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ENGINEERING

**Hamilton Unnamed 07 East Tributary
Master Drainage Plan
Northumberland County**



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Town of Cobourg Council Presentation
February 2021



Project Team

The Advisory Team Included:

- | | |
|--------------------|--------------------------|
| • Denise Marshall | County of Northumberland |
| • Brooke Gillispie | County of Northumberland |
| • Laurie Wills | Town of Cobourg |
| • Terry Hoekstra | Town of Cobourg |
| • Rob Franklin | Town of Cobourg |
| • Lucas Kelly | Hamilton Township |
| • Nadeem Paracha | Ganaraska Conservation |
| • Ken Thajer | Ganaraska Conservation |
| • Leslie Benson | Ganaraska Conservation |

The Wills Consultant Team Included:

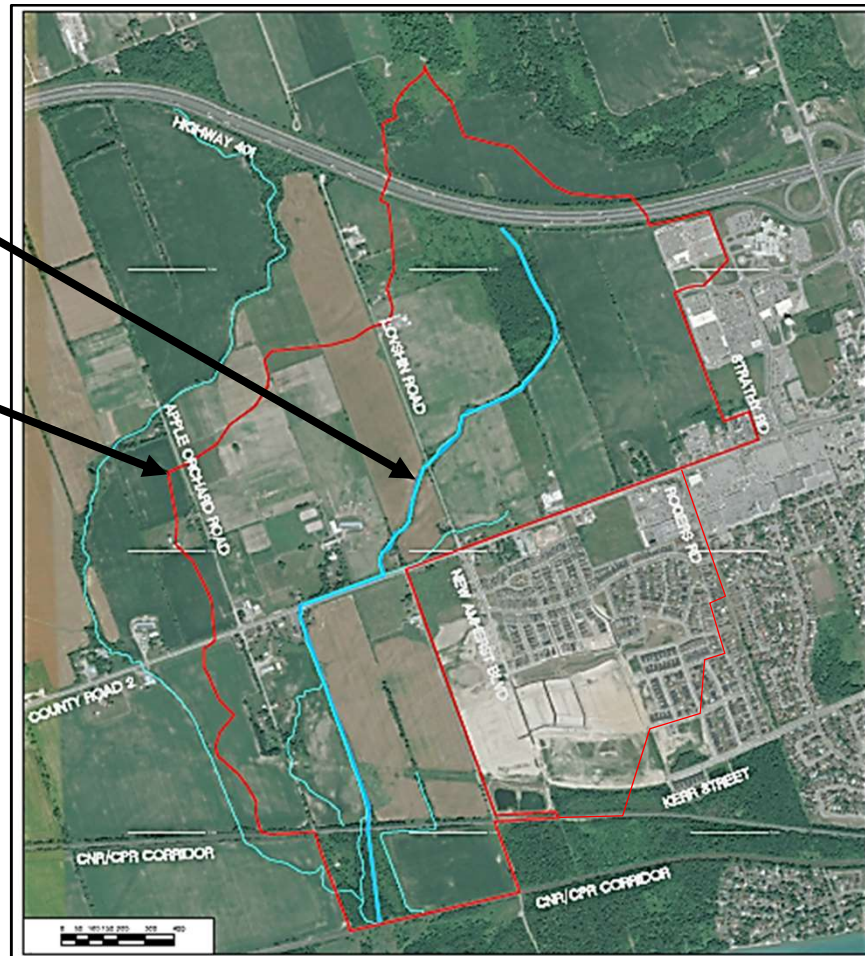
- | | |
|----------------------|------------------------------|
| • Ken Smith, P. Eng. | Manager, Water Resources |
| • Mark Hoar, P. Eng. | Water Resource Engineer |
| • Caitlyn Howe, EIT | Water Resource EIT |
| • Francis Wilbur | Senior Environmental Planner |

Project Location

The Hamilton 07 Unnamed Tributary is located between Strathy Road and Apple Orchard Road (Bob Carr Road), South of Hwy 401.

Hamilton
Unnamed 007
East Tributary

Catchment Area





Project Background and Direction

The **Master Drainage Plan** is an outcome of the **County Road 2** Environmental Assessment (2016):

- A Stormwater Management Study was completed as part of the County Road 2 EA; it stated that a Master Drainage Plan should be completed for the 07 Tributary;
- The Master Drainage Plan is intended to guide future design decisions with a watershed-based, broad perspective;
- The next steps will be specific, targeted technical and planning studies (for example, to create select outlets or develop stormwater infrastructure).

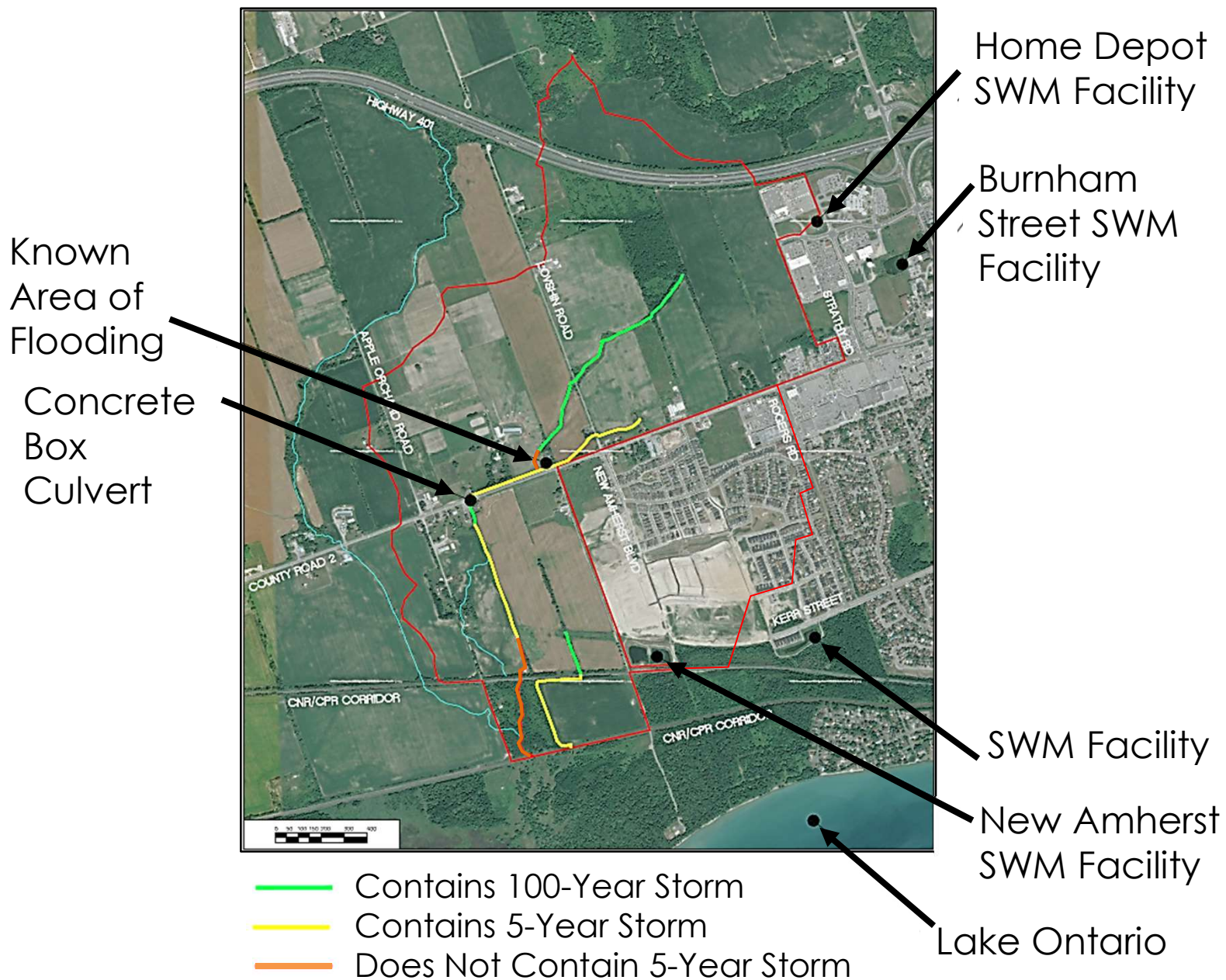


Project Scope

The Master Drainage Plan was directed by a problem/opportunity statement which guided the team to:

- **Understand the ‘lay of the land’;**
- **Identify development areas;**
- **Recommend limits on surface water discharge from development;**
- **Provide recommendations to expand and or create channels and drains; and**
- **Host two (2) public meetings to present alternatives.**

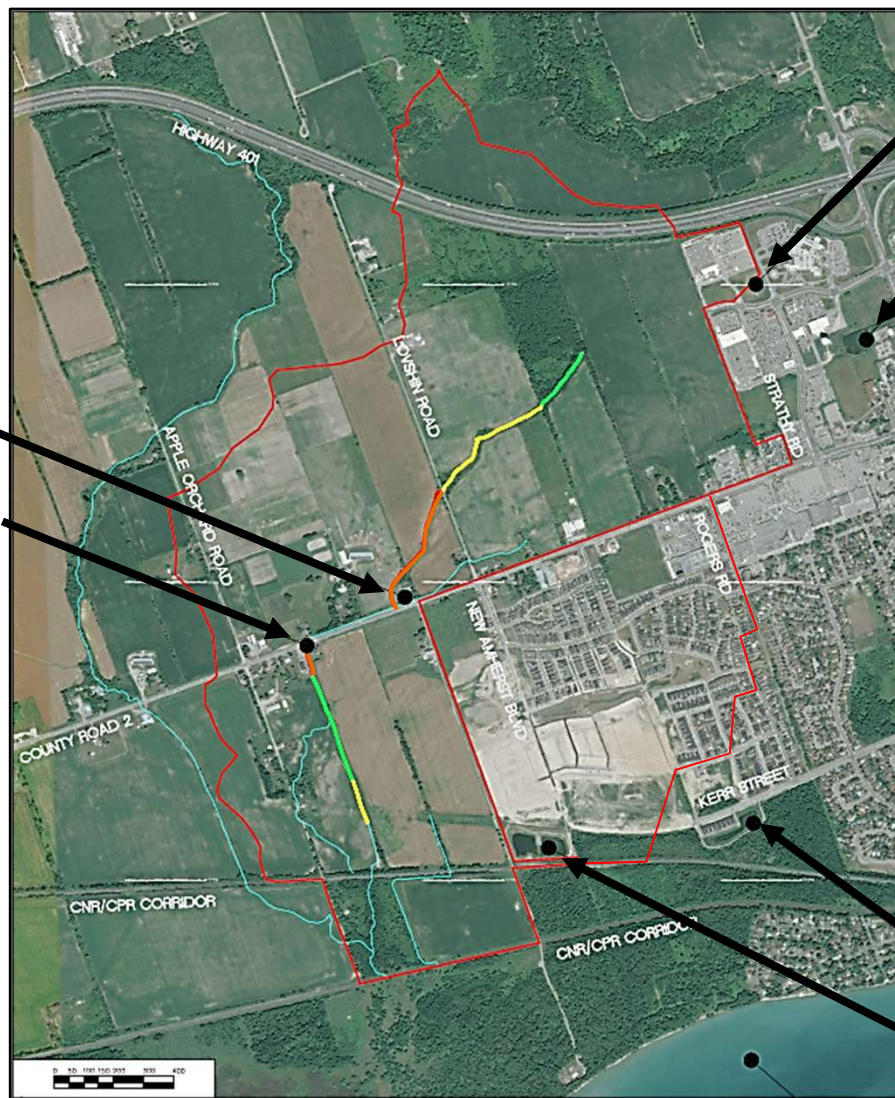
Drainage Summary



Erosion Summary

Known
Area of
Flooding

Concrete
Box Culvert



Home Depot
SWM Facility

Burnham
Street SWM
Facility

SWM Facility
New Amherst
SWM Facility

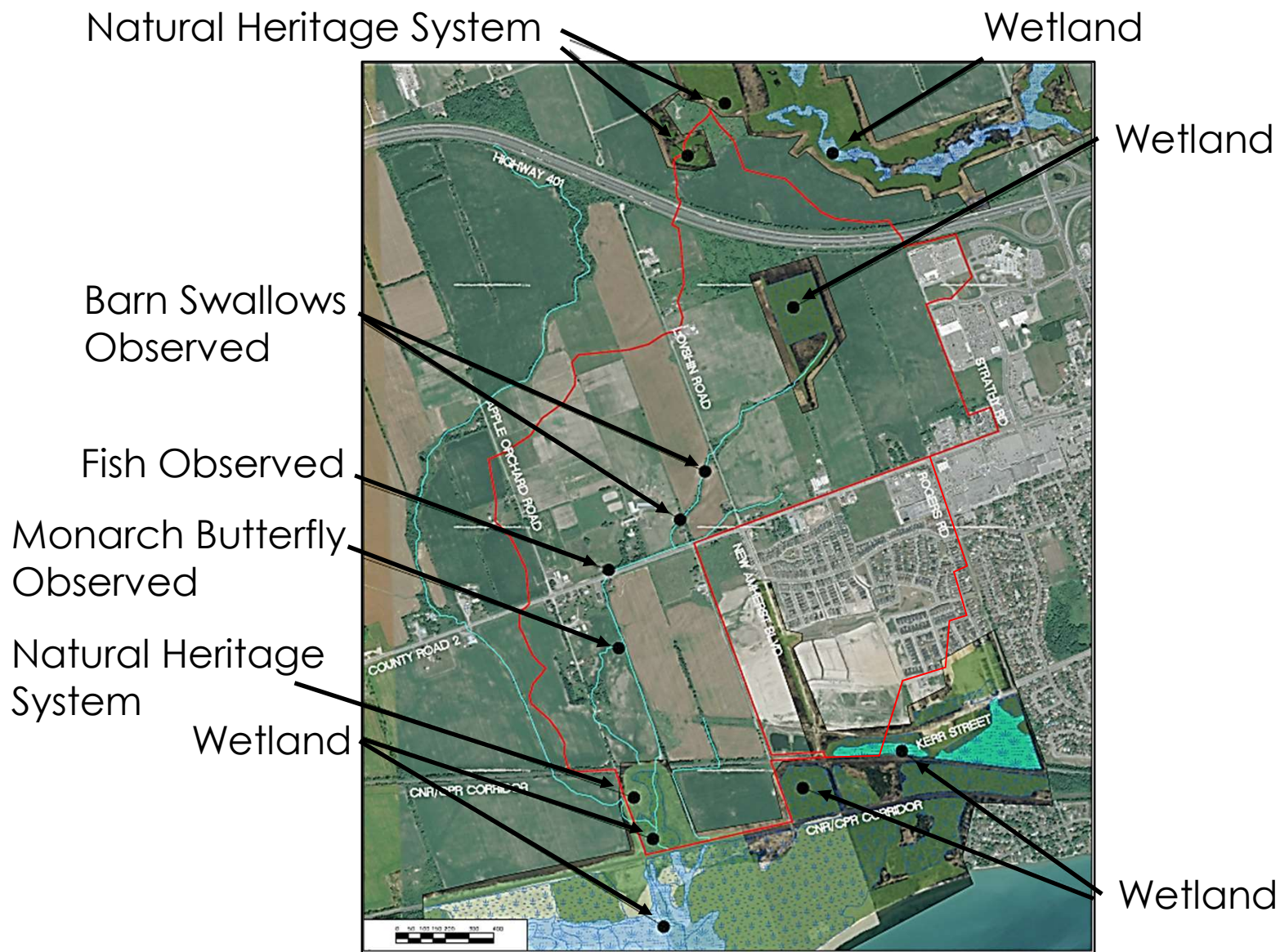
— In Regime (Stable)

— Transitional (Moderate)

— In Adjustment (Unstable)

— Not Assessed / Constructed

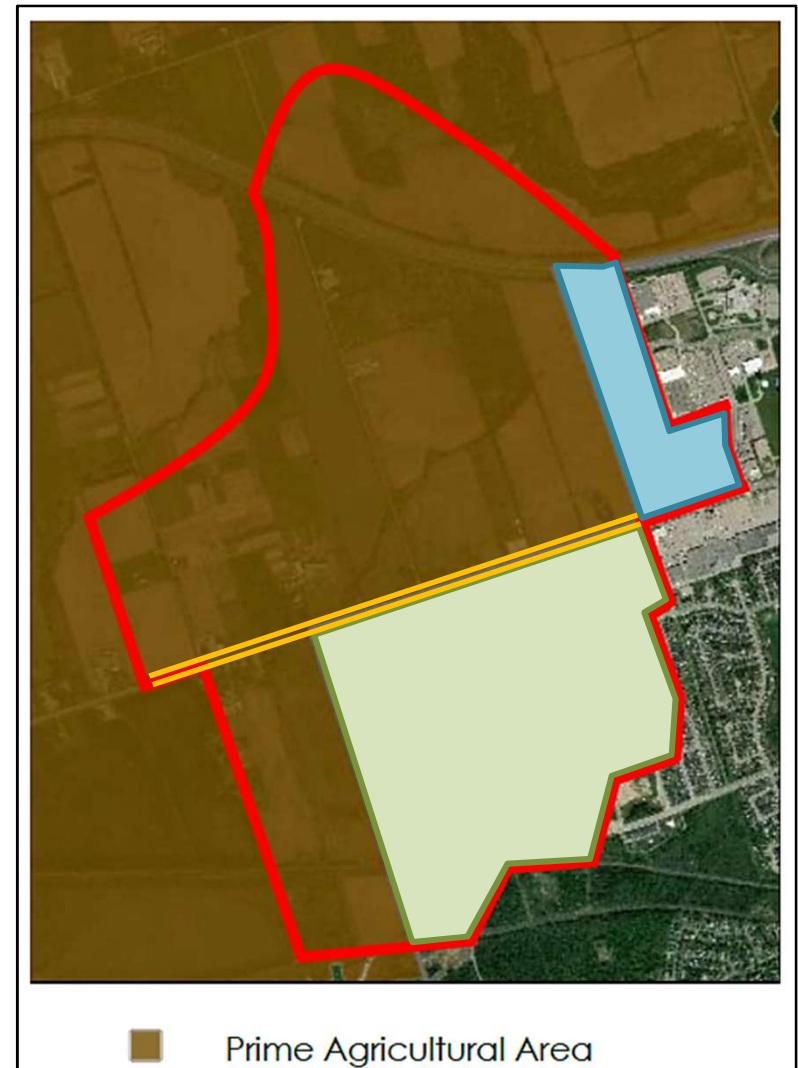
Natural Heritage Summary



Development Potential

With consideration to applicable planning documents, there are three (3) opportunities for development within the watershed:

- County Road 2 widening
- Development of 'Area B'
- Build-out of the New Amherst Subdivision



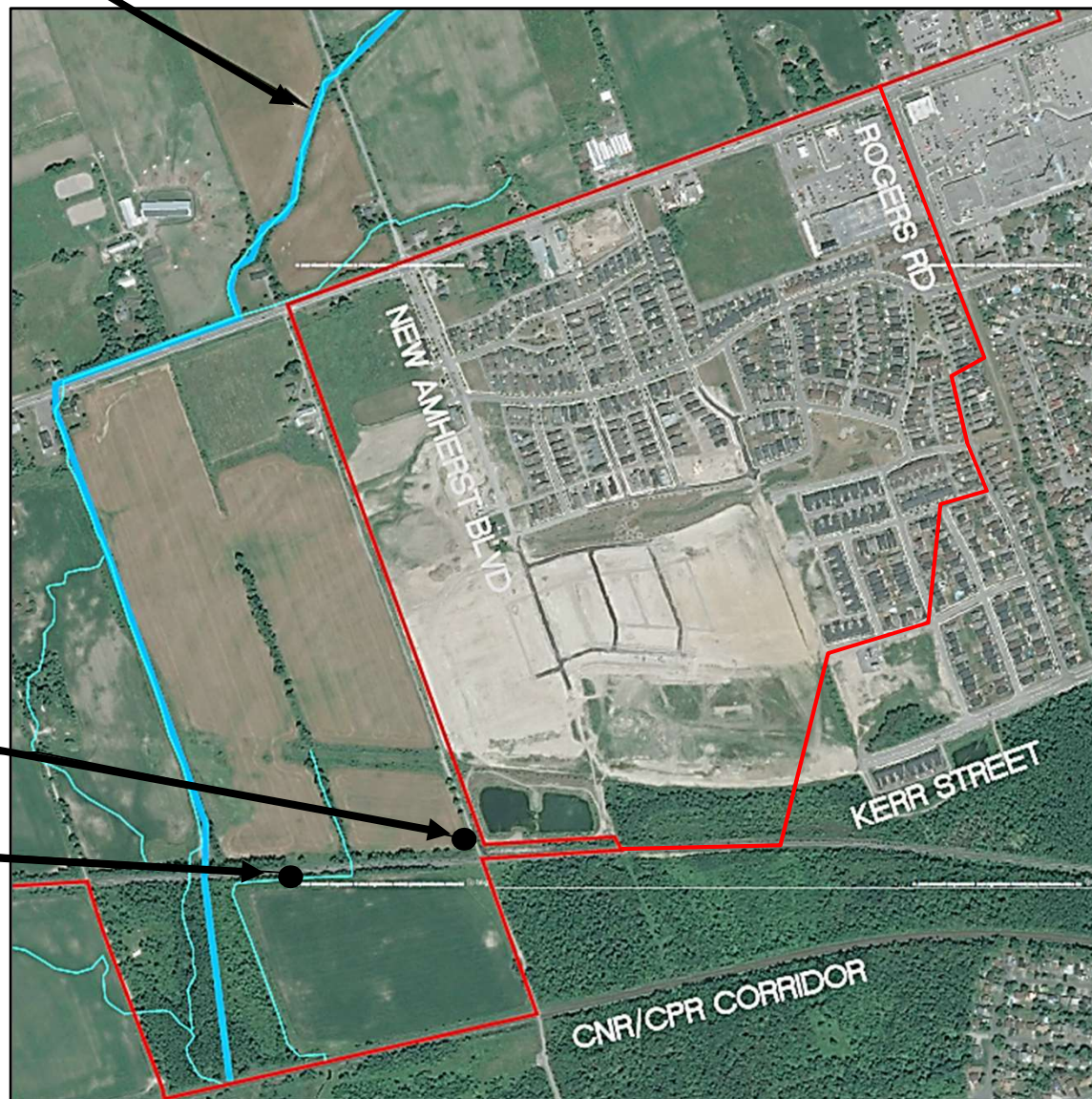


New Amherst Subdivision

Hamilton Unnamed 007 East Tributary

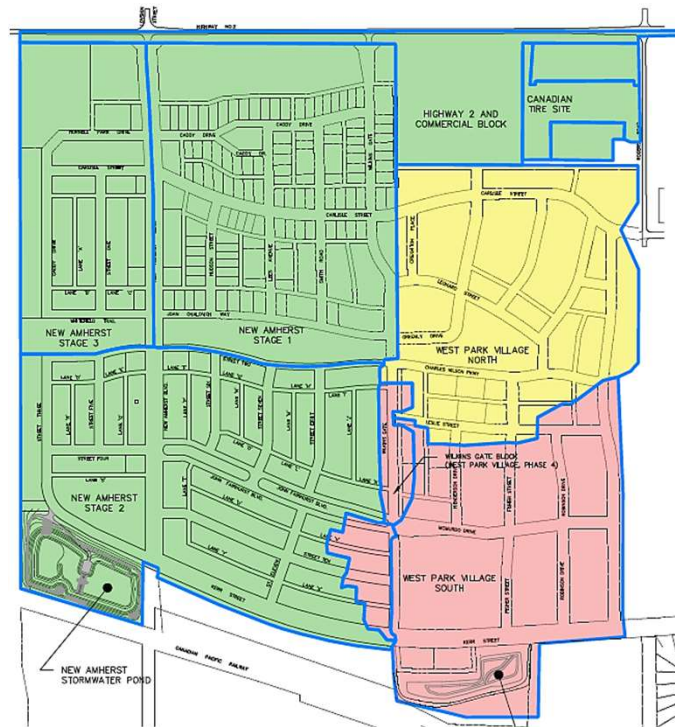
Pond Outlet

Outlet
Watercourse



Recommendations: New Amherst

- **No Change from past planning studies;** implement the New Amherst Stormwater Management Strategy (Sernas 2006)



-  Major and Minor Flow to New Amherst Stormwater Pond
-  Major Flow to New Amherst Stormwater Pond
Minor Flow to West Park Village Stormwater Pond
-  Major and Minor Flow to West Park Village Stormwater Pond



Proposed Alternatives

The following alternatives were developed to satisfy the problem/opportunity statement:

- **Alternative 1: Do Nothing**
- **Alternative 2: Improve Conveyance; direct runoff from Area B to the south**
- **Alternative 3: Improve Conveyance; direct runoff from Area B to the west**
- **Alternative 4: Over-control Runoff; direct runoff from Area B to the west**
- **Alternative 5: Over-control Runoff; direct runoff from Area B to the south**



Evaluations of Alternatives

The alternatives were evaluated based on the following criteria:

- **Natural Heritage:** Potential Impacts to Wetlands; Species at Risk; Fish and Fish Habitat; Water Quality; Erosion Potential; Significant Vegetation
- **Social:** Potential Impacts to Public During Construction; Flooding Potential
- **Cultural Heritage:** Potential Impacts of Archeologic Significance; First Nations Engagement
- **Construction/Engineering:** Potential Impacts to Utilities; Infrastructure Burden; Constructability; Life-cycle Impacts; Flow Conveyance and Flood protection; Traffic and Transportation Planning
- **Economic:** Land Access and/or Acquisition; Capital Construction Costs; Maintenance Costs; Legal Risks and Liabilities



Preferred Alternative

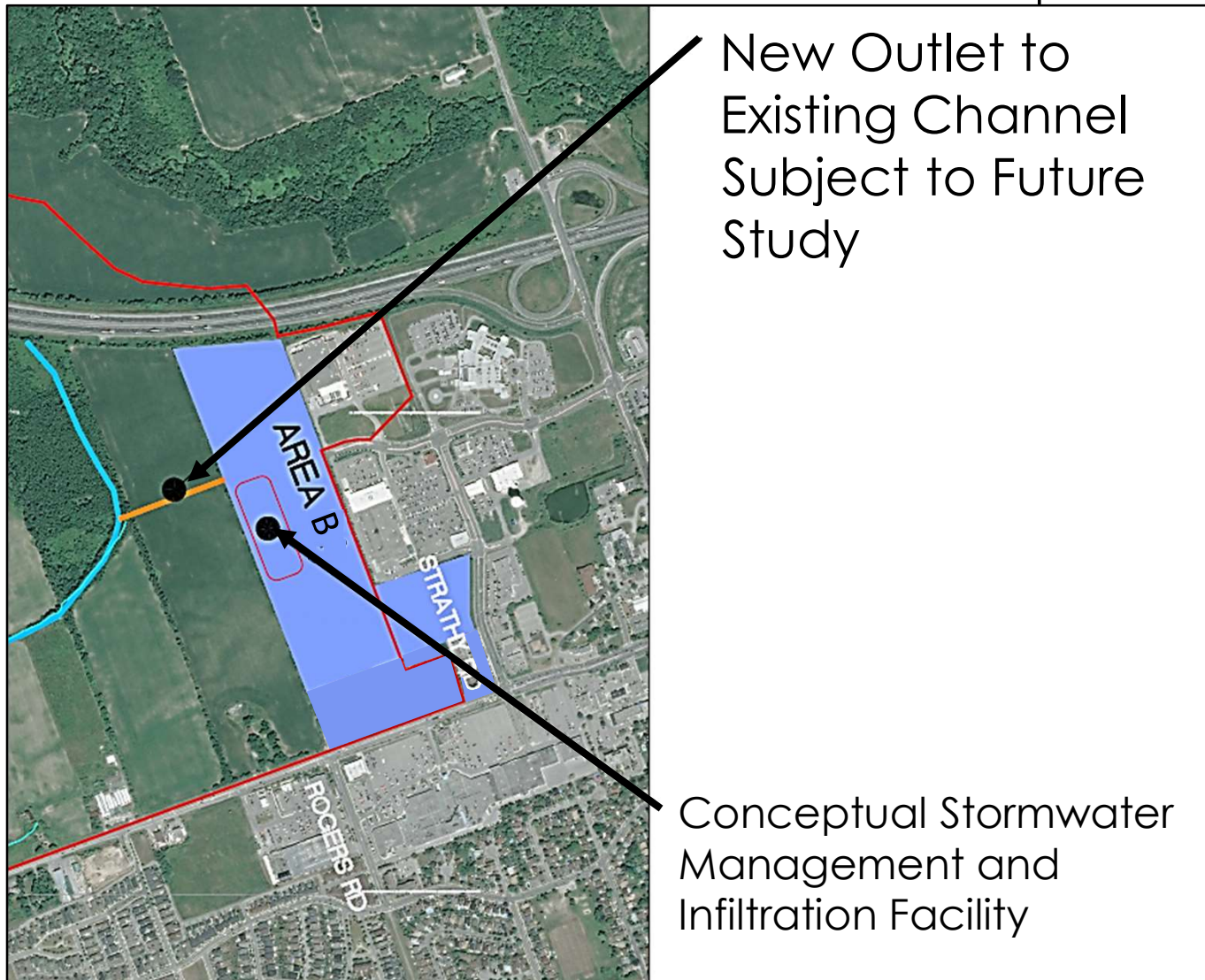
Alternative 3: Improve Conveyance; runoff from Area B to the west

- A key consideration was the potential impact to the wetland to the west of Area 'B'
- Over-control of flow was not preferred; it did not result in sufficient relief of the overburdened channel or the County Road 2 culvert
- Alternative 3 (Area 'B' to west) is preferred to Alternative 2 (Area 'B' to south) because it will:
 - maintain the existing natural path of flow and riparian rights;
 - reduce infrastructure along CR2;
 - reduce grading challenges;
 - maintain previous technical recommendations;
 - improve, rather than bypass, reaches of the watercourse;

It is acknowledged that facilitating the outlet to the west from Area 'B' is important, and will be managed through a focused study.

Preferred Alternative: Area 'B'

- Implement Post-to-Pre Stormwater Controls (Typical)
- Formalize the Outlet to the West , which will require an EA



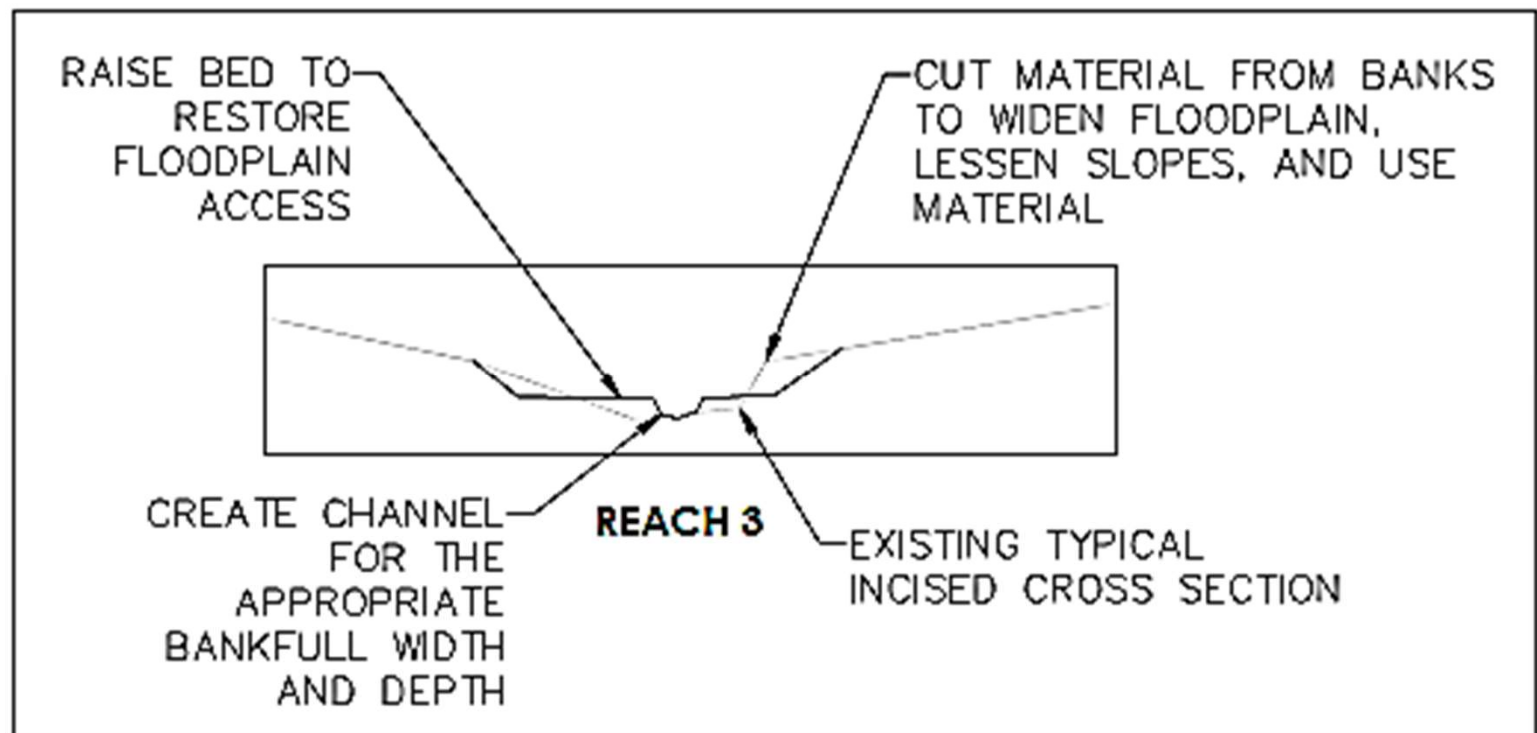
Preferred Alternative: County Road 2

- Implement Low-Impact Development
- Improve Capacity at one (1) existing Concrete Box Culvert
- Maintain Existing Flow in and through New Amherst



Preferred Alternative: Channel Improvements

- Implement Channel Improvements at select 'Reaches'
- Utilize Natural Channel Principles (example below)





Implementation Plan

The Master Drainage Plan includes an **implementation plan**; which presents the following key next steps:

- Develop a Stormwater Management Plan for Area 'B' which will achieve the targets laid out in the Plan (post-to-pre peak flow control, water balance, etc.)
- Improve the hydraulic capacity of the culvert at the point where the channel crosses County Road 2
- Improve the channel geometry at Reach 3, 4, 8, and 10 using Natural Channel design principles, and conduct a Schedule 'B' EA
- Conduct a Schedule 'B' EA to facilitate the new outlet west of Area 'B', for the purpose of developing a preferred configuration and a means of securing a right of drainage.



Next Steps

The Draft Master Plan Report will be made available for Public Review for 30 days

- Comments and feedback will be incorporated into the Final Report where necessary;
- The Final Report will be brought forward to County Council for approval.

Thank you very much

Questions and Comments Welcome



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Ken Smith, P.Eng.

February 2021



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