

# City of Hamilton Green Standards and Guidelines for Site Servicing (Stormwater Management)

Planning Committee Presentation –  
October 1, 2024



# Presentation Agenda

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- 1 Introduction/Project Overview
- 2 Green Standards and Guidelines Design Approach and Practices
- 3 Next Steps & Other Considerations

Section 1

# Introduction /Project Overview



## Background

- Council interested in promoting Green Development to align with its strategic priorities including guidance from:
  - Climate Change Action Plan
  - Biodiversity Action Plan
  - Green Building Standards
  - Chedoke Creek Water Quality Improvement Framework
  - Complete Streets Manual
  - Watershed Action Plan
- From **Council & Committee 2022/2026 Council Priorities, Outcomes & Measures of Success**  
*“protect our unique natural landscape and waterways and to mitigate the impacts of climate”change*

## Study Purpose and Objectives

- Develop Green Standards and Guidelines (GSG) for managing stormwater on **new development sites subject to Site Plan control**
- GSG to be complementary to what City has been doing in the SWM realm since pre-amalgamation; to reflect the evolution of the science and industry
- Consult with Stakeholders:
  - Various City Departments,
  - Technical Agencies,
  - Development Industry
- Provide developers and City staff with a **decision methodology and implementation considerations** to inform and guide new development applications

## Goals and Objectives

- **Goal 1: Protect, improve, or restore the quality and quantity of water**
- **Goal 2: Create sustainable and resilient communities**
- **Goal 3: Build livable, attractive, and economically prosperous communities**
- **Goal 4: Support effective implementation of the GSG**

## Provincial Guidance:

- **Stormwater Planning and Design Manual, MOE 2003**
  - Remains formally in-place – sets approach to water quality management.
- **Low Impact Development Guidelines, CVC/TRCA, 2010**
  - Adopted as the Provincial Guide for Low Impact Development Measures .
- **A Place to Grow Growth Plan for the Greater Golden Horseshoe (Growth Plan) (2019)**
  - provides direction on growth and development within the Greater Golden Horseshoe and recommends that municipalities develop stormwater master plans that consider LID, green infrastructure and stormwater retrofits.
- **Provincial Policy Statement (PPS) (2020- updated 2024)**
  - supports the use of LID measures that require SWM measures for new development, promoting stormwater management best practices, including stormwater attenuation and re-use, water conservation and efficiency.
- **Consolidated Linear Infrastructure (CLI) permission approach – MECP- (2022)**
  - replaced the Environmental Compliance Approvals (ECA) framework for low-risk municipal stormwater management projects. CLI ECA requires alignment with the MECP’s Draft LID Guidance upon approval .
- **Low Impact Development, Stormwater Management Guidance Manual, MECP, (2022 Draft)**

## Low Impact Development, Stormwater Management Guidance Manual, MECP 2022 (Draft)

- Provides flexible guidance to implement stormwater management using a “treatment train” through: source, conveyance and end-of-pipe controls that meet the needs of the local communities
- Guidance strengthens protection and sustainability of water resources through an increased emphasis on maintaining the natural hydrology
- Provides performance guidance on Runoff Volume Control Targets (RVCT)– based on 90<sup>th</sup> percentile storm events
- Hierarchal approach advocated for implementation using:
  - Better site design practices and pollution prevention
  - Priority 1: Retention / Infiltration,
  - Priority 2: Filtration,
  - Priority 3: Conventional Practices



Section 2

# GSG Design Approach and Practices



## Need for a Minimum Capture concept

- Council is seeking a greener community with less emphasis on grey infrastructure
- Overarching preference that all new development has some form of “green” stormwater management (SWM)
- Brings forward the need for a minimum capture concept since not all lands and development forms are capable of accommodating the same amount of capture
- MECP Runoff Volume Criteria Target (RVCT) for Hamilton Area
  - 29 mm capture based on 90<sup>th</sup> percentile rainfall

## Industry Best Practices

Several North American municipalities have adopted the concept of **minimum capture or on-site retention target** ; some examples include:

- Mississauga, Burlington, Barrie, Niagara Region – 5 mm
- Kitchener – 12.5mm
- Toronto – 5 mm to 25 mm
- Halifax – 10 mm
- Vancouver – 48 mm
- Nashville, Atlanta – 25.4 mm

## What Constitutes ‘Green’?



Cage Park, Hamilton

Wide variety of SWM practices which achieve a level of source control:

- **Surface based**– bio-swales, rain-gardens, bioretention, tree pits
- **Sub-surface based**– OGSs, tanks, trenches
- **Others**– green roofs, blue roofs, water reuse/ cisterns

Hamilton’s philosophy to “greening” emphasizes **surface-based** techniques, which include a filter media component, to achieve minimum targets from a **water quality retention** perspective

The use of subsurface infrastructure is also supported to meet RVCT beyond the specified minimum water quality capture volumes and for development in combined service areas

## Hamilton's approach

1. Applies to new development subject to Site Plan Control
2. Uses a “variable” minimum capture concept for water quality which considers:
  - a. **Sciencebased direction from Subwatershed Studies and Master Plans**
  - b. **Type of drainage system— combined or separated**
  - c. **Size of Development application— small (<0.5 ha) or large (> 0.5 ha)**
2. Places priority on use of “green” practices (surface-based)
3. Acknowledges potential for site constraints which may limit practical application of City targets (Note: subject to documentation from development applicants using provincial Maximum Extent Possible (MEP) approach)



## City's Application Hierarchy

- Hamilton aligns with Province's 3-tiered system:
  - Retention (Priority 1)
  - Filtration (Priority 2)
  - Conventional (Priority 3)
- City is seeking to have proponents meet the "minimum" through **Retention** using its definition of eligible "green" practices (i.e., surface based)
- Balance of capture volume to be met through filtration and/ or conventional measures, to meet the requirements set out in the governing studies or the Provincial amount premised on the 90<sup>th</sup> percentile RVCT (which ever is greater)



# Acceptable City Practices

Priority Category		LID BMP Type
Priority 1A - Retention (Surface)	Vegetated Systems	Bioretention System
		Rain Gardens
		Bioswale
		Green Roofs
		<u>Soakaways</u> / Infiltration Trenches with Filter Media (at Surface)
	Other	Soil Cells & Tree Trenches
		Permeable Pavement
		Compost / Soil Amendments
Priority 1B - Retention (Subsurface / Collection)		Perforated Pipes
		Rainwater Harvesting
		Blue Roofs
		<u>Soakaways</u> , Infiltration Trenches and Chambers (Piped)
Priority 2 - Filtration		Biofiltration
		Enhanced Grassed Swale
		Manufactured Filters
		Priority 1 (Surface) Feature with an Impermeable Liner / Underdrain
Priority 3 - Conventional		Dry Pond
		End-of-Pipe Wet Facility (Wet Pond/Wetland/Hybrid)
		Manufactured Treatment Devices
		Parking Lot Storage
		Rooftop Detention Storage

## Recommended Hamilton-Specific Criteria

- City proposes a form of “Decision-tree” to establish SWM Criteria for Green Practices on New or Re-developing sites as follows:
  - Is the development in a Combined or Separate Drainage system?
  - Is the development covered by the guidance from an approved Subwatershed Study?
  - Is the Site size greater or smaller than 0.5 ha?
- Based on the foregoing the **Minimum Water Quality Capture** would be:
  - Combined Sewersheds:
    - Site Size <0.5 ha → 2.5 mm
    - Site Size >0.5 ha → 5 mm
  - Separated Sewersheds:
    - Site Size <0.5 ha → 5 mm
    - Site Size >0.5 ha → 10 mm



## Recommended Hamilton-Specific Criteria

City of Hamilton Criteria					Provincial Criteria
Sewershed Type	Subwatershed Study?	Site Size (ha)	Better Site Design	Minimum Water Quality Retention Target (mm)	Runoff Volume Control Target (mm)
Combined	Yes	> 0.5	Yes	5.0 <sup>1</sup>	Greater of 29mm or as prescribed in SWS <sup>2,3</sup>
		< 0.5	Yes	2.5 <sup>1</sup>	
	No	> 0.5	Yes	5.0	
		< 0.5	Yes	2.5	
Separated	Yes	> 0.5	Yes	10.0 <sup>1</sup>	
		< 0.5	Yes	5.0 <sup>1</sup>	
	No	> 0.5	Yes	10.0	
		< 0.5	Yes	5.0	

**Note 1** If the Subwatershed Study source control criteria does not incorporate a water quality component or is less than the Minimum Water Quality Retention Target, then the Minimum Water Quality Retention Target is to be achieved.

**Note 2** The 29 millimetres Runoff Control Volume Target is to be achieved using the Provincial Hierarchy applying retention practices to the Maximum Extent Possible (MEP) (but no less than the minimum), then filtration practices to the MEP and any remaining amount using conventional treatment.

**Note 3** The Runoff Volume Control Target includes the Minimum Water Quality Retention Target.

## Summary

- City approach is consistent with Provincial direction in:
  - Consolidated Linear Infrastructure Environmental Compliance Approvals (2022)
  - Low Impact Development Guidelines (2022 – Draft)
  - Provincial Policy Statement (2020 – updated 2024) and Growth plan (2019)
- City approach:
  - acknowledges guidance in science-based studies
  - recognizes differences in need for treatment in combined vs. separated drainage systems
  - provides flexibility in minimum retention for small vs. larger sites
- City approach acknowledges potential for site constraints to limit the practical ability to fully apply the targets and provides alternate means/ approaches aligned with Province
- City has provided guidance on those practices considered “green” vs. those that would not be considered green

Section 3

# Next Steps & Other Considerations



## NEXT STEPS

1. Continue to engage with the development industry on the application of the Green Standards and Guidelines for Stormwater Management to improve and refine approach
2. Engage with City Technical Review Staff to update procedures (incorporate GSG) related to the review of SWM applications for new development
3. Develop Catalogue/Inventory Process to document Private Green Practices as this will assist the need to consider options to deal with Highly Constrained or Impractical Sites

## OTHER CONSIDERATIONS

1. Potential for a Complement to Private GSG with Guidance for Public Right-of-Ways
2. Consider a Cash-in-lieu Program/Approach for potentially Highly Constrained or Impractical Sites
3. Consider a Monitoring Program for Private Green Practices approved through this policy
4. Potential to establish O&M Reporting and Enforcement for Private Green Practices approved through this policy

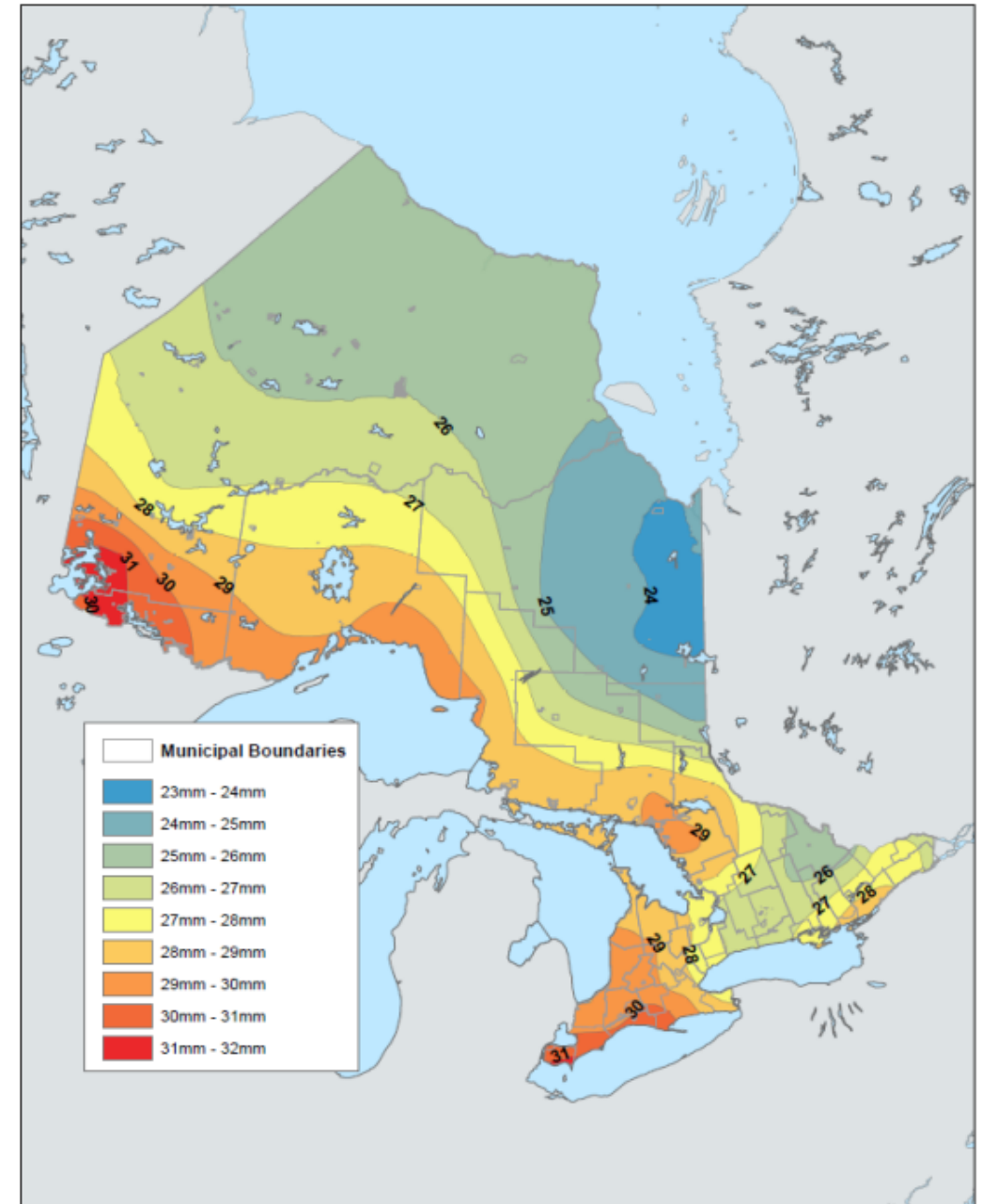


# EXTRA SLIDES

## 90th Percentile Concept

- 90th percentile event represents the volume of rainfall which is not exceeded in 90 percent of all runoff-producing rainfall events
  - i.e., 90 percent of rainfall events will produce runoff volume less than the 90th percentile event
- Basis for planning and designing source controls (LID BMPs) for runoff volume control (i.e., based on “runoff volume control target”)
- Capture and treatment of the “90<sup>th</sup> percentile event” found to best maintain the natural hydrologic cycle and also best manage water quality impacts.
- MECP draft guidelines provide the Rainfall Frequency Spectrum (RFS), which determines the 90<sup>th</sup> percentile event by region across the Province.

Figure 3.3 - Regionally Specific 90<sup>th</sup> Percentile Precipitation Event Runoff Volume Control Target – Precipitation Isohyets



## Role of Subwatershed Studies

- Section 3.4 of the draft MECP Guidelines acknowledge the direction provided by higher-level studies (i.e., watershed plans, subwatershed studies, MDPs, etc.)

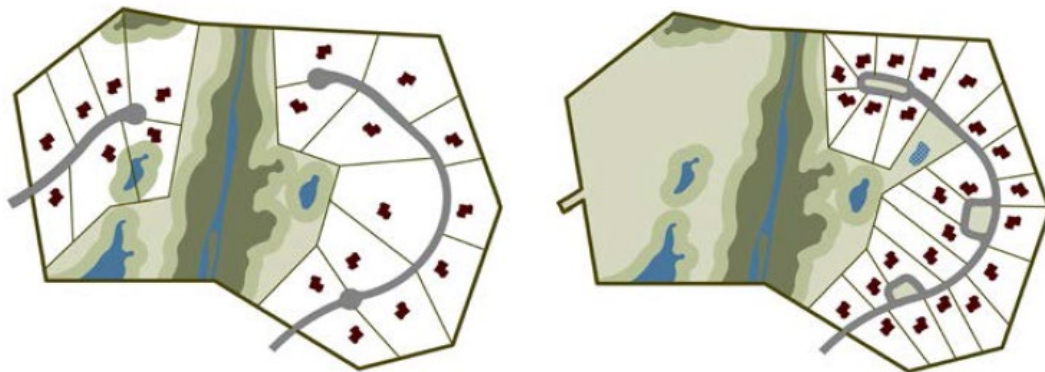
*“The Runoff Volume Control Target does not change water quantity control requirements related to flood control or erosion control identified through watershed/watershed stormwater management / master drainage plans completed following the Municipal Class Environmental Assessment Master Planning process. “*

- The Guidelines further acknowledge that the hierarchal approach may be used to satisfy some of the stormwater management requirements specified in higher-level studies

## Hierarchal Approach

### Better Site Design and Pollution Prevention:

- Land use practices can reduce and minimize impervious cover, including:
  - Preserving natural areas, site reforestation, open space design, innovative site designs to reduce impervious areas (e.g., narrower streets, slimmer sidewalks, etc.), among others
- Best practices applied to reduce pollutant generation and risk of spills



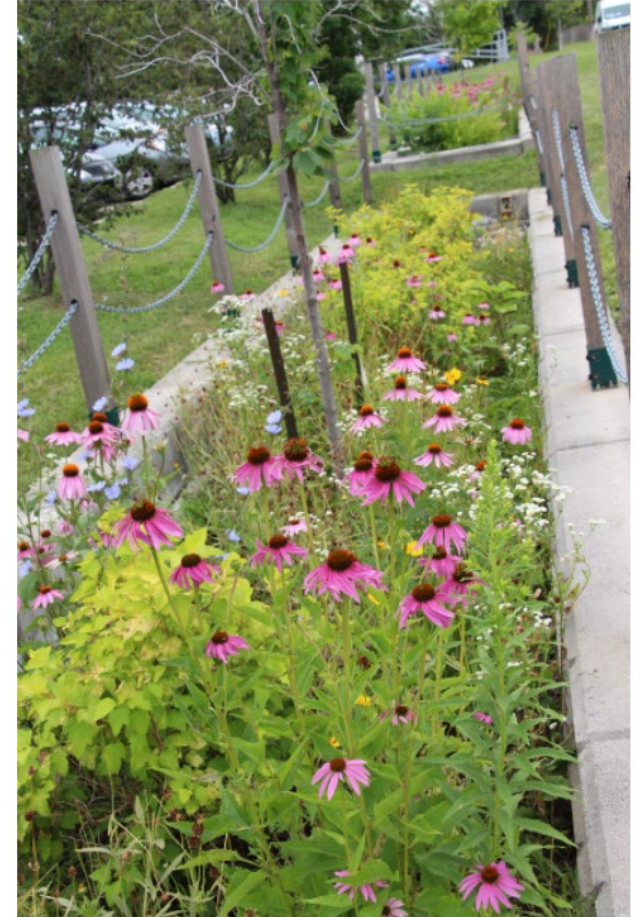
*Example of Typical Subdivision Design Concept (Left) and Open Space/ Cluster Design (Right).*



## Hierarchal Approach

### Priority 1: Retention

- Apply LID retention practices which use the mechanisms of **infiltration, evapotranspiration and/or re-use** to recharge shallow and/ or deep groundwater; return collected rainwater to the atmosphere and/ or use harvested rainwater
- Examples include:
  - bioretention, rain garden, green roof, permeable pavement, rainwater harvesting, etc.
- Functionally these practices work to reduce runoff volumes from the site, contribute to stream baseflow and maintain the existing hydrologic cycle to the extent possible
- Water quality benefits include more consistent pollutant control, thermal mitigation, and CSO reductions

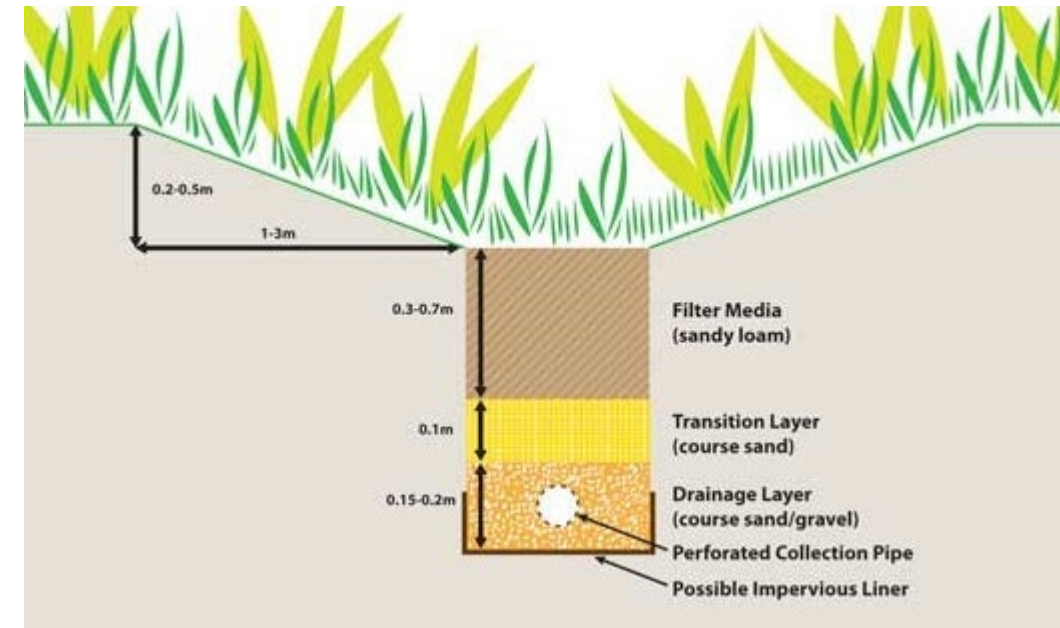


*Bioretention Cell Example (ref. STEP, 2022)*

## Hierarchal Approach

### Priority 2: LID Filtration

- Apply LID technologies which use appropriate media to filter runoff released to the municipal sewer networks or surface waters at a reduced rate and volume
- Examples include:
  - biofiltration, enhanced grassed swales, manufactured filtration, etc.
- Functionally these practices reduce some runoff volume through absorption, material wetting and increased depression storage; however, they primarily treat runoff through physical filtration for water quality
- Water quality benefits include more consistent pollutant control and greater water quality treatment through pollutant adsorption and sedimentation



Biofiltration/ Lined Cell Example (ref. Geocaching, 2023)

## Hierarchal Approach

### Priority 3: Conventional Treatment

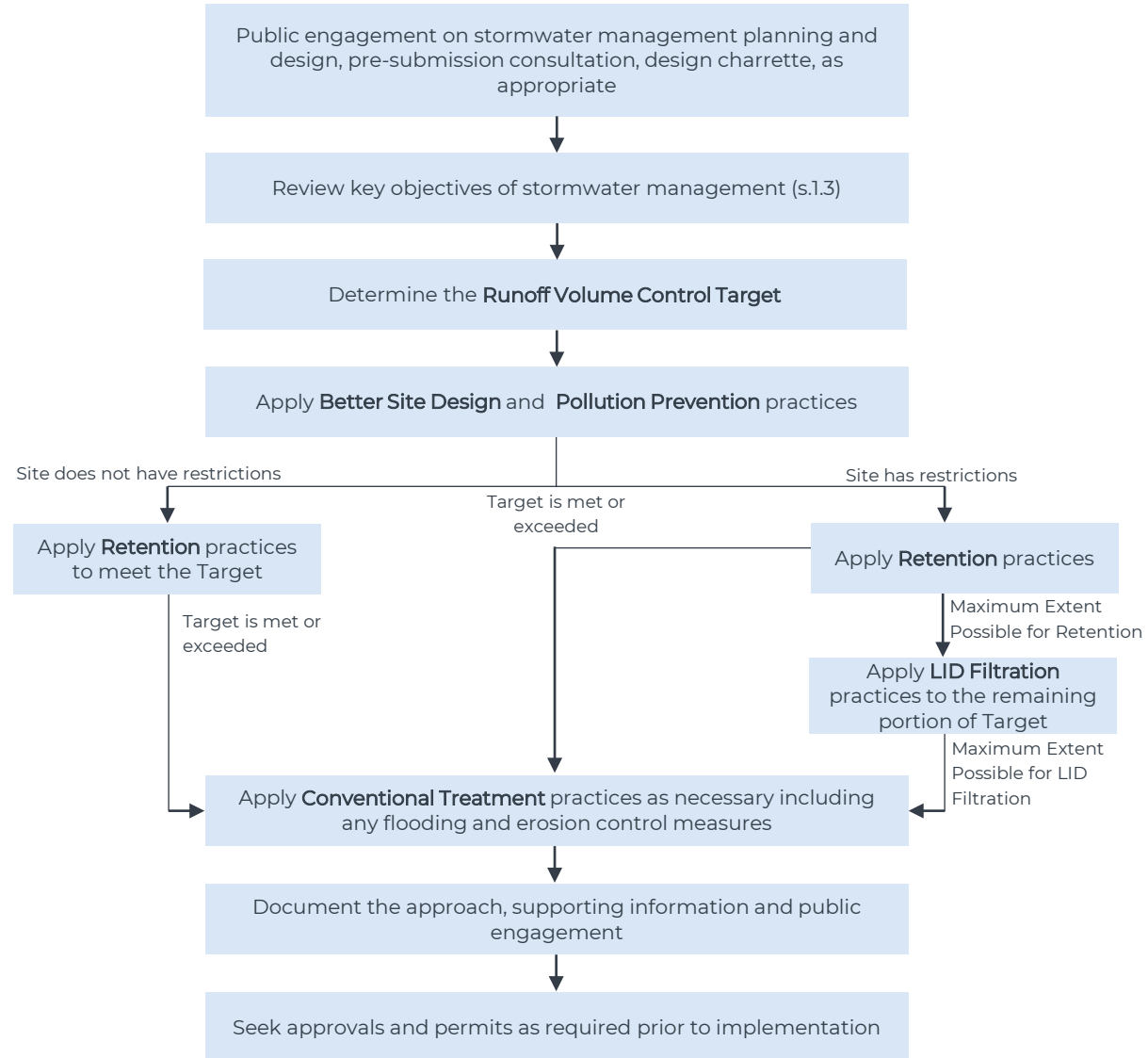
- Application of those other stormwater practices which use filtration, hydrodynamic separation and/ or sedimentation to detain and treat runoff
- Examples include:
  - Extended detention wet ponds, constructed wetlands, oil-grit-separators, manufactured treatment devices, etc. (i.e., end-of-pipe facilities per 2003 MOE Guidelines)
- Functionally these practices do not reduce runoff volume
- Water quality benefits are per 2003 MOE Guidelines for treatment process and sedimentation
- Some of these systems also provide erosion and flood control



*Extended Detention Wet Pond Example (ref. TRCA, 2020)*

# MECP Application Approach

Figure 3.4 – Steps for Applying the Runoff Volume Control Target Hierarchy



Section 4

MECP  
Consolidated  
Linear  
Infrastructure  
ECA



## Concept/Rationale

- MECP adopted a Consolidated Linear Infrastructure (CLI) permission approach in 2022 to replace the Environmental Compliance Approvals (ECA) framework for low-risk municipal stormwater management projects
  - Instead of ECAs for individual stormwater management projects, a single CLI ECA will be issued for all of a municipality's stormwater management works
- Purpose of CLI ECA is to reduce administration and provide consistent regulatory requirements in Ontario
  - Sets the approach for municipalities to comply with the Ontario Water Resources Act (OWRA) through a consolidated process for their SWM system
  - Reinforces the responsibility on municipalities to review third-party applications for compliance
  - CLI ECA will require alignment with the MECP's Draft LID Guidance upon approval (i.e., application of the 90<sup>th</sup> percentile RVCT), in absence of local studies

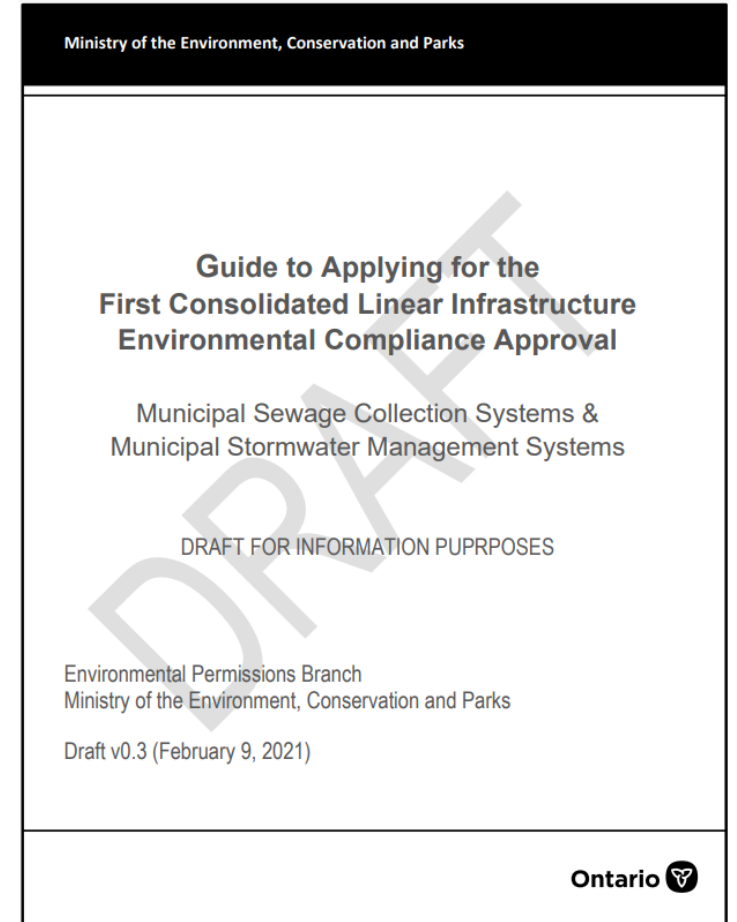


## Municipal Requirements

- Each municipalities' CLI ECA application needs to include information on the following:
  - System description, collection system by diameter, SWM facilities by type
  - Details on Storm sewersheds (area and outfalls) and treatment level
  - Master Plans and Watershed/ Subwatershed Plans
- SWM infrastructure listed within the Municipality's CLI ECA will be subject to the same MECP requirements, which includes requiring older SWM infrastructure to be improved to current requirements, where possible during renewal of infrastructure
- City of Hamilton will be responsible for ensuring that third-parties (i.e., developers) meet the performance criteria of the CLI ECA in designing and constructing SWM infrastructure
- Should a project proposed by a third-party deviate from the performance criteria in the CLI ECA, a direct application to the MECP would be required to receive approval and thereby amend the City's CLI ECA

## Hamilton CLI ECA Process Status

- Current status:
  - The City has received the draft documents for both Sanitary and Stormwater CLI ECAs from the MECP.
- Next steps:
  - The City will be providing the MECP with proposed wording for conditions specific to the CLI ECA.
  - The new CLI ECA framework will be rolled out once the proposed conditions are approved by the MECP.



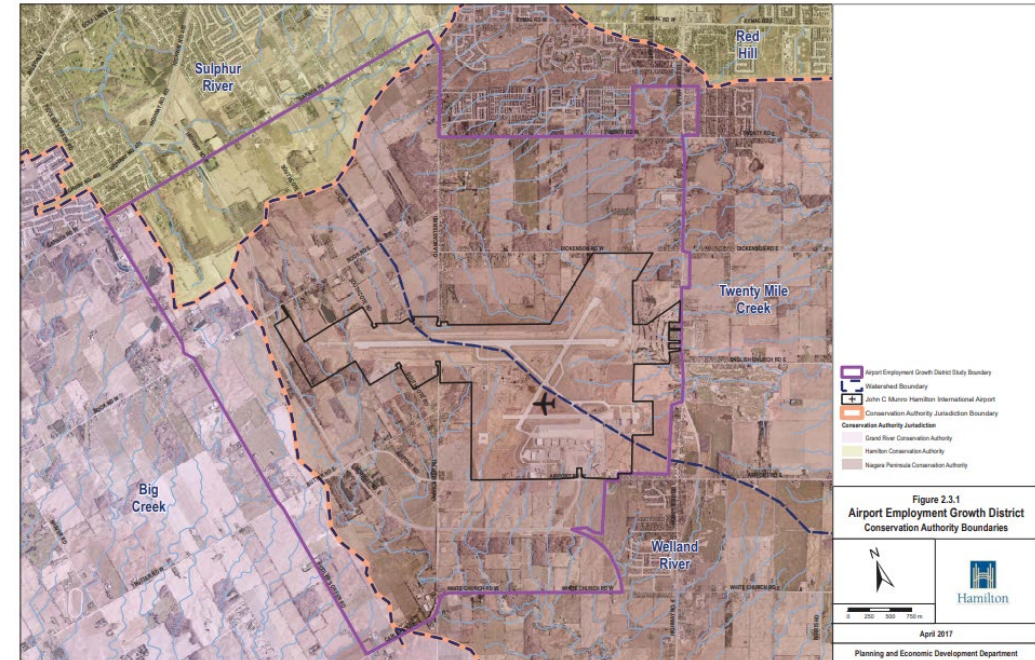


## Purpose/Objectives

- City of Hamilton, based on Council and provincial directives, intends to build “greener”:
  - Ministry of Municipal Affairs & Housing (MMAH) Letter (February 28<sup>th</sup>, 2023) outlining future refinements to the Ontario Building Code around green building standards and supporting the development of green standards by Municipalities
- To achieve this objective, the City is preparing these Green Standards & Guidelines (GSG), in consultation with various industry stakeholders
- City is clearly laying out its vision of a more sustainable, resilient, and greener community through:
  - Establishing a set of preferred practices related to LID and GI
  - Setting Criteria for the application of green practices for:
    - Water quality
    - Water Balance

## Science-Based Targets

- Future Secondary Plans for greenfield areas will require supporting Subwatershed Studies (SWS)
- SWS will provide local science-based targets for source controls to meet water quality and water balance targets
- In the absence of specific local science based targets for water quality and water balance capture, the Province is advocating for a standard amount of capture based on its 90<sup>th</sup> percentile approach
- Hence, if proposed development lands have been assessed through, a formal/ approved contemporary SWS – the amount and form of capture for water quality and water balance will be based on the guidance therein



Airport Employment Growth District (ref. Aquafor Beech, 2017)

## General Understanding of Combined and Separate Systems

- Development pressures include:
  - Combined Systems generally experience re-development and infill/ intensification
  - Separate Systems can be either re-development/ I/ I or greenfield (new) development
- Opportunities / Strategies for SWM are typically:
  - Centralized / Planned SWM Retrofits are expected to be more common for Combined Systems as well as those Separate Systems under re-development pressure
  - Newly developing areas (greenfield) would be less constrained hence more opportunities for planning on on-site source controls per MECP guidance



Combined and Separated Sewer Systems in Hamilton (ref. City of Hamilton, 2023)