



REPORT

Council

January 27, 2025

FROM: Transportation and Engineering Department

DATE: January 14, 2025

SUBJECT: **Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study**

LOCATION: Fourteen Mile Creek and McCraney Creek from Dundas Street to Lake Ontario

WARD: Ward 2 , 5, 7

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RECOMMENDATION:

That the Notice of Completion for the Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study, Municipal Class Environmental Assessment Study be published, commencing a 30-day public review period from April 1, 2025, to April 30, 2025.

KEY FACTS:

The following are key points for consideration with respect to this report:

- In 2008 the *Town-Wide Flood Prioritization Study Review* identified, at a high-level, flood-prone areas throughout the town, including Fourteen Mile Creek and McCraney Creek watersheds.
- The Fourteen Mile Creek and McCraney Creek Study Flood Mitigation Opportunities Study (herein referred to as the Study) is a follow up to the 2008 study and includes a detailed assessment of riverine flood risk and recommends works to reduce these risks, in accordance with the Municipal Class Environmental Assessment (MCEA), Master Plan Process.
- The recommendations to mitigate creek flood risks include a combination of green infrastructure, a crossing upgrade along McCraney Creek at Lakeshore Road and berming (where feasible) when carrying out future creek erosion mitigation projects.

- The EA recommendations will be assessed through the lens of the Rainwater Management Financial Plan to prioritize against all other stormwater related infrastructure projects.
- An Environmental Study Report has been compiled, documenting the selection of the preferred alternatives. This report, subject to Council's endorsement, will be made available for public review, commencing April 1, 2025, to April 30, 2025.

BACKGROUND:

Town-wide Flood Prioritization Study identified flood-sensitive sites and subsequent creek studies have been completed and currently underway.

In 2008, the town compiled the findings from a long list of historical studies into one comprehensive document which was used to quantify the magnitude of riverine flood risk exposure in Oakville. Over 40 flood-sensitive sites were identified and documented in the 2008 *Town-Wide Flood Prioritization Study Review* report (Philips Engineering Ltd., 2008). The report contains details on each flood sensitive area, mapping, and high-level options for mitigation.

Subsequent detailed studies of those creek channel reaches with flood sensitive sites were initiated to determine the most viable and responsible mitigation options. Follow-up flood mitigation studies to date include:

- Munn's Creek Flood Mitigation Opportunities Study (Completed in 2017)
- Sheldon Creek Flood Mitigation Opportunities Study (Completed in 2019)
- Joshua's Creek Flood Mitigation Opportunities Study (Completed in 2024)
- Lower Morrison and Lower Wedgewood Creeks Flood Mitigation Opportunities Study (Completed in 2024)

As part of the 2008 flood study, several creek flood prone sites were identified within Fourteen Mile Creek and McCraney Creek watersheds.

COMMENT/OPTIONS:

The town retained WSP to complete the Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study as a Master Plan study carried out under the Municipal Class Environmental Assessment process (herein referred to as the "Study").

The Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study assessed flood risks for properties along the creeks.

The purpose of the Study is to establish recommended municipality-led capital work to reduce flood risks. This study is not an exercise in floodplain mapping for the purposes of establishing floodplain Regulatory boundaries, pursuant to the Conservation Authorities Act and under the authority of Conservation Halton (CH).

The limits of the study area extend from Lake Ontario to Dundas Street encompassing the Fourteen Mile Creek and McCraney Creek watersheds that originate north of Dundas Street. McCraney Creek has two main tributaries north of the Canadian National Rail (CNR) tracks: Taplow Creek and Glen Oak Creek.

Flood risks refer to the condition that occurs when any depth of riverine waters is present on a property, and/or a building is exposed to any depth of flood water on one or more of its sides, posing a potential danger to public safety and/or potentially causing damage to property and the environment. Flood risk is quantified into two categories for properties along the creeks:

1. "Property at risk" -
 - a. Flooding risk on property, no flooding in the building
 - b. Flooding risk on property, no buildings (vacant property)
2. "Building at risk" - Flooding risk on property, flooding risk in the building

Fourteen Mile Creek and McCraney Creek Results

Results indicate that flood risk is possible during the more frequent flooding events along the creeks (i.e. less than a 10-year flood event); however, flooding impacts are greatest during the Regional Storm conditions. Specifically, during the Regional storm event, there are 263 properties and 289 buildings at risk for potential flooding.

Flood mitigation alternatives were developed and screened based on functionality (technical merits) initially. Shortlisted alternatives were then comparatively assessed based on natural, social environment, and economic considerations. The alternatives, and the preferred alternatives (recommendations), are summarized in the table below:

ALTERNATIVE SOLUTIONS	DESCRIPTION / RESULT OF EVALUATION
Do Nothing	<p>"Status quo." Do Nothing option is required to be included within the Municipal Class EA to provide a benchmark for the other alternatives.</p> <p>Not recommended</p>

ALTERNATIVE SOLUTIONS	DESCRIPTION / RESULT OF EVALUATION
Low Impact Development Best Management Practices (LID BMPs)	<p>Low impact development (LID) measures to promote infiltration, evaporation, harvesting, filtration, and detention of stormwater.</p> <p>Recommended with other alternatives as part of the Town’s green infrastructure preferred approached to rainwater management – LIDs as a stand alone alternative are not designed to provide flood control for severe flood events, such as a 100-year storm and therefore cannot be considered a standalone solution. However, LIDs for the detention of runoff from more frequent storms will be incorporated during the detailed design phase.</p>
Culvert/ Bridge Upgrades	<p>Culvert and/or bridge upgrades can increase conveyance capacity and mitigate upstream flood conditions or the overtopping of roadways.</p> <p>Recommended alternative (McCraney Creek crossing at Lakeshore) – estimated at \$6.15 million.</p>
Floodplain /Channel Improvements	<p>Improve channel and floodplain flow capacity by widening the channel, local grading improvements, removal of flow obstructions and channel lowering.</p> <p>Not recommended Limited space available to widen channel and floodplain.</p>
Flood Proofing Buildings	<p>Buildings can be flood proofed by sealing low building openings or alternatively by constructing localized berms and/or flood walls.</p> <p>Recommended alternative (berms) - estimated at \$1.8 million.</p>
Modifying Culvert Inlets	<p>Change existing culvert inlets to prevent debris from blocking the inlet.</p> <p>Not recommended Ineffective at reducing flooding for larger storm events (i.e., flows greater then a 2-year storm event.</p>
Roadway Profile Modifications	<p>Modify roadway profiles to reduce the upstream channel flooding by lowering the road, allowing more water to flow over the road and create less back-up upstream.</p> <p>Not recommended Lowering roadway profile would negatively impact vehicle movement over roadways during storm events.</p>

ALTERNATIVE SOLUTIONS	DESCRIPTION / RESULT OF EVALUATION
Flood Storage (Off-Line/On-Line)	<p>Store flood waters to reduce peak flows using off-line and/or online surface ponds and underground storage tanks.</p> <p>Not recommended High cost and minimal benefit in decreasing property and buildings at risk (off-line storage). Not permissible due to ecological and regulatory concerns (on-line storage).</p>
Flow Diversion	<p>The use of a channel or pipe to convey flow/drainage away from high-risk flood areas to locations further downstream within the same creek, or within another creek system that has capacity.</p> <p>Not recommended High cost and minimal benefit in decreasing property and buildings at risk</p>
Over Control North of Dundas Street.	<p>Provide additional flood storage within planned stormwater management facilities (SWMF) north of Dundas Street to reduce flows within Fourteen Mile Creek.</p> <p>Not recommended Storage north of Dundas Street would provide minimal flow reduction south of QEW.</p>
Reinforce /Optimize Crossings	<p>Modifying and reinforcing existing crossings to optimize flood storage.</p> <p>Not recommended Existing culverts are already optimized to the full extent to provide flow reduction south of QEW.</p>
Combination	<p>Combination of the foregoing alternatives used to strategically improve flood mitigation effectiveness.</p> <p>Recommended alternative</p>

The preferred alternative is a combination green infrastructure (LID), a McCraney Creek crossing upgrade, and floodproofing in the form of berms in the amount of approximately \$8 million.

The McCraney Creek crossing upgrade at Lakeshore Road, at the detailed design stage will need to consider property boundaries, construction access, road design, structural design, existing utilities, soil conditions, stream morphology, and natural heritage impacts. Further assessment of the crossing was carried out through the

town’s McCraney Creek Bridge Replacement EA Study. Design of this structure will commence in 2025. The 10-year capital forecast identifies that construction will commence in 2028 with utility work in the first year, followed by bridge reconstruction in 2029.

Berming along McCraney Creek and 14 Mile Creek will require full participation from landowners as it may impact private property use and require significant tree removal. Notably, some of the identified berming areas coincide with areas of monitoring for potential future erosion mitigation projects (as identified in the Town’s 2021 Creek Inventory and Assessment). Therefore, it is recommended that the feasibility of berming along the creek is to be assessed during future erosion mitigation works, considering that the area will need to be disturbed at that time. Currently, there is one berming area along McCraney Creek, just north Rebecca Street, scheduled for erosion mitigation work as part of the 10-year capital plan with design commencing in 2031 and construction in 2034.

Future detail design phase of the recommended alternatives will incorporate green infrastructure design.

Town Council passed a motion that green infrastructure be preferred, and grey infrastructure used only where necessary and will be adopted under the town’s Climate Action Plan.

The Study assessed Low Impact Developments (LIDs) as an option to reduce flood risk, however LIDs is not intended for flood control during severe storms. LIDs employ various strategies, such as infiltration, evaporation, harvesting, filtration, and stormwater detention at a smaller scale. During the detail design phase, LIDs such as tree conservation, soil improvements, and infiltration measures will be incorporated.

The implementation of the preferred alternatives will benefit 110 properties by reducing flood risk or removal from flooding during the Regional storm event.

	Locations At Risk during Regional Storm Flooding	Reduced Flood Risk	Removed from Flood Risk	Remaining Properties at Risk
<i>Property at Risk</i>	263	32	35	196
<i>Building at Risk</i>	289	9	34	246

After implementation of the preferred alternatives, there will be properties that will continue to experience flood risks, as there are limited engineering solutions on publicly owned lands that can assist in the mitigation of the risks. However, there are several resources available to Oakville residents to help ensure their safety and minimize property damage due to flooding. This includes the Town of Oakville's Emergency Preparedness webpage and the Region of Halton's Community Hazards webpage. Additional flooding resources are available through Conservation Halton's webpages and the University of Waterloo Intact Centre on Climate Adaptation at www.intactcentreclimateadaptation.ca/.

Rainwater Management Financial Plan

The Rainwater Management Financial Plan (RWMP) is a long-term plan to improve climate resiliency and protect our stormwater infrastructure and natural assets.

The RWMP takes comprehensive approach to integrate the state of good repair and increase resiliency of the town's stormwater network based on various studies and assessments completed to date. The multi-phase RWMP will deliver a financing plan that provides an all-inclusive approach to planning and implementing stormwater-related infrastructure renewal and improvement projects into the future.

Results from the Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study will be assessed through the lens of the RWMP to prioritize recommendations along with all other stormwater initiatives, including all other riverine flood study recommendations and related creek erosion mitigation recommendations. The RWMP has developed a matrix to prioritize the projects from the various study recommendations that considers, asset management principles, cost/benefit, risk and likelihood of service impact and alignment/coordination with other projects so that projects in areas with the greatest risk and provide the most benefit are prioritized first.

Each watershed has its own unique characteristics that influence the nature of flooding within an area, this includes features such as drainage area, topography, proximity of urban land use to watercourse, etc. As a result of these differences, a consistent level of flood mitigation protection cannot always be achieved from one creek system to another or in one area to another within the same creek system. For example, not all mitigation options are able to protect a neighbourhood entirely from flooding at the more extreme events (i.e. 100-year storm, Regional storm event). The RWMP will evaluate these protection measures in conjunction with their cost-effectiveness and level of flood protection as it prioritizes projects for future capital budgets.

Conclusion

The Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study has been compiled documenting the selection of a recommended preferred alternative. Appendix B is the consultant's Executive Summary Report.

In accordance with a Municipal Class EA Master Plan undertaking, the project file must be made available for a minimum 30-day public review period and staff are proposing to do so after the final Consultant's report is received, commencing April 1, 2025, to April 30, 2025. The Report will be made available on the town's website and special accommodations to view hard copies will be determined on an as needed basis. A Notice of Study Completion will be sent out to the public and stakeholders and posted on the town's website and will have details on the public review period and how those interested can provide comments. Should no requests be made to Minister of Environment, Conservation and Parks requiring further study on the grounds of prevention, mitigation, or remedy of adverse impacts on constitutionally protected Aboriginal and treaty rights during the review period, the study will be deemed approved.

Moving forward, the Study recommendations will be integrated in the town's RWMP which will prioritize works against all other works related to stormwater assets.

CONSIDERATIONS:

(A) PUBLIC

Property owners located within the Study areas have received notifications about the Study and have been invited to attend Public Information Centres (PICs). Community groups, including Oakville Green and local residents' association, were also informed at various stages during the Study.

Three (3) PICs held on November 14, 2013, December 2, 2014, and November 6, 2024, presented an overview of the issues, background and modelling results, evaluation, and preliminary preferred alternatives. Feedback was gathered from residents, community groups, and agencies such as Conservation Halton, the Region of Halton, the Ministry of Environment, Conservation, and Parks, and the Ministry of Natural Resources and Forestry.

Additionally, Indigenous groups, including the Mississauga of the Credit First Nation, Haudenosaunee Confederacy Council, Metis Nations of Ontario, and Six Nations of Grand River, were provided opportunity to engage with the project team, ask questions, and provide feedback.

(B) FINANCIAL

There is currently no financial impact from the Study recommendations. Recommendations from the Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study will be evaluated alongside other stormwater initiatives, using the RWMP framework to prioritize projects for the capital forecast which is pending the development of a sustainable financing plan which is currently underway.

(C) IMPACT ON OTHER DEPARTMENTS & USERS

Recommendations from the Study have taken into consideration feedback from Parks and Open Space, Asset Management, Planning and Development and Legal, and external parties such as Conservation Halton, Region of Halton, area stakeholders and residents.

(D) COUNCIL STRATEGIC PRIORITIES

This report addresses Council's strategic priority:

- Environmental Sustainability

(E) CLIMATE CHANGE/ACTION

The recommendations of the report support the incorporation of climate change resiliency through flood protection measures. This initiative offers community benefits by safeguarding private and public lands, thereby mitigating the risks posed by more frequent and severe rainstorms resulting from climate change.

APPENDICES:

- Appendix A - Map of Study Area
- Appendix B - Fourteen Mile Creek and McCraney Creek Flood Mitigation Opportunities Study Executive Summary.

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