. See **Appendix C** for the complete Technical Memorandum outlining the results from the F-5-5 analysis.

Table 4-1 High Priority Overflow Facilities

Sewershed	Overflow Facility	Overflow Volume During 2018 Typical Year (m ³)	F-5-5 % Capture	Receiving Water Quality (Impaired vs. Unimpaired)
Greenway	PM-02 ¹	10,322	83% ²	Unimpaired
Greenway	PM-09 ¹	7,752	78% ²	Unimpaired
Greenway	SD-03	160	86%	Unimpaired
Greenway	SN-05	3,373	85%	Unimpaired
Greenway	SW-01	38,842	87%	Unimpaired
Greenway	SP-45	146	98%	Impaired
Greenway	SD-05	2,531	96%	Unimpaired
Greenway	PM-03	1,397	97%	Unimpaired
Greenway	SP-58 (replaced SD-01)	6,174	95%	Unimpaired
Greenway	CP-09	325	97%	Impaired
Greenway	SW-03	5	100%	Impaired
Greenway	TP-04 (temporarily replaced CW-04)	672	100%	Unimpaired
Greenway	Berkshire PS	24	100%	Unimpaired-Transitional
Greenway	Medway PS	478	100%	Unimpaired
Greenway	Dingman PS	37,635	N/A ⁴	Impaired
Adelaide	Adelaide WWTP	21,667 ³	89% ³	Unimpaired
Pottersburg	Pottersburg WWTP	18,419 ³	91% ³	Unimpaired
Oxford	Oxford WWTP	0 ³	100% ³	Transitional
Vauxhall	Vauxhall WWTP	1,548 ³	99% ³	Unimpaired
Greenway	Greenway WWTP	2,801 ³	98% ³	Unimpaired-Transitional

¹ PM-02 and PM-09 are part of the Pall Mall collection system overflow group, and any strategy to manage overflows at these two sites will also extend to the remainder of overflows within the Pall Mall system.

² Dingman PS was missing total flow information for 2018; due to the magnitude of overflow during the typical year, this facility has been included as a high priority overflow.

³ WWTP overflow volume and F-5-5 capture rate include both the raw and secondary plant bypass.

⁴ F-5-5 % capture estimates not available for Dingman PS; included as high priority overflow site due to high annual discharge volume and receiving watercourse quality.

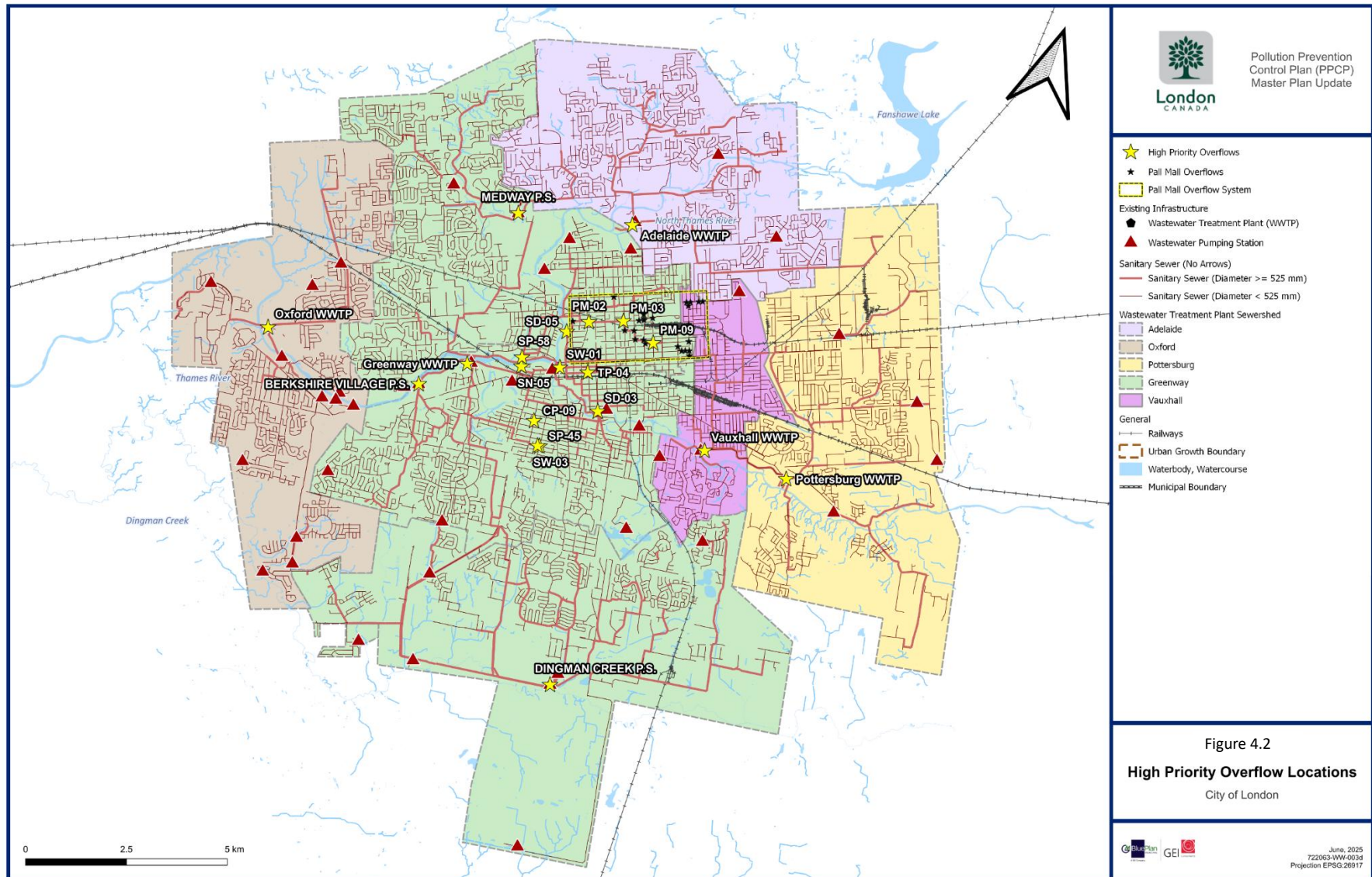


Figure 4-2 High Priority Overflow Locations

5. Alternatives Development and Evaluation

An evaluation of alternative mitigation strategies was conducted to determine the most suitable long-term strategy to implement for the City by analyzing the benefits and drawbacks. Once the preferred mitigation strategy was selected, the preferred approach was determined based on a set of evaluation criteria used to calculate an overall rating. The process is shown in **Figure 5-1**.

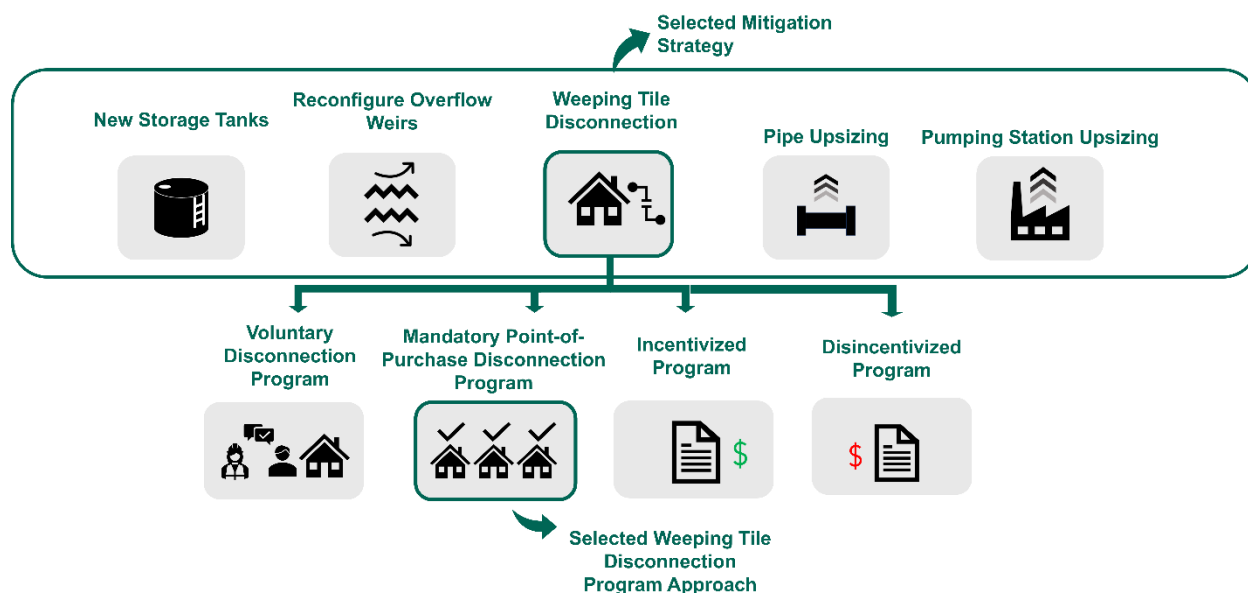


Figure 5-1 Selection of Mitigation Strategy and Disconnection Approach

5.1. Mitigation Strategies

From the F-5-5 Analysis, a list of overflow locations within the City, including those characterized as high priority, were identified. The alternatives developed addressed how these overflows can be eliminated or mitigated in the short, medium, and long-term. The mitigation strategies are outlined in **Table 5-1**.

Several alternative strategies were available given the existing infrastructure within the study area. Many of these alternatives have been implemented in the past, but do not meet long-term expectations to achieve the F-5-5 90% compliance capture. An evaluation of the following alternatives was conducted to determine most suitable long-term strategy to implement for the City:

- **Provision of Storage:** Tanks temporarily hold excess flows, but face limitations in capacity for extreme events and siting challenges.
- **Reconfiguration of Overflow Weirs:** Adjusting weir heights to retain more volume but can increase downstream spillage or upstream basement flooding risk if not carefully managed.
- **Linear Conveyance Upsizing:** Replacing sewers with larger diameters, which is costly and designed for specific return periods.
- **Pumping Station Capacity Upgrades:** Installing larger pumps and potentially upsizing forcemains, effective at the station level but expensive and does not address the source of inflow.

- **Weeping Tile Disconnection:** Disconnection of weeping tiles from the sanitary system, and installation of a sump pit and pump.

5.1.1. Provision of Storage

Storage tanks are designed, either above or below ground, to temporarily hold excess stormwater and sewage during peak rainfall periods and are then emptied slowly into the sewer system and treated once capacity is available, helping to prevent overflows. To store large volumes, storage tanks will need to be flexible in location as there are limited siting areas available. Generally, odour may also be an issue, if not properly maintained and emptied, when located near urban areas. Some of these operational concerns may be less of a factor for in-line (passive) storage which generally have less operational and maintenance needs (in comparison to off-line storage tanks).

5.1.2. Reconfiguration of Overflow Weir

Overflow weirs are structures designed to manage excess flow in a sewer system by allowing spills during peak flows or extreme rainfall events. Although the weirs help to prevent system backups, this leads to untreated or partially treated sewage being released into the environment and ultimately reducing the ability to capture 90% of flows as per F-5-5.

Note that reconfiguration of overflow weirs may not be feasible in the majority of sewersheds. This alternative is also not applicable to most overflows in the City, as many overflow locations are not controlled by weirs.

5.1.3. Linear Conveyance Upsizing

Linear conveyance upsizing refers to increasing the capacity of sewers by replacing them with a larger diameter to handle higher volumes. Municipalities proactively upsize sewers to address future demands due to urban growth and more intense rainfall patterns caused by climate change. However, upsizing is typically only designed to handle a maximum return period, and costs increase significantly to accommodate larger design storms. A larger conveyance system means that for a certain design storm event, the system can carry the combined flow of sewage and stormwater without reaching its overflow threshold during normal and peak flow conditions.

5.1.4. Pumping Station Capacity Upgrades

Sanitary pumping stations transfer sewage from local collection systems to treatment plants and are used where gravity is insufficient at moving sewage due to elevation changes. Capacity upgrades at pumping stations require installing larger or additional pumps such that more sewage can be moved by forcemain. Upsizing of the forcemain may also be required to accommodate the increased volume and flow. Also, storage improvements such as wet wells or retention basins should be considered to temporarily hold excess flow during peak times. It is imperative that the facility have regular maintenance to ensure continuous and reliable operation during extreme rainfall events. This alternative would be very effective at reducing bypasses at the pumping stations but would be very costly as it involves many different upgrades. However, the pumping stations would only be moving more flow to downstream overflow locations and do not address the issue at the source.

5.1.5. Weeping Tile Disconnection

Weeping tiles that are connected to the sanitary sewer contribute additional stormwater inflows to the system, which can quickly become overwhelmed during extreme rainfall events. By disconnecting weeping tiles, the overall volume of stormwater entering the system is reduced, thus lowering the frequency and severity of overflows. Additional benefits include reducing basement flooding risks for the immediate neighbourhood area. Implementing a disconnection solution across a large area may be very logistically complex, requiring coordination with local regulations, and can take a long time before the expected impacts are achieved. If not properly redirected or alternative drainage solutions are not properly designed and maintained, the weeping tile disconnection will not be as effective for larger design storms. The disconnection process can also be disruptive to property owners, and they will need to be informed and engaged to ensure successful implementation.

Ultimately, weeping tile disconnection was identified as the long-term strategy to reduce I&I at the source, improve downstream system performance, and enhance water quality. It will also reduce the City's frequency and volume of CSO and SSO discharges beyond the F-5-5 90% compliance: eventually achieving 100% capture rate at most, if not all, high priority overflow sites. In comparison, hard infrastructure measures, including upsizing sewers and constructing storage tanks, will only aim to achieve the minimum compliance target. In the future, if Ontario regulation is updated or changed to become more stringent, the City will already be prepared with an effective weeping tile disconnection program to meet the new limits.

Table 5-1 Evaluation of Mitigation Strategies on Meeting the F-5-5 90% Wet Weather Flow Requirements

			 Selected Mitigation Strategy		
Mitigation Strategies	New Storage Tanks	Reconfigure Overflow Weirs	Weeping Tile Disconnection	Pipe Upsizing	Pumping Station Upsizing
Description	Temporarily hold excess overflows which are then slowly emptied into the sewer system and treated once capacity is available.	Designed to allow spills during extreme rainfall events to prevent system backups.	Disconnection weeping tiles from the sanitary system, and installation of a sump pit and pump.	Increased sewer capacity with larger diameter sewers to handle higher volumes.	Install larger or additional pumps so more sewage can be moved through system towards the treatment plants.
Benefits	Reduce frequency and volume of CSOs and SSOs during extreme rainfall events	- Reduce frequency and volume of CSOs and SSOs during extreme rainfall events - Better flow control to retain more volume in the system - Low cost - Localized solution	- Reduce frequency and volume of CSOs and SSOs during extreme rainfall events - Reduce overall stormwater volume entering system - Lower basement flooding risks - Prepare City for future potential provincial compliance changes	- Reduce frequency and volume of CSOs and SSOs during extreme rainfall events - Provide capacity for additional growth - Better suited to carry combined flow of sewage and stormwater	- Reduce frequency and volume of CSOs and SSOs during extreme rainfall events - Prevent system backup - Additional storage available to temporarily hold excess overflow
Drawbacks	- Odour - Location availability - Storage limits - Variable costs	- Increase downstream spillage risks - Increase upstream flooding risks - Limited ability to implement in existing system	Requires property owner participation	- Higher costs with larger upgrades - Designed capacity limits	- Highest cost - Does not eliminate overflow risk downstream - Significant maintenance required

5.2. Weeping Tile Disconnection Program Approaches

5.2.1. Limitations of Existing Disconnection Programs

The City has implemented various initiatives, including public education campaigns, a Basement Flooding Grant Program (offering up to 90% subsidy for disconnections and related works), and pilot projects (e.g., Blanchard Crescent, Remy Crescent, Augusta Crescent). While these programs have demonstrated that source control through weeping tile disconnection is effective in reducing I&I and can be less expensive than large-scale infrastructure upgrades, they face significant challenges due to low homeowner participation rates. For instance, participation in pilot projects ranged from 11% to 64%, and the *Basement Flooding Grant Program* only achieved 499 disconnections between 2013 and 2023, with an average of 45 disconnections per year. This low uptake is attributed to a lack of homeowner awareness, concerns about process and costs, and unwillingness to undertake invasive work without greater incentives.

5.2.2. Evaluation and Feasibility

Different weeping tile disconnection approaches were assessed with critical commentary on its overall effectiveness. Local weeping tile disconnection programs, including those offered by some Ontario municipalities, that have been successfully implemented either through voluntary, mandatory, or (dis)incentivized approaches, were identified as examples.

Four main approaches for weeping tile disconnection were reviewed:

1. **Voluntary:** Relies on homeowner initiative, often supported by financial incentives for those eligible. While offering flexibility, it suffers from low participation rates.
2. **Mandatory – City-Wide ("Point-of-Sale"):** A "soft mandatory" approach where disconnection is required upon property sale. This transfers responsibility to the seller and allows enforcement at a natural trigger point (title transfer). Examples from New York State municipalities (e.g., Town of Tonawanda) show this approach's potential.
3. **Incentivized:** Uses additional incentives shown as a credit benefit on the homeowner's recurring wastewater bills to encourage disconnections. However, these are not enforced for compliance.
4. **Disincentivized:** Uses enforcement shown as a punitive charge on the homeowner's recurring wastewater bills to encourage disconnections, as seen in Stratford, ON.

The effectiveness of the disconnection approaches can vary and be difficult to compare. The evaluation provided in **Table 5-2** was used in selecting the preferred approach based on the overall rating. Each approach was given a score between 0 (empty circle) to 4 (full circle) based on the expected impact to each criterion. Some criteria, such as Participation Rate, Efficacy, and System Improvement Potential, were necessary to be weighted higher than others to more clearly reflect the beneficial impact they would have on meeting the F-5-5 90% wet weather flow capture requirements. Below is a brief description of each criterion:

- **Flexibility of Choice** – Ability of each approach to empower homeowners to decide whether to participate in the program based on their individual needs and constraints.

- **Participation Rate** – Ability of each approach to satisfy minimum homeowner participation requirements to be effective at meeting the City’s objectives for overflow reduction potential and basement flooding risk.
- **Financial Implications** – Ability of each approach to be financially feasible and sustainable, considering both immediate and future costs, to allow the homeowner to disconnect without significant financial implications.
- **Customer Impact** – Ability of each approach to directly and indirectly affect impacted homeowners, considering the level of disruption caused as well as practical, financial, and emotional considerations.
- **Efficacy of Meeting City’s Objectives** - Ability of each approach to effectively meet the City’s objectives for overflow reduction potential and basement flooding risk within the same area/ sewershed, not specific to individual homes.
- **System Improvement Potential** – Ability of each approach to enhance and improve the level of service in the sanitary sewer system, both in the short-term and long-term, by addressing existing capacity constraints to accommodate extreme wet weather flows.
- **Implementation Flexibility** - Ability of each approach to be easily controlled by the City in terms of program logistics, including timing and spatial variability, to help determine the scalability and practicality from an operational perspective.
- **City Workload Management** – Ability of each approach to limit the administrative complexity, requiring efficient allocation of City resources, including staff, budget, and legal considerations, without adding strain on existing workloads.
- **Program Time Scale** - Ability of each approach to meet the City’s objectives within a reasonable time scale, considering enforcement and compliance measures.

Table 5-2 Evaluation of Disconnection Approaches on Meeting the F-5-5 90% Wet Weather Flow Requirements

	WEIGHTING 1 = lowest, 2 = mid, 3 = highest weighting	Voluntary E.g. City of London (City-wide)			Point-of-Sale Mandatory E.g. Town of Tonawanda, NY			Incentivized E.g. City of London (Blanchard Cres.)			Disincentivized E.g. City of Ann Arbor, MI		
Flexibility of Choice	1		4	Homeowners can decide not to participate with no legal or financial repercussions		1	By-law requirement, legal repercussions if not in compliance		4	Credit benefit/ additional funding incentive offered for homeowners who decide to participate		2	Punitive charge incentive applied for homeowners who decide not to participate
Participation Rate	3		1	Low participation expected without additional funding, relies on public education for homeowners to act		4	Highest participation expected as it is a requirement for all eligible homeowners across the City		2	Higher participation expected than voluntary due to additional funding, relies on public education for homeowners to act		3	Higher participation expected than voluntary and incentivized, relies on public education for homeowners to act
Financial Implications	2		4	Most financially feasible for homeowners as subsidies are available to cover capital costs, 90% up to a maximum		1	Some rebate/ subsidy opportunities may be available to support homeowners, but will be less than voluntary		4	Most financially feasible for homeowners as credit benefit/ additional funding is available to cover capital costs and future costs		1	Some rebate/ subsidy opportunities may be available to support homeowners, but will be less than voluntary
Customer Impact	2		4	Maintaining the existing <i>Basement Flooding Grant Program</i> will satisfy and benefit existing flood-impacted homeowners, while not disrupting others		0	Impacted homeowners affected due to potential property closing delays and may disproportionately disrupt certain demographics, leading to increased risk for legal challenges		2	Level of disruption and impact dependent on homeowners’ choice to disconnect		1	Level of disruption and impact dependent on homeowners’ choice to disconnect, may disproportionately affect certain demographics
Efficacy of Meeting City’s Objectives	3		1	Variable decrease in basement flooding risk and minimal overflow reduction anticipated, dependent on homeowner participation in same area/ sewershed		4	Decreased risk of basement flooding for homeowners in same area with limited number of overflows anticipated across the City		1	Variable decrease in basement flooding risk and variable overflow reduction anticipated, however more homeowners expected to participate in same area/ sewershed compared to voluntary		2	Variable decrease in basement flooding risk and variable overflow reduction anticipated, however more homeowners expected to participate in same area/ sewershed compared to voluntary and incentivized
System Improvement Potential	3		1	Minimal system improvements anticipated, no meaningful beneficial change from existing at current participation rate		4	Large system improvements and resiliency anticipated, including long-term WWTF and PS cost savings		2	Some system improvements compared to existing due to higher participation rate		3	More system improvements compared to existing and incentivized due to higher participation rate
Implementation Flexibility	1		3	More flexibility in scheduling inspections for seasons where weather conditions are favourable		1	Less flexibility in scheduling inspections, based on timing of home sale		2	Building Division required to inspect work when homeowner calls		2	Building Division required to inspect work when homeowner calls
City Workload Management	1		4	No additional implementation necessary, no strain anticipated on existing workloads		1	High complexity expected requiring significant administration and City resources once by-law is approved and operational		3	Some complexity expected, requiring additional funding approval for incentives		3	Some complexity expected, requiring additional coordination with City wastewater operations team for wastewater billing when applying punitive charges
Program Time Scale	2		0	No enforcement available as it is homeowner initiated, program length may be indefinite without additional measures		4	Strict and streamlined enforcement for homeowner compliance across the City will help to minimize program length		2	No enforcement available as it is the homeowner’s choice to disconnect, program length anticipated to be shorter than voluntary		3	Enforcement in the form of punitive charge for non-disconnection will help to minimize program length
Overall Rating			33	Least preferred disconnection approach		49	Most preferred disconnection approach		36	Second least preferred disconnection approach		41	Second most preferred disconnection approach
LEGEND:			Negative Outcome/ Greatest Overall Impact							Positive Outcome/ Lesser Overall Impact			

5.2.3. Preliminary Preferred Disconnection Approach

Based on the results of the evaluation, the preferred disconnection approach was determined to be mandatory followed by disincentivized and incentivized, with the existing voluntary being the least preferred. Overall, implementing a City wide Point-of-Sale mandatory weeping tile disconnection program is preferred for the long term, allowing for enhanced enforcement and higher homeowner participation rates.

Weeping tile disconnection across the City over a long time would achieve significant wet weather overflow volume reduction, far exceeding the minimum F-5-5 requirement for volumetric capture at overflow locations. It was recommended that the City proceed with the development of a Point-of-Sale mandatory weeping tile disconnection program as the primary strategy to reduce the volume and frequency of wet weather overflows at all locations. This program is expected to achieve significant I&I reduction at the source, mitigate downstream capacity issues, reduce basement flooding risks for homeowners, and improve environmental protection by reducing pollution to receiving streams. Additionally, this could enable the City to reclaim sewer capacity within the existing system which could be allocated to future greenfield or intensification growth.

While this may necessitate future upgrades to the storm sewer system in some areas, the long-term cost-benefits are considerable. It is anticipated to yield the highest participation rates and significant system improvements and resiliency, despite potential customer impact and increased City workload for administration and enforcement.

5.2.3.1. Feasibility of a Point-of-Sale Disconnection Program

Using Municipal Property Assessment Corporation (MPAC) data from 2013-2023, the study determined that approximately 3,558 single-family detached homes are sold annually in London. Given that roughly 51,337 qualifying homes (built before 1985 with assumed connected weeping tiles) exist, a Point-of-Sale program could lead to an estimated 4.4% of these homes disconnecting their weeping tiles annually. This means an expected annual peak wet weather flow reduction of 351 L/s to 3,513 L/s for the entire City during a storm. It is estimated that it would take approximately 15 years for all qualifying homes to be sold and disconnect their weeping tiles through this program.

A meeting with the Town of Tonawanda, NY, who have implemented a similar program, provided insights into program scalability for a larger municipality, their inspections process and legal limitations on public funding for private land in New York State.

5.2.3.2. Managing Public Perspectives and Risk Disclosure

Implementing the mandatory Point-of-Sale disconnection program requires robust communication to address potential negative public responses, which often stem from misinformation or concerns about cost, disruption, and property rights. Public education and outreach materials will be used to inform homeowners about the risks associated with having a weeping tile connected to the sanitary sewer system and the benefits of disconnecting it. This will be achieved through workshops, seminars, and public information campaigns to increase public awareness of the proposed by-law changes.

The concept of a "certificate of compliance" at the Point-of-Sale is also comparable to the provincial vehicle safety standards certificate, in which the public is already familiar with. Transparency regarding a property's drainage system and flood risk is also crucial, with a recommendation for mandatory disclosure by real estate professionals.

See **Appendix D** for the complete Technical Memorandum outlining the disconnection program feasibility analysis.

6. Public Information Centre

A crucial component of this study was public consultation, which aims to facilitate information exchange and gather feedback from the public and stakeholders.

The first and only PIC was held in-person on May 7, 2025. To ensure broad awareness, the Project Team used multiple communication channels such as Newspaper Advertisement, Online Advertisement and Electronic Mail Out.

The PIC served as a forum to:

- Educate and inform the public and stakeholders about the PPCP Update Study.
- Present the Project Team's preliminary evaluation results, including the development of alternative mitigation strategies and disconnection approaches, along with their respective evaluations.
- Seek feedback on the proposed long-term strategy recommended for the City's wastewater system.
- Increase accessibility and engagement through direct communication with the Project Team.

The materials presented covered a wide range of topics, including:

- Study Introduction and Background, Existing System Constraints, and I&I.
- MECP Procedure F-5-5, Previous PPCP Strategy, Overflow Assessment Update, and High Priority Overflows.
- Mitigation Strategies, Weeping Tile Disconnection and Sump Pit and Pump, Types of Weeping Tile Disconnection Programs, Evaluation Criteria, and Evaluation Results.

The core long-term strategy proposed at the PIC is the development of a Point-of-Sale mandatory weeping tile disconnection program, which aims to significantly reduce wet weather flow volumes at overflow locations. This approach is seen as the most preferred disconnection strategy for its potential for enhanced enforcement and higher homeowner participation rates, ultimately improving system resiliency and reducing untreated discharges to the Thames River and other receiving streams.

6.1. First Nations Communities Engagement

Recognizing the unique understanding and traditional knowledge of First Nations communities regarding the natural environment, extensive efforts were made for engagement and consultation:

- The City of London acknowledged its location on the traditional lands of the Anishinaabek, Haudenosaunee, Lūnaapéewak, and Attawandaron, and committed to honouring relevant treaties.
- Project status update letters, including an invitation to the PIC and an offer for a separate meeting, were circulated via email to nine First Nations communities on March 13, 2025

- The overall aim of consultation with First Nations was to seek input on potential impacts of the proposed strategy to their Treaty Rights, particularly concerning the Thames River, which is considered a life source and vital for health and wellbeing.

Project status update letters, which offers an opportunity to meet with the Project Team and an invitation to attend the PIC event, were also circulated via email to the following First Nations communities on March 13, 2025:

- Aamjiwanaang First Nation;
- Bkejwanong Territory (Walpole Island) First Nation;
- Caldwell First Nation;
- Kettle and Stoney Point First Nation;
- Chippewas of the Thames First Nation;
- Munsee Delaware Nation;
- Delaware Nation at Moraviantown;
- Oneida Nation of the Thames; and,
- Oneida Nation Council of Chiefs.

6.2. Key Feedback and Outcomes

Only two members of the public, outside of the Project Team, attended the in-person event. Attendees were encouraged to provide comments and questions during the event or through an online feedback form available for a three-week comment period. Crucially, no comments related to the PIC materials were received by the Project Team, either through the feedback form or by email. An accessible version of these materials was made available on the City's Project Website.

The following has been documented in **Appendix E**, the PIC Summary report:

- Information presented at the PIC;
- Summary of attendance and engagement; and
- Summarized table of comments received, and responses provided. All correspondences were tracked to support transparency and traceability.

7. Recommendations and Implementation Plan

7.1. Mandatory Point-of Purchase Program

Following the City's analysis of the weeping tile disconnection program approaches, the implementation of a mandatory Point-of-Sale program was recommended as the preliminary preferred strategy to manage wet weather flows and reduce overflows to the Thames River and other tributaries.

However, after additional feasibility analysis and discussions with the City, the strategy shifted to be a mandatory Point-of-Purchase program, with a focus on the buyer instead of the seller. This would involve a new by-law or amendment to the existing by-law, requiring buyers of qualifying properties to disconnect their existing weeping tiles if connected to the municipal sanitary sewer system. An inspection would be triggered at the Point-of-Purchase (i.e., when the title transfer is flagged to the City), and a Certificate of Compliance would need to be obtained, requiring successful disconnection if applicable.

An implementation plan was developed which outlines resource requirements and phasing and discusses the critical steps required for Council buy-in and by-law legality. The aim is to ensure that the high-level aspects of the weeping tile Point-of-Purchase Disconnection Program are well documented and provide consideration for all parties involved in the program's execution.

7.2. Implementation Methodology

The overview schematic shown in **Figure 7-1** outlines the process for obtaining a Certificate of Compliance under the proposed Point-of-Purchase Disconnection By-Law, once implemented. It details the transfer of ownership trigger, the necessary weeping tile inspection conducted by City staff, the actions required if weeping tiles are connected to the sanitary system, and the Certificate of Compliance validation period. The timeline for inspection and compliance will be further assessed and determined in the future.

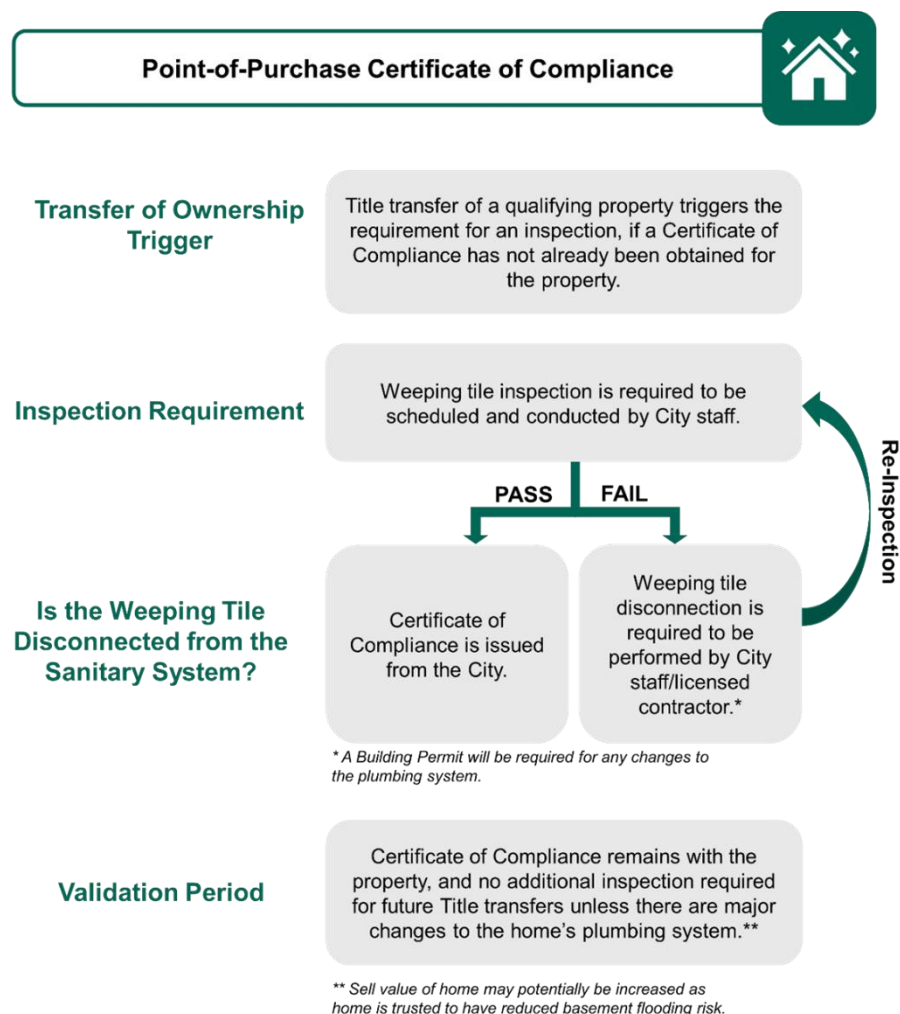


Figure 7-1 Overview Schematic of the Point-of-Purchase Certificate of Compliance

The seller is highly encouraged to complete the inspection and the required remedial work to obtain a Certificate of Compliance prior to closing. This would be a key selling point, and the sell value of the home may potentially be increased as the home is trusted to have reduced basement flooding risk. However, the responsibility ultimately falls with the buyer once the property is transferred.

7.2.1. Inspection Process

An inspection is required for all single-family detached housing types to verify that no weeping tiles are connected to the municipal sanitary sewer system, if a Certificate of Compliance has not already been obtained for the property.

Each inspection will require one Inspection and Compliance Officer (potentially accompanied by one Technical Support). **Figure 7-2** outlines three potential scenarios encountered during the 0.5 hour visual inspection, to determine whether there is an existing sump pump and pit and to confirm that the weeping tile is connected to it. Scenario 1 is the ideal system and results in a *pass* with no further inspections required. Scenarios 2 and 3 result in a *fail* and requires a further 1.5 hour assessment and report generation using BSDI. No excavation or invasive investigative work will be involved in the

inspections, unless the homeowner would like to hire a 3rd party contractor to confirm the results, at their own expense.

The National Association of Sewer Service Companies (NASSCO)'s BSDI focuses on building sewers and drains and typically starts from an interior clean-out or very close to the building and goes down through the lateral toward the sewer main. The Inspection and Compliance Officers will need to become BSDI certified, which costs \$180 to complete a 1.5 hour course and exam, and requires recertification every three years. The reports generated would follow the same Pipeline Assessment Certification Program (PACP) condition-coding that the City is already familiar with. Inspection and Compliance Officers will need to have the appropriate equipment (any push camera with on-screen footage timestamp) on hand for every inspection.

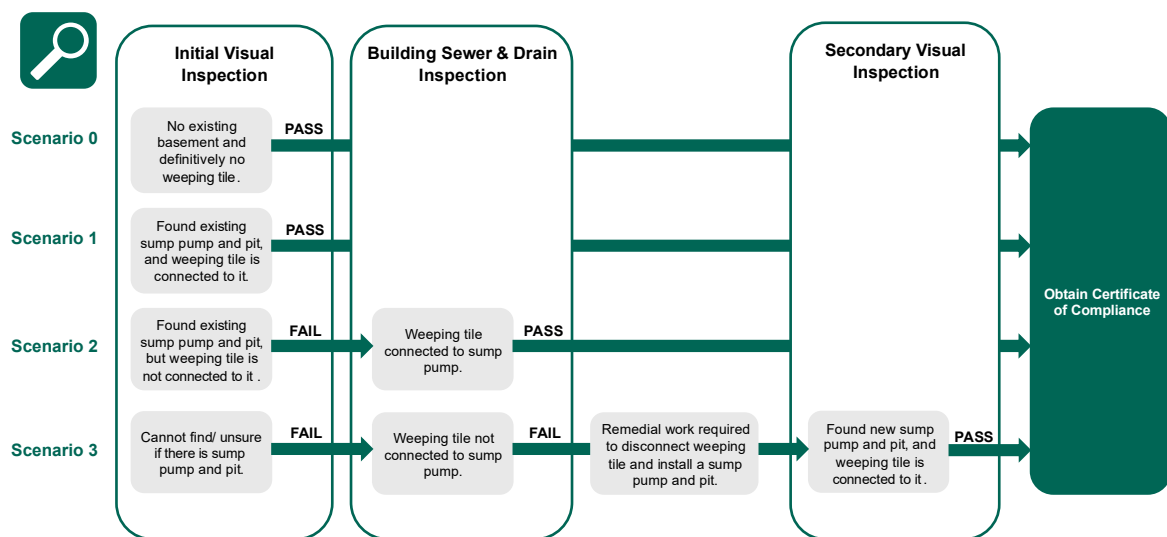


Figure 7-2 Visual Inspection Scenarios

Following BSDI, if a weeping tile is confirmed to be connected to a sump pump, it results in a *pass* and a Certificate of Compliance can be obtained in Scenario 2. However, if it results in a *fail*, then remedial work is required to disconnect the weeping tile and install a new sump pump and pit. In Scenario 3, an additional secondary visual inspection will be completed on a separate visit to review that the remedial work is correct, and then a Certificate of Compliance can be obtained.

7.2.2. Disconnection Process

Once the inspection is completed, any remedial work identified must be completed within a specified timeline of the initial inspection date. The general construction process is described below:

1. **Excavation:** Dig to access the existing weeping tile system.
2. **Reconfiguration:** Reconfigure the existing weeping tile to flow into the sump pit.
3. **Sump Pit Installation:** Install the sump pit in a suitable location in the basement or crawl space inside the home.
4. **Sump Pump Installation:** Install the sump pump inside the pit, ensuring it is correctly connected to the discharge line which ultimately discharges to the ground surface or storm

sewer lateral, whichever is most feasible at the time of construction. Note that electrical work may also be required to install an isolated circuit for the sump pump.

5. **Testing and Sealing:** Ensure the system works effectively and seal off any openings.
6. **Restore to preconstruction condition:** Fill in what was excavated.

7.2.3. Enforcement

Enforcement of the Disconnection By-law occurs at the Point-of-Purchase, and the objective of enforcement is to ensure proper weeping tile disconnection is completed if a single-family detached home is determined to have an existing connection. It is the buyer's responsibility to schedule an inspection, complete remedial work, and obtain a Certificate of Compliance if one has not already been obtained for the property. Therefore, enforcement penalties are only applicable to buyers of qualifying properties as part of the Disconnection By-law.

As well, the City may choose to use escalation measures for failure to adhere to the Disconnection By-law (i.e. failure to pay the enforcement penalties) via the water bill. When an account is not paid by the due date stated on the bill, a late payment charge will apply. Should the bill remain unpaid, the outstanding balance and additional administrative fees may be transferred to the property tax bill as per Ontario's Municipal Act. Note that the enforcement penalties are solely for achieving weeping tile disconnection compliance, and not for generating profit. The exact amounts will be further assessed and determined in the future.

Under the Disconnection By-Law, all single-family detached homes are subject to an initial visual inspection, however it is at the City's discretion whether to conduct the inspection. New single-family detached homes that will be constructed after the Disconnection By-law has been implemented (i.e. January 1, 2028) will be exempted and therefore do not need to be inspected and required to obtain a Certificate of Compliance.

7.3. Legal Considerations

Creating a new municipal by-law requires careful attention to numerous legal considerations to ensure it is valid, enforceable, and resistant to legal challenges. Procedural fairness is essential as the by-law must be passed in accordance with the correct legislative steps as outlined above. Additionally, the language of the by-law must be clear, specific, and not overly vague, allowing homeowners to understand the requirements and enabling by-law officers to apply the enforcement measures consistently. Should the by-law be challenged, the City's legal team can easily evaluate that the Point-of-Purchase Disconnection By-law appropriately serves a legitimate public interest without being oppressive.

To minimize legal risk, the new by-law will need to be reviewed internally by the City's legal and risk management team before it is introduced to Council. They will provide legal advice and assist the City in navigating the implementation of an unprecedented new by-law. A comprehensive review will help confirm compliance with legal standards and reduce the likelihood of future litigation.

7.4. Implementation Schedule

The implementation schedule outlined in **Table 7-1** shows that the planned timeline for year 0, years 1-4, years 5-8, and years 9 and beyond, which aligns with the City's multi-year budget cycle. This will help to ensure that the Point-of-Purchase Disconnection By-law is executed in a structured and efficient manner, minimizing disruption to homeowners and optimizing resource allocation. In addition, it will be used to track the program's progress over time and allow opportunities for feedback from key parties to improve future iterations.

Table 7-1 Implementation Schedule

Timeline	Objective
Year 0 (2027)	Establish a baseline for the program, increase public awareness, and hire the necessary personnel
Years 1-4 (2028-2031)	Monitor early adoption and address any operational challenges.
Years 5-8 (2032-2035)	Assess the mid-term performance and identify barriers for long-term adoption
Years 9 (2036) and beyond	Effectively manage the program, optimized for efficient use of resources and support

7.5. Resources Required

7.5.1. Additional City Staff

To implement the disconnection program, and throughout its duration, the City would need to hire additional FTEs with a broad range of skill sets. These positions are briefly described below in **Table 7-2**.

Table 7-2 Implementation Plan Roles and Responsibilities

FTE Position	Quantity	Roles and Responsibilities
Project Manager	1	Oversee the program, ensuring that goals are met, timelines are followed, and resources are allocated efficiently and within budget. The Project Manager would also need to develop appropriate communication strategies to educate property owners about the program. This may include organizing workshops, preparing informational materials, managing a website, or handling inquiries from the public.
Administrative Staff	3	Assist with day-to-day administrative tasks, including processing Certificate of Compliance applications, maintaining records, scheduling inspections, and coordinating with licensed contractors. They must also manage communication with homeowners, including handling questions and complaints related to the Point-of-Purchase program which are expected to be high volume, especially in the beginning.
Inspection and Compliance Officers	Variable	Inspect existing drainage systems and identify potential weeping tile connection points. Ensure that the disconnection work is completed according to Ontario Building Code (OBC) standards and enforce compliance with the by-law.

FTE Position	Quantity	Roles and Responsibilities
Licensed Disconnection Worker	Variable	Excavate and prepare the site for disconnection and reconfiguration, install sump pits and pumps, test and seal, and ensure proper surface discharge. They must also make sure the work meets OBC standards and City quality control standards.
Technical Support	Variable	Provide support during weeping tile inspections and/or weeping tile disconnection work, whenever and wherever required. The objective is to learn and develop the skills required to eventually become an Inspection and Compliance Officer or a Licensed Disconnection Worker.

Licensed contractors must be used to perform the disconnection of weeping tiles from the municipal sanitary sewer. It is recommended that the City allow homeowners to choose between using licensed City staff to complete the remedial work or to find their own preferred licensed private contractor. This blended approach helps to ensure compliance and standardization if using City staff, while offering more flexibility and potentially faster turnaround if using a private contractor. Similar to a PDC replacement, the City will perform the remedial work for a flat-rate fee. Note that the flat-rate fee should be representative of the average market price, and the City may need to conduct bi-annual surveys of the market construction cost to ensure the price remains fair. The initial flat rate fee will be further assessed and determined in the future.

7.5.2. Program Costs

The total cost for the Point-of-Purchase Disconnection Program is a combination of the number of initial inspections completed (including visual and BSDI), the number of disconnections completed by City staff (depending on the split between Licensed Disconnection Workers and licensed private contractors), and the number of secondary inspections completed (to confirm the remedial work).

The cost for inspections can be more easily estimated since the number of inspections required is backed by 10 years of MPAC data to determine the average number of single-family detached homes sold per year. However, the cost to complete physical disconnections is much harder to estimate due to numerous uncertain or unknown parameters. For example, the exact cost of labour, vehicles, materials, and equipment is not yet known, and will depend on whether the City would require additional yard space to store their fleet of vehicles.

As the biggest cost component for the program would be the disconnection aspect, further study is recommended to fully understand all the cost associated with disconnection prior to implementing this program. It should be noted that in general the cost per disconnection would decrease as more disconnections are completed, as the capital investment and overhead expenditures by the City would be spread over a larger number of disconnection projects (i.e., it would be more cost-efficient to have a greater proportion of the disconnections completed by City staff, assuming that adequate resources are available). Council may also decide to fully-fund the remedial work required or provide partial rebates instead.

Other program costs include the labour costs for one Project Manager, three Administrative Staff, and variable Inspection and Compliance Officers, Licensed Disconnection Workers, and Technical Supports

based on the number of inspections and disconnections anticipated. These staff quantities are similarly preliminary in nature and are subject to change based on further study. Public engagement costs for brochures/ notices, website management, and advertisements should also be included in overall program costs.

In summary, actual total estimated program costs will be determined at a later date. See **Appendix F** for the complete Technical Memorandum outlining the full implementation plan for the recommended Point-of-Purchase Disconnection Program.

8. Conclusion

Overall, implementing a City-wide Point-of-Purchase mandatory weeping tile disconnection program is preferred for the long term, allowing for enhanced enforcement and higher homeowner participation rates. The implementation plan for the Point-of-Purchase Disconnection By-law provides a structured and proactive approach for reducing the frequency and volume of overflows at all locations to meet the MECP Procedure F-5-5 requirements. The enforcement mechanisms outlined in this plan support a sustainable, cost-effective, and source-control focused solution to address environmental pollution, infrastructure strain, and basement flooding risks. Consistent public education and coordination with real estate professionals and lawyers will be integral to the program's long-term success and adaptability.