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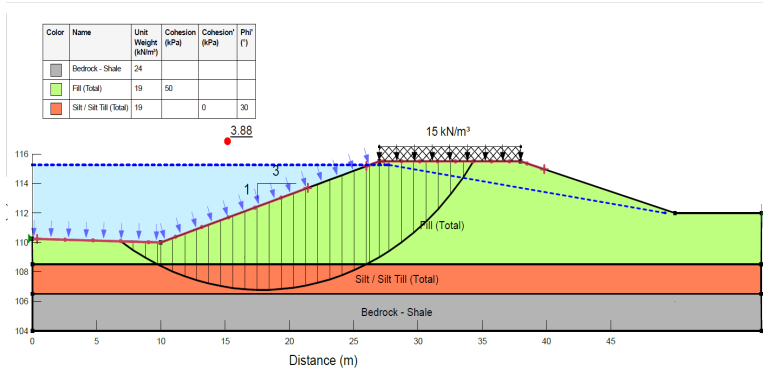
Credit Valley Conservation inspired by nature

To Credit or Not to Credit
The Enigma of Flood Storage

Ron Scheckenberger, M.Eng., P.Eng.

Scheckenberger & Associates Ltd.



Presentation Overview

1. Synopsis
2. Current Provincial Guidance
3. Issues & Examples
4. Industry Practice
5. Recommendations to Province of Ontario

1. Synopsis

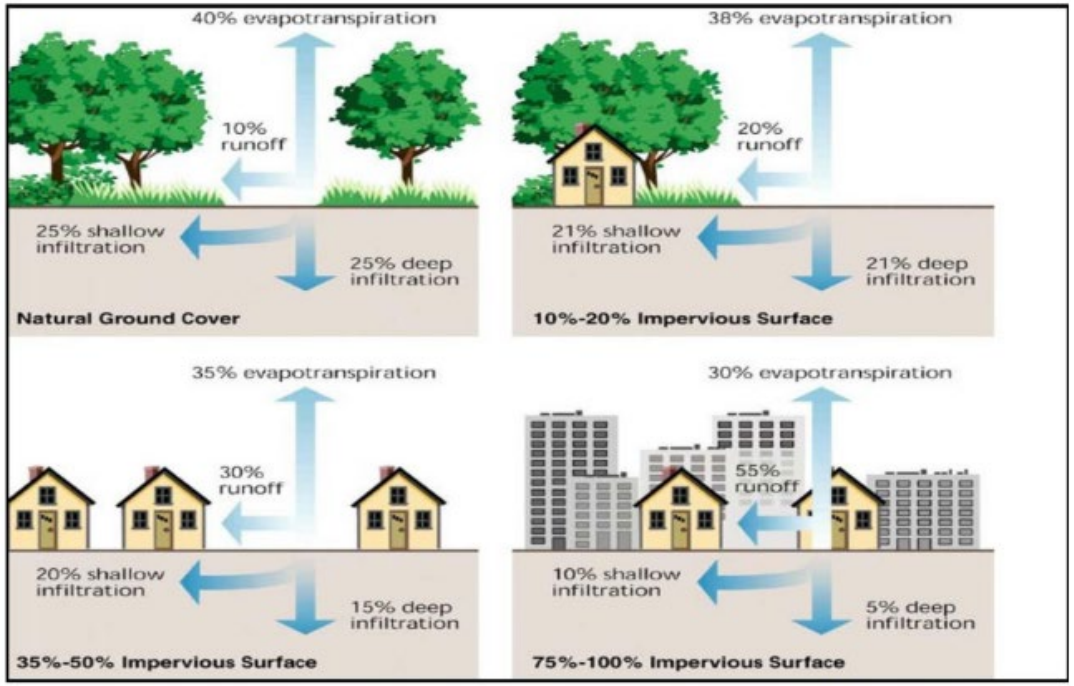
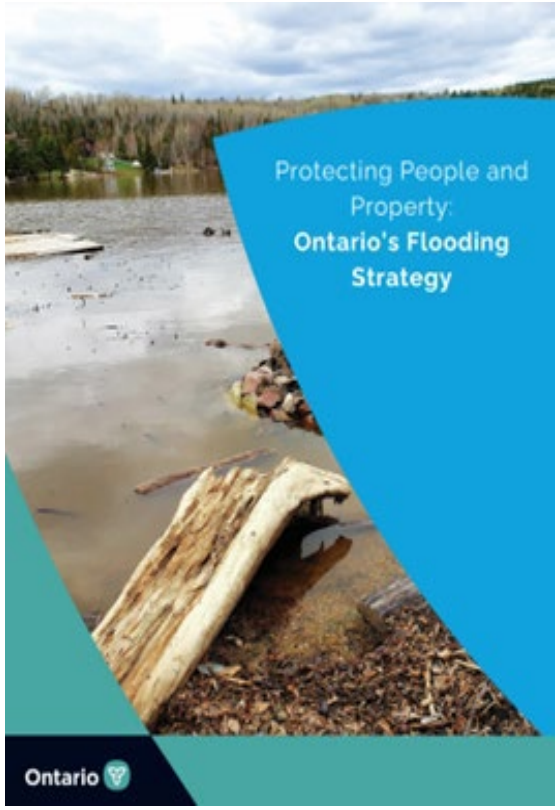


Figure 1 - Land Use Change and the Hydrologic Cycle (US EPA, 2007)

- Urbanization increases runoff volume and rates without SWM
- Primary means of SWM since 1970s – storage-based controls
- 2002 MNR Technical Guidelines recommend SWM storage not be accounted for when determining d/s Regulatory peak flows
- As such, ABSENT SWM STORAGE, all development will lead to higher Regulatory peak flows and corresponding flood hazard limits will increase

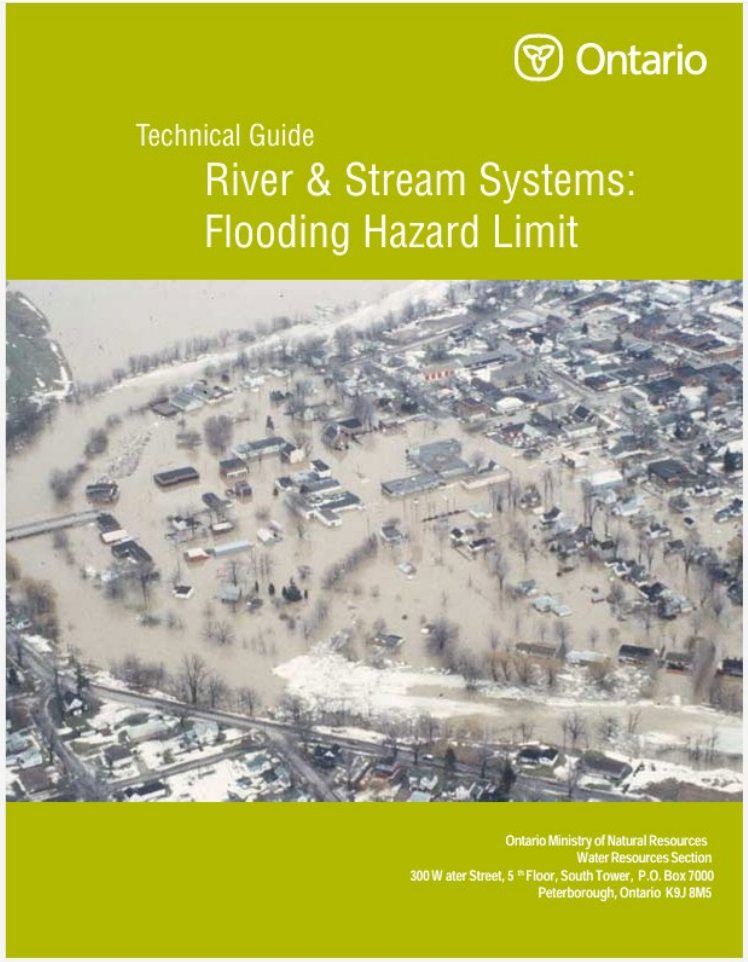
1. Synopsis

- The lack of tools and updated Provincial Guidance has led to numerous issues in the industry:
  - *Higher Costs/Delays*
  - *Litigation*
  - *Confusion with the Public and Stakeholders*
- The Industry has responded (*because it had to*!)
- It's time for the Province to respond with clarity and foresight – *we have some ideas!*



2. Current Provincial Guidance

2. Current Provincial Guidance - *2002*

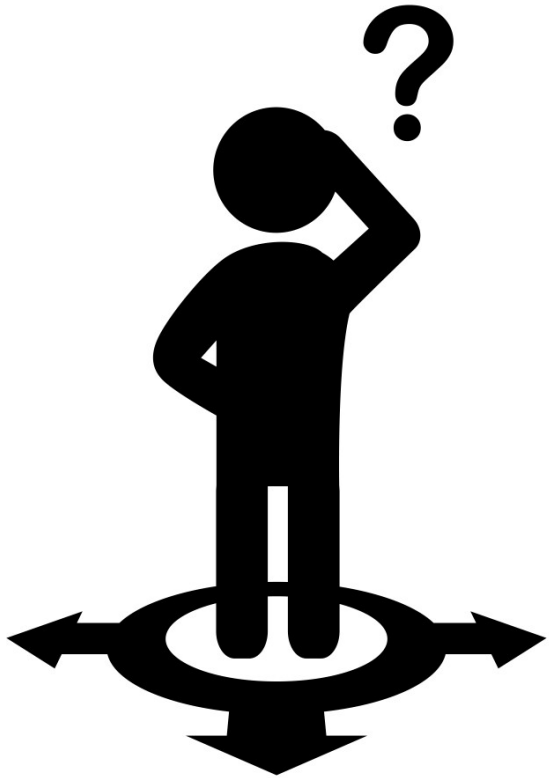


4.6 Stormwater Management Ponds

Stormwater management facilities may not be used to provide any reduction in flood flows.

A. Preface

The Guide cannot replace good engineering and environmental judgement in adopting the most appropriate procedures required to achieve the amount of detail and effort involved, and in determining the practical degree of accuracy achievable when adopting a flood related study program.

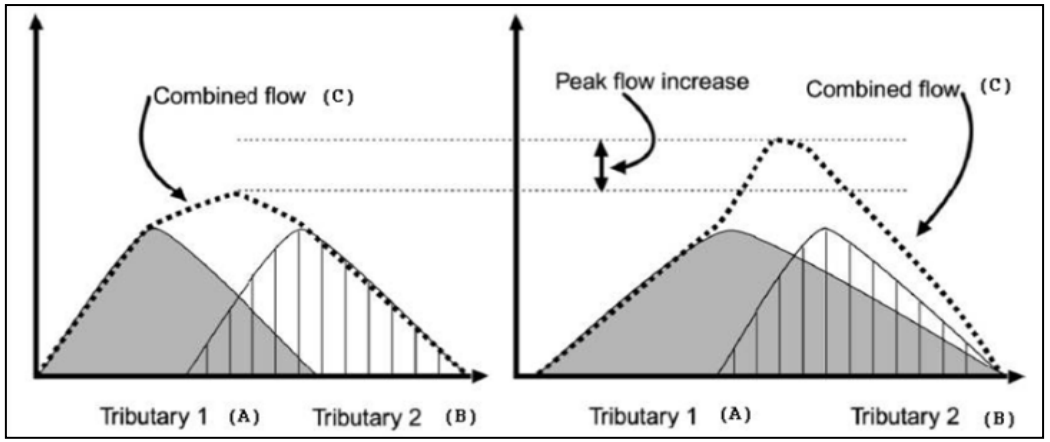


3. Issues and Examples

3. Issues and Examples

We are seeing incremental **increases to Regulatory peak flows and runoff volumes** due to:

- Intensification/Higher densities - *per Provincial Guidance*
- Increased coverage of urban development form – *e.g. single family*
- Higher quality input data and tools – *LiDAR & models*
- Timing effects - *changes to catchment hydrographs*



3. Issues and Examples

- Impacts to Regulatory Flows are inevitable if flood storage is not credited
- This has led to various issues for Regulators, Municipalities, Developers and the Public/Homeowners
- Solutions often cited by the Province:
  - Bigger culverts/bridges/channels
  - Consent from affected property owners

NOT PRACTICAL!!!!!

3. Issues and Examples – *Burlington*

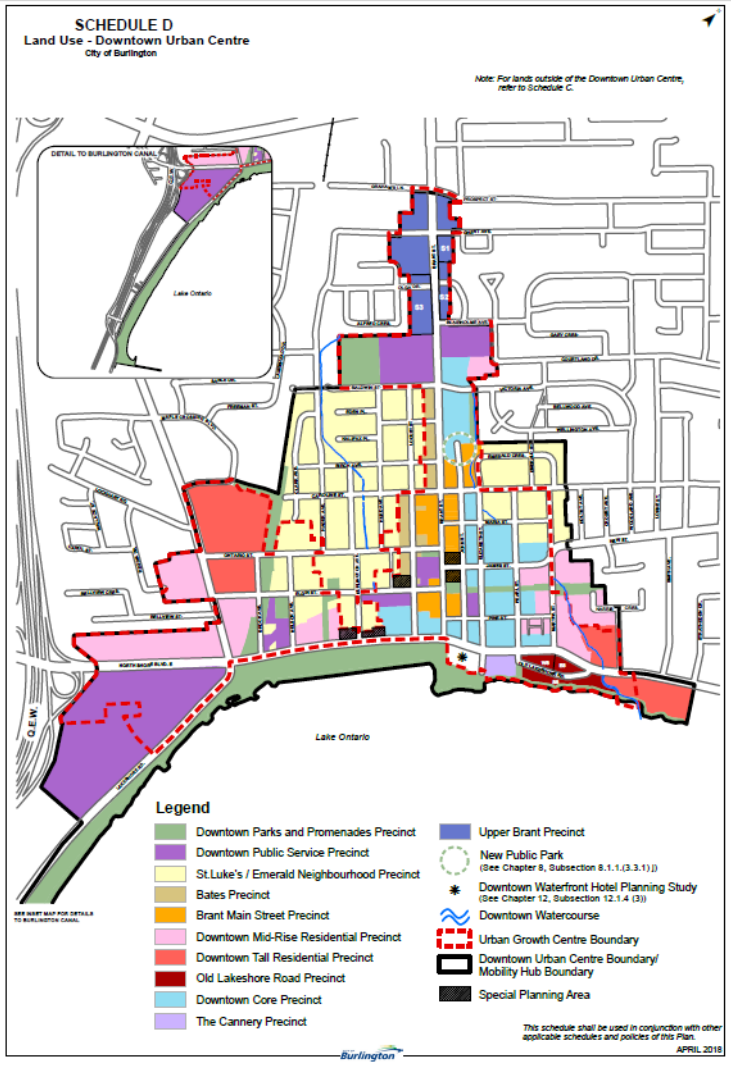
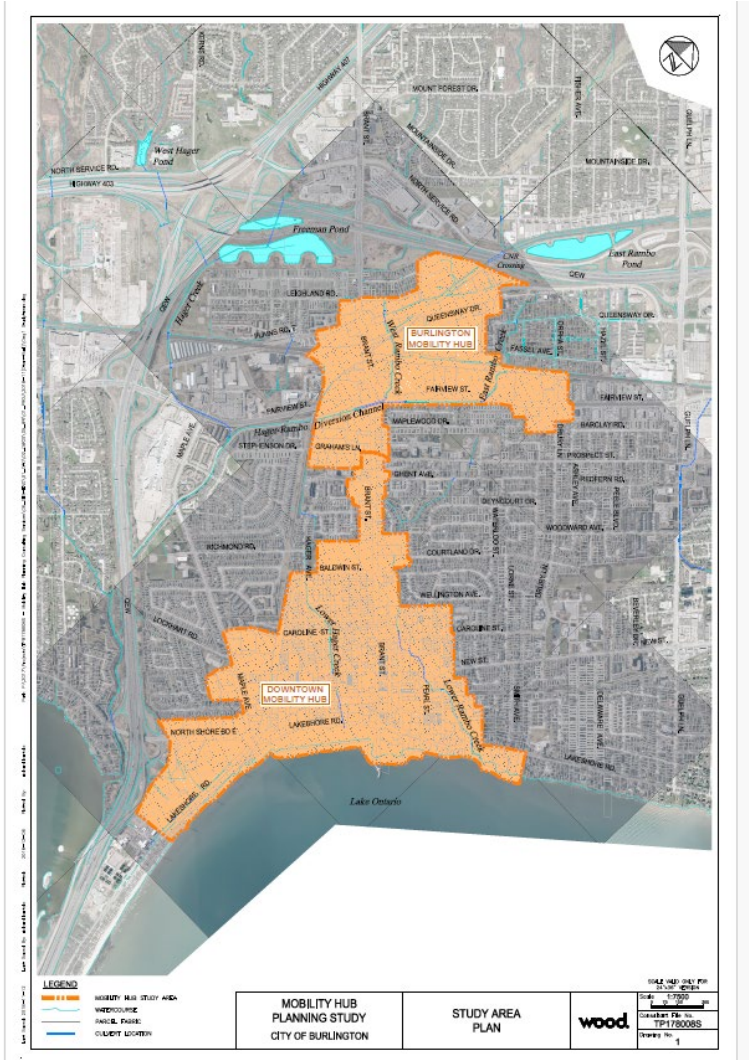


Figure 6: Adopted Official Plan Schedule D – Land Use – Downtown Urban Centre, 2018 showing the existing Precincts

- City's Official Plan identified four (4) Major Transit Station Areas (MTSA) for intensive growth
- Municipal Official Plans and Provincial Planning Statement point to intensification in existing urban areas
- *Downtown Burlington* is one such area

3. Issues and Examples – *Burlington*



- Hager Rambo Flood Control Facilities built 1990s
- Partnership amongst CH, MTO and City
- Jointly operated by CH and City
- Largely built to accommodate diversion caused by Hwy 407
- Three (3) Major FCF:
  - *Freeman Pond (290,000 m^3)*
  - *East Rambo Pond (110,000 m^3)*
  - *West Hager Pond (37,000 m^3)*

3. Issues and Examples – *Burlington*

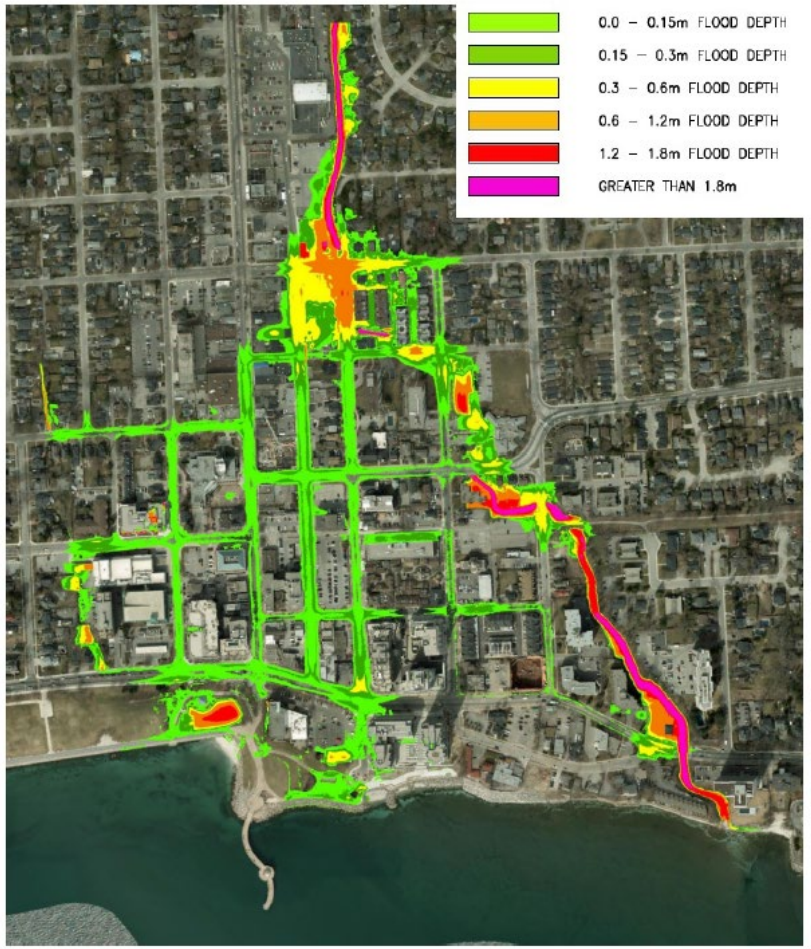


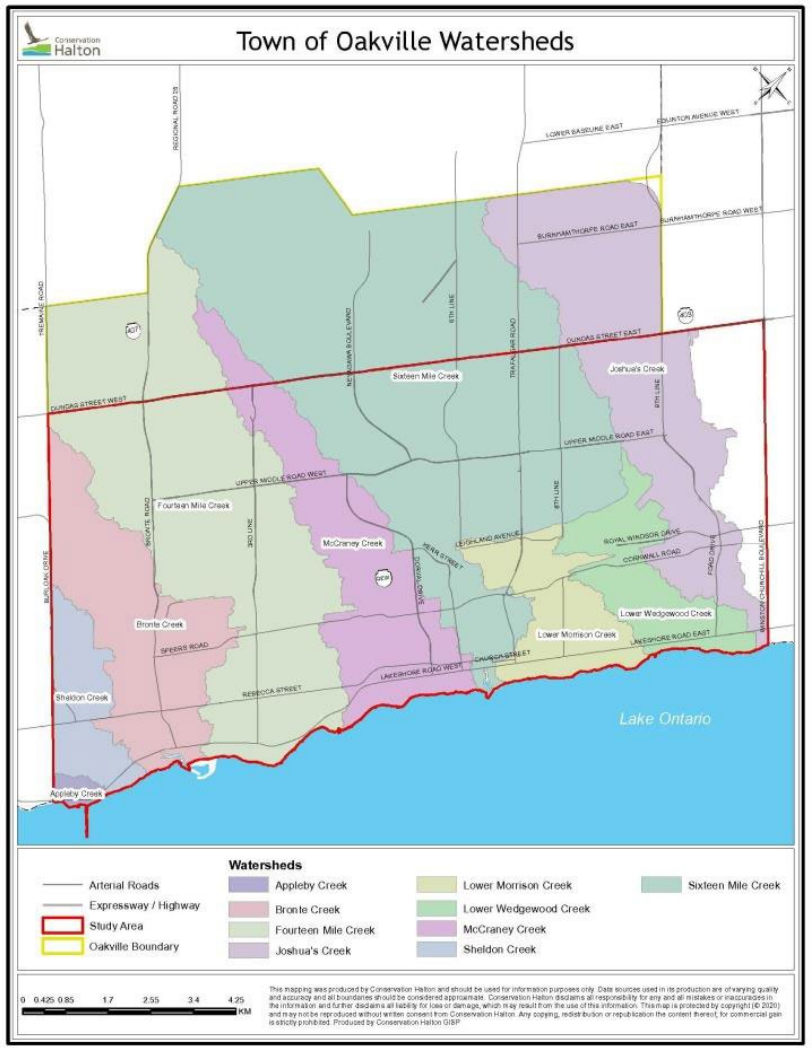
Figure 3.2.2. Regional Storm (with Spills and FCFs Credited) Inundation Limits and Flood Depths

- Hager Rambo FCF reduce peak flows dramatically:
  - 100 yr ~ reduced by 100 to 350%
  - Regional Storm ~ reduced by 5 to 65%
- Even with Hager Rambo Flood Control Facilities credited – Downtown Burlington remains at risk of flooding
- That said - crediting Hager Rambo FCF allows for **practical solutions** to be considered to realize growth potential for Downtown Burlington

3. Issues and Examples - *Oakville*

- In 2021, a group of residential landowners in south Oakville sued area municipalities and regulators in a proposed class action
- Basic premise related to **increased flood hazard zones** and associated **impacts on property values and rights** of owners due to urbanization in the tributary watersheds
- Claim was made against:
  - Oakville, Milton, Halton, Conservation Halton, Province of Ontario
- Value of claim: **$990,000,000.00**

3. Issues and Examples - *Oakville*



- Numerous watersheds of varying size; several extended beyond Oakville town limits (e.g., Milton)
- Proposed Class Members were in various locations across Oakville
- Five parties named as defendants in the action, each of who had to defend the claim ($$$)
- Certification Motion scheduled for Fall of 2023, case settled before motion was heard in 2024

3. Issues and Examples - *Oakville*

Outcome

- Provided by Justice Baltman – June, 2024
- $1,000,000 settlement
  - $500,000 for Intact Centre to develop the "Oakville Home Flood Education and Protection Program" for class members
  - $500,000 for Class Legal fees and an honorarium
- Plaintiffs faced many challenges including:
  - Difficulty proving that any particular development caused a specific impact to the regulatory flood hazard
  - Difficulty proving who actually suffered a loss given transfers of properties during the proposed class period (2005-2024)

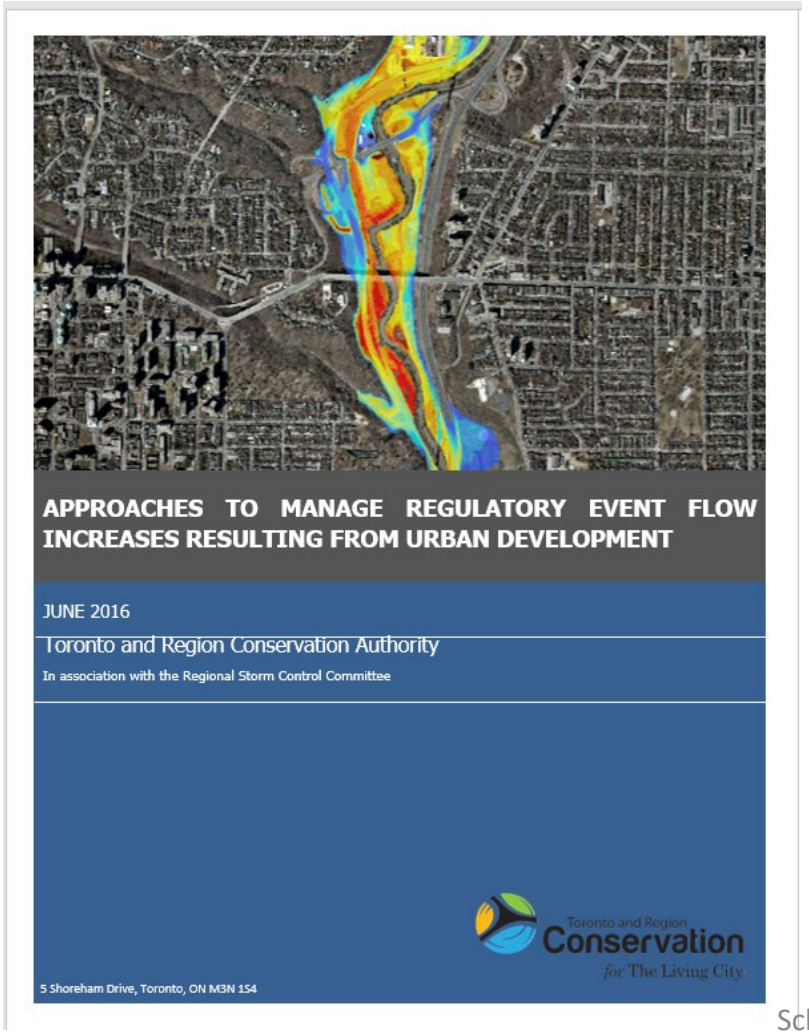
4. Industry Practice

4. Industry Practice

The Players and the Legislation that guides them:

- Province of Ontario
  - **Provincial Planning Statement (2024)**
  - *"… provides policy direction on matters of provincial interest related to land use planning and development."*
- Municipalities (such as Burlington and Oakville)
  - **Municipal Act and the Planning Act**
  - *" … confers broad authority on the municipality to enable the municipality to govern its affairs as it considers appropriate and to enhance the municipality's ability to respond to municipal issues"*
  - Municipality "*makes local planning decisions that will determine the future of communi*ties" using Official Plan and Zoning By-Laws
- Conservation Authorities (such as Conservation Halton)
  - **Conservation Authorities Act/ O. Reg. 41/24**
  - purpose "*…is to provide for the organization and delivery of programs and services that further the conservation, restoration, development and management of natural resources in watersheds in Ontario*"
  - *empowers CAs to prevent or restrict development in regulated areas where the control of flooding, … may be affected by development … intent is to ensure that development activities do not worsen existing erosion or flooding hazards, and that new hazards are not created*

4. Industry Practice



- 2016 technical document prepared through Conservation Ontario by GTA Conservation Authorities
- Intent to provide **guidance to practitioners** as to what options are available and explicitly how to build FCF in order that they can safely manage the impacts of urbanization and maintain off-site flood hazards

4. Industry Practice

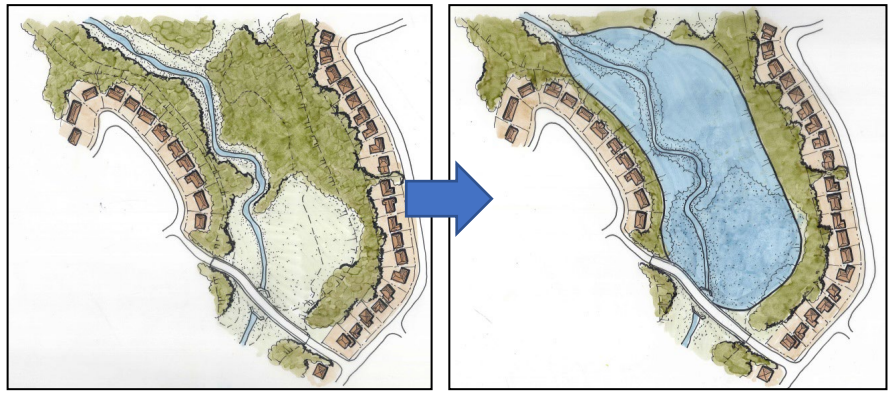
“2016 Approaches” document examines various alternatives:

i. Status Quo - no Regulatory flood control or mitigation
ii. Regional Storm Flood Control Facilities (FCF)
    i. On-line
    ii. Off-line
iii. Flood Risk Remediation/Mitigation
iii. Policy approaches
iv. Combinations

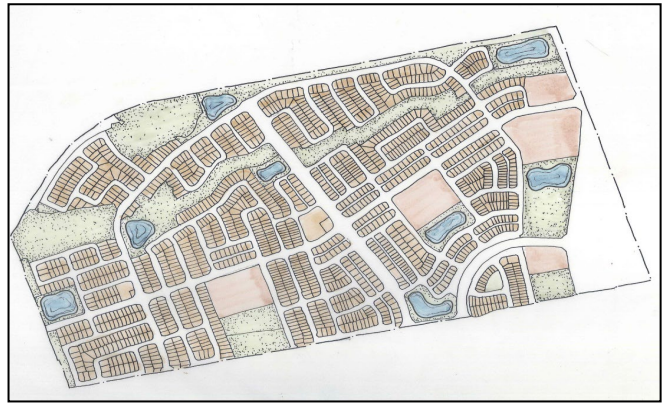
4. Industry Practice

For Regional Storm FCF to be credited they need to:

- Be assessed through a risk-based, watershed scale study
- Consider potential impacts to riparian owners
- Be designed robustly in accordance with Provincial standards
- Preferably be off-line systems which are largely subsurface
- Have suitable freeboards and emergency spillways



On-line

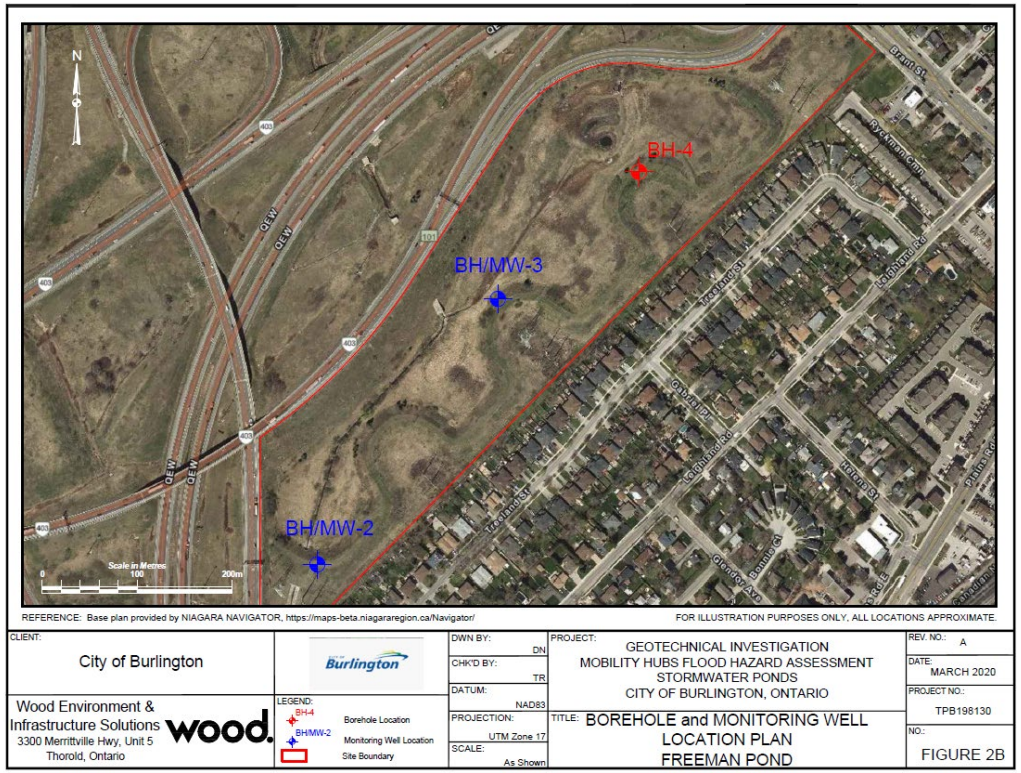


Off-line/Distributed

4. Industry Practice

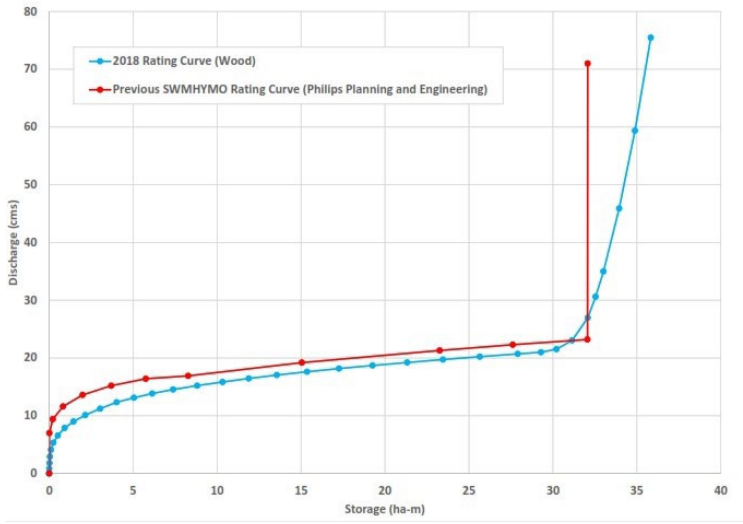
- In Burlington, Conservation Halton prepared **detailed Terms of Reference** to assess the Hager Rambo FCF system in order to determine if the FCFs could be credited
- **Collaborative approach** with City and CH
- Key detailed assessments and studies:
  - *Hydrology/hydraulics*
  - *Structural engineering*
  - *Geotechnical engineering*
  - *Climate Change/Sensitivity Analysis*
- Ultimately led to a comprehensive **Operations and Maintenance** program including required **funding**

4. Industry Practice



Geotechnical Assessment - Borings

Structural Condition Assessment



Rating Curve Confirmation and H&H Assessment

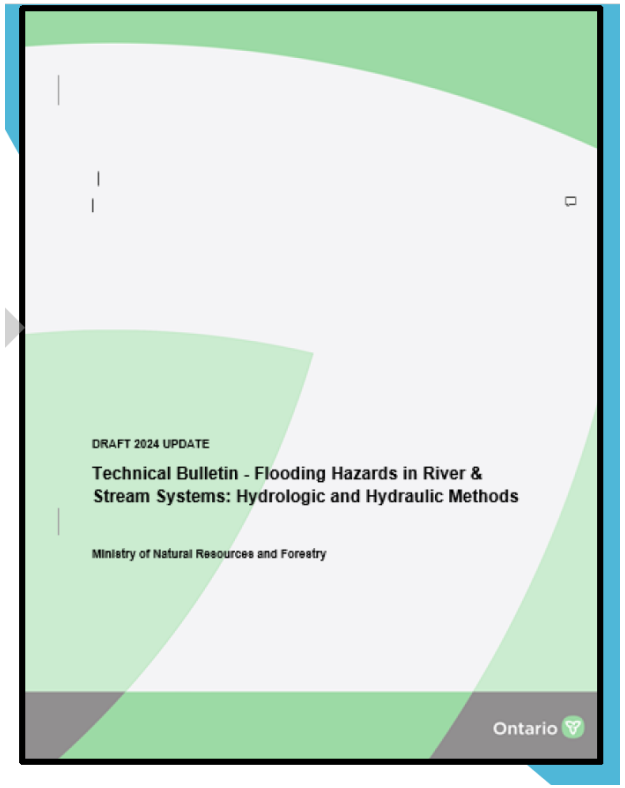
4. Industry Practice

- Since 2000's +/- numerous jurisdictions have been building and ultimately crediting attenuative benefits of Regulatory Flood Control Facilities including (but not limited to):

Milton
Oakville
Hamilton

Mississauga
Markham
Brampton

Conservation Halton
Conservation Hamilton
Credit Valley Conservation
Grand River CA
Toronto Region CA



5. Recommendations for Province

5. Recommendations to Province

- Issue a **Technical Bulletin** immediately citing support for "2016 Approaches" document including ability to credit Regulatory FCF
- Develop **design standards and methodologies** for flood control facilities, whose function can be recognized in the delineation of downstream flood hazard limits, **in partnership with the province, conservation authorities and affected municipalities (as well as developers)** and incorporate into an update of the MNR *Technical Guide*.
- Embrace **new technology, data and industry understanding** – understanding is that MNR is in the process of updating 2002 Technical Guide and potentially issuing multiple Technical Bulletins – the industry needs this guidance now!

Acknowledgements

- City of Burlington:
  - Cary Clark
  - Umar Malik
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  - Matt Senior

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